SFD Report

Salfeet
Palestinian territories

Final Report

This SFD Report - SFD level 2 - was created through desk-research and interviews by the Palestinian Water Authority (PWA), the Municipality of Salfeet and World Waternet (WWn).

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SFD Report Salfeet, Palestinian territories, 2024

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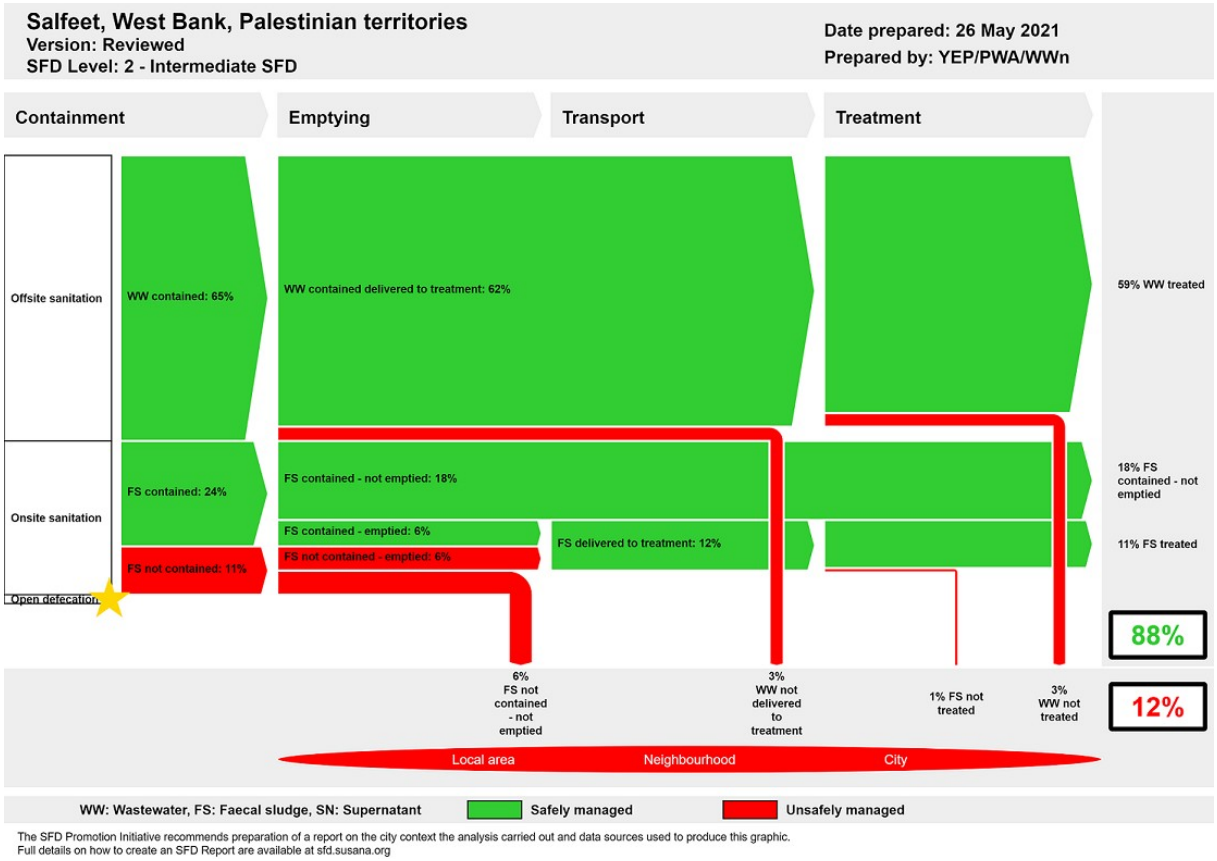
This Executive Summary and SFD Report are available from:

www.sfd.susana.org

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:

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3. General city information

Salfeet is located in the middle of the West Bank. It is bordered by the Ariel settlement and Marda village to the north, Nablus Governorate to the east, the Green Line (the 1949 Armistice Line) to the west, and Ramallah Governorate to the south. As a region, Salfeet covers a total land area of 27 km^2.

The 2021 population is 11,873 inhabitants (PCBS, 2021) with a population growth rate of 0.22%. Salfeet is built over natural, mountainous hill and is further characterized by topography and altitude variations. It has an elevation varying between 400-610 metres above sea level.

Salfeet's climate is generally the Mediterranean, hot and dry in the summer, with mild winters. While the quantity of rainfall varies from year to year, the mean annual rainfall is 700 mm. Salfeet city is located above the huge aquifer, and many springs and wells provide people the drinking water. The Israelis drinking water company Mekorot provides the rest of the drinking water needed. The city has cultivated much of the land for agricultural purposes, providing fruit and vegetables to the surrounding villages and towns.

4. Service outcomes

Currently there are three sanitation technologies in place. 65% of the population have flush or pour-flush toilets that discharge directly into a centralized sewage system where wastewater is contained. This 65% is now treated at the WWTP. Which means this wastewater is contained and safely delivered to the WWTP.

From the 35% not connected to the sewage system, it is estimated that 12% of the soak pits are working properly. From the remaining 23%, it is estimated that 10% are soak pits that need to be regularly emptied (which is not the case if a soak pit is not clogged) and therefore do not work properly. The other 13% is a mix of septic tanks, cesspits and other solutions with impermeable walls and open bottoms. They have to be emptied frequently and should be considered as a not working treatment installation.

At the end of 2023, the Municipality will be in charge of the operation and maintenance of the new WWTP, and the sewage network should cover 90% of the population. The Municipality of Salfeet has a good registration data system and know which household is connected and which ones will be connected to the new WWTP. However, it is challenging to have an overview of the last percentage of the population that is not yet connected or will not be connected (10%) in terms of wastewater treatment status.

Salfeet has three main springs for drinking water supply:

- Al-Matwi spring which provides approximately 15% of water production.
- Al-Sikka spring which provides approximately 15% of water production
- A 400-metre deep artesian spring which provides about 20% of the drinking water supply.
- The Israelis drinking water company Mekorot provides the rest of the drinking water needed (up to 50%).

Close to the spring of Al-Matwi lies a stream of wastewater coming from the Israelis settlement Araiel. The Municipality of Salfeet does not measure any contamination yet but it is controlled closely especially because the groundwater level is shallow (5-10 metres).

The SFD graphic for Salfeet Municipality shows that 12% of the excreta generated are unsafely managed while 88% are safely managed.

5. Service delivery context

The Water Sector Regulatory Council has the objective to monitor all aspects related to the operation of service providers, with the aim of ensuring a good quality and efficiency for customers. The Council reports to the Cabinet of Ministers. At the moment there are 300 service providers active in the Palestinian territories. According to the Water Sector Reform plan those service providers will merge into 10 to 15 Regional Water Utilities by 2030. The Palestinian Water Authority will establish regional water utilities which will be responsible for wastewater services. The establishment will be regulated in line with a regulation issued by the Cabinet of Ministers. Each utility will be responsible for the provision of wastewater services within a specified administrative and geographical scope. The utilities are expected to provide services following sustainable economic, social and environment principles. As well as implement the required measures and develop the plans and programs to develop these services.

Salfeet Municipality is the main service provider in Salfeet city since the construction of the wastewater treatment plant and the sewage network. Service standards are part of the National water and wastewater policy. Salfeet Municipality will include in their legislation that a connection to the sewer system, if technically possible, is mandatory. There is no awareness programme in place, but this will be developed in the future. Salfeet Municipality does inform home owners about the importance of emptying their septic tanks and use it properly, so there is no negative impact on the environment. There is system for enforcement and regulation in place. Salfeet Municipality will be almost solely responsible for wastewater services. The new WWTP is just operational, it is a possibility that certain hitches need to be fixed until the desired service standard is reached. There will be a small group that cannot be connected and will be dependent on private service providers.

The Municipality applies one tariff for all its inhabitants. The city is small and the urban poor have not been identified. An issue is the wastewater from the Israelis settlement, this is a challenge for the municipality, and a political issue.

6. Overview of stakeholders

The stakeholder engagement tool of FSM toolbox was the first step in the stakeholder analysis. The main objective of this stakeholder analysis is to identify key stakeholders to facilitate improvements in cooperation on wastewater and create an overview for the sanitation system in Salfeet city. The stakeholders that were classified fall within three broad categories, The broad categories include stakeholders at the national, local, and

international levels. At the local level, Salfeet Municipality is a pilot area for the SFD project.

