SFD Report

Rhino Refugee Settlement and Host Community
Uganda

Final Report

This SFD Report - SFD Intermediate - was prepared by

GFA Consulting Group GmbH

On behalf of *Water Supply and Sanitation for Refugee Settlements and Host Communities in Northern Uganda* (WatSSUP Programme) implemented by GIZ with funding from BMZ

Date of production: 21 December 2020

Updated on: 31 January 2021

Last update: 07 July 2021

SFD Report Rhino, Uganda, 2021

Produced by:

Leonie Hyde-Smith and Moses Nyakana

This SFD report was prepared by GFA Consulting GmbH and commissioned by GIZ GmbH

This Executive Summary and SFD Report are available from:

THE REPUBLIC OF UGANDA

Ministry of Water and Environment

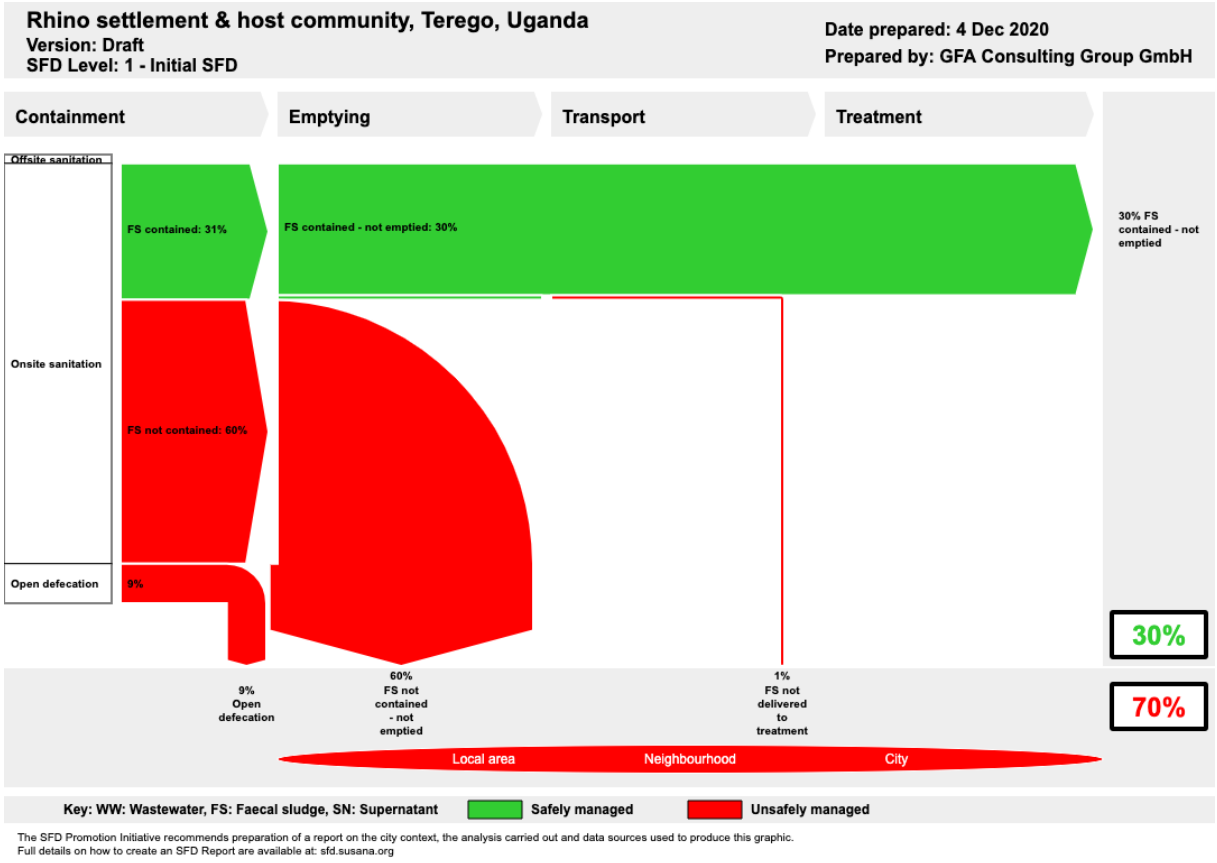
german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by:

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

GFA CONSULTING GROUP

1. The SFD Graphic



The SFD Promotion Initiative recommends preparation of a report on the city context, the analysis carried out and data sources used to produce this graphic.
Full details on how to create an SFD Report are available at: sfd.susana.org

2. Diagram information

SFD Level:

Intermediate.

Produced by:

This SFD report was produced by GFA Consulting Group GmbH and commissioned by GIZ GmbH.

Collaborating partners:

GIZ Water Supply and Sanitation for Refugees Settlements and Host Communities in Northern Uganda – GIZ WatSSUP Programme.

Status:

This is a final SFD report.

Date of production: 21/12/2020

Date of Revision: 07/07/2021

3. General city information

Rhino Refugee Settlement is in the North-West Nile Region of Uganda. The settlement covers an area of approximately 225 km^2 and stretches over parts of Odupi, Omugo, and Uriama sub-counties (Terego District) and extends into Rigbo sub-county in Madi-Okollo District. The settlement is divided into ten zones and has 42 villages. It is important to understand that Rhino refugee settlement is not a continuous geographical area, but the refugees settle in 'pockets' in the area (UNDP, 2018). The host community constitutes of the population of the four sub-counties in which these settlement pockets are located. As a result, for the scope of this report, we assume a total population of 275,333, of which around 44% are refugees, and 56% are non-refugee host communities.

Rhino settlement and the host communities can be characterised as rural with some towns/urban areas in host communities. The main economic activity among both the host and refugee communities is some form of agriculture, mainly crops (ILO, 2020).

The climate in the District is characterised by a unimodal rainfall pattern with a rainy season between April and November an a dry season between December and March (Arua District Local Government, 2009).

4. Service outcomes

Containment: Rhino refugee and host communities are rural communities. The entire population relies on onsite facilities, mainly unlined pit latrines which are abandoned when full. There is conflicting information about the sharing of latrines.

Some institutions such as healthcare facilities, district offices and schools in the host community as well as in the refugee settlement have semi-lined or lined latrines and there are very few flush toilets (BIBCO Investments Ltd, 2019; Arua District Office, 2020).

Seasonal flooding, and the collapse of pits latrines due to sandy soils and raised groundwater tables during the rainy season is a challenge (Arua District Office, 2020).

Emptying and transport: The emptying of household toilets is not common in the reporting area. Private cesspool emptying businesses are contracted to empty institutional latrines.

Treatment/Disposal/End-use: There is currently no treatment facility for faecal sludge in Terego District. The private emptying businesses are therefore left to come into agreement with private landowners in the host communities to dump the sludge in pits on private land. Due to lack of demand, there is no reuse of sludge (Muammar Holdings Ltd, 2020). There are reports of illegal dumping of waste onto public land (BIBCO Investments Ltd, 2019).

5. Service delivery context

At the national level, the Ministry of Water and Environment (MWE) is responsible for overall coordination, policy formulation, the setting of standards, inspection, monitoring, and technical back-up and initiating legislation.

The mandate of the MWE regarding sanitation and hygiene is limited to development of public sanitary facilities and promotion of good practices of hygiene and sanitation in small towns and rural growth centres.

The Urban Water and Sewerage Department (UWSD) within MWE takes care not only of gazetted urban areas but also of piped water systems supplying rural growth centres. It has set up two sets of regional deconcentrated units:

- Water and Sanitation Development Facilities (WSDFs) for the implementation of new water supply and sanitation schemes and major rehabilitations.
- Umbrella Authorities for operation and maintenance.

The National Environment Management Authority (NEMA) is responsible for licensing all private businesses that are dealing with waste. NEMA also registers private entrepreneurs in the waste sector.

The Ministry of Health (MoH) is responsible for the promotion of public health and sanitation at the household level. This ministry operates under the National Health Policy (1999), and the Local Governments Act (1997). The Environmental Health Policy (2005) defines environmental health priorities of the Government as well as providing a framework for the development of services together with programs at national and local government levels. It reinforces the Public Health Act (2000) with the overall policy objective to achieve 100% hygienic sanitation facilities in urban and rural areas. The policy implies that management, responsibility, and ownership by users of sanitation facilities result in more hygienic facilities.

6. Overview of stakeholders

The main stakeholders in the current institutional and organisational set-up in Rhino settlement and host community are summarised in Table 1.

Table 1: Key stakeholders Rhino refugee settlement and host community

Key Stakeholders	Institutions / Organizations /
Public Institutions	Office of the Prime Minister (OPM) Terego District Office (not established yet), Arua District Office, Northern Umbrella of Water and Sanitation, MWE
Non-governmental Organisations	Water Mission, World Vision Uganda, Uganda Red Cross Society, OXFAM, Malteser and Ceford
Private Sector	Muammar Holdings Ltd (private cesspool emptying business/contractors of Water Mission)
Development Partners, Donors	UNHCR, GIZ WatSSUP

7. Process of SFD development

Prior to the field mission, the authors prepared a draft version of the SFD matrix, graphic and selection grid as well as a draft write-up of the justification of all major assumptions used to generate the SFD graphic. This first draft was based on extensive literature and document review as well as discussions with WatSSUP and NaSa staff. During the field mission, the assumptions and estimates were discussed with the key informants who reviewed and validated the assumptions and estimates.

In total, ten key informant interviews were carried out during the field visits in Terego District in December 2020. Site visits and observations were beneficial for the data collection process as they gave the authors a clearer understanding of the framework conditions in the host communities and the refugee settlement.

8. Credibility of data

This report is based on desk-based literature review as well as primary data collected during a dedicated field mission to Terego District in December 2020. In total, ten key informant interviews were carried out along with field visits and observations. A draft of the service outcomes section including SFD matrix, selection grid and the graphic was validated and reviewed with key stakeholders during the field mission.

There is no detailed sanitation mapping data for the area. Major uncertainties exist around the percentage of the population practising open defecation, the vulnerability of groundwater and the percentage of the population sharing toilets with neighbours.

Rhino refugee settlement and the host community is a setting in which most toilets are unlined pits that get abandoned once full. In such a scenario, the risk of groundwater contamination is the main factor determining whether the sludge is considered safely managed or not. In the absence of detailed sanitation maps, we had to estimate the groundwater pollution risk based on consultancy reports and the expert opinion of key informants but more rigorous approaches to assessing the groundwater vulnerability would improve the quality of the report.

