

SFD Report

Imvepi Refugee Settlement and Host Community Uganda

Final Report

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SFD Report Imvepi, Uganda, 2021

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THE REPUBLIC OF UGANDA
Ministry of Water and Environment

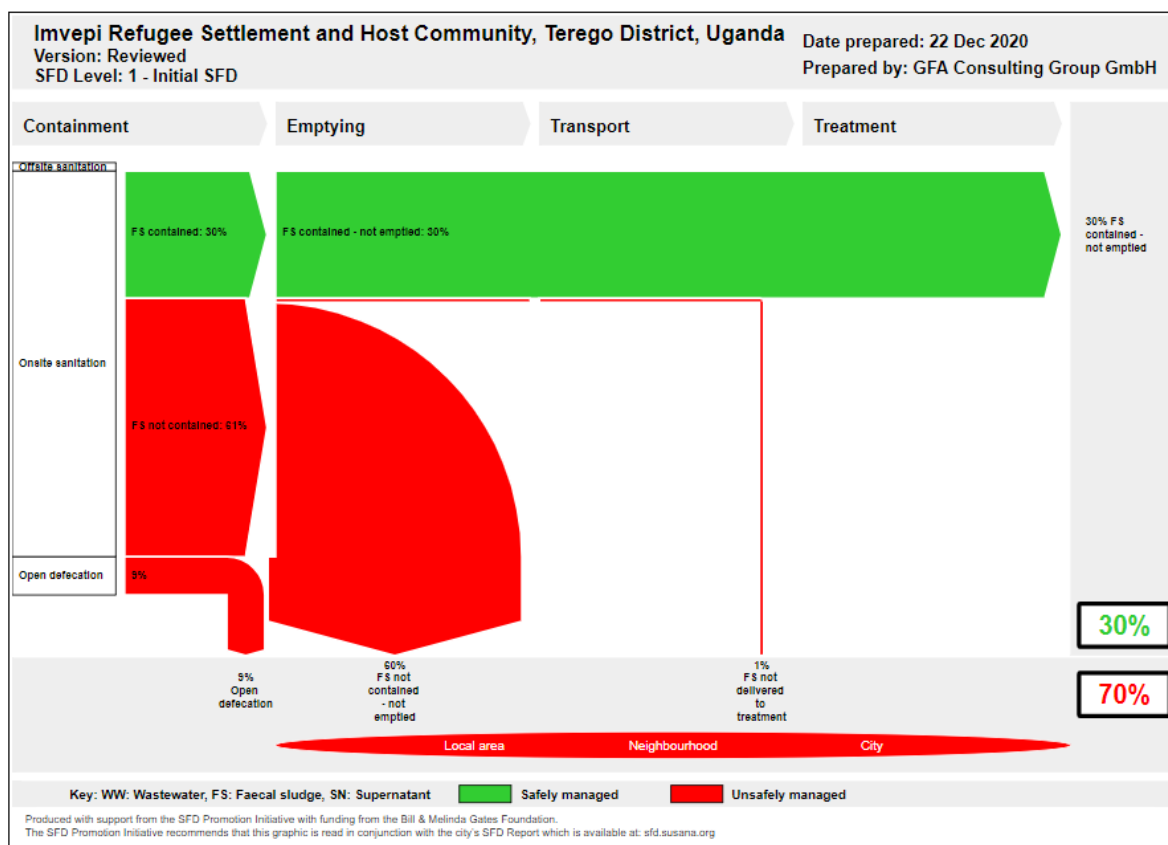


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1. The SFD Graphic



2. Diagram information

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3. General city information

Imvepi refugee settlement is located in the newly established Terego District in the West Nile part of the Northern Region of Uganda. Terego district was carved out of Arua District with effect on 1st July 2020 (The Independent, 2020). Imvepi settlement is located in Odupi sub-county and was opened in February 2017

and currently hosts 67,439 refugees of which the vast majority are from South Sudan (UNHCR, 2020c). The non-refugee population of Odupi sub-county (host-community population) was estimated to be 45,300 (UBOS, 2019). For the scope of this report, we assume a total population of 112,739, of which around 60% are refugees, and 40% are non-refugee host community population.

The refugee settlement is divided into three zones and stretches over around 53km². (UNHCR and UNOPS, 2017).

The sub-county can be characterised as rural. The topography is hilly with deep valleys which create interconnected drainage systems. The average elevation is around 700 m above mean sea level (UNHCR and UNOPS, 2017).