The FSM tool maps all the stakeholders based on interest-influence using 6- levels: unknow, little or none, some, moderate, high and crucial. In this case interest is the needs, constraints and problems which are a priority and influence is the power of the stakeholder, mainly in terms of the level of control on the decision-making process.

Table 1: Overview of stakeholders (Salfeet Municipality, 2021).

Key Stakeholders	Institutions / Organizations
High influence/high interest	
Donor Agencies	Dutch Embassy
Local Government	Mayor; Water supply and sanitation department
High interest / low influence	
City Service providers	Commercial desludging private company (informal)
Key Representatives of the society	NGOs/CBOs/Welfare groups, Media
Low influence / low interest	
National Government	Ministry of finance; Ministry of local government, Ministry of Public Housing
Local youth group	Local youth committee

7. Context-adapted SFD Graphic

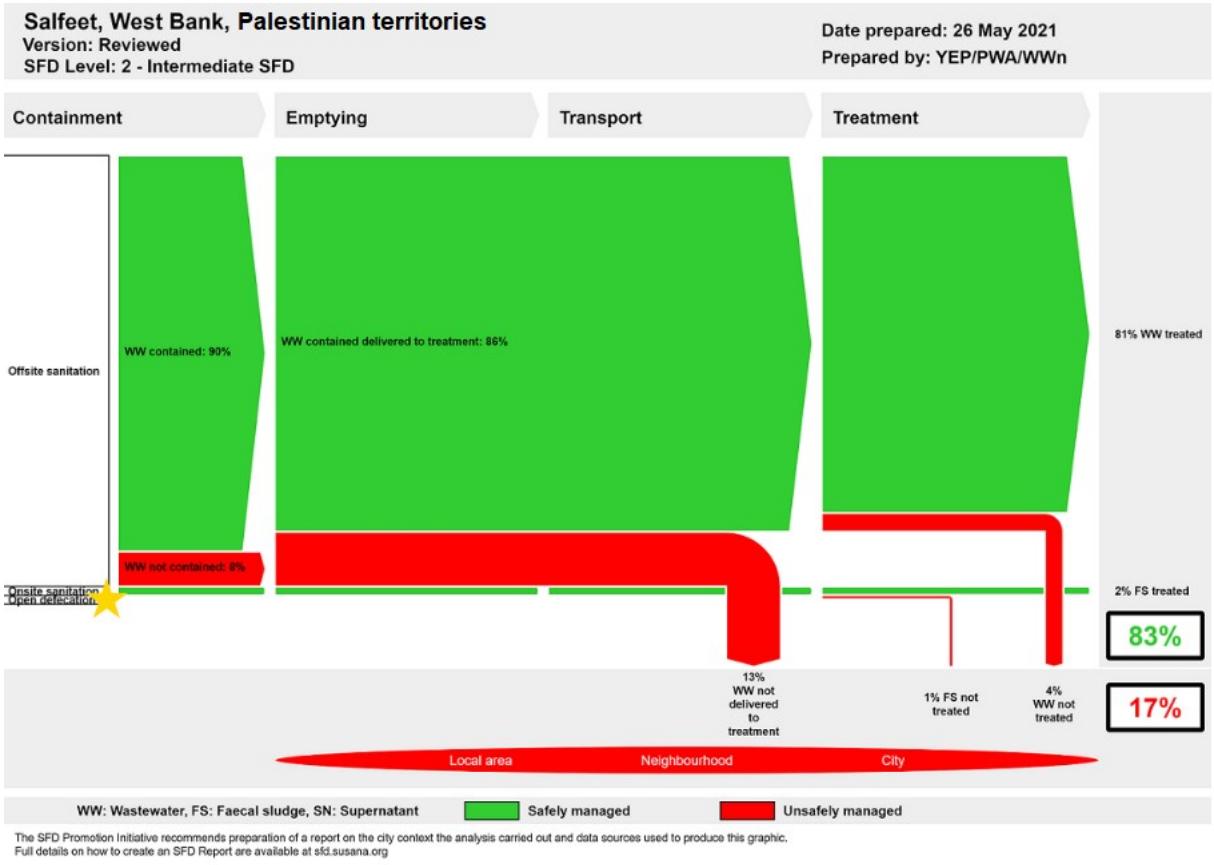

Figure 1: Context-adapted SFD Graphic (Source: Salfeet Municipality).

8. Description of context-adapted SFD graphic

This context-adapted SFD graphic represents the future situation in Salfeet.

Before the end of 2023 the sewage network of Salfeet will be extend and allow to cover 15% extra of the population. This extra sewer will be connected to the existing network and allow the wastewater to be treated at the WWTP of Salfeet.

By the end of 2023, 90% of the population of Salfeet will be connected to the sewage network and ensure that the wastewater is treated properly.

For the last 10% of the population that cannot connect to the sewage network for different reasons, 17% of unsafely managed excreta will be the next challenge for the municipality of Salfeet. For this 17%, it should be investigated what kind of treatment is installed, if it is working properly and answers to the right capacity. Different solutions will be then provided (new individual system, reparation or other).

2% of this 10% will be connected to a decentralized wastewater treatment unit. This unit, called the BluElephant, will be installed in 2022 as a pilot installation. World Waternet, PWA and the municipality of Salfeet will run for a year this research installation. If successful this decentralized unit could be used for different location in Salfeet and in the Palestinian territories.

9. Process of SFD development

The SFD team (consisting of two Dutch professional from World Waternet, one Palestinian professional from YEP/PWA and one French wastewater professional from Waternet) took the lead in filling in the SFD graphic and FSM stakeholder tools and writing the report.

The stakeholders were directly involved in the SFD project, through (individual) meetings, work group discussion, sharing information and reviewing the report. A factsheet made in English and Arabic, was made for the communication with the stakeholders/partners. The meetings and discussions were used to identify the stakeholders' roles and interests in cooperation within the project and identify challenges facing wastewater in the city. Data obtained from these meetings and reviewing of documents led to a good understanding of the wastewater situation in Salfeet. The local

government (Salfeet Municipality) and the national government (PWA) are the two governmental bodies, that were identified as important key players in the SFD process. Two introductory meetings with these two stakeholders were organized online. Salfeet municipality has a database with all the information about the sanitation within Salfeet. The normal process includes an obligatory 'prove of sanitation' when applying for a building permit. These documents are handed in on paper, but are processed in a digital system as well as in Geographical Information System (GIS). The meetings with Salfeet Municipality involved the people responsible for this data. During the session, the matrix was explained and further completed based on their knowledge. In case of missing data, some assumptions were made based on field experience together with the Municipality of Salfeet.

Meantime, many stakeholders were indirectly involved in the project, such as the Ministry of Health, Ministry of Finance, Ministry of Environment, associations of farmers, NGOs, septic tanks owner, youth committee, universities, and donors. Moreover, all those stakeholders participate in the project, which is valuable for the development of the scientific base, training activities, research, making decisions and pilot testing.

10. Credibility of data

The Representativeness of the data's as a high level. Data's are actual and were delivered from the municipality of Salfeet.

The major assumptions which as to be made regards the population who will not be connected to the sewage system of the city (10%). A campaign of field visit will be organise in order to identify the actual treatment of those 10%. After making this overview, advise and solution will be provided in how to make sure those locations are safe for the users and the environment.