9. List of data sources

- BIBCO Investments Ltd. 2019. *Consultancy Services for Feasibility Study and Design of Sludge Waste Treatment Plant in Rhino Camp Refugee Settlement, Arua District, Uganda. Final Design Report.* Kampala: OXFAM.
- Eberhard, R. 2018. *Access to Water and Sanitation in Sub-Saharan Africa. Case Study: Uganda.* Eschborn: Gesellschaft fuer Internationale Zusammenarbeit (GIZ).
- Kasozi, S. 2017. *Hydrogeological study in Imvepi refugee settlement of Lugbari and Impevi Parishes, Odupi Sub-county, Terego County in Arua District (Final Report).* Kampala, Uganda: OXFAM NOVIB.
- Milnes, E. 2017. *Mission Report: Hydrogeological field mission in West Nile (Uganda)* Kampala, Uganda: UNHCR.
- MoH. 2019. *Arua District Rural Sanitation Report.* Kampala, Uganda: Ministry of Health - Environmental Health Division.
- Schoebitz, L., Niwagaba, C. and Strande, L. 2016. *SFD Report Kampala.* Duebendorf, Switzerland: Sandec, Eawag.
- UBOS. 2014. Northern Region - Parish Level Profiles (Census 2014). [Online]. [Accessed 26 November 2020]. Available from: https://www.ubos.org/explore-statistics/20/
- UBOS. 2019. Population projections by sub-county and sex (2015-2030). [Online]. [Accessed 26 November 2020]. Available from: https://www.ubos.org/?pagename=explore-publications&p_id=20
- UNDESA. 2020. *Sustainable Development Knowledge Platform.* [Online]. [Accessed 12 December 2020]. Available from: https://sustainabledevelopment.un.org/sdgs
- UNDP. 2018. *Understanding Land Dynamics and Livelihood in Refugee Hosting Districts of Northern Uganda.* Kampala, Uganda: United Nations Development Programme (UNDP).
- UNHCR. 2020b. *Refugees and Asylum-Seekers in Uganda. Uganda Refugee Response - October 2020.* Kampala: United Nations High Commissioner for Refugees.
- UNHCR. 2020c. Rhino camp consolidated sanitation matrix - 21.09.2020. unpublished. [Online].
- UNHCR. 2020d. *UNHCR WASH Dashboard for Refugee Settings.* [Online]. [Accessed 03 December 2020]. Available from: https://wash.unhcr.org/wash-dashboard-for-refugee-settings/

SFD Rhino Refugee Settlement and host community, Uganda, 2021

Produced by:

GFA Consulting Group GmbH, Leonie Hyde-Smith & Moses Nyakana

Editing:

GFA Consulting Group GmbH

Review:

Charles Niwagaba

On behalf of:

Water Supply and Sanitation for Refugee Settlements and Host Communities in Northern Uganda (WatSSUP Programme) implemented by GIZ with funding from BMZ

This Executive Summary and the SFD Report are available from: www.sfd.susana.org

Table of Contents

1 City context 5
2 Service Outcomes 7
2.1 Overview 7
2.1.1 Containment 7
2.1.2 Emptying and transport 8
2.1.3 Treatment/Disposal/End-use 8
2.2 SFD Matrix 9
2.2.1 Risk of groundwater contamination 9
2.2.2 SFD Matrix Explanation – Containment 10
2.2.3 SFD Matrix Explanation – Emptying, Transport, Treatment 12
2.2.4 Discussion of data uncertainties/challenges 12
2.3 SFD Graphic 13
3 Service delivery context 14
OBJ
3.1.1 Policy 14
3.1.2 Institutional roles 16
3.1.3 Service provision 20
3.1.4 Service standards 21
3.2 Outputs 23
3.2.1 Monitoring and reporting access to services 23
4 Stakeholder Engagement 24
4.1 Key informant interviews 24
4.2 Observations 24
4.3 Validation of results 24
5 Acknowledgements 24
6 References 25
7 Appendix 27
7.1 Appendix 1: Stakeholder identification 27
7.2 Appendix 2: Tracking of stakeholder engagement 28
7.3 Appendix 3: SFD matrix 29
7.4 Appendix 4: SFD Graphic 30
7.5 Appendix 5: UNHCR WASH Priorities by phase 31

List of Tables

Table 1: Key stakeholders Rhino refugee settlement and host community II
Table 2: Population estimates Rhino refugee and host communities 6
Table 3: Assumptions for groundwater pollution risk assessment 10
Table 4: Distribution of sanitation technologies in refugee settlements and host communities 11
Table 5: Distribution of the population in refugee settlements and host communities 11
Table 6: Distribution of containment types used for SFD matrix 12
Table 7: Main legal and policy documents for the sanitation sector 14
Table 8: Summary of institutional responsibilities 16
Table 9: Summary of main regulations and standards in the Ugandan water and sanitation sector 22
Table 10: Summary of most relevant Sphere excreta management standards 22
Table 11: Stakeholder identification 27
Table 12: Stakeholder engagement tracking 28

List of Figures

Figure 1: Map showing Rhino camp 5
Figure 2: Selection grid for Rhino refugee settlement and host community 7
Figure 3: SFD Matrix 9
Figure 4: SFD Graphic 13
Figure 5: Institutional Roles in the Water Sector (status 2017) 14

Abbreviations

DEA	Department of Environmental Affairs
DWD	Directorate of Water Development
DWRM	Directorate of Water Resources Management
DWSCG	District Water and Sanitation Conditional Grant
EAC	East African Community
FSM	Faecal Sludge Management
FSTP	Faecal Sludge Treatment Plant
GIZ	German Development Cooperation
ILO	International Labour Organisation
IWRM	Integrated Water Resources Management
JPF	Joint Partnership Fund
JWESSP	Joint Water and Environment Sector Support Program
KAP	Knowledge, Attitudes and Practices
LVBC	Lake Victoria Basin Commission
MoES	Ministry of Education and Sports
MoFPED	Ministry of Finance, Planning and Economic Development
MoH	Ministry of Health
MoLHUD	Ministry of Lands, Housing and Urban Development
MoU	Memorandum of Understanding
MWE	Ministry of Water and Environment
NaSa	GIZ Sector Programme Sustainable Sanitation
NBI	Nile Basin Initiative
NEMA	National Environment Management Authority
NSGE	National Strategy for Girls' Education
NWSC	National Water and Sewerage Corporation (NWSC)
OPM	Office of the Prime Minister
RGCs	Rural Growth Centers
RWUs	Regional Water Utilities
SDGs	Sustainable Development Goals
SFD	Shit-flow Diagram
TSU	Technical Support Unit
UBOS	Uganda Bureau of Statistics
UNDP	United Nations Development Programme
UNHCR	United Nations High Commissioner for Refugees

UNICEF	United Nations Children's Fund
URCS	Uganda Red Cross Society
UWSA	Umbrella of Water and Sanitation Authority
UWSA-N	Umbrella of Water and Sanitation Authority - North
UWSD	Urban Water and Sanitation Department
WASH	Water, Sanitation and Hygiene
WatSSUP	Water Supply and Sanitation for Refugees Settlements and Host Communities in Northern Uganda (GIZ Programme)
WMZs	Water Management Zones
WPC	Water Policy Committee
WSDF-N	Water and Sanitation Development Facility - North
WSDFs	Water and Sanitation Development Facilities
WSSAs	Water Supply and/or Sewerage Authorities

1 City context

Rhino Refugee Settlement is one of the oldest refugee settlements in Uganda and was established in the 1980s. The settlement is in the North-West Nile Region of Uganda. The settlement covers an area of approximately 225 km^2 and stretches over parts of Odupi, Omugo, and Uriama sub-counties (Terego District) and extends into Rigbo sub-county in Madi-Okollo District.

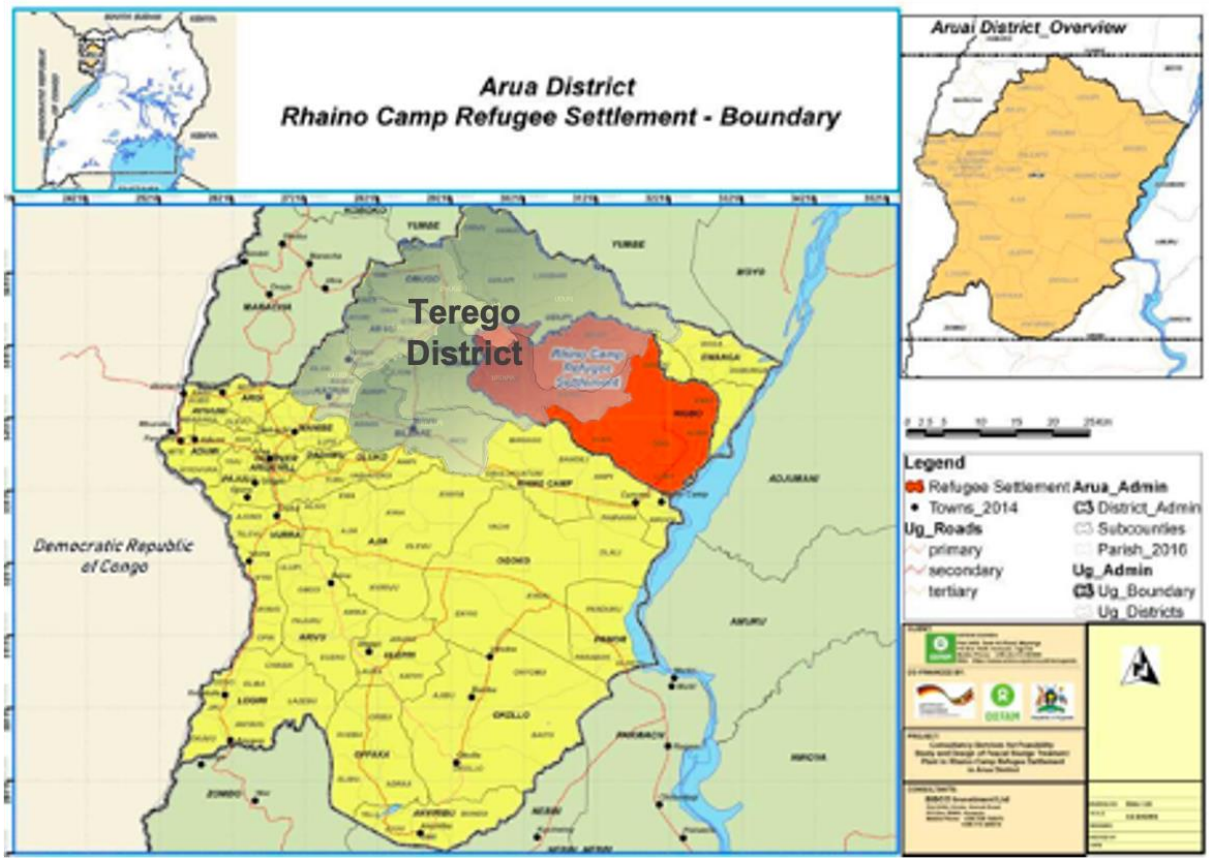


Figure 1: Map showing Rhino camp

*Source: adapted from BIBCO Investments Ltd (2019)

The settlement is divided into ten zones and has 42 villages. Due to the influx of refugees in 2016 and 2017, Rhino refugee settlement was extended to cater for new arrivals (UNDP, 2018). It is important to understand that Rhino refugee settlement is not a continuous geographical area, but the refugees settle in 'pockets' in the area. Before the refugee influx, each refugee household used to be allocated a residential plot of 20*30m and cultivation land of 50*50m. Currently, OPM is allocating 50*50m for both settlement and backyard garden (UNDP, 2018).