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

4. Service outcomes

Containment: Imvepi refugee and host communities are rural communities. There are no major urban centres in the reporting area. The entire population relies on onsite sanitation

facilities, predominantly traditional unlined pit latrines, which are abandoned when full.

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

Seasonal flooding is common and the collapse of pit 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 mainly 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).

A Faecal Sludge Treatment Plant (FSTP) (funded by the Uganda Red Cross Society) for Imvepi refugee settlement and the surrounding host communities is currently under construction.

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 (1964, revised in 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.

6. Overview of stakeholders

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

Table 1: Key stakeholders Imvepi 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 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.

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 author 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.

Imvepi 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 probably improve the quality of the report.

9. List of data sources

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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

Imvepi refugee settlement is located in the newly established Terego District in the West Nile part of Northern Uganda Region. Terego district was carved out of Arua District with effect on 1st July 2020 (The Independent, 2020). Imvepi settlement was opened in February 2017 and currently hosts 67,439 refugees of which the vast majority are from South Sudan (UNHCR, 2020c). Imvepi settlement is located in Odupi sub-county. The non-refugee population of Odupi sub-county constitutes the host community. Odupi sub-county comprises seven parishes: Azapi, Imvepi, Lugbari, Ombokoro, Orivu, and Otumbari (UBOS, 2014). The non-refugee population of Odupi sub-county was estimated to be 45,300 (UBOS, 2019). For the scope of this report, we assumed a total population of 112,739, of which around 60% are refugees, and 40% are non-refugee host community population.

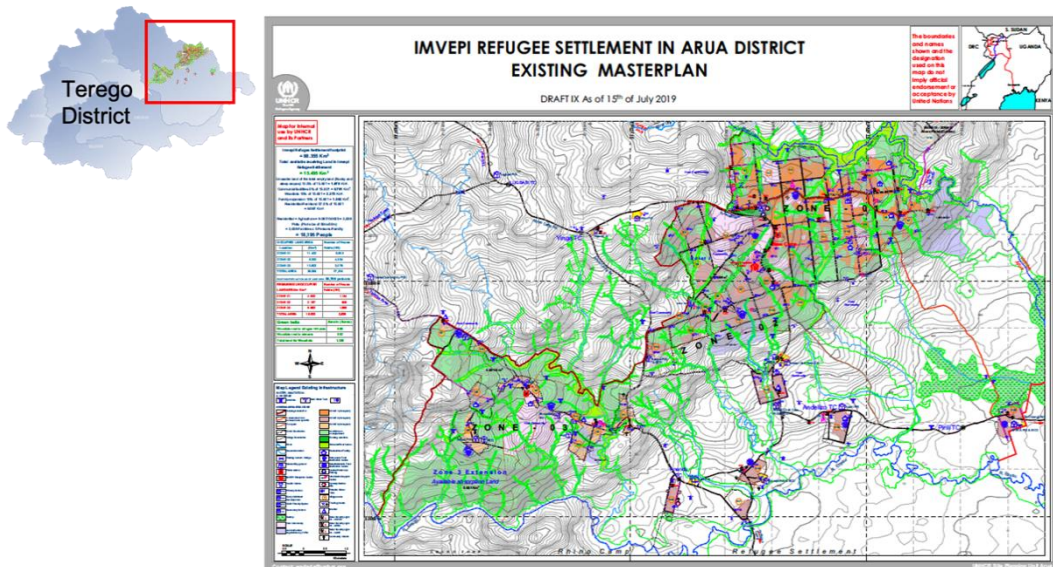


Figure 1: Imvepi refugee settlement

Source: adapted from UNHCR (2019)

Imvepi refugee settlement covers parts of Lugbari and Imvepi parishes and stretches over around 53km². The camp is divided into three zones. River Ore which is the boundary between Terego and Yumbe district is the Northern border of the settlement. River Anyau forms the Southern border of the settlement (UNHCR and UNOPS, 2017).

Before the refugee influx, each refugee household used to be allocated a residential plot of 20*30m and cultivation land of 50*50m. Currently, the Office of the Prime Minister (OPM) is allocating 50*50m for both settlement and backyard garden (UNDP, 2018).

The sub-county can be characterised as rural. The main economic activity among both the host and refugee communities in the sub-county is some form of agriculture, mainly crops (ILO, 2020). The topography is hilly with deep valleys, which create interconnected drainage systems. The average elevation is around 700m above sea level (UNHCR and UNOPS, 2017).