11. List of data sources

Sources to produce this executive summary include:

- MACC, 2019. MACC has established work in Salfeet Wastewater Treatment Plant. 26 June 2019.
- Palestinian Central Bureau of Statistics, 2021. Projected Mid -Year Population for Salfeet Governorate by Locality 2017-2026
- Palestinian Water Authority, 2014, Decree No.(14) for the year 2014 Relating to the Water Law
- Salfeet Municipality, 2021. Interview with Municipality staff members, April-September 2021. United Nations Office for the Coordination of Humanitarian Affairs, 2018. Map of the area, showing the Israeli occupation arrangements in the governorate. (https://www.ochaopt.org/atlas2019/wbclosure.html)

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Table of Content

1 General city information 1
1.1 Population 1
1.2 Topografy 1
1.3 Climate 2
1.4 City context 2
2 Service Outcomes 3
2.1 Overview 3
2.2 SFD Matrix 3
2.2.1 Risk of Ground water contamination 7
2.2.2 Certainty/uncertainty level of associated data used for the SFD Matrix 7
2.3 Summary of assumptions 7
2.4 SFD Graphic 8
3 Service delivery context 9
3.1 Policy, legislation and regulation 9
3.1.1 Policy 9
3.1.2 The institutional roles 9
3.1.3 Service provision 10
3.2 Service standards 10
3.3 Planning 10
3.3.1 Service targets 10
3.3.2 Investments 10
3.4 Equity 11
3.4.1 Current choice of services for the urban poor 11
3.4.2 Plans and measures to reduce inequity 11
3.5 Outputs 11
3.5.1 Capacity to meet service needs, demands and targets 11
3.5.2 Monitoring and reporting access to services 11
3.6 Expansion 12
3.6.1 Stimulating demand for services 12
3.6.2 Strengthening service provider roles 12
4 Stakeholder Engagement 13

5 Acknowledgements 16
6 References 17
7 Appendix 18
7.1 Appendix 1: FSM Stakeholder Analysis 18
7.2 Appendix 2: Context-adapted SFD Graphic 27

List of Tables

Table 1: SFD Matrix. 4

Table 2: Overview of water laws and regulations in the Palestinian territories (Salfeet Municipality, 2012). 9

Table 3: Overview of stakeholders (FSM toolbox, 2021). 13

List of Figures

Figure 1: Map of the area, showing the Israeli occupation arrangements in the governorate (United Nations, 2018). 1

Figure 2: Rainfall map of the Palestinian territories (Amr et al. 2018). 2

Figure 3 Selection grid. 3

Figure 4: Picture of the WWTP of Salfeet City. 5

Figure 5: Vacuum truck discharging the faecal sludge at the WWTP of Salfeet. 6

Figure 6: SFD Graphic. 8

Figure 7: Graph with interest versus influence of various stakeholders, (FSM toolbox, 2021).15

Figure 8: Context-adapted SFD Graphic. 27

Abbreviations

CBO	Community-Based Organization
FSM	Faecal Sludge Management
GIS	Geographical Information System
KfW	Kreditanstalt für Wiederaufbau
MACC	Masoud And Ali Contracting Company
NGO	Non-Governmental Organization
PCBS	Palestinian Central Bureau of Statistics
PWA	Palestinian Water Authority
SFD	Shit Flow Diagram
WWn	World Waternet
WWTP	Wastewater Treatment Plant
YEP	Young Expert Programmes

1 General city information

1.1 Population

Salfeet is located in the middle of the West Bank (Figure 1). The word «Sal- feet» consists of two syllables –(sal) meaning “baskets” and (feet) means “grapes” Therefore, Salfeet means “Baskets of Grapes” This shows that its land was famous for its grapes besides the olive tree. It is bordered by the Ariel settlement and Marda village to the north, Nablus Governorate to the east, the Green Line (the 1949 Armistice Line) to the west, and Ramallah Governorate to the south. As a region, Salfeet covers a total land area of 27 km^2. These include Palestinian built-up areas, Israeli settlements, closed military areas, military bases, open spaces, forests, and construction sites**.** With a growth rate of 2.3%, the 2021 population is 11,873 inhabitants (PCBS, 2021).

1.2 Topografy

Salfeet is built over natural, mountainous hill and is further characterized by topography and altitude variations. It has an elevation varying between 400-610 metres above sea level. Its western part oversees the beginning of Al-Matwi Valley, which is considered as downstream of the wastewater coming from Salfeet and Ariel settlement, whereas its eastern part overlooks al-Sha'er Valley.

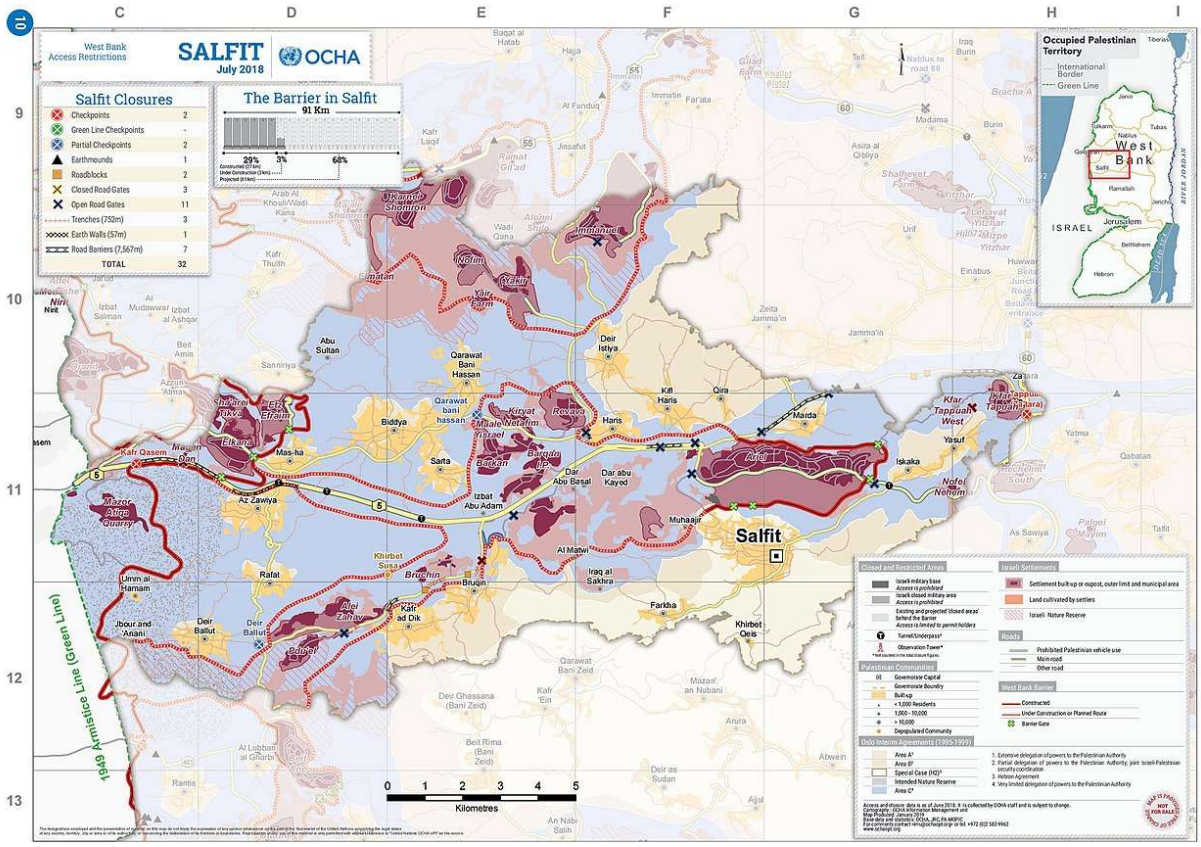

Figure 1: Map of the area, showing the Israeli occupation arrangements in the governorate (United Nations, 2018).

1.3 Climate

Salfeet's climate is generally the Mediterranean, hot and dry in the summer, with mild winters. The temperatures rise maximum to 38° C during the peak summer season and drop down to a minimum of 0° C during the winter season (Figure 2).

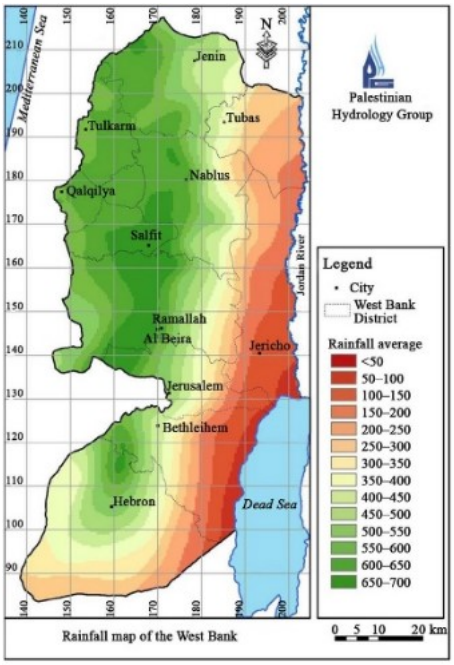

Figure 2: Rainfall map of the Palestinian territories (Amr et al. 2018).

While the quantity of rainfall varies from year to year, the mean annual rainfall is 700 mm, with an average humidity of 60% recorded by the Palestinian Meteorological Department. Salfeet is located above the huge aquifer, and many springs and wells provide people the drinking water.