The host community population constitutes of the population of the four sub-counties in which these settlement pockets are located. As a result, for the scope of this report, we assume a total population of 275,333, of which around 44% are refugees, and 56% are non-refugee host communities (Table 2).

Table 2: Population estimates Rhino refugee and host communities

Area	Population (2020)
Rigbo sub-county*	30,300
Odupi sub-county*	45,300
Omugo sub-county*	51,000
Uriama sub-county*	27,400
Total host-community	**154,000**
Rhino refugee settlement**	121,533
Total	**275,533**

* (UBOS, 2019); ** (UNHCR, 2020b)

Rhino settlement and the host communities can be characterised as rural. The main economic activity among both the host and refugee communities is some form of agriculture, mainly crops (ILO, 2020).

The climate in the District is characterised by a unimodal rainfall pattern (Nsubuga et al., 2014) with one rainy season from April to November and one dry season from December to March. The months of April to July, and the month of October receive light rains. The wettest months are usually August and September with rainfalls of around 120mm/month. The average annual rainfall is 1250mm, and the dry season is between December and March (Arua District Local Government, 2009).

Parts of Rhino settlement are prone to flooding and waterlogging during the rainy season (UNHCR, 2020a).

2 Service Outcomes

2.1 Overview

This section presents the range of infrastructure/technologies, methods and services designed to support the management of faecal sludge through the sanitation service chain in Rhino host and refugee communities (Figure 2). For details on quantitative estimations, refer to Section 2.2.

List A: Where does the toilet discharge to? (i.e. what type of containment technology, if any?)	List B: What is the containment technology connected to? (i.e. where does the outlet or overflow discharge to, if anything?)									
	to centralised combined sewer	to centralised foul/separate sewer	to decentralised combined sewer	to decentralised foul/separate sewer	to soakpit	to open drain or storm sewer	to water body	to open ground	to 'don't know where'	no outlet or overflow
No onsite container. Toilet discharges directly to destination given in List B					Significant risk of GW pollution Low risk of GW pollution					Not Applicable
Septic tank					Significant risk of GW pollution Low risk of GW pollution					
Fully lined tank (sealed)					Significant risk of GW pollution Low risk of GW pollution				T1A3C9	
Lined tank with impermeable walls and open bottom	Significant risk of GW pollution Low risk of GW pollution	Significant risk of GW pollution Low risk of GW pollution	Significant risk of GW pollution Low risk of GW pollution	Significant risk of GW pollution Low risk of GW pollution	Significant risk of GW pollution Low risk of GW pollution					Significant risk of GW pollution Low risk of GW pollution
Lined pit with semi-permeable walls and open bottom	Not Applicable									Significant risk of GW pollution Low risk of GW pollution
Unlined pit										Significant risk of GW pollution Low risk of GW pollution
Pit (all types), never emptied but abandoned when full and covered with soil										T2B7C10 T1B7C10
Pit (all types), never emptied, abandoned when full but NOT adequately covered with soil										
Toilet failed, damaged, collapsed or flooded										T1B9 C1 TO C10
Containment (septic tank or tank or pit latrine) failed, damaged, collapsed or flooded										
No toilet. Open defecation	Not Applicable							T1B11 C7 TO C9		Not Applicable

Figure 2: Selection grid for Rhino refugee settlement and host community

2.1.1 Containment

Rhino refugee and host communities are rural communities, and most households use traditional unlined pit latrines which are abandoned when full. Around 69% of the households in the Rhino refugee settlement have access to a private household latrine (UNHCR, 2020c). There is conflicting information about the sharing of latrines. According to Busquet (2015), sharing of latrines is common in Arua district, but WASH implementing partners in the refugee settlement estimated that sharing of household toilets is rare as households would try to prevent latrines from filling up quickly (Water Mission, 2020). There are no major urban centres in the reporting area, and the entire population relies on onsite sanitation facilities.

NGOs such as Water Mission provide households in the refugee settlement and adjacent host communities with latrine slabs but are not actively involved in latrine construction (Water Mission, 2020). Some institutions such as healthcare facilities, district offices and schools in the host community as well as in the refugee settlement have built permanent latrines (semi-

lined or lined,) and there are very few flush toilets (BIBCO Investments Ltd, 2019; Arua District Office, 2020).

Seasonal flooding is common, and stormwater fills up latrines in low-lying areas during the rainy season. The collapse of pits due to sandy soils and raised groundwater tables during the rainy season is a challenge (Arua District Office, 2020).

2.1.2 Emptying and transport

As mentioned above, the emptying of household toilets is not common in the reporting area. Some institutional toilets are emptied by private cesspool emptying businesses, one of which is also contracted by Water Mission to empty the institutional toilets within the refugee settlement. Since there is no Faecal Sludge Treatment Plant or official disposal site in the District, the sludge is buried on private plots (see below) (Water Mission, 2020). OXFAM has procured an 8m^3 exhauster truck that will be handed over to OPM and used for the desludging of latrines within the refugee settlement (OXFAM, 2020).

2.1.3 Treatment/Disposal/End-use

There is currently no treatment facility for faecal sludge in Terego District. The nearest faecal sludge treatment plant is located in Arua City. It is a state-of the art facility, newly developed and operated by the National Water and Sewerage Corporation. Another faecal sludge treatment plant (FSTP), which will be located nearer, in Imvepi refugee settlement is still under construction by the Uganda Red Cross Society. The private emptying business is therefore left to come into agreement with private landowners in the host communities where pits of about 3*3*3m are excavated, sludge dumped, and hypochlorite added. These pits are fenced off while in use, backfilled with soil as a means of decommissioning. Due to lack of demand, there is no reuse of sludge (Muammar Holdings Ltd, 2020). There are reports of illegal dumping of waste into the environment (BIBCO Investments Ltd, 2019).

There are plans for the construction of a FSTP in Rhino settlement funded by OXFAM (BIBCO Investments Ltd, 2019) comprising of eight (8) constructed wetlands, twelve (12) sludge drying beds and four (4) horizontal rock filters. The construction of this treatment plant is expected to start soon. The effluent is expected to meet national regulatory standards for release to the natural environment. Furthermore, a FSTP and solid waste treatment plant in neighbouring Imvepi settlement funded by the Red Cross Society is ongoing. This FSTP in Rhino camp is still in the planning phase, but the FSTP in Imvepi is currently under construction.

The FSTP currently being constructed in Imvepi is funded by the Uganda Red Cross Society (Uganda Red Cross Society, 2020) and is approximately 95% complete. It is designed to treat 10 m^3/day of FS. The FSTP in Imvepi comprises of: 1) Preliminary treatment, which basically consists of a receiving area and two sets of bar screens of 10 and 5 mm spacings; 2) Dewatering using uncovered sludge drying beds; 3) Secondary anaerobic treatment using an anaerobic baffled reactor; 4) Secondary aerobic/facultative treatment using a horizontal gravel filter; and finally, 5) Post treatment using aerobic polishing/maturation pond.

2.2 SFD Matrix

Rhino settlement & host community, Terego, Uganda, 4 Dec 2020. SFD Level: 1 - Initial SFD
Population: 275533
Proportion of tanks: septic tanks: 100%, fully lined tanks: 100%, lined, open bottom tanks: 1

System label	Pop	F3	F4	F5
System description	Proportion of population using this type of system	Proportion of this type of system from which faecal sludge is emptied	Proportion of faecal sludge emptied, which is delivered to treatment plants	Proportion of faecal sludge delivered to treatment plants, which is treated
T1A3C9 Fully lined tank (sealed) connected to 'don't know where'	1.0	100.0	0.0	0.0
T1B11 C7 TO C9 Open defecation	9.0			
T1B7C10 Pit (all types), never emptied but abandoned when full and covered with soil, no outlet or overflow	30.0			
T1B9 C1 TO C10 Toilet failed, damaged, collapsed or flooded, connected to sewer, soak pit, open drain or storm sewer, water body, open ground or 'don't know where'	16.0			
T2B7C10 Pit (all types), never emptied but abandoned when full and covered with soil, no outlet or overflow, where there is a 'significant risk' of groundwater pollution	44.0			

Figure 3: SFD Matrix

2.2.1 Risk of groundwater contamination

According to Milnes (2017), the majority of Rhino refugee settlement is in an area with a porous aquifer system. The porous aquifer is composed of layered aquifer horizons of mostly unconsolidated or lightly consolidated sediments. Milnes (2017) collected water samples for bacteriological analysis along the entire water supply chain in Rhine refugee settlement. Whilst the results showed a high degree of contamination at all tap-stands and water points that were supplied by storage tanks, samples taken directly at the hand pumps did not reveal any contamination. This indicates that at least at the time of the field mission, there was no groundwater source contamination at the water points in the camp.

Most of the groundwater in the porous aquifer zone is found at a depth of more than 20m. The topsoil is mostly alluvium and clay (Kasozi, 2017).

The risk of groundwater contamination was assessed based on the groundwater pollution risk estimation tool provided on the SFD website. Table summarises the input data in the tool and the respective groundwater risk result.