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).

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 Imvepi 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					Not Applicable
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	Significant risk of GW pollution	Significant risk of GW pollution	Significant risk of GW pollution	Significant risk of GW pollution					Significant risk of GW pollution
	Low risk of GW pollution	Low risk of GW pollution	Low risk of GW pollution	Low risk of GW pollution	Low 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
Unlined pit										Significant risk of GW pollution
Pit (all types), never emptied but abandoned when full and covered with soil										Low risk of GW pollution
Pit (all types), never emptied, abandoned when full but NOT adequately covered with soil										
Toilet failed, damaged, collapsed or flooded										
Containment (septic tank or tank or pit latrine) failed, damaged, collapsed or flooded										T1B10C10
No toilet. Open defecation	Not Applicable							T1B11 C7 TO C9		Not Applicable

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

2.1.1 Containment

Imvepi refugee and the host communities in Odupi sub-county are rural communities, and the vast majority of households use traditional unlined pit latrines, which are abandoned when full. 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 camps 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 more 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 storm water 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). During the site visit, it was observed that toilets get abandoned due to termite infestation.

2.1.2 Emptying and transport

The emptying of household toilets is not common in the reporting area. Some institutional toilets get emptied by local private cesspool emptying businesses. Water Mission contracted one of these businesses 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). Due to this, the emptying services which come from far have been charging enormous amounts of money, making it too costly and unaffordable to empty and transport sludge. Currently, there is ongoing construction of a faecal sludge treatment plant. Consequently, the emptying and transportation of faecal sludge is likely to be less expensive, thereby making this component of the sanitation chain more relevant in the area.

2.1.3 Treatment/Disposal/End-use

There is currently no treatment facility for faecal sludge in Terego District. The nearest disposal is a faecal sludge treatment plant in Arua City, which is over 60 km away. 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 and 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 onto public land (BIBCO Investments Ltd, 2019).



Figure 3: New FSTP for Imvepi under construction

*Source: Moses Nyakana

A Faecal Sludge Treatment Plant (FSTP) and Solid Waste Management (SWM) plant for Imvepi refugee settlement and the surrounding host communities is currently under construction (Figure 3). The FSTP is funded by the Uganda Red Cross Society (Uganda Red Cross Society, 2020). It is designed to treat 10 m³/day of FS. The plant is designed to consist of: 1) Preliminary treatment, which basically consists of a receiving area and two sets of bar

screens; 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. At the time of writing this report, the FSTP and SWM facility construction was at 95% completion but no detailed tentative start of operation is known.

2.2 SFD Matrix

Imvepi Refugee Settlement and Host Community, Terego District, Uganda, 22 Dec 2020. SFD Population: 112739 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
T1B10C10 Containment (fully lined tanks, partially lined tanks and pits, and unlined pits) failed, damaged, collapsed or flooded - with no outlet or overflow	15.0	0.0	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			
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	45.0			

Figure 4: SFD Matrix

2.2.1 Risk of groundwater contamination

Kasozi (2017) characterised two main hydrogeological conditions in the area covered by Imvepi refugee settlement: the fractured and the porous aquifer domains. The smaller part of the settlement area is located in an area with fractured aquifer system whilst in the bigger part of the settlement the porous aquifer is composed of layered aquifer horizons of mostly

unconsolidated or lightly consolidated sediments. Most of the groundwater in the porous aquifer zone is found at a depth of more than 20m. The top soil is mostly alluvium and clay.

The risk of groundwater contamination was assessed based on the groundwater pollution risk estimation tool provided on the SFD website. Table 2 summarises the input data in the tool and the respective groundwater risk result:

Table 2: 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 measures are in place
Overall Risk of groundwater pollution (as per SFD GW Risk estimation tool)	Significant risk

Imvepi refugee settlement and host communities are located in a hilly area. Most of the population relies on groundwater for their drinking water supply. In the refugee settlement 99% of the households collect their drinking water from a protected/treated source (UNHCR, 2020d). According to the Imvepi Masterplan (Appendix 6: Masterplan of Imvepi showing waterpoints and contour lines), there are a number of boreholes and waterpoints located downhill from settlement pockets. 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 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 on 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 Odupi sub-county, the census data gives an average of only 17% of households with any type of toilet (UBOS, 2014). Considering that the census data is quite dated 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 Imvepi settlement were adapted from a recent socio-economic household survey that was carried out in the neighbouring Rhino settlement as part of the feasibility study for the planned FSTP (BIBCO Investments Ltd, 2019) and data given by UNHCR (UNHCR, 2020a) and other key informants.