1.4 City context

Despite being hemmed in by illegal Israeli settlements, Salfeet has managed to become something of a Palestinian success story. This small city is home to the Al Quds Open University campus, a hospital, a lively high street and infrastructure. It is a large administrative and commercial centre for many surrounding villages in the central West Bank, which means different flow through the midday. An industrial zone that cuts marble and stone to the east, while other industries also operate in the area. Salfeet is also the West Bank's largest olive oil producer, making 1,500 tons annually. Salfeet is perhaps best known for its 'green revolution', the move to cultivate much of the land for agricultural purposes, providing fruit and vegetables to the surrounding villages and towns. Consequently, there was an urgent need to establish the wastewater treatment plant.

2 Service Outcomes

2.1 Overview

Sanitation technologies and methods used in Salfeet are a combination off onsite and off-site solutions. Figure 3 shows the sanitation system selection grid.

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	T1A1C1				Significant risk of GW pollution T1A1C5					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					
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			T1A4C8		Significant risk of GW pollution T1A4C10
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										Significant risk of GW pollution 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										
No toilet. Open defecation	Not Applicable									Not Applicable

Figure 3: Selection grid.

2.2 SFD Matrix

The percentage of the population connected to the various technologies are outlined in Table 1.

Table 1: SFD Matrix.

Salfeet, West Bank, Palestinian territories, 26 May 2021. SFD Level: 2 - Intermediate SFD
Population: 11873
Proportion of tanks: septic tanks: 100%, fully lined tanks: 100%, lined, open bottom tanks: 100%

Containment						
System type	Population	WW transport	WW treatment	FS emptying	FS transport	FS treatment
	Pop	W4a	W5a	F3	F4	F5
System label and description	Proportion of population using this type of system (p)	Proportion of wastewater in sewer system, which is delivered to centralised treatment plants	Proportion of wastewater delivered to centralised treatment plants, which is treated	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
T1A1C1 Toilet discharges directly to a centralised combined sewer	65.0	95.0	95.0			
T1A1C5 Toilet discharges directly to soak pit	12.0					
T1A4C10 Lined tank with impermeable walls and open bottom, no outlet or overflow	12.0			50.0	100.0	95.0
T1A4C8 Lined tank with impermeable walls and open bottom, connected to open ground	11.0			50.0	100.0	95.0

Currently, there are four sanitation technologies in place:

Off-site sanitation:

- 65% of the population have flush or pour-flush toilets that discharge directly into a centralized sewage system where wastewater is contained. As shown in the SFD matrix (Table 1), 65% of the population is now connected to a new sewage system managed by the Municipality of Salfeet.
- Salfeet Municipality is now finishing constructing a Wastewater Treatment Plant (WWTP) to improve service for existing and new customers and enhance the water quality in Wadi Al-Matwi and downstream communities (i.e., Kufur Alddeek and Bruqeen). The project's outcome is an integrated wastewater system that provides a cost-effective and sustainable health and environmental solution to the wastewater collection, reuse for the agricultural, treatment, and disposal for Salfeet.
- The WWTP is now been tested with the contractor and Salfeet Municipality. By the end of 2022, the WWTP should be turned over to Salfeet Municipality. Currently, only 65% of the population is connected to the sewage system, operated by the Salfeet Municipality. The wastewater is collected and transferred by gravity to the WWTP.
- The WWTP of Salfeet is using sprinkling technique as a main treatment for the carbonate and nitrogenous pollution removal. The picture of the WWTP in Figure 4 gives an

interesting view of the plant. The plant is built with a coarse grit and fine screen removal, sand and grease removal and Imoff tanks for primary sedimentation and stabilization of the sludge. After those pre-treatment installation the trickling filters in combination with clarification tanks insure the main treatment of the wastewater. The primary and secondary sludge is extracted and treated with drying beds technique. The biogas from the Imoff tanks is burned with a flare. There are no tertiary treatment at the moment (disinfection of effluent for re-use for example).

Figure 4: Picture of the WWTP of Salfeet City.

- This 65% of the population´s wastewater is now treated at the WWTP. Salfeet Municipality will be operating the WastewaterTreatment Plant (WWTP) at the end of 2022. The WWTP is now operated by the contractor. The current sewage system is covering 65% of the city and will be covering 90% of the city by the end of 2023.
- According to data received by Salfeet Municipality in July 2021, the sewage network is composed of about 43 km pipelines. The leading network is around 31 km with an additional 12 km lateral line. An extension of the network consists of approximately 11 km of branch sewers. The project aims to raise the number of households connected to the network and increase the flow into the WWTP currently in the test phase. 90% of inhabitants will be connected to sewage system after the extension project (expected at the end of 2023).

On-site sanitation:

- The unserved parts of the city are using septic tanks, cesspits and soak pits. It represents 35% of the total.
- 12% of the population have flush or pour flush toilets that discharge into soak pits. They have been modelled as system T1A1C5. It is estimated that those soak pits are working properly and ensure a treatment of the wastewater. In 2022, 10% of the 12% will be connected to the sewage network. The remaining 2% of the population will still not be connected to the sewage system and shall be reviewed. If needed their soak pits will be repaired or modified.
- 11% of the population have flush or pour flush toilets that discharge in a septic tank and thereafter into the ground. They have been modelled as lined tanks with impermeable walls and open bottom, connected to open ground (T1A4C8). Of this 11% approximately 50% are soak pits that are clogged or partially clogged and need to be emptied like the cesspit. Of this 11% it is estimated that 50% only is regularly emptied. In 2022, with the additional sewage network, 6% of this 11% will be connected. Only 4% will remain as an individual treatment and shall be reviewed. If needed their cesspits will be repaired or modified.
- 12% of the population have flush or pour flush toilets that discharge in a septic tank without outlet. They have been modelled as lined tanks with impermeable walls and open bottom, no outlet or overflow (T1A4C10). Of this 12% approximately 50% are soak pits that are clogged or partially clogged and need to be emptied like the cesspit. Of this 12%, it is estimated that 50% only is regularly emptied. In 2022, with the additional sewage network, 7% of this 12% will be connected. Only 4% will remain as an individual treatment and shall be reviewed. If needed their cesspits will be repaired or modified. Figure 5 shows a vacuum truck discharging the faecal sludge at the WWTP of Salfeet.

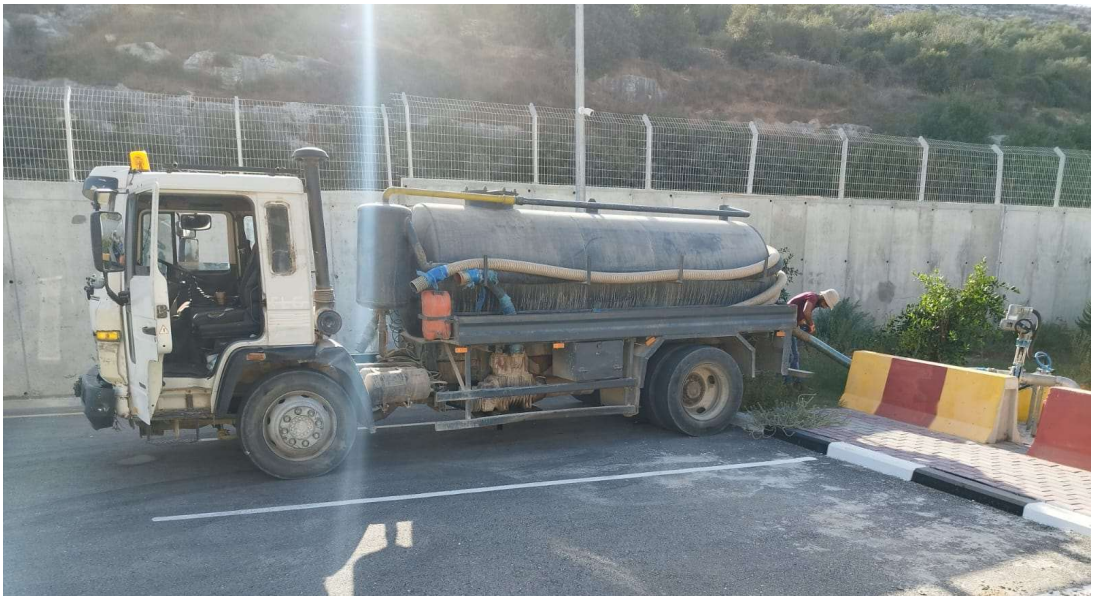

Figure 5: Vacuum truck discharging the faecal sludge at the WWTP of Salfeet.