Table 3: Assumptions for groundwater pollution risk assessment

Indicator according to SFD Groundwater Risk Estimation Tool	Input / Assumption
Rock type in the unsaturated zone	Fine sand, silt, clay
Depth of groundwater table	> 10m
% of sanitation facilities that are located < 10m from groundwater sources	Less than 25%
% of sanitation facilities, if any, that are located uphill of groundwater source	Greater than 25%
Water production technology used	Protected boreholes, protected dug wells or protected springs where adequate sanitary measure are in place
Overall Risk of groundwater pollution (as per SFD GW Risk estimation tool)	**Significant risk (Low risk)**

Rhino refugee settlement and host communities are located in a hilly area interconnected to valleys. Most of the population relies on groundwater for their drinking water supply. According to information provided by key informants, most boreholes and water sources are located in low lying areas downhill from settlement pockets (Arua District Office, 2020; Terego District Office, 2020). The result of the groundwater risk assessment changes from low risk to significant risk depending on whether the percentage of sanitation facilities that are located uphill of groundwater sources is estimated as less than 25% or greater than 25%. In the absence of detailed sanitation mapping data, we assumed that 60% of the population resides in an area with a significant risk of groundwater pollution and 40% of the population resides in an area with low risk of groundwater pollution. This distribution is a rough estimate based on the available maps and hydrogeological assessments, which was discussed and agreed upon with the relevant stakeholders during the field mission. Assessing the groundwater pollution risk has been a major limitation of the SFD assessment (☞ Section 2.2.4).

2.2.2 SFD Matrix Explanation – Containment

It is important to note that there is no integrated data on sanitation coverage and technologies used for the refugee settlements and the host community. The only data for sanitation coverage at sub-county level is provided in the 2014 census. However, the census data only gives the proportion of households that have any sanitation facility. For the sub-counties forming the host community of Rhino settlement, the census data gives an average of 23% of households with any type of toilet (UBOS, 2014). Considering that the census data is outdated and might have limited accuracy, the authors decided to estimate the sanitation coverage based on the Arua District Rural Sanitation Report (MoH, 2019). The sanitation data for Rhino settlement were taken from a recent socio-economic household survey that was carried out in Rhino settlements as part of the feasibility study for the planned FSTP (BIBCO Investments Ltd, 2019). This data is presented in Table 4.

Table 4: Distribution of sanitation technologies in refugee settlements and host communities

Sanitation technology used	Non-refugee population (host community)		Rhino refugee settlement
	(MoH, 2019)	Adapted estimate after key informant interviews	(BIBCO Investments Ltd, 2019)
Private pit latrine	74%	-	75%
Shared pit latrine (neighbours)	MD	-	15%
Shared pit latrine (public)	MD	N/A	2%
Pit latrine (private or shared)	MD	90%	92%
A household with flush pour-flush toilets	3%	<1%	MD
Open defecation	MD	10%	8%

MD = missing data

As mentioned above, there is conflicting information about the practice of sharing of toilets in the area (Busquet, 2015; Water Mission, 2020). Unfortunately, the Arua District Rural Sanitation Data does not give any information about the proportion of households without own latrine and who are using the toilet of their neighbours or public latrines against the proportion of those households that practise open defecation. It can further be assumed that most of the households with a flush or pour-flush toilet are located in urban areas with household water connections. For the rural communities in the host community, this proportion is likely to be lower. In Table 4 we have adapted the figures from the Arua District Rural Sanitation Report and validated these assumptions with key stakeholders during the field mission.

Subsequently, the authors estimated the proportions for the SFD matrix based on calculating the weighted average from separated data as illustrated by Table 5.

Table 5: Distribution of the population in refugee settlements and host communities

Location	Population	% of the total population
Odupi, Omugo, Uriama, Rigbo sub-counties (host community)	154,000	56%
Rhino refugee settlement	121,533	44%
Total	275,533	100%

It was assumed that households with water-based toilets and the public sanitation facilities in the camp are toilets with holding tanks. The estimates given by the above mentioned sources were validated through observations and key informant interviews with stakeholders during the field visits. Limitations to the data used are presented in Section 2.2.4.

Subsequently, the general technologies were transferred to the system descriptions used in the SFD Manual. Based on the results of the groundwater contamination risk assessment using the SFD groundwater risk evaluation tool (Section 2.2.1) it was assumed that 60% of the population resides in an area with a significant risk of groundwater pollution and 40% of the population resides in an area with low risk of groundwater pollution. It was furthermore assumed that at least 15% of the unlined pit latrines in the refugee settlements and 20% of the unlined pit latrine in the host communities could be categorised as *T1B10C10 Containment*

(fully lined tanks, partially lined tanks and pits, and unlined pit latrines) failed, damaged, collapsed or flooded – with no outlet or overflow. This assumption was based on the authors' observations as well as on the climatic conditions with regular flooding of facilities and the prevalent poverty in both the camp and the town, which impedes the users' capacity for preventive maintenance and repairs and confirmed by the Terego District Health Officer. Even though it can be assumed that there are some badly constructed septic tanks (e.g., no proper soak pit, not fully sealed), this category was not further subdivided since the low total share of this technology would have made any further dissection meaningless. Table 6 summarises the resulting percentages used for developing the SFD Matrix.

Table 6: Distribution of containment types used for SFD matrix

ID (Reference)	Description	Non-refugee population	Rhino refugee settlement	Total rounded
T1A3C9	Fully lined tank (sealed)	0%	1%	**1%**
T2B7C10	Pit (all types), never emptied but abandoned when full and covered with soil, no outlet or overflow where there is "significant risk" of groundwater pollution	43%	46%	**44%**
T1B7C10	Pit (all types), never emptied but abandoned when full and covered with soil, no outlet or overflow	29%	31%	**30%**
T1B10C10	Containment (fully lined tanks, partially lined tanks and pits, and unlined pit latrines) failed, damaged, collapsed or flooded – with no outlet or overflow.	18%	14%	**16%**
T1B11C7TOC9	Open defecation	10%	8%	**9%**

2.2.3 SFD Matrix Explanation – Emptying, Transport, Treatment

As explained in Section 2.1.2 and 2.1.3 only a very small part of the toilets in the area is emptied, and none of the sludge is currently treated.

2.2.4 Discussion of data uncertainties/challenges

As explained above, there is no detailed sanitation mapping data for the area. Major uncertainties exist around the percentage of the population practising open defecation and the percentage of the population sharing toilets with neighbours. However, whether people use individual latrines or share toilets with their neighbours does not influence the outcome of the SFD.

Stakeholders reported that there is are high rates of 'sporadic' open defecation practised by farmers when working on their fields during the day. Fields are often located far away from the dwellings and household toilets, and thus people do not have any other option than using 'bush facilities' during the day, when they are working in their gardens. We have included this

sporadic open defecation into our estimates by rounding up, but there remains uncertainty around the magnitude of the challenge.

Rhino refugee settlement and the host community is a setting in which most toilets are unlined pits that get abandoned once full. In such a scenario, the risk of groundwater contamination is the main factor determining whether the sludge is considered safely managed or not. In the absence of detailed sanitation maps, we had to estimate the groundwater pollution risk based on consultancy reports and the expert opinion of key informants.

2.3 SFD Graphic

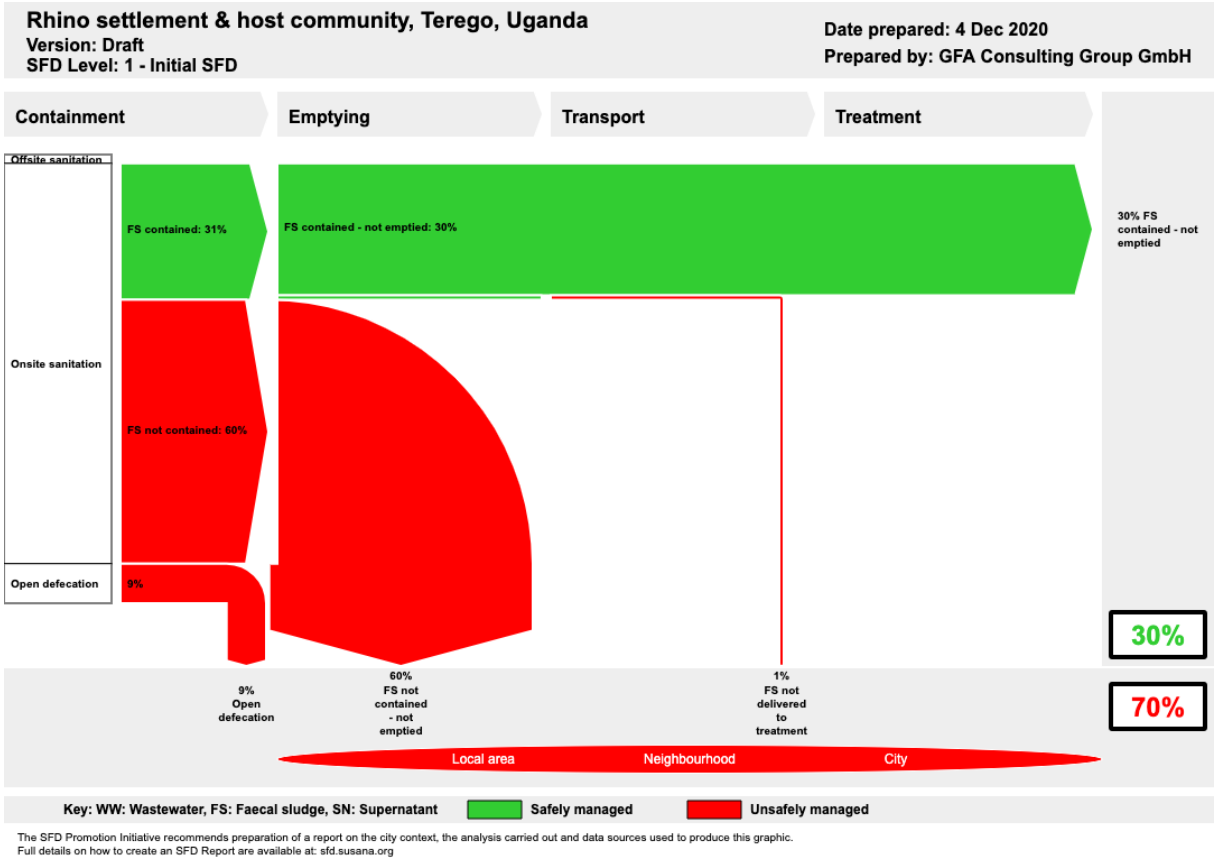
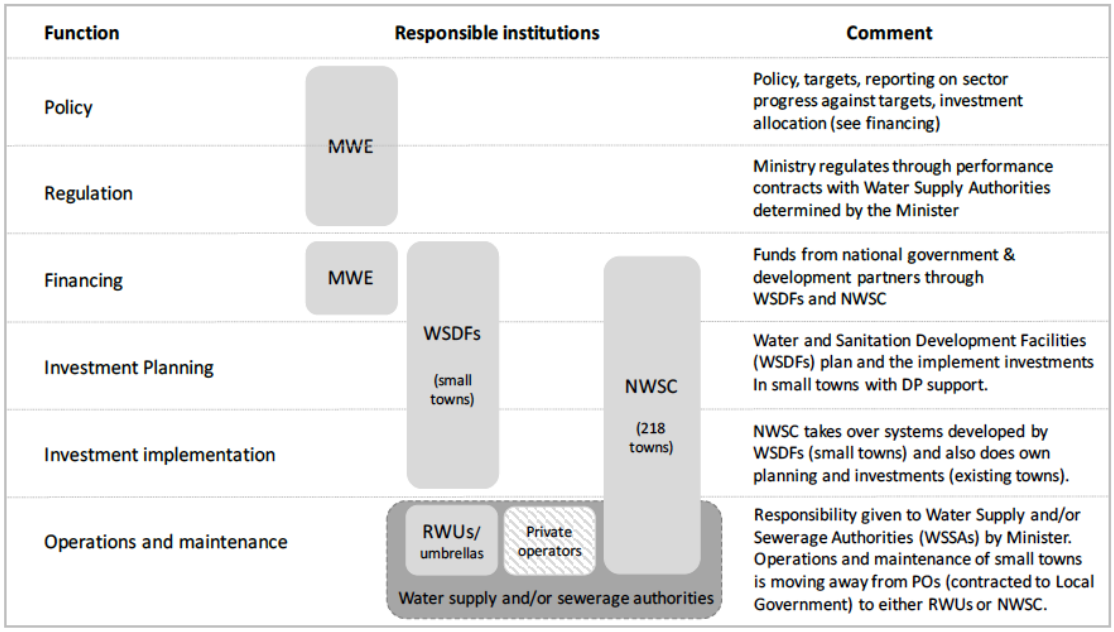