Table 3: Distribution of sanitation technologies in refugee settlements and host communities

Sanitation technology used	Non-refugee population (host community)		Imvepi refugee settlement
	(MoH, 2019)	Adapted estimate after key informant interviews	Based on BIBCO Investments Ltd (2019) and UNHCR (2020a) adapted after key informant interviews
Private pit latrine	74%	-	87%
Shared pit latrine (neighbours)	MD	-	3%
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 low. In Table 3, 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 in Table 4.

Table 4: Distribution of population in refugee settlements and host communities

Location	Population	% of total population
Odupi sub-county (host community)	45,300	40%
Imvepi refugee settlement	67,439	60%
Total	112,739	100%

It was assumed that households with water-based toilets and the public sanitation facilities in the refugee settlements are toilets with holding tanks or fully lined pits. 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 high poverty prevalence in both the refugee settlement and the town, which impedes the users' capacity for preventive maintenance and repairs and confirmed by the Terego District Health Officer. Despite the fact that it can be assumed that there are some badly designed or 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 5 summarises the resulting percentages used for creating the SFD Matrix.

Table 5: Distribution of containment types used for SFD matrix

ID (Reference)	Description	Non-refugee population	Imvepi refugee settlement	Total rounded
T1A3C9	Fully lined tank (sealed)	0%	2%	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%	45%
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 2.1.3, only a very small proportion of the toilets in the area is emptied, and none of the sludge is currently treated. For the SFD matrix we assumed that 100% of the holding tanks are eventually emptied. Since only 1% of the population is assumed to be using a holding tank, a further subdivision of proportions would not have been sensible.

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 are high rates of ‘sporadic’ open defecation practised by farmers during 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. We have included this sporadic open defecation into our estimates by rounding up, but there remains uncertainty around the magnitude of the challenge.

There is no detailed sanitation baseline data about the type of toilets used for Imvepi settlement or the host community. Based on observations and key informant interviews, the authors assumed that the situation is comparable to Rhino settlement but this could be reassessed once more detailed data is available.

Imvepi 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, the groundwater pollution risk was estimated based on consultancy reports and the expert opinion of key informants.