2.2.1 Risk of Ground water contamination

Salfeet city has three main springs for drinking water supply:

- Al-Matwi spring which provides approximately 15% of water production.
- Al-Sikka spring which provides approximately 15% of water production
- A 400-metre deep artesian spring which provides about 20% of the drinking water supply.

Close to the spring of Al-Matwi lies a stream of wastewater coming from the Israelis settlement Araiel. The Municipality of Salfeet does not measure any contamination yet but it is controlled closely especially because the groundwater level is shallow (5-10 metres).

The last 50% of drinking water is delivered from Israel through pipelines from the drinking water company Mekorot. Therefore, it has been assumed that there is no risk of groundwater contamination.

2.2.2 Certainty/uncertainty level of associated data used for the SFD Matrix

The Municipality of Salfeet has done a great work connecting 65% of the population to the sewage system. The Municipality has a good registration data system and know which household is connected and which ones will be connected before the end of 2023.

However it is not easy to have an overview of the last percentage of the population that is not yet connected or will not be connected (10%) in terms of wastewater treatment status. It is not always clear which kind of treatment is in place. In the area, soak pits and cesspits are mostly installed. And it is not always clear if the treatment is working properly. Therefore some assumptions were made based on field experience together with the Municipality of Salfeet.

2.3 Summary of assumptions

Offsite sanitation systems:

✓ 65% of the population are connected to the sewer system. Since the wastewater treatment plant and the sewer network are new, variables W4a (proportion of wastewater delivered to treatment) has been set to 95% and W5a (proportion of wastewater delivered to treatment which is treated) has been set to 95% (COD removal is 93.5%, BOD removal 96.3% and TSS removal is 95.5%).

Onsite sanitation systems:

✓ The proportions of FS in septic tanks and fully lined tanks, lined tanks with impermeable walls and open bottom and all pits were set to 100% according to the relative proportions of the systems in the municipality, as per the guidance given in the Frequently Asked Questions (FAQs) in the Sustainable Sanitation Alliance (SuSanA) website.

✓ Variable F3 (proportion of FS which is emptied) for each sanitation system (T1A4C8 and T1A4C10) was set to 50%. 50% is a estimation made with the municipality. The household survey in Salfeet was not always easy to follow. With the few data and field experience, 50% was chosen as representative enough for the situation.

- ✓ Variable F4 (proportion of FS emptied which is delivered for treatment) for each sanitation system (T1A4C8 and T1A4C10) was set to 100%.
- ✓ The emptied faecal sludge is treated at the WWTP of Salfeet. Thus, variable F5 (proportion of FS delivered to treatment which is treated) for each sanitation system (T1A4C8 and T1A4C10) was set to 95%.

2.4 SFD Graphic

Figure 6 shows the SFD graphic for Salfeet Municipality where 12% of the excreta generated are unsafely managed while 88% are safely managed. The unsafely managed excreta originate from wastewater delivered to treatment but not treated (3%), wastewater not delivered to treatment (3%) and Faecal Sludge (FS) not contained - not emptied (6%). It can be highlighted that the emptied sludge from the septic tanks will be treated at the WWTP in the coming future and 15% of the households will be connected to the sewage system before the end of 2023. The final 10% cannot be connected and will need repairs or replacement of their existing sanitation options. Of this 10%, 2% will be connected next year to a decentralized mobile wastewater treatment unit (the BluElephant).

The safely managed excreta originate from wastewater delivered to treatment and treated (59%), FS contained - not emptied (18%) and FS not contained – emptied (11%). However, when pits and tanks start to fill up, this FS that remains inside the pits and tanks will require to be emptied by emptying service providers. The context-adapted SFD graphic, which represents the future situation in Salfeet, has been included in section 7.2 (Appendix 2).

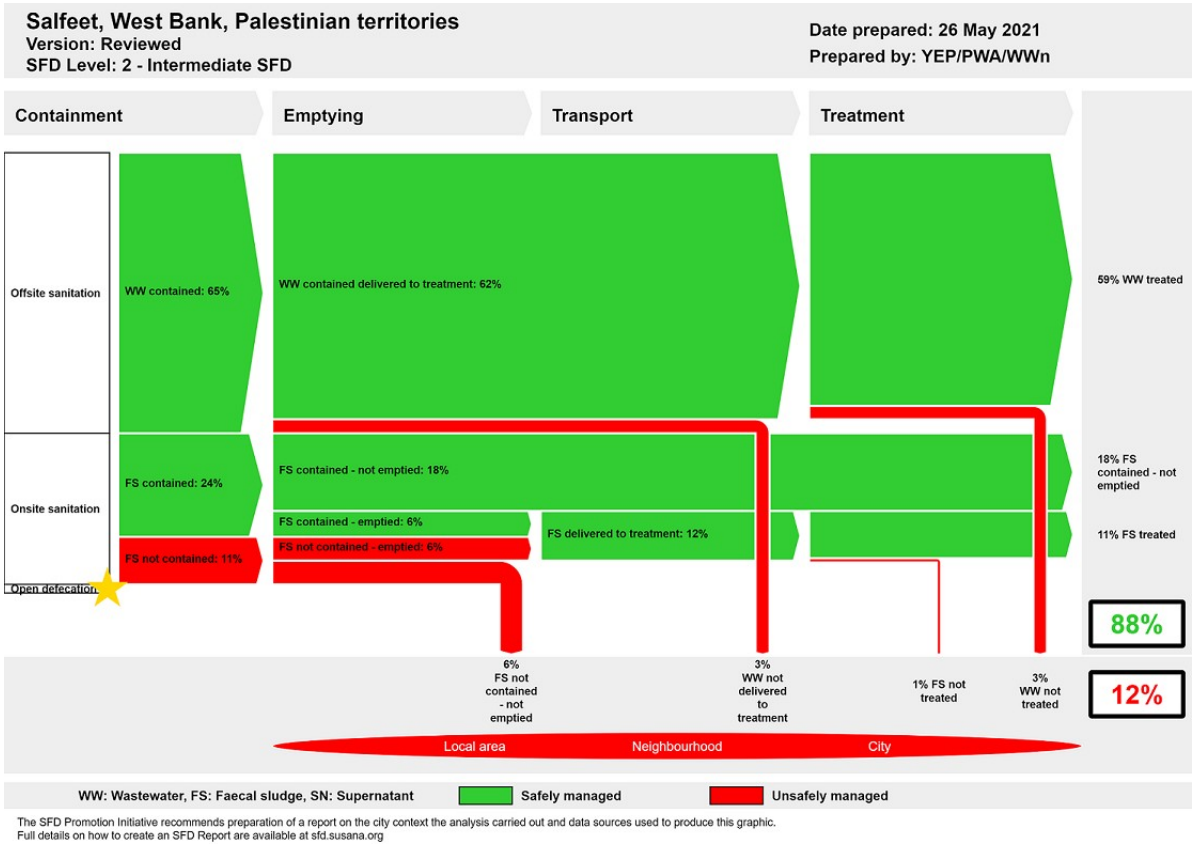

Figure 6: SFD Graphic.

3 Service delivery context

3.1 Policy, legislation and regulation

3.1.1 Policy

The main documents relating policy and legislation are

- The National Water and Wastewater Policy 2013-2032;
- The Water Law 2014;
- Water Users Association Regulation 2018.

Table 2 provides an overview of the previous/underlying laws or regulations.

Table 2: Overview of water laws and regulations in the Palestinian territories (Salfeet Municipality, 2012).

Policy	Year	Law or regulation
National Water and Wastewater Policy 2013-2032	1995	National Water Policy
	1997	Draft Water Resource Management Strategy
	1999-2004	Coastal and Aquifer Management Plan (CAMP)
	2000	Water Sector Strategy Planning Study (WSSPS)
	2000	Water National Plan (NWP)
	2011-2013	Strategy for the Water and Wastewater Sector
Water Law 2014	1997	Palestinian Local Government Law
	1999	Environmental Law No 7 and amendments
	2002	Water Law
	2003	Basic Law and amendments
	2003	Agricultural law
Water Users Association Regulation 2018	2003	Basic Law
	2014	Water Law

3.1.2 The institutional roles

The Water Sector Regulatory Council

The Council has the objective to monitor all *aspects related to the operation of service providers, with the aim of ensuring a good quality and efficiency for customers. The council reports to the Cabinet of Ministers in a semi-annual report. The council has the following responsibilities and powers:*

- Monitoring operational processes of wastewater management.
- Ensuring that wastewater treatment costs take into consideration the interests of all concerned parties.
- Monitoring the compliance of the National Water Company and Service Providers with the adopted standards for the provision of water and Sanitation services

Regional Water Utilities and Water Users Associations

At the moment there are 300 service providers active in the Palestinian territories. According to the Water Sector Reform plan, those service providers will merge into 10 to 15 Regional Water Utilities by 2030. The Palestinian Water Authority will establish regional water utilities which will be responsible for wastewater services. The establishment will be regulated in line with a regulation issued by the Cabinet of Ministers. Each utility will be responsible for the provision of wastewater services within a specified administrative and geographical scope. The utilities are expected to provide services following sustainable economic, social and environment principles. As well as implement the required measures and develop the plans and programs to develop these services (PWA, 2014).