Figure 4: SFD Graphic

3 Service delivery context

3.1 Policy, legislation, and regulation

The Uganda national policies, laws (Acts) and regulations govern the implementation of water, sanitation and hygiene (WASH) activities in Uganda with no exception to Refugees and other humanitarian operations. The relevant institutions are described in relation to existing policies, laws, and regulations (Section 0) and the institutional links between them. An overview given in this section is based on Schoebitz et al. (2016) and Eberhard (2018).



Notes: MWE = Ministry of Water and Environment; WSDF = Water and Sanitation Development Facilities (part of MWE); NWSC= National Water and Sewerage Corporation; RWUs = Regional Water Utilities; WSSAs = Water Supply and/ or Sewerage Authorities.

Figure 5: Institutional Roles in the Water Sector (status 2017)

*Source: Eberhard, 2018

3.1.1 Policy

The Constitution of Uganda (1995) and as amended in 2005 and 2018 provides the basis for the legal framework in Uganda. It provides national objectives, overall principles of state policy and the framework for major policies relevant to WASH. The legal and policy framework for the management and development of the water and environment sector in Uganda is anchored in Table 7.

Table 7: Main legal and policy documents for the sanitation sector

Policy / Act	Key points
National Environment Act, Cap 153 (2019**)**	The principal law governing environmental management and conversation in Uganda and stipulates the establishment of Environment Committees to act as local regularity, monitoring and feedback mechanisms. This provides the roadmap and enabling framework for environmental policies and subsequent management of environmental services in Uganda. Section 73 provides for licensing of persons dealing in hazardous

Policy / Act	Key points
	chemicals or products by NEMA; and faecal sludge falls in the category of hazardous materials.
Water Act, Cap. 152 (1997)	Establishes ground for use, protection and management of water resources and supply; provides for the constitution of water and sewerage authorities; and facilitates the devolution of water supply and sewerage services.
National Water and Sewerage Corporation Act (1995)	Mandates NWSC provision of water and sewerage services in gazetted urban centres and provides clear responsibility of sewer network operation, maintenance and expansion, and wastewater treatment to NWSC.
National Forestry and Tree Planting Act (2003)	Supports tree planting by communities and private sector and encourages collaborative forest management as well as an intensification of watershed management and soil conservation.
National Water Policy (1999)	Sets the framework for water resources management and development, and the policy documents also include aspects of domestic water supply and references to sanitation. The need to plan for sanitation facilities and drainage of excess water in connection with the provision of water supply is recognised. Furthermore, community participation is considered essential when choosing sanitation technologies. The emphasis lies on acceptability (culturally and financially) by user communities with a preference on low-cost onsite sanitation technologies.
National Water Policy (2012)	The main objective is to manage and develop water resources in an integrated and sustainable manner. It further provides for the management of wastewater and sanitation.
National Climate Change Policy (2014)	Provides the overarching objectives to ensure that all stakeholders harmoniously address climate change impacts and their causes through appropriate adaptation and mitigation measures, while promoting sustainable development and a patch to a green economy.
Uganda National Forestry Policy (2004)	Seeks to achieve sustainable increase in economic, social, and environmental benefits from forests and trees by all, especially the poor and vulnerable.
National Policy for the Conservation and Management of Wetland Resources (1995)	Establishes the principles by which wetland resources can be optimally used now and in the future.
The Local Governments Act (1997)	Includes a decentralisation policy, and is an important document that empowers service provision at the local government level. Local governments constitute districts, town councils, and sub-counties, with the mandate and responsibility for planning and implementing water and sanitation sector activities for their communities. A district is an administrative unit comprising of clearly delineated counties, a municipality or/ and town council with clear administrative structures consisting of elected and government appointed officials. Counties are made up of sub-counties and, these comprise a number of parishes, which furthermore are made up of villages.

3.1.2 Institutional roles

The roles and responsibilities of each institution presented in this section are summarised in Table 8.

Table 8: Summary of institutional responsibilities

Function	MoH	MoES	MWE	NEMA	NWSC	Local Gov.	OPM	NGOs
Sewer network construction, O&M					✓			
Wastewater and Fecal sludge treatment					✓			
Household onsite sanitation						✓		
Public Latrines	✓		✓			✓		
School Latrines	✓	✓				✓		
Faecal and sludge emptying and collection					✓	✓		✓
Health/ Hygiene Promotion	✓	✓	✓			✓		✓
Physical planning						✓		
Waste discharge permits				✓		✓		
FSTP construction			✓		✓			
Planning control			✓			✓	✓	
Disaster Response and Refugee Coordination			✓			✓	✓	

Ministry of Water and Environment: At the national level, the Ministry of Water and Environment (MWE) is responsible for overall coordination, policy formulation, the setting of standards, inspection, monitoring, and technical back-up and initiating legislation.

MWE has three directorates: Directorate of Water Resources Management (DWRM), Directorate of Water Development (DWD) and the Directorate of Environmental Affairs (DEA). In response to the increasing number of districts and the need to provide support to local government, the MWE has established a few deconcentrated entities which are outlined below.

The mandate of the MWE regarding sanitation and hygiene activities is stipulated in the Memorandum of Understanding that was signed by MoH, MoES, and MWE. However, this MoU was established in 2001 to be operational for 10 years. It expired in 2011 and has not been renewed. The role of MWE is limited to development of public sanitary facilities and promotion of good practices of hygiene and sanitation in small towns and rural growth centres.

The Directorate of Water Resources Management: The Directorate of Water Resources Management (DWRM) is responsible for developing and maintaining national water laws, policies and regulations; managing, monitoring and regulation of water resources through issuing water use, abstraction and wastewater discharge permits; Integrated Water Resources Management (IWRM) activities; coordinating Uganda's participation in joint management of trans-boundary waters resources and peaceful cooperation with Nile Basin riparian countries.

While the traditional institutional arrangements for water resources management have been centralised, de-concentration of these functions to regional and local levels has been initiated. Thus, institutional arrangements for the management of water resources in Uganda now exist at three levels, namely the national level (DWRM mentioned above and the Water Policy Committee (WPC)), the regional and trans-boundary level, and the local level.

- The WPC is a statutory body provided for in the Water Act which advises the Minister of Water and Environment regarding the integrated and sustainable management and development of water resources of Uganda. The WPC is supported and facilitated to effectively perform its functions, and it meets twice a year.
- Trans-boundary Level Institutions such as Lake Victoria Basin Commission (LVBC) and Nile Basin Initiative (NBI): LVBC is a legal entity, linked to the East African Community (EAC), responsible for the sustainable management of the water resources of Lake Victoria basin. Similarly, the Nile Basin Initiative is a transitional institutional arrangement responsible for sustainable management and development of the Nile basin water resources. Some 98% of Uganda lies within the Nile basin, and the active participation of Uganda in the Nile Basin Initiative activities is, therefore, key to the sustainable management and development of Uganda's water resources.
- Water Management Zone offices are operational in the 4 WMZs (Victoria, Albert, Kyoga, and Upper Nile). The main purpose of the WMZs is to deconcentrate WRM closer to where action is needed to mobilise local community efforts and other stakeholders to achieve catchment based IWRM and to ensure effective coordination with other water resources related activities being implemented at district levels such as environment, forestry, and water supply.

Directorate of Water Development: Directorate of Water Development (DWD) is responsible for providing overall technical oversight for planning, implementation, and supervision of the delivery of urban and rural water and sanitation services across the country. DWD is responsible for the regulation of provision of water supply and sanitation and the provision of capacity development and other support services to Local Governments, Private Operators, and other service providers. Originally, DWD comprised three Departments; Rural Water Supply and Sanitation; Urban Water Supply and Sewerage and Water for Production. A fourth department has been added to DWD, referred to as the Water Utility Regulation Department. This department is responsible for ensuring adherence to set standards of service established by the sector for water supply, currently restricted to piped water supplies in the country. The type of regulation being exercised by the department is "Regulation by Contract." This is realised through Performance and Management Contracts with Water Authorities is regulating urban water supply services.

Technical Support Units (TSUs) are established under the Rural Water and Sanitation Department in 10 locations to build capacity at the districts following decentralisation of rural water supply and sanitation and the channeling of government grants to the sub-sector via the District Water and Sanitation Conditional Grants (DWSCG). The TSUs were intended to be temporary and to gradually withdraw from well-performing districts. The TSU functions were originally contracted out to private sector companies and/or NGOs, but more recently the staff have been hired on individual contracts by the MWE and paid through the Partnership Fund (JPF). Over time, TSU's roles have also expanded to provide support to Rural Growth Centers (RGCs) and also water resources and water for production.

The MWE, through its Urban Water and Sewerage Department, is responsible for overall coordination, policy formulation, setting standards, inspection, monitoring, technical back-up and initiating legislation. It also directly oversees and supports water supply and sanitation service delivery in all water supply areas that are not gazetted for management by the National Water and Sewerage Corporation.