2.3 SFD Graphic

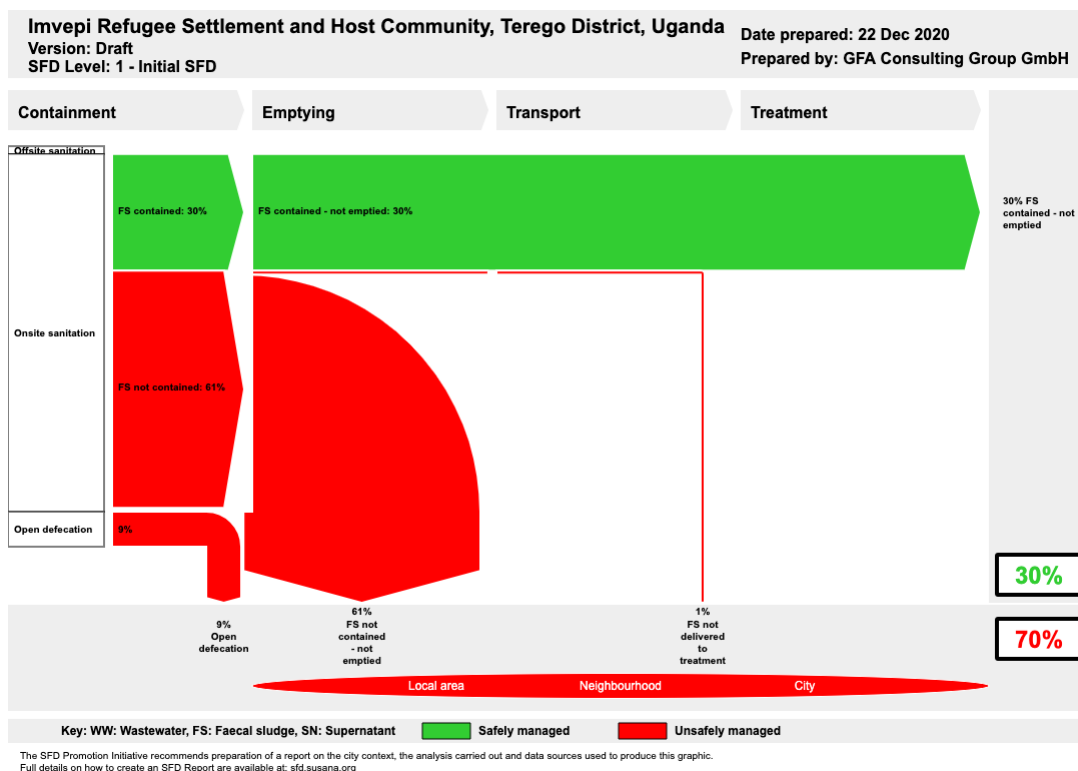


Figure 5: SFD Graphic

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. The overview given in this section is largely based on Schoebitz et al. (2016) and Eberhard (2018).

Function	Responsible institutions	Comment
Policy	MWE	Policy, targets, reporting on sector progress against targets, investment allocation (see financing)
Regulation	MWE	Ministry regulates through performance contracts with Water Supply Authorities determined by the Minister
Financing	MWE	Funds from national government & development partners through WSDFs and NWSC
Investment Planning	WSDFs (small towns)	Water and Sanitation Development Facilities (WSDFs) plan and the implement investments in small towns with DP support.
Investment implementation	NWSC (218 towns)	NWSC takes over systems developed by WSDFs (small towns) and also does own planning and investments (existing towns).
Operations and maintenance	RWUs/umbrellas, Private operators, Water supply and/or sewerage authorities	Responsibility given to Water Supply and/or Sewerage Authorities (WSSAs) by Minister. Operations and maintenance of small towns is moving away from POs (contracted to Local Government) to either RWUs or NWSC.

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 6: Institutional Roles in the Water Sector (status 2017)

*Source: Eberhard, 2018

3.1.1 Policy

The Constitution of Uganda (1995) (1995) as amended (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 the Table 6:

Table 6: Main legal and policy documents for the sanitation sector

Policy / Act	Key points
National Environment Act, No. 5 of 2019	The principle law governing environmental management and conservation in Uganda and stipulates the establishment of District Environment and Natural Resources 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 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 to provide 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 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 path 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, 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 councils with clear administrative structures consisting of elected and technical staff. 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 7 below.

Table 7: 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 number of 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 in order 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: The 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 channelling of government grants to the sub-sector via the 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 Joint 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 Imvepi, 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 National Environmental Management Authority (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 (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 boys and girls 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 and the Ministry of Education and Sports (MoES), which stipulates mandates for sanitation.

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 (OPM) 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 directorate 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 organising sanitation event days 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 (see 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 MWE 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 established 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 Imvepi 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 MWE, UNICEF, and other WASH partners, established a National WASH Humanitarian Coordination Platform - anchored under the MWE's department of Rural Water Supply and Sanitation, and co-led 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.

Apart from Water Mission, OXFAM and the Uganda Red Cross Society are two of the main NGO stakeholders in WASH in Imvepi settlement.

OXFAM is involved in Faecal Sludge Management (FSM) through the construction of institutional pit latrines and their desludging. Designs have been completed to build a FSTP in Rhino refugee settlement comprising of eight constructed wetlands, 12 sludge drying beds and four rock filters. Construction of the plant that is supposed to serve Imvepi settlement and host communities as well is expected to commence soon. 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) m³ 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).

The Uganda Red Cross Society is currently constructing a FSTP in Imvepi. Under the LIFT (Living Conditions in Imvepi Fostered Together, 2018-2020) project, which is co-funded by the Austrian Red Cross, the Ugandan Red Cross is also involved in the construction of institutional and household pit latrines, emptying them using exhausters and gulpers. To enhance their role in sanitation operation and maintenance, they provide capacity building for refugee livelihood groups engaged in treated faecal sludge valorisation. Red Cross has developed the Faecal Sludge Quantification Matrix tool to enable monitoring of sludge emptying in institutional sanitation facilities. Furthermore, they engage in hygiene promotion activities and demand creation for reuse of treated faecal sludge (Uganda Red Cross Society, 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 8):

Table 8: Summary of main regulations and standards in the Ugandan water and sanitation sector

Date	Regulation/Standard
1998	Water Resources Regulations
1998	Waste Discharge Regulations <i>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.</i>
1999	Water Supply Regulations
1999	Sewerage Regulations
1998	Environmental Impact Assessment Regulations <i>Requiring an environmental impact assessment before the implementation of all projects that may have a significant impact on the environment.</i>
1999	National Environment (Waste Management) Regulations
1999	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 with regard to sanitation in the refugee camp. A summary of the most relevant sanitation standards specified in these documents is given in Table 9.