3.1.3 Service provision

Salfeet Municipality is the main service provider in Salfeet since the construction of the wastewater treatment plant and the sewage network. Currently 65% of the city is connected to the main sewer. The other 35% depends on private service providers to empty their septic tank. There is not a strict control of where the faecal sludge ends up. By the end of 2023 it is expected that 90% of the people will be connected to the sewer system.

3.2 Service standards

Service standards are part of the National water and wastewater policy. Salfeet Municipality will include in their legislation that a connection to the sewer system, if technically possible, is mandatory. Salfeet Municipality will be almost solely responsible for wastewater services. The wastewater treatment plant is just operational, it is a possibility that certain hitches need to be fixed until the desired service standard is reached. There will be a small group that cannot be connected and will be dependent on private service providers.

3.3 Planning

3.3.1 Service targets

Salfeet Municipality is in the process of extending its main sewage system with 10 km, which will result in a coverage of 90% by the end of the year 2023. As well as the main sewage network will be connected to the wastewater treatment plant and this will be operational by the end 2021. However the remaining 10% will not be able to be connected due to circumstances such as geographical location.

3.3.2 Investments

Early water treatment plant

In 1998 the construction of a wastewater treatment plant started, funded by the German development bank (KFW). However, the construction was halted by Israel due to security reasons. Another 4 years later, in 2002, there was an approval to build another wastewater treatment plant at a different site. A requirement was that Ariel, an Israelis settlement, would be connected as well. This suggestion was denied by the Palestinians, and the construction was put on hold. In 2008, the Palestinians agreed to an alternative option, namely a large pipeline transporting the wastewater of Ariel to an Israeli treatment plant. However, till 2013 this pipeline was still not build, causing the build of the wastewater treatment plant to remain

on hold (Al Jazeera, 2013). The construction of the WWTP started in 2018 and now in trial operation by the contractor.

Current water treatment plant (2019-2022)

In 2019, the organization Masoud And Ali Contracting Company (MACC) began working in Salfeet, consisting of a Wastewater Treatment Plant and a small Solar PV plant (MACC, 2019).

The project is funded by KfW. In 2020, it was announced that another 3 million euros would go to the project, resulting in a total fund of 19,2 million euro (Mid East Environment, 2020). The contractor on this project is JV MACC-MESOGEOS and consulting companies involved JV GITEC-IGIP with Saiji-CEC.

3.4 Equity

3.4.1 Current choice of services for the urban poor

Salfeet applies one tariff for all its inhabitants. The tariff for the wastewater treatment is part of the tariff for the drinking water consumption. The tariff is 1 shekel per cubic metre drinking water (USD 0,26).

For people with septictank or (clogged) soakpit, the service to empty the tanks costs between 205-250 shekel (USD 53-65). This a quiet expensive action especially because most of the tanks should be empty 3 to 4 times per year. This is one of the main reason why many people do not do it and there for the risk for sanitation and the environment pollution grows bigger.

The city is small and the urban poor have not been identified.

3.4.2 Plans and measures to reduce inequity

Currently there are no plans to implement a system with differencing prices.

3.5 Outputs

3.5.1 Capacity to meet service needs, demands and targets

Due to the geography, 10% is not able to be connected. 2% of this 10% will be treated by the Pilot of the BluElephant. The remaining 8% will need some on-site investigation and individual treatment solutions. The wastewater treatment plant should be sufficient for the 90% of the Salfeet area that can be connected. An issue is the wastewater from the Israelis settlement, this is a challenge for the municipality, and a political issue.

3.5.2 Monitoring and reporting access to services

The WWTP and sewage network are relatively new and there is no monitoring and reporting yet in place, it will be developed in the future.

3.6 Expansion

3.6.1 Stimulating demand for services

Starting in 2022, it will be mandatory for inhabitants to be connected to the sewer system. There is no awareness programme in place, but this will be developed in the future. Salfeet Municipality does inform home owners about the importance of emptying their septic tanks and use them properly, so there is no negative impact on the environment. There is system for enforcement and regulation in place.

3.6.2 Strengthening service provider roles

Salfeet Municipality is the main service provider. The municipality is responsible for the sewage network and the WWTP. They are doing the maintenance and the operating of both sewage system as WWTP. For the emptying of the different on-site sanitation system private vaccum truck companies are providing this service.

4 Stakeholder Engagement

In 2019 a FGD meeting was organised with World Waternet (WWn) and the municipality of Salfeet. During this meeting the WWn team introduced the SFD concept. After that different FGD (approximately 7 meetings) were conducted with different employees from different departments in order to create a team for the realisation of the SFD graphic. One employee (Loay Alatrash) of WWn is based in Salfeet and provides good support and coordinate this SFD project.

After the establishing of the SFD team, a stakeholder analysis was carried out. The main objective of this stakeholder analysis is to identify key stakeholders to facilitate improvements in cooperation on wastewater management and to create an overview for the sanitation system in Salfeet. The stakeholder engagement tool of the FSM (Faecal Sludge Management) toolbox was the first step in the stakeholder analysis.

The summary of the FSM tool is shown in Table 3. The full report is added as annex.

Table 3: Overview of stakeholders (FSM toolbox, 2021).

Typology	Stakeholder	Color
High influence/high interest		
Donor Agencies	Dutch Embassy	
Local Government	Mayor	
	Water supply and sanitation department	
High interest/ low influence		
Key Representatives of the Society	NGOs/CBOs/Welfare groups	
City Service Providers	Commercial desludging private company (informal)	
High influence/ low interest		
National Government	Ministry of finance	
	Ministry of local government	
Low influence/ low interest		
Key Representatives of the Society	Media	
National Goverment	Ministry of public housing	
Local Youth Group	Local Youth Committe	

The stakeholders that were classified fall within three broad categories. The main categories include stakeholders at the national, local, and international levels. At the local level, Salfeet Municipality is a pilot area for the SFD project. At the national level, the Palestinian Water Authority (PWA), Ministry of Local Government. KFW, World Waternet, and Consultancy

office are considered at an international level. The previous stakeholders were directly involved in the SFD project, through meetings, discussions, sharing information and reviewing the report.

A factsheet made in English and Arabic, was made for the communication with the stakeholders/partners. The factsheet includes a detailed description of what a SFD graphic is and what the process of making a SFD graphic entails. Also included is general information about sanitation and specific information about Salfeet which is relevant to the SFD graphic. Besides creating a useful factsheet to use in the communication consultations, individual meetings, and working group discussions were held. These meetings and discussions were used to identify the stakeholders' roles and interests in cooperation within the project and identify challenges facing wastewater in the city. Data obtained from these meetings and reviewing of documents led to a good understanding of the wastewater situation in Salfeet.

The local government (Salfeet Municipality) and the national government (PWA) are the two governmental bodies, that were identified as important key players in the SFD graphic process. Two introductory meetings were organized online. The objective of these meetings was mainly to share information and to inform on the current problem, what the SFD graphic entails, why to jointly make an SFD graphic and explain expectations within the process. The first session was with only PWA. However the second session was held with both PWA and Salfeet Municipality, as well as two content based meetings with Salfeet Municipality to fill in the SFD matrix. Salfeet municipality has a database with all the information about the sanitation within Salfeet. The normal process includes an obligatory 'prove of sanitation' when applying for a building permit. These documents are handed in on paper, but are processed in a digital system as well as in Geographical Information System (GIS). The meetings with Salfeet Municipality involved the people responsible for this data. During the session, the matrix was explained and further completed based on their knowledge.