Traditionally, the Urban Water and Sewerage Department (UWSD) takes care not only of gazetted urban areas but also of piped water systems supplying rural growth centres. For effective infrastructure development, operation, and maintenance it has set up two sets of regional deconcentrated units:

- Water and Sanitation Development Facilities (WSDFs) for the implementation of new water supply and sanitation schemes and major rehabilitations.
- Umbrella Authorities for operation and maintenance of the constructed water supply schemes. The Water and Sanitation Umbrella Authorities (WSUA) are operating in the areas considered to be rural. In the case of Rhino refugee settlement, the Water and Sanitation Umbrella Authority - North (WSUA-N) is in charge of managing piped water supplies in the refugee settlements and surrounding host communities.

The four WSDF Branches plan, finance and implement new water and sanitation projects in Northern, Eastern, Central and South Western Uganda, from their headquarters located in Lira, Mbale, Wakiso and Mbarara, respectively. WSDFs have delegated procurement and accounting authorities and operate following a common Operations Manual. Mobilisation and design activities are partly contracted out and partly done by in-house staff, as appropriate, whereas construction works are always carried out by private contractors.

National Environment Management Authority (NEMA): The NEMA besides being a semi-autonomous body is directly linked to the MWE and responsible for licensing all private businesses that are dealing with waste. This includes domestic, industrial, chemical and construction waste. NEMA issues discharge permits and also registers private entrepreneurs in the waste sector.

Ministry of Health (MoH): MoH is responsible for promotion of public health and sanitation at the household level. This ministry operates under the National Health Policy (1999), prepared within the context of the Constitution of Uganda (1995) and the Local Governments Act (1997). One of the ten guiding principles of the National Health Policy is the collaboration and partnership between public and private sectors, including NGOs, private and traditional practitioners. The policy was revised and updated in 2012. The Environmental Health Policy (2005) defines environmental health priorities of the Government as well as providing a framework for the development of services together with programs at national and local government levels. It reinforces the Public Health Act (2000) with the overall policy objective to achieve 100% hygienic sanitation facilities in urban areas. The policy implies that management responsibility and ownership by users of sanitation facilities result in more hygienic facilities. Inadequate access to sanitation and solid waste management, together with poor drainage, are recognised as major contributors to the spread of disease. The goal of the Environmental Health Policy is ‘the attainment of a clean and healthy living environment for all citizens,’ which is in line with the Health Sector Strategic Plan and the Poverty Alleviation Program. The policy identifies local governments that are responsible for the provision of infrastructure and services essential for public health (e.g., water, public latrines, waste collection and disposal, drainage, sewerage, and vector control) while the national government

is responsible for establishing policy, legal and institutional frameworks for strategies and services (KSP, 2008). Furthermore, the MoH provided guidance for the implementation of the National Water Policy (1999), established by the MWE. Guidance is provided by the National Sanitation Guidelines issued by the Ministry of Health in 1992 and revised in 2000 (KSP, 2008). The guidelines were produced in a series of publications developed to support sanitation and hygiene promotion in Uganda. Other publications in this series include:

- Concept Paper: Promotion of Sanitation in Uganda (Ministry of Health, 1997)
- National Sanitation Forum Report (Ministry of Health, 1997)
- National Sanitation Policy (Ministry of Health, 1997)
- Guidelines for School Sanitation (Ministry of Health, 1999)

The MoH is guided by the National Health Sector Reform Program and the National Poverty Alleviation Program (1997, revised in 2001 and 2004) in which water supply and sanitation are recognised as key issues.

The Ministry of Education and Sports (MoES): The MoES is responsible for school latrine construction and public health (hygiene) education in primary schools. It is mandated to provide for, support, guide, coordinate, regulate and promote quality of education and sports to all persons in Uganda (MoES, 2013). The MoES prepared a National Strategy for Girls' Education (NSGE), which is related to the National Gender Policy (1997) emphasising the government's commitment to gender-responsive development as part of the Constitution of Uganda (1995). This strategy includes the formulation of gender-responsive policies (NSGE, section 2.1.1), including the construction of separate sanitation facilities for children and highlighting the aspect that these facilities are critical for girls with disabilities (MoES, 2013).

In 2001, a Memorandum of Understanding (MoU) was signed between the MWE, the Ministry of Health (MoH) and the Ministry of Education and Sports (MoES), which stipulates mandates for sanitation. As mentioned above, this MoU expired and has not yet been renewed.

National Water and Sewerage Corporation (NWSC): The NWSC is a government-owned utility company that operates and provides water and sewerage services in more than 200 towns across the country. NWSC's activities are aimed at expanding service coverage within the water supply area while improving the quality and efficiency of service delivery. Key among its objectives is to invest back generated revenue surplus for existing infrastructure improvements and develop new facilities.

NWSC operates under the NWSC Act (1995) which states that the National Water and Sewerage Corporation (NWSC) shall operate and provide water and sewerage services in areas entrusted under the Water Statute (1995). This Act mandates NWSC provision of Water and sewerage services in gazetted urban centres. This document provides clear responsibility of sewer network operation, maintenance and expansion, and wastewater treatment to NWSC.

Office of the Prime Minister: The Office of The Prime Minister in Uganda has the mandate to coordinate development of capacities for prevention, preparedness, and response to natural and human-induced disasters and Refugees; and coordinate and monitor the implementation of special government policies and programmes for Northern Uganda, Luwero-Rwenzori, Karamoja, Bunyoro and Teso affairs. Through its directorates of Disaster Preparedness, Management and Refugees, the office has a role in ensuring water and Sanitation standards are adhered to in Refugee settlements.

District level: Terego District Office has not been fully established yet, and some functions are still assumed by Arua District. The main department involved in sanitation is the District Health Office. The Terego District Health Office actively supervises sanitation in the refugee settlement during the reception/settlement phase. The district office also builds the capacity of hygiene promoters, water user committees and coordination of WASH cluster meetings with other partners and plays a leading role in sanitation event days organisation like Sanitation Week, World Hand Washing Day, World Toilet Day, Water Week commemorations. Community mobilisation is carried out through Village Health Teams and Local Council officers that are supervised by Health Assistants under the same office. The District Health Office is also responsible for compiling sanitation and hand-washing monitoring data for the Ugandan Bureau of Statistics and the national Ministry of Health (Section 3.2.1).

Refugee settlements: The United Nation High Commissioner for Refugees (UNHCR) is responsible for the management of the provision of basic services. The UNHCR WASH office coordinates the activities of all WASH partners within the refugee settlements. This is done mainly through planning and convening of hygiene and sanitation technical working group meetings, joint monitoring of refugee sanitation activities, review of WASH implementing partner's annual sanitation budgets and work plans and provision of sanitation gap data to new potential partners. The UNHCR WASH Office also ensures that relevant national and/or global sanitation standards are adhered to during implementation. The UNHCR office ensures that at least one KAP survey is undertaken on an annual basis. The UNHCR WASH Office is also responsible for capacity building of partners based on identified capacity needs.

UNHCR has delegated the implementation of WASH-related activities within Rhino and Imvepi settlement to the international NGO Water Mission. Water Mission has a designated role of WASH cluster coordination, a member of the Technical Work Group on sanitation, provides institutional pit latrines emptying services and supplies pit latrine slabs for household sanitation systems.

3.1.3 Service provision

Host communities: Since August 2017, the Ministry of Water and Environment has introduced a new management model that is tailored for piped water schemes supplying small towns and rural areas. The model builds on the structures and experience of the six regional "Umbrellas of Water and Sanitation" that were put in place between 2002 and 2014 to provide O&M back-up support services for small water supply schemes. Under the new model, the Umbrellas – now referred to as Umbrella Authorities – are appointed as Water Authorities. Instead of playing a supporting role as in the past they assume direct management responsibilities for the "gazetted" schemes. Umbrella Authorities continue to provide backstopping support to all piped water schemes outside NWSC regardless of their management arrangement and size. Terego District falls under the responsibility of the Northern Water and Sanitation Umbrella. The Water and Sanitation Umbrella has a role of operating and maintaining sanitation facilities usually constructed by their sister organisation WSDF-N. The Northern Water and Sanitation Umbrella has currently no engagement in sanitation in Rhino refugee settlement.

Refugee settlements: In the settlement phase of refugees and during reception, the OPM WASH department, coordinates WASH partners in pit latrine desludging and disposal in safe

gazetted places to negate adverse impact to the environment and public health of refugees. This role also avoids sanitation related conflicts between hosts and refugees.

Early this year, UNHCR, in consultations with the Ministry of Water and Environment (MWE), UNICEF, and other WASH partners, established a National WASH Humanitarian Coordination Platform - anchored under the Ministry of Water and Environment's department of Rural Water Supply and Sanitation, with co-lead arrangements with UNHCR, who are responsible for coordinating WASH interventions in refugee contexts in Uganda; and UNICEF supporting WASH coordination in non-refugee contexts. At District and settlement-level, the local/ district authorities either lead or co-lead the WASH Coordination platform.

Through their Public Health Engineering Department, OXFAM is a WASH implementing Partner of UNHCR in Rhino settlement. They are currently involved in Faecal Sludge Management (FSM) through the construction of institutional pit latrines and their desludging. OXFAM has designed a FSTP, which will soon be constructed in Rhino settlement, and is piloting household emptying technologies. In addition, OXFAM is providing alternative household containment technologies where rocky soils make it difficult for excavation of earthen unlined pit latrines. They are also involved in hygiene promotion through behaviour change campaigns and creating demand for the use of treated faecal sludge. OXFAM has also organised refugee women associations in Imvepi and Rhino camp to engage in the valorisation of FS into briquettes as an energy source for cooking. The groups' capacity to handle the project has been developed through training and provided with the required equipment. Oxfam has procured an eight (8) m^3 cesspool exhauster, which will be desludging institutional pit latrines in Rhino and Imvepi. This service awaits the completion of the Red Cross FSTP (see below). The exhauster will be handed over to OPM, WSDF-N and the Northern Umbrella of Water and Sanitation who are expected to be responsible for the O&M of the equipment (OXFAM, 2020).

Water Mission provides latrine slabs for refugee latrines in settlements and host communities in Terego District. They are not involved in household latrine construction, which is the responsibility of the households (Water Mission, 2020).

Private cesspool emptiers operate in the host communities and refugee settlements (see Section 2.1.2) but services are costly and only suitable for lined latrines that are used by institutions (Water Mission, 2020).

3.1.4 Service standards

Internationally, the human right to water and sanitation, and the Sustainable Development Goals (SDGs) guide the setting of service standards for water and sanitation.