Table 9: 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.

Indicator	Key points
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 Knowledge Attitudes and Practices (KAP) survey is undertaken on an annual basis (UNHCR, 2020b).

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. During those visits, general observations were undertaken 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 develop 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.

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7 Appendix

7.1 Appendix 1: Stakeholder identification

Table 10: 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 Uganda (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 11: 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

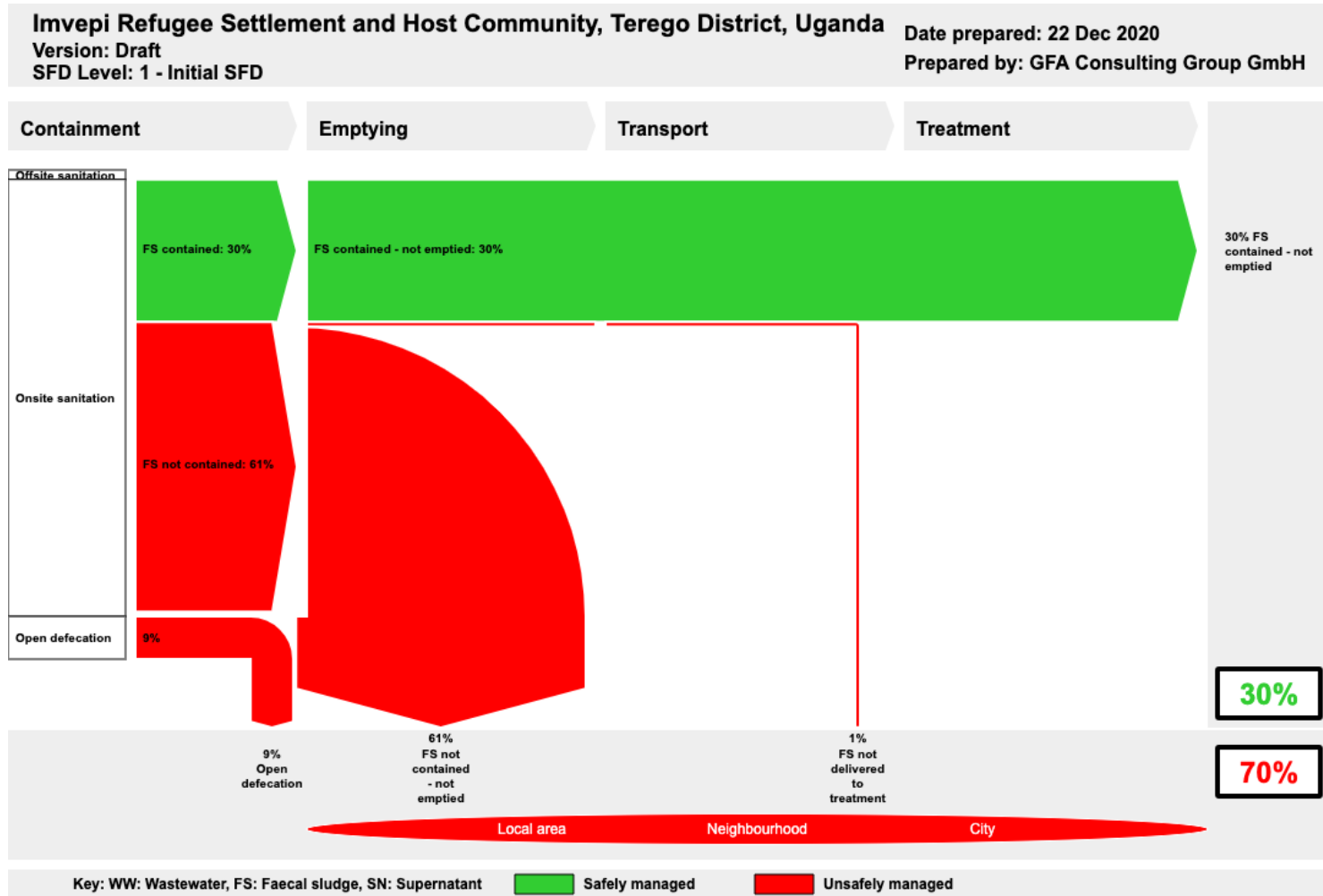
**Imvepi Refugee Settlement and Host Community, Terego District, Uganda, 22 Dec 2020. SFC
Population: 112739**