Meantime, many stakeholders were indirectly involved in the project, such as the Ministry of Health, Ministry of Finance, Ministry of Environment, associations of farmers, NGOs, septic tanks owner**,** youth committee**,** universities, and donors. Moreover, all those stakeholders participated in the project, which is valuable for the development of the scientific base, training activities, research, making decisions and pilot testing.

The FSM tool maps all the stakeholders based on interest-influence using 6- levels: unknown, little or none, some, moderate, high and crucial. In this case interest is the needs, constraints and problems which are a priority and influence is the power of the stakeholder, mainly in terms of the level of control on the decision-making process (Figure 7).

Figure 7: Graph with interest versus influence of various stakeholders, (FSM toolbox, 2021).

5 Acknowledgements

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6 References

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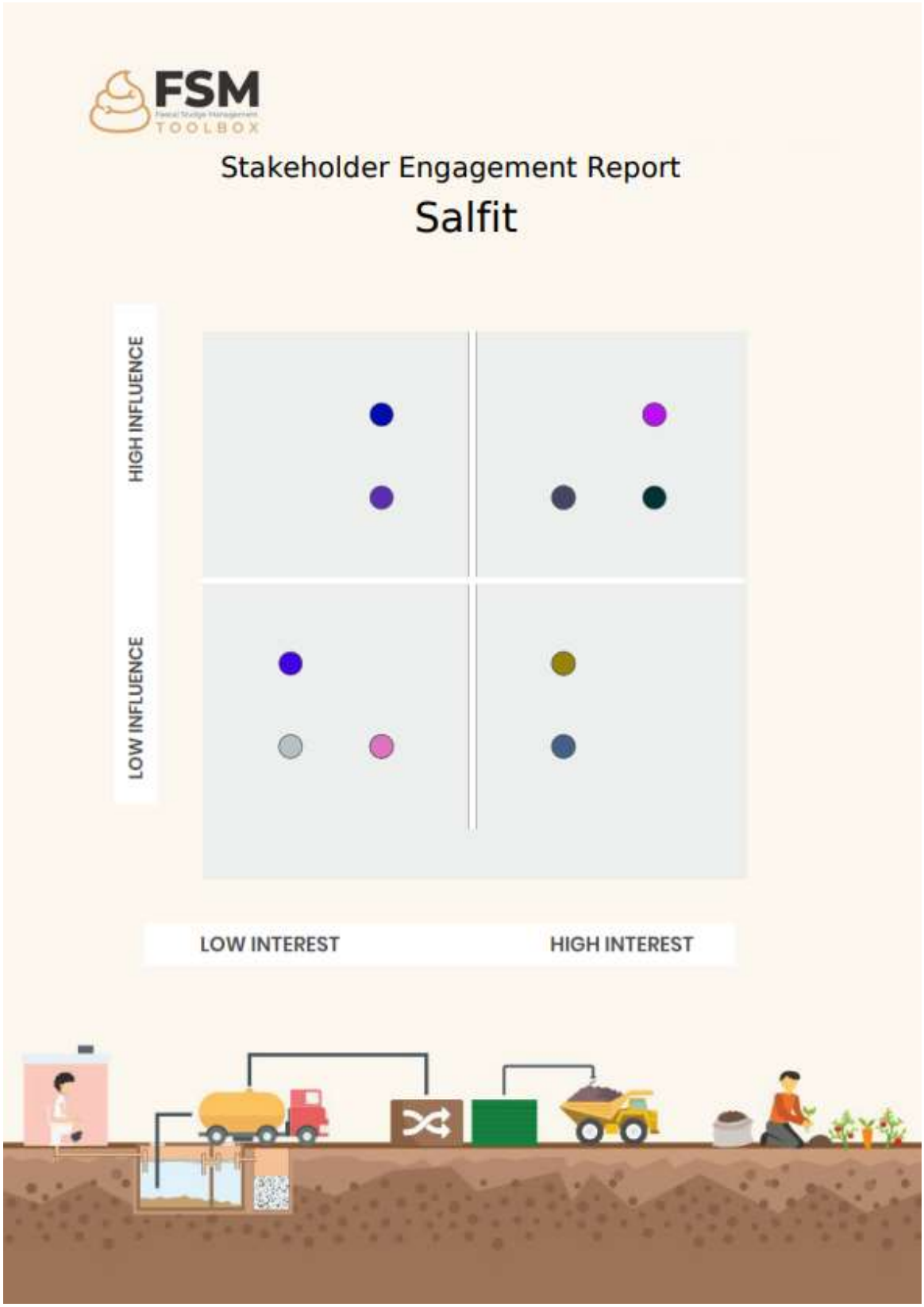
7 Appendix

7.1 Appendix 1: FSM Stakeholder Analysis



Stakeholder Engagement Report

Salfit

15 December 2020

Produced By: EFD team, World Waternet, Salfit, Salfit, Palestinian Territory Occupied.

Stakeholder engagement planning helps you identify and classify stakeholders in the FSM ecosystem based on their level of interest and influence. It also provides broad guidelines for engagement for each category of stakeholders. Stakeholders offer value to their local FSM ecosystem in the following ways:

- Play a vital role across the FSM value chain (construction of toilets/desludging services/treatment/sale or safe disposal of treated sanitation products) such as infrastructure development, service delivery, planning, financing, regulation, capacity building, monitoring, IEC/BCC.
- Be a beneficiary at any part of the value chain.
- Learn/support/oppose the overall implementation of the FSM project.

Basic Information about your city:

- **City Name:** Salfit
- **State:** Salfit
- **Country:** Palestinian Territory Occupied
- **Total Population:** 11000

Typology	Stakeholder Types	Stakeholder Names
National Government	Ministry of public works	Ministry of public works
	Ministry of public housing	Ministry of public housing
	Ministry of finance	Ministry of finance
	Environmental authority	Environmental authority
	Ministry of local government	Ministry of local government
	West bank water department (drinking water supply)	West Bank Water Department
	Ministry of Health	Ministry of Health
	Water sector regulatory council	Water sector regulatory council
	Ministry of agriculture	Ministry of agriculture

	Palestinian Water Authority	Palestinian Water Authority
Local Government	Mayors	Mayor
	Water supply and sanitation department	Water supply and sanitation department
Key Representatives of the society	Media	Media
	Alzaytona University	Alzaytona University
	Birzeit University	Birzeit University
	Al Quds University	Al Quds University
	Farmer representation	Farmer representation
	Poor households	Poor Households
	Better-off households	Better-off household
	NGOs/CBOs/welfare groups	NGOs/CBOs/welfare groups
	Environmentalists	Environmentalist
City service providers	Masons	Masons
	Mechanical and manual emptiers	Mechanical and manual emptiers
	Sewerage/treatment plant engineers	Sewerage/treatment plant engineers
	Potential end users - farmers/industries	Potential end users - farmers/industries
	Commercial desludging private company (informal)	Commercial desludging private company (informal)
Donor Agencies	GIZ	GIZ

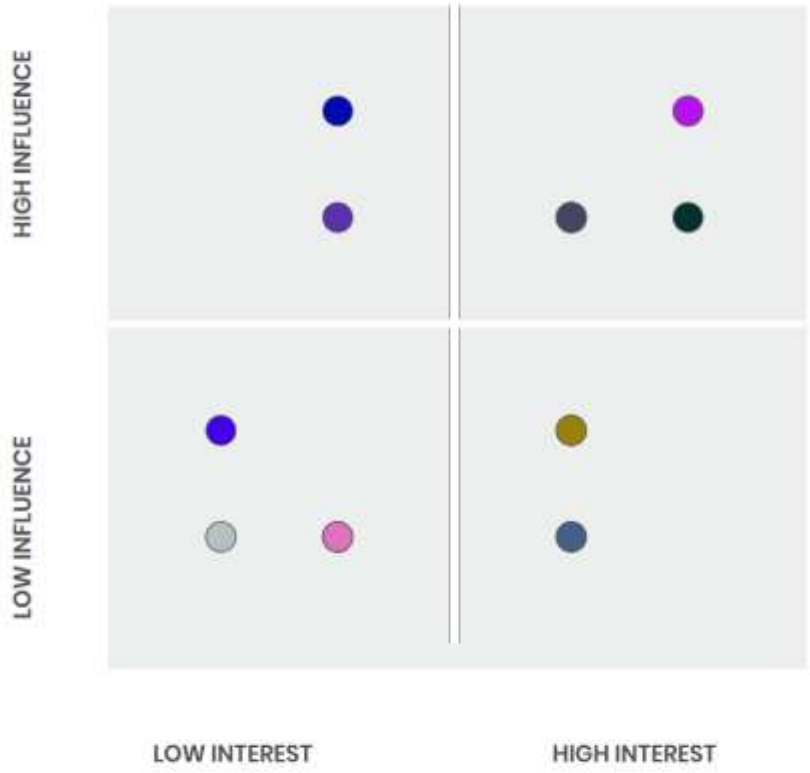
	KFW	KFW
	WB	WB
	JICA	JICA
	UNICEF	UNICEF
	Dutch Embassy/Gov	Dutch Embassy
Local Youth Group	Local Youth Committee	Local Youth Committee

Interest-Influence Mapping

The scoring scale for Interest and Influence of FSM stakeholders consists of 6 levels – Unknown, Little or None, Some, Moderate, High and Crucial.