In 2010, the UN General Assembly and the Human Rights Council explicitly recognised the human rights to water and sanitation. These rights are derived from the right to an adequate standard of living as stipulated in Article 11 of the International Covenant on Economic, Social and Cultural Rights and other international human rights treaties. This right is recognised in the Ugandan Constitution of 1995, as amended in 2005 and 2018. For refugees, the United Nations High Commissioner for Refugees is committed to ensure that all refugees in all settings are guaranteed (UNHCR, 2018).

Within the global development agenda, a framework for sanitation service standards is given by SDG 6 *Ensure access to water and sanitation for all* – Target 6.2 *By 2030, achieve access*

to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations. The proposed indicator for SDG target 6.2 refers to the proportion of people using safely managed sanitation services. This acknowledges a shift in the focus on the containment element of the sanitation chain and recognises the necessary focus on system-based approaches along the entire sanitation chain (UNDESA, 2020).

The Ugandan water and sanitation sector is guided by the following standards and regulations (Table 9):

Table 9: Summary of main regulations and standards in the Ugandan water and sanitation sector

Date	Regulation/Standard
1998	Water Resources Regulations
1998	Waste Discharge Regulations *Regulates the effluent or discharge of wastes onto land or into water. All dischargers of domestic or industrial waste should comply to these standards and should obtain a permit from NEMA to own and operate such facilities.*
1999	Water Supply Regulations
1999	Sewerage Regulations
1998	Environmental Impact Assessment Regulations *Requiring an environmental impact assessment before the implementation of all projects that may have a significant impact on the environment.*
2020	National Environment (Waste Management) Regulations
2020	National Environment (Standards for Discharge of Effluent into Water or Land) Regulations

Sanitation service standards in the refugee settlements: The 1951 Convention relating to the Status of Refugees is the foundation of international refugee law. It establishes the principle that refugees should not be forcibly returned to a territory where their lives or freedom would be threatened and sets out the duties of refugees and States' responsibilities toward them (UNHCR, 2017). The UNHCR WASH Guidebook (2018) as well as in the internationally recognised Sphere Standards set the main service standards in the refugee camp. A summary of the most relevant sanitation standards specified in these documents is given in the Table 10 below.

Table 10: Summary of most relevant Sphere excreta management standards

Indicator	Key points
Safe excreta disposal	Safe excreta disposal aims to keep the environment free from uncontrolled and scattered human faeces.
Distance of defecation systems from water sources	The distance of soak pits, trench latrines and/or toilets from water sources should be at least 30 metres and the bottom of the pits should be at least 1.5 metres above the groundwater table.
Sharing of toilets	A maximum of 20 people use each toilet
Distance from dwellings	Toilets are no more than 50 metres from dwellings
Shared use of toilets	Use of toilets is arranged by household(s) and/or segregated by sex

*Source: Sphere Association (2018)

UNHCR recognises four main phases of assistance to refugees in which different WASH standards and priorities apply. An overview on these principles is shown in ☞ Appendix 5.

3.2 Outputs

3.2.1 Monitoring and reporting access to services

Within the refugee settlements, UNHCR collects data on household sanitation coverage. Sanitation coverage data is published on the UNHCR WASH Dashboard online (UNHCR, 2020d). The UNHCR WASH office ensures that at least one KAP survey is undertaken on an annual basis (UNHCR, 2020a).

For the host communities, the District Health Officer annually reports on the sanitation coverage in the District in the District Rural Sanitation Report (MoH, 2019). The report not only gives coverage data but also some information about the type of latrines used as well as hygiene and health campaigns (e.g., village open defecation campaigns) carried out. In the last reporting period, data for Terego district was still included in the Arua District Sanitation Report.

4 Stakeholder Engagement

4.1 Key informant interviews

In total ten key informant interviews were carried out during the field visits in Terego District in December 2020 (Appendix 2). Some of the interviews had to be carried out via telephone or email. Key informant interviews included various staff of the Arua, Terego and Madi-Okollo District administration as well as representatives of UNHCR, Water Mission, OXFAM, the Uganda Red Cross Society, and private cesspool emptiers. In addition, there were various knowledge exchanges and discussions with WatSSUP staff.

4.2 Observations

One of the authors carried out a seven-day field mission to Terego and Madi-Okollo District in December 2020. The mission was dedicated to gathering information for this and two other related reports. The observations during those visits included general observations about the urbanisation of the District, the settlement structure as well as the topographic and climatic conditions that influence the service provision. The observations were beneficial for the data collection process as they gave the authors a clearer understanding of the framework conditions in the host communities and the refugee settlement.

4.3 Validation of results

Prior to the field mission, the authors prepared a draft version of the SFD matrix, graphic and selection grid as well as a draft write-up of the justification of all major assumptions used to create the SFD graphic. This first draft was based on extensive literature and document review as well as on discussions with WatSSUP and NaSa staff. During the field mission, the assumptions and estimates were discussed with the key informants who reviewed and validated the assumptions and estimates.

5 Acknowledgements

This report was produced under the GIZ Water Supply and Sanitation for Refugees Settlements and Host Communities in Northern Uganda – GIZ WatSSUP Programme in cooperation with the GIZ Sustainable Sanitation Sector Programme (NaSa). We would like to thank both programmes for their support. We owe special gratitude to Ms. Anne Serunjogi (GFA/WatSSUP), Ms. Cecilia Carvalho Rodrigues, and Ms. Lena Loechte (both GIZ NaSa) for their valuable support and guidance. The experience, knowledge, and support of Mr Patrick Nyeko (GFA/WatSSUP) were fundamental for the for the success of the field mission. Finally, the authors are grateful to the key informants who provided expert opinions and validation of the results. The SFD Report was reviewed by Dr. Charles B. Niwagaba.

6 References

Arua District Local Government. 2009. *Land and Climate in Arua.* [Online]. [Accessed 15 December 2020]. Available from: https://aruadistrict.blogspot.com/2009/06/land-and-climate-in-arua.html

Arua District Office. 2020. *Interview with Nyakana, M.* 07 December 2020, Arua.

BIBCO Investments Ltd. 2019. *Consultancy Services for Feasibility Study and Design of Sludge Waste Treatment Plant in Rhino Camp Refugee Settlement, Arua District, Uganda. Final Design Report. .* Kampala: OXFAM.

Busquet, M. 2015. *The practice of sharing sanitation facilities. A case study on shared sanitation facilities as sustainable form of access to sanitation in the West Nile Region, Uganda*. MSc International Development Studies thesis, Utrecht University.

Eberhard, R. 2018. *Access to Water and Sanitation in Sub-Saharan Africa. Case Study: Uganda.* Eschborn: Gesellschaft fuer Internationale Zusammenarbeit (GIZ).

ILO. 2020. *Paving the way for better jobs and improving livelihoods for refugees and host communities in Arua, Uganda. An approach to inclusive market systems (AIMS) for refugees and host communities.*. nternational Labour Organisation.

Kasozi, S. 2017. *Hydrogeological study in Imvepi refugee settlement of Lugbari and Impevi Parishes, Odupi Sub-county, Terego County in Arua District (Final Report).* Kampala, Uganda: OXFAM NOVIB.

Milnes, E. 2017. *Mission Report: Hydrogeological field mission in West Nile (Uganda)* Kampala, Uganda: UNHCR.

MoH. 2019. *Arua District Rural Sanitation Report.* Kampala, Uganda: Ministry of Health - Environmental Health Division.

Muammar Holdings Ltd. 2020. *Interview with Nyakana, M.* 08 December 2020,

OXFAM. 2020. *Interview with Nyakana, M.* 11 December 2020,

Schoebitz, L., Niwagaba, C. and Strande, L. 2016. *SFD Report Kampala.* Duebendorf, Switzerland: Sandec, Eawag.

Sphere Association. 2018. *Sphere Handbook: Humanitarian Charter and Minimum Standards in Disaster Response.* fourth edition ed. Geneva, Switzerland: Sphere Association.

Terego District Office. 2020. *Interview with Nyakana, M.* 09 December 2020,

UBOS. 2014. Northern Region - Parish Level Profiles (Census 2014). [Online]. [Accessed 26 November 2020]. Available from: https://www.ubos.org/explore-statistics/20/

UBOS. 2019. Population projections by sub county and sex (2015-2030). [Online]. [Accessed 26 November 2020]. Available from: https://www.ubos.org/?pagename=explore-publications&p_id=20

UNDESA. 2020. *Sustainable Development Knowledge Platform.* [Online]. [Accessed 12 December 2020]. Available from: https://sustainabledevelopment.un.org/sdgs

UNDP. 2018. *Understanding Land Dynamics and Livelihood in Refugee Hosting Districts of Northern Uganda.* Kampala, Uganda: United Nations Development Programme (UNDP).

UNHCR. 2017. *A guide to international refugee protection and building state asylum systems. .* Geneva: United Nations High Commissioner for Refugees.

UNHCR. 2018. *UNHCR WASH Manual: Practical Guidance for Refugee Settings.* Geneva: United Nations High Commissioner for Refugees.

UNHCR. 2020a. *Interview with Nyakana, M.* 12 December 2020, Email Interview.

UNHCR. 2020b. *Refugees and Asylum-Seekers in Uganda. Uganda Refugee Response - October 2020.* Kampala: United Nations High Commissioner for Refugees.

UNHCR. 2020c. Rhino camp consolidated sanitation matrix - 21.09.2020. unpublished. [Online].

UNHCR. 2020d. *UNHCR WASH Dashboard for Refugee Settings.* [Online]. [Accessed 03 December 2020]. Available from: https://wash.unhcr.org/wash-dashboard-for-refugee-settings/

Water Mission. 2020. *Interview with Nyakana, M.* Arua.