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
T1B10C10 Containment (fully lined tanks, partially lined tanks and pits, and unlined pits) failed, damaged, collapsed or flooded - with no outlet or overflow	15.0	0.0	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			
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	45.0			

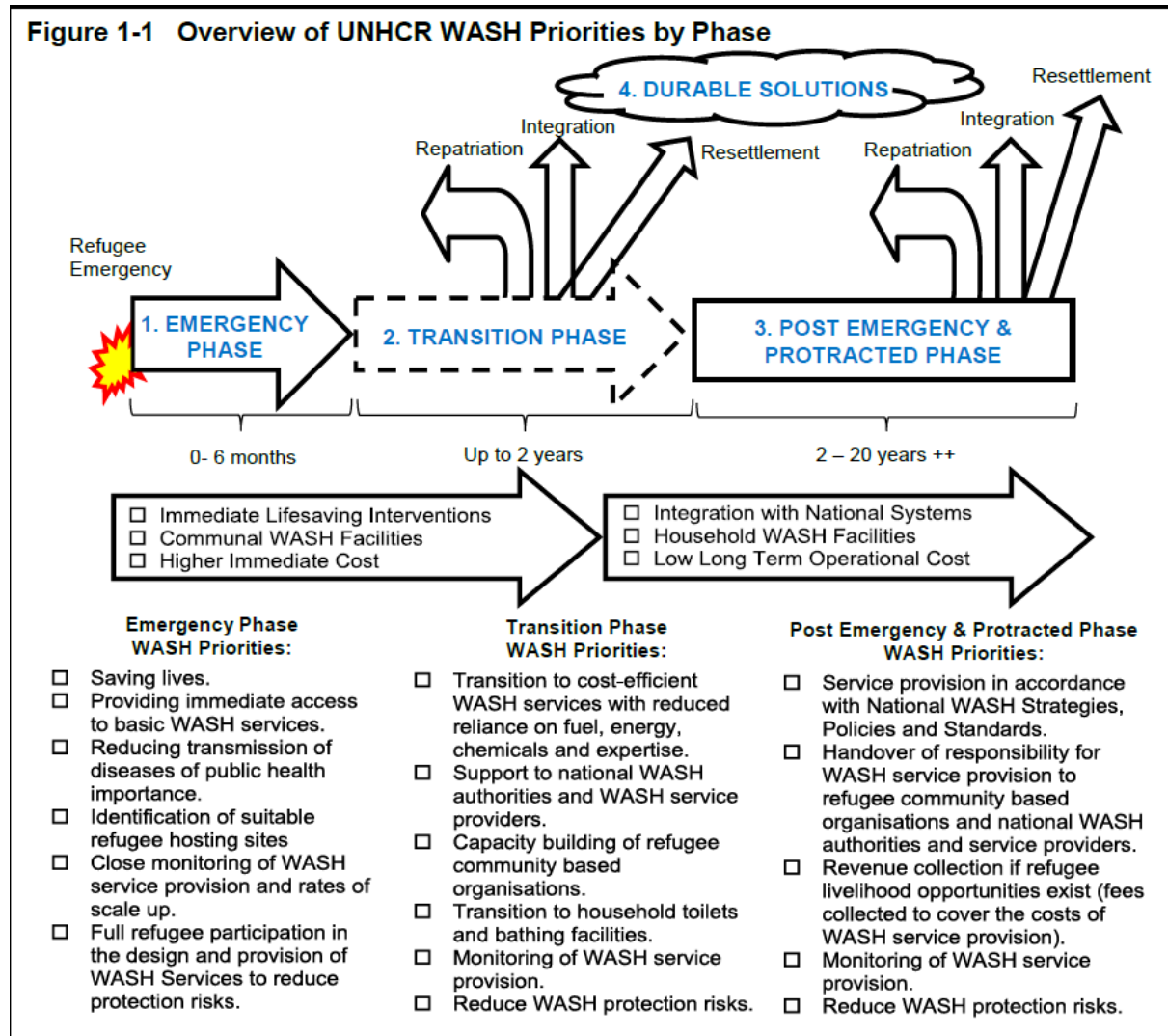


7.4 Appendix 4: SFD Graphic