Interest is characterized by the stakeholders' needs, constraints and problems being a priority in the FSM strategy. **Influence** is the power that stakeholders have on the project i.e. in terms of controlling the decision-making process and facilitating the implementation

You can view the relative positioning of the stakeholders in the Interest-Influence Matrix based on the rating given online in the following figure.



Recommendations

The stakeholders are classified into four groups based on the positioning in the interest-influence matrix. A set of guidelines for collaboration for each category of stakeholder are provided below.

High Interest + High Influence

These stakeholders should be closely involved throughout the preparation and implementation of the project to ensure their support for the project. It is recommended that these stakeholders are utilized for Consultation, Collaboration & Delegation of responsibilities. In your local scenario, they are:

Typology	Stakeholder Types	Stakeholder Names
Donor Agencies	Dutch Embassy/Gov	Dutch Embassy
	GIZ	GIZ
	JICA	JICA
	KFW	KFW
	UNICEF	UNICEF
	WB	WB
Local Government	Mayors	Mayor
	Water supply and sanitation department	Water supply and sanitation department
National Government	Ministry of Health	Ministry of Health
	Palestinian Water Authority	Palestinian Water Authority
	Water sector regulatory council	Water sector regulatory council

High Interest + Low Influence

Stakeholders of low influence and high interest must be consulted and these stakeholders have the potential to be Empowered with responsibilities..

In your local scenario, they are:

Typology	Stakeholder Types	Stakeholder Names
Key Representatives of the society	Better-off households	Better-off household
	Environmentalists	Environmentalist
	NGOs/CBOs/welfare groups	NGOs/CBOs/welfare groups
	Poor households	Poor Households
City service providers	Commercial desludging private company (informal)	Commercial desludging private company (informal)
	Mechanical and manual emptiers	Mechanical and manual emptiers
	Potential end users - farmers/industries	Potential end users - farmers/industries
	Sewerage/treatment plant engineers	Sewerage/treatment plant engineers
National Government	Ministry of agriculture	Ministry of agriculture

High Influence + Low Interest

These stakeholders may be consulted, but must be well informed about project progress..
In your local scenario, they are:

Typology	Stakeholder Types	Stakeholder Names
National Government	Ministry of finance	Ministry of finance
	Ministry of local government	Ministry of local government

Low Influence + Low Interest

These stakeholders may be informed about the project progress at key stages of the project

lifecycle..
In your local scenario, they are:

Typology	Stakeholder Types	Stakeholder Names
Key Representatives of the society	Al Quds University	Al Quds University
	Alzaytona University	Alzaytona University
	Birzeit University	Birzeit University
	Farmer representation	Farmer representation
	Media	Media
National Government	Environmental authority	Environmental authority
	Ministry of public housing	Ministry of public housing
	Ministry of public works	Ministry of public works
	West bank water department (drinking water supply)	West Bank Water Department
Local Youth Group	Local Youth Committee	Local Youth Committee
City service providers	Masons	Masons

Click to view knowledge materials that are most relevant to your city

7.2 Appendix 2: Context-adapted SFD Graphic

Figure 8 shows the context-adapted SFD graphic, which represents the future situation in Salfeet.

Before the end of 2023, the sewage network of Salfeet will be extend and allow to cover 15% extra of the population. This extra sewer will be connected to the existing network and allow the wastewater to be treated at the WWTP of Salfeet.

By the end of 2023, 90% of the population of Salfeet will be connected to the sewage network and ensure that the wastewater is treated properly.

For the last 10% of the population that cannot connect to the sewage network for different reasons, 17% of the unsafely managed excreta will be the next challenge for the municipality of Salfeet. For this 17%, it should be investigated what kind of treatment is installed, if it is working properly and answers to the right capacity. Different solutions will be then provided (new individual system, reparation or other).

2% of this 10% will be connected to a decentralized wastewater treatment unit. This unit, called the BluElephant, will be installed in 2022 as a pilot installation. World Waternet, PWA and the municipality of Salfeet will run for a year this research installation. If successful this decentralized unit could be used for different location in Salfeet and in the Palestinian territories.

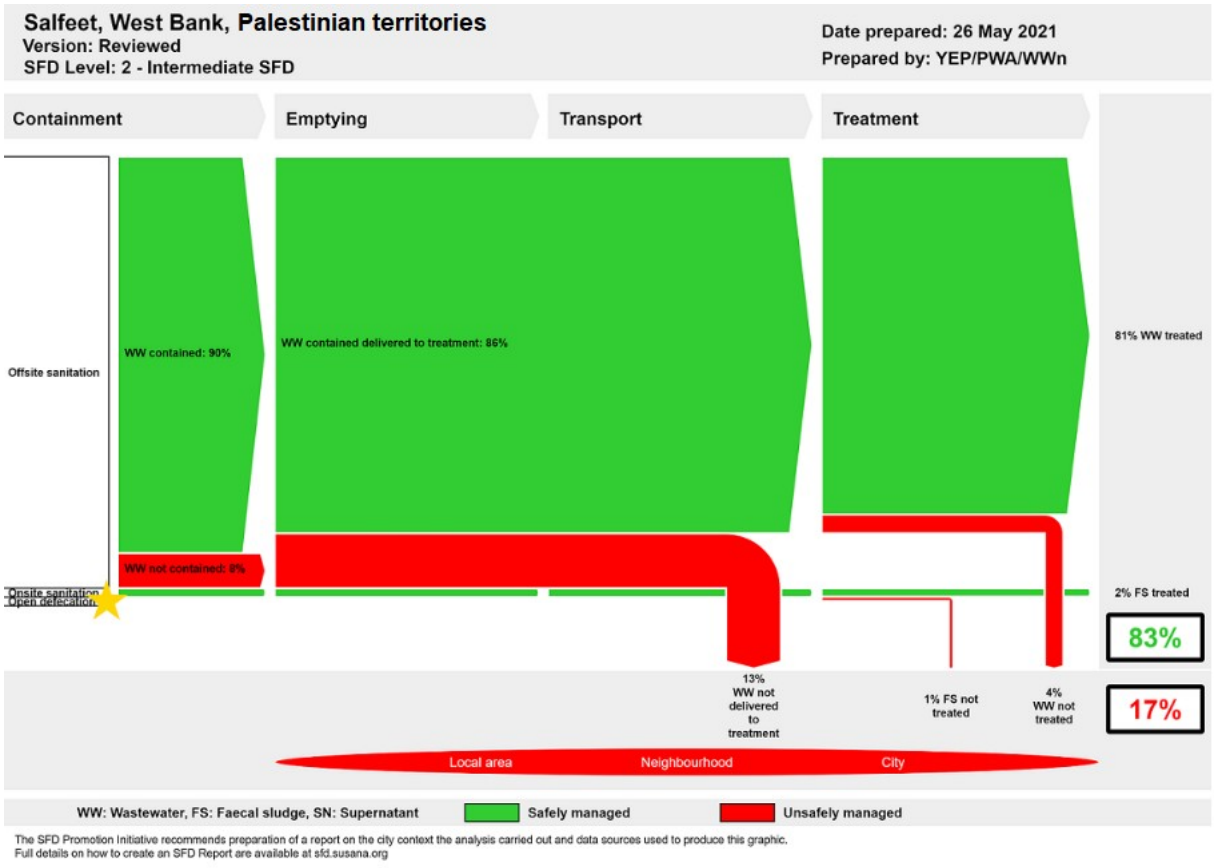


Figure 8: Context-adapted SFD Graphic.

SFD Salfeet, Palestinian territories, 2024

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