SFD Rhino Refugee Settlement and host community, Uganda, 2021

Produced by:

GFA Consulting Group GmbH, Leonie Hyde-Smith & Moses Nyakana

Editing:

GFA Consulting Group GmbH

Review:

Charles Niwagaba

On behalf of:

Water Supply and Sanitation for Refugee Settlements and Host Communities in Northern Uganda (WatSSUP Programme) implemented by GIZ with funding from BMZ

This Executive Summary and the SFD Report are available from: www.sfd.susana.org

7 Appendix

7.1 Appendix 1: Stakeholder identification

Table 11: Stakeholder identification

N°	Stakeholder group	Contact
	City council	n/a
1	Municipal authority	Terego/Madi-Okollo/Arua District Offices
	Utility	Northern Umbrella of Water and Sanitation
2	Ministry in charge of urban sanitation and sewerage	MWE
3	Ministry in charge of urban solid waste	Ministry of Lands, Housing and Urban Development (MoLHUD)
4	Ministry for Finance, Planning and Economic Development (MoFPED)	MoFPED
5	Regulation of urban water and sanitation	MWE
6	Service provider for construction on onsite sanitation technologies	Uganda Red Cross Society (construction of FSTP)
7	Service provider for emptying and transport of faecal sludge	Private cesspool emptiers (Muammar Holdings Ltd)
8	Service provider for operation and maintenance of treatment infrastructure	n/a
9	Market participants practising end-use of FS end products	n/a
10	Market participants practising collection of solid waste	n/a

7.2 Appendix 2: Tracking of stakeholder engagement

Table 12: Stakeholder engagement tracking

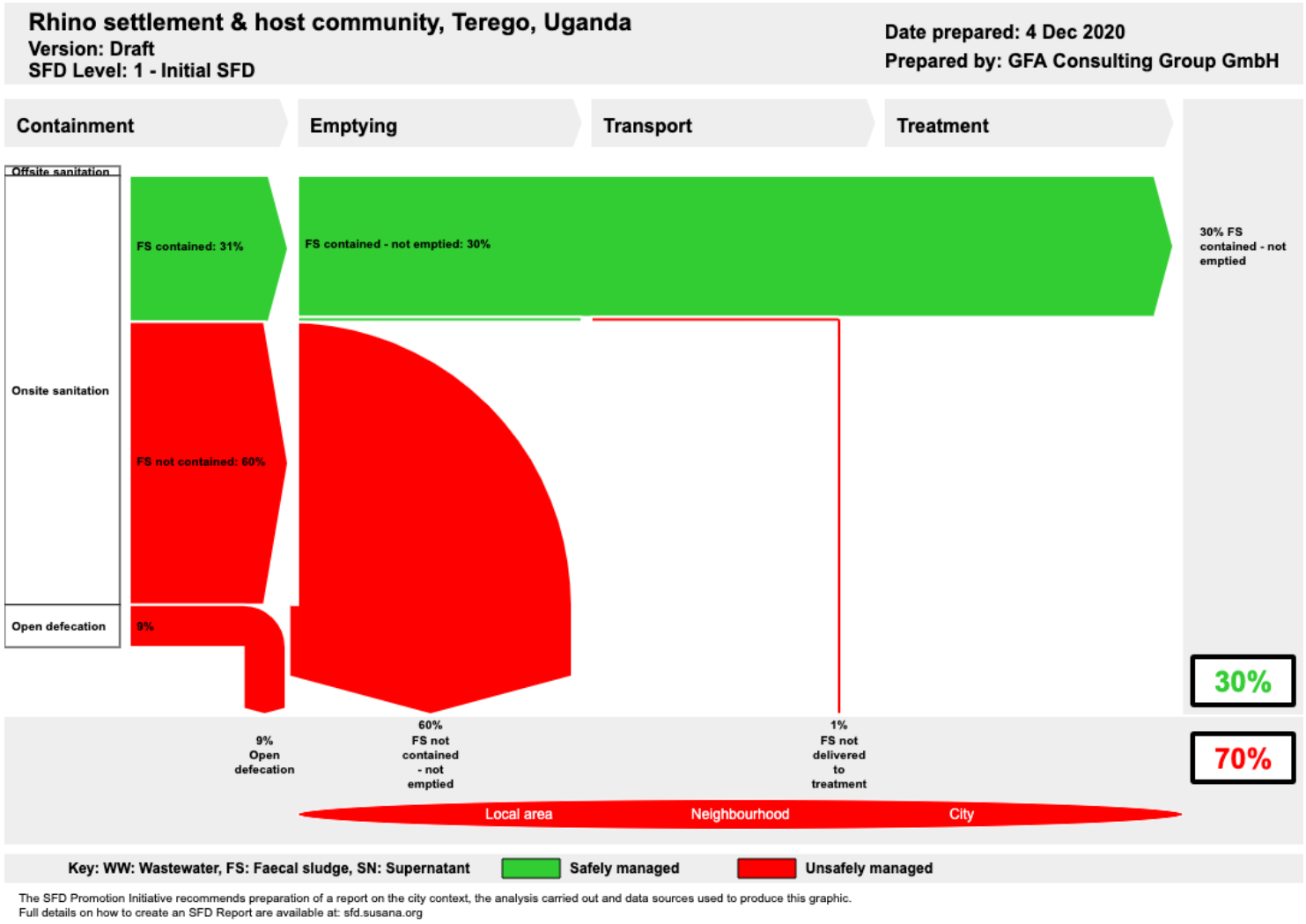
N°	Stakeholder	Date(s) of engagement	Purpose of engagement
1	GIZ WatSSUP / GIZ NaSa	Various November 2020 – March 2021	Cooperation on sanitation assessment for Terego district / Informal knowledge exchange / Facilitation of site visits
2	Acting District Health Officer for Environmental Health - Arua District	07 December 2020	KII
3	Team Leader Imvepi, Rhino and Kiryandongo Refugee Settlements	08 December 2020	KII
4	Manager of Muammar Holdings Ltd (Private cesspool emptiers and contractors of Water Mission)	08 December 2020	KII
5	Assistant District Health Officer for Environmental Health - Terego District	09 December 2020	KII
6	Acting District Water Officer - Terego District	09 December 2020	KII
7	Acting District Water Officer and Assistant District Health Officer for Environmental Health - Madi-Okollo District	09 December 2020	KII
8	Assistant Settlement Commander and Focal Person for WASH-Imvepi Refugee Settlement - OPM	10 December 2020	KII
9	Manager Northern Umbrella of Water and Sanitation	11 December 2020	KII
10	UNHCR WASH focal person	12 December 2020	KII

7.3 Appendix 3: SFD matrix

Rhino settlement & host community, Terego, Uganda, 4 Dec 2020. SFD Level: 1 - Initial SFD
Population: 275533
Proportion of tanks: septic tanks: 100%, fully lined tanks: 100%, lined, open bottom tanks: 1

System label	Pop	F3	F4	F5
System description	Proportion of population using this type of system	Proportion of this type of system from which faecal sludge is emptied	Proportion of faecal sludge emptied, which is delivered to treatment plants	Proportion of faecal sludge delivered to treatment plants, which is treated
T1A3C9 Fully lined tank (sealed) connected to 'don't know where'	1.0	100.0	0.0	0.0
T1B11 C7 TO C9 Open defecation	9.0			
T1B7C10 Pit (all types), never emptied but abandoned when full and covered with soil, no outlet or overflow	30.0			
T1B9 C1 TO C10 Toilet failed, damaged, collapsed or flooded, connected to sewer, soak pit, open drain or storm sewer, water body, open ground or 'don't know where'	16.0			
T2B7C10 Pit (all types), never emptied but abandoned when full and covered with soil, no outlet or overflow, where there is a 'significant risk' of groundwater pollution	44.0			

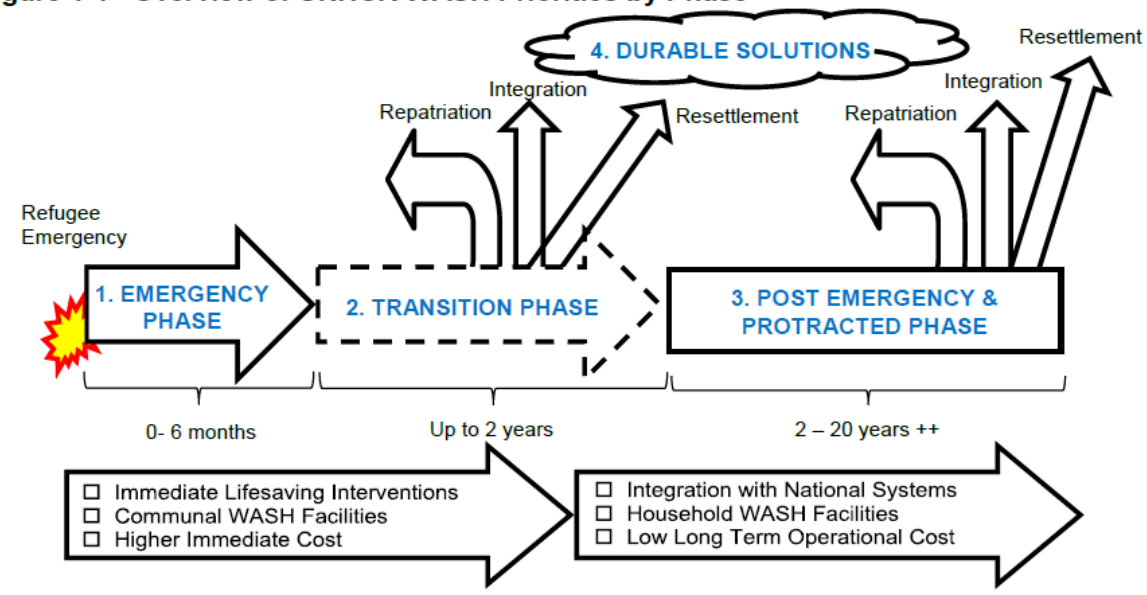
7.4 Appendix 4: SFD Graphic



The SFD Promotion Initiative recommends preparation of a report on the city context, the analysis carried out and data sources used to produce this graphic.
Full details on how to create an SFD Report are available at: sfd.susana.org

7.5 Appendix 5: UNHCR WASH Priorities by phase

Figure 1-1 Overview of UNHCR WASH Priorities by Phase



Emergency Phase WASH Priorities:

- Saving lives.
- Providing immediate access to basic WASH services.
- Reducing transmission of diseases of public health importance.
- Identification of suitable refugee hosting sites
- Close monitoring of WASH service provision and rates of scale up.
- Full refugee participation in the design and provision of WASH Services to reduce protection risks.

Transition Phase WASH Priorities:

- Transition to cost-efficient WASH services with reduced reliance on fuel, energy, chemicals and expertise.
- Support to national WASH authorities and WASH service providers.
- Capacity building of refugee community based organisations.
- Transition to household toilets and bathing facilities.
- Monitoring of WASH service provision.
- Reduce WASH protection risks.

Post Emergency & Protracted Phase WASH Priorities:

- Service provision in accordance with National WASH Strategies, Policies and Standards.
- Handover of responsibility for WASH service provision to refugee community based organisations and national WASH authorities and service providers.
- Revenue collection if refugee livelihood opportunities exist (fees collected to cover the costs of WASH service provision).
- Monitoring of WASH service provision.
- Reduce WASH protection risks.

*Source: UNHCR (2018)