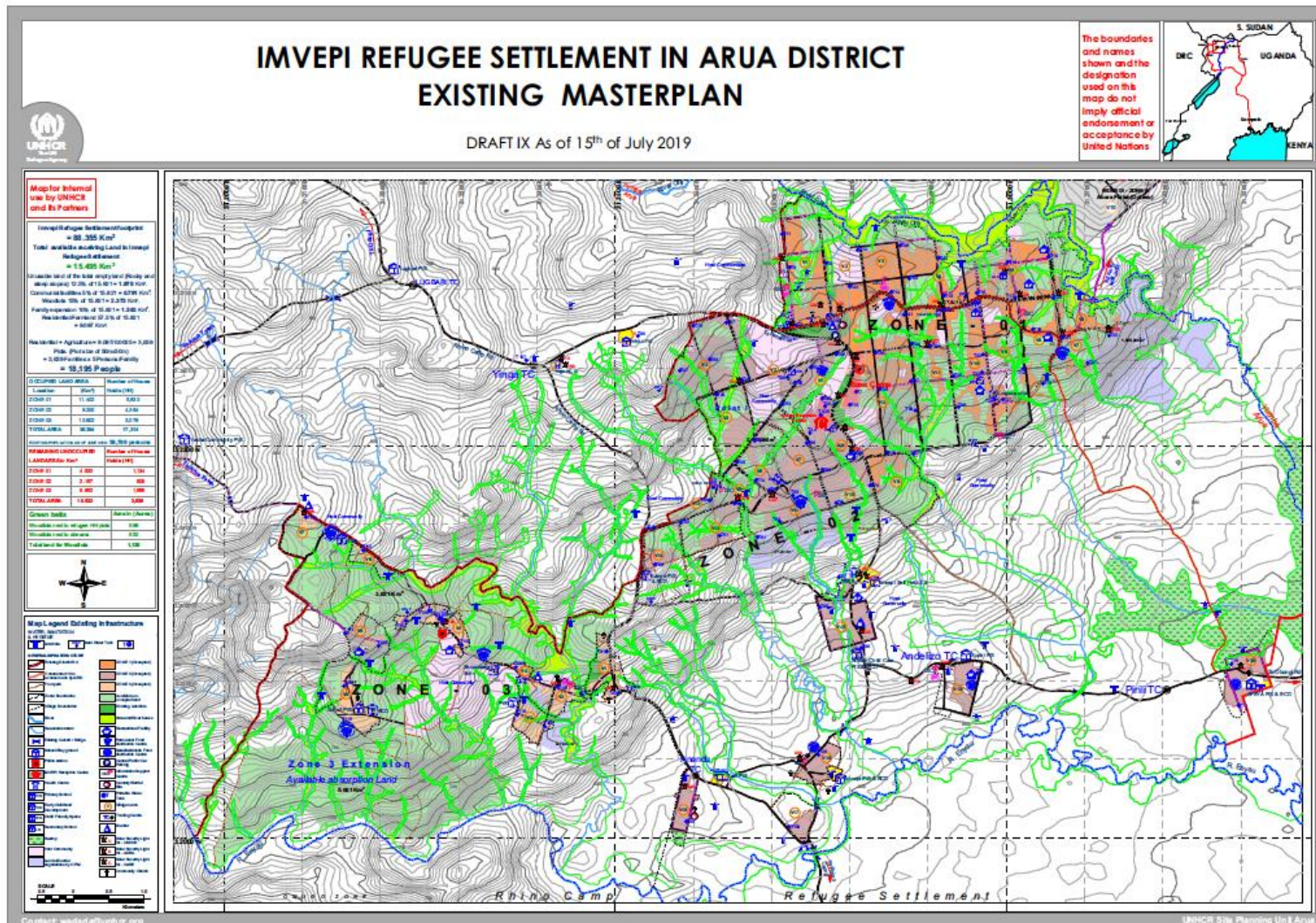
The SFD Promotion Initiative recommends preparation of a report on the city context, the analysis carried out and data sources used to produce this graphic. Full details on how to create an SFD Report are available at: sfd.susana.org

7.5 Appendix 5: UNHCR WASH Priorities by phase



*Source: UNHCR (2018)

7.6 Appendix 6: Masterplan of Imvepi showing waterpoints and contour lines



*Source: UNHCR (2019)