

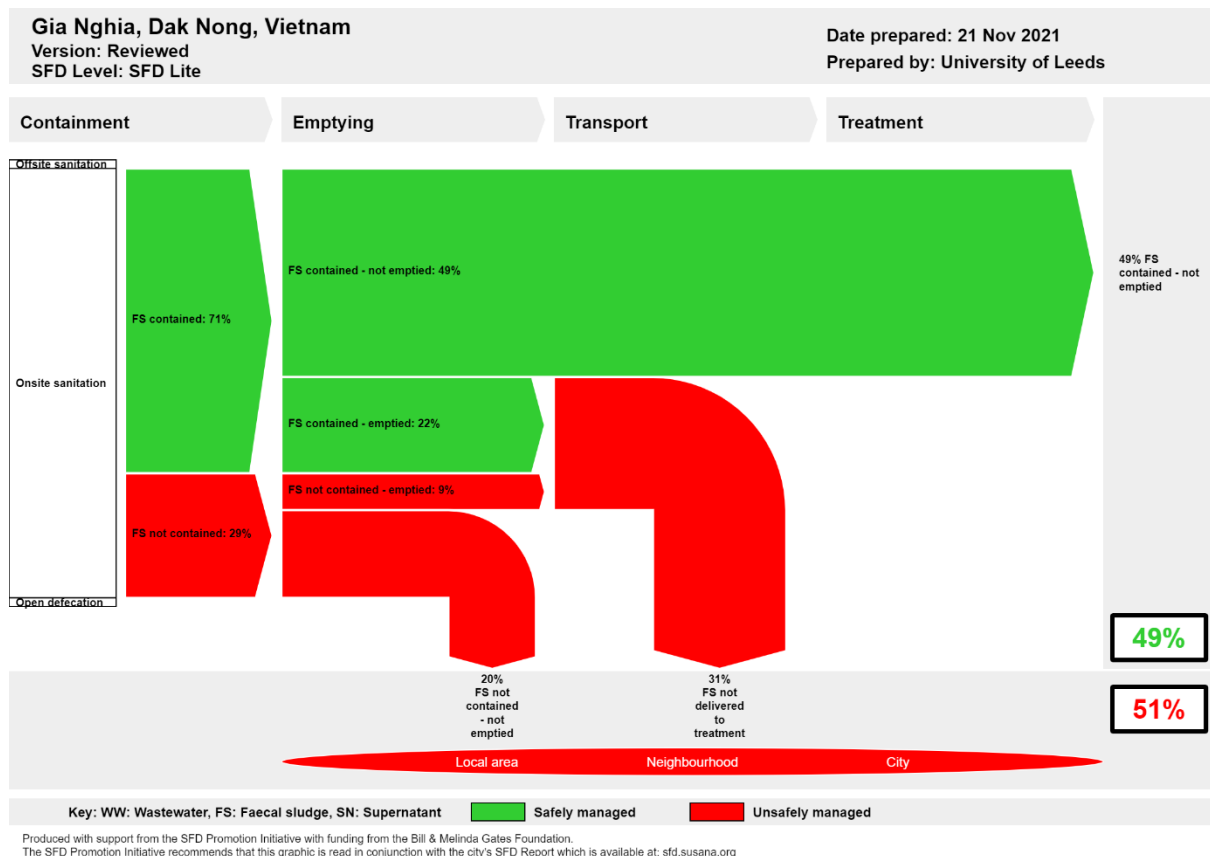
SFD Lite Report

Gia Nghia Vietnam

This SFD Lite Report was prepared by the University of Leeds
based on an Asian Development Bank study in 2019

Date of production/ last update: 21/11/2021

1 The SFD Graphic



SFD Graphic for Gia Nghia, Vietnam

2 SFD Lite information

Produced by:

- The University of Leeds from Asian Development Bank, 2019, Secondary Cities Environment Improvement Project, Gia Nghia, Dak Nong Province (ADB, 2019)
- All data presented here are from ADB (2019) except where otherwise noted.

Date of production: 21/11/2021

3 General city information

The population of Gia Nghia is estimated to be 67,783 in the year 2019. This is made up of 15,063 households with an average household size of 4.5 persons.

The boundary chosen for this SFD follows that chosen in the ADB report, which is the 286 square kilometre area within the state capital boundary.

Gia Nghia is a small but quickly growing and urbanising town. 87% of households have water supply provided on premises with projects underway to bring this to over 90%, and 100% of the population has access to a sanitation system (no open defecation is reported). Waste stabilisation ponds were constructed to treat wastewater, but these are not operational due to a lack of connections to the sewer network.

4 Service outcomes

4.2.1 Containment

Table 1 shows the proportion of the population using each of the different sanitation systems and how they are classified for the purposes of this report using the SFD PI methodology. Table 2 shows the full SFD matrix and all the percentages used in the generation of the SFD graphic.

All households use some form of onsite sanitation (there is no sewerage network), the majority of which (69%) are so called 'septic tanks' which are in turn connected to different locations. Four fifths of these (56% of the total population) are connected to soak pits (T1A2C5 = 56% on Table 1). A quarter of the population use tanks that have an open bottom and are not connected to anything. Fifty percent of these are estimated to be in locations where there is a significant risk of groundwater pollution (T2A4C10 = 13% on Table 1).

4.2.2 Emptying and transport

Tank emptying is demand based, with requests for the service made when tanks are full, or when owners perceive them to be full (often because of pipe blockages). Only 21% of tank access hatches are visible, with most completely buried. Many of these are located under tiles or flooring that would have to be broken for emptying, which will discourage householders from requesting this service. 67% of septic tanks owners reported they had not yet had their tanks emptied, but this is likely to be due to the large tank sizes that are not yet full, and the tank emptying service that has only been running for the last 4 years. For the purposes of this report it is estimated that 33% of all tanks have been emptied (F3 = 33% on Table 2).

As there are no faecal sludge or wastewater treatment facilities, all emptied faecal sludge is disposed unsafely (F4 = 0% on Table 2), most is spread on local agriculture fields without any treatment, the rest is dumped into the environment.

4.2.3 Treatment

There are no operational faecal sludge or wastewater treatment facilities.

Table 1 – Proportion of households using different sanitation systems and SFD PI classification used in this report

ADB system description (see Figure 3)	SFD PI description and system label (as used on SFD GG matrix)		Proportion of population using this type of system (%)
Septic tank – fully sealed with multiple chambers, leading to soakpit	Septic tank, discharges to soakpit (with low risk of groundwater pollution)	T1A2C5	56%
Septic tank – fully sealed with multiple chambers, leading to the ground outside the yard	Septic tank, discharges to open ground	T1A2C8	10%
Septic tank – fully sealed with multiple chambers, leading to open drain	Septic tank, discharges to open drain or storm sewer	T1A2C6	1%
Septic tank – fully sealed with multiple chambers, leading to under the house	Septic tank, discharging to ‘don’t know where’	T1A2C9	2%
Leaking nature soakaway tank – not sealed bottom, one compartment, no outlet mentioned	Lined tank with impermeable walls and open bottom, no outlet or overflow (with low risk of groundwater pollution)	T1A4C10	12%
	Lined tank with impermeable walls and open bottom, no outlet or overflow, where there is a significant risk of groundwater pollution	T2A4C10	13%
Cesspool (open pond)	Toilet discharges directly to soak pit (with low risk of groundwater pollution)	T1A1C5	3%
	Toilet discharges directly to soak pit where there is a significant risk of groundwater pollution	T2A1C5	3%

Table 2: SFD Matrix for Gia Nghia

Gia Nghia, Dak Nong, Vietnam, 9 Sep 2021. SFD Level: SFD Lite

Population: 67783

Proportion of tanks: septic tanks: 100%, fully lined tanks: 100%, lined, open bottom tanks: 100%

Containment						
System type	Population	FS emptying	FS transport	FS treatment	SN transport	SN treatment
	Pop	F3	F4	F5	S4e	S5e
System label and description	Proportion of population using this type of system (p)	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	Proportion of supernatant in open drain or storm sewer system, which is delivered to treatment plants	Proportion of supernatant in open drain or storm sewer system that is delivered to treatment plants, which is treated
T1A1C5 Toilet discharges directly to soak pit	3.0					
T1A2C5 Septic tank connected to soak pit	56.0	33.0	0.0	0.0		
T1A2C6 Septic tank connected to open drain or storm sewer	1.0	33.0	0.0	0.0	0.0	0.0
T1A2C8 Septic tank connected to open ground	10.0	33.0	0.0	0.0		
T1A2C9 Septic tank connected to 'don't know where'	2.0	33.0	0.0	0.0		
T1A4C10 Lined tank with impermeable walls and open bottom, no outlet or overflow	12.0	33.0	0.0	0.0		
T2A1C5 Toilet discharges directly to soak pit, where there is a 'significant risk' of groundwater pollution	3.0					
T2A4C10 Lined tank with impermeable walls and open bottom, no outlet or overflow, where there is a 'significant risk' of groundwater pollution	13.0	33.0	0.0	0.0		

4.3 Risk of Groundwater Pollution

The risk of groundwater contamination was estimated using the SFD PI risk of groundwater pollution assessment tool. With less than 25% of the population relying on groundwater for their water supply, the risk of groundwater pollution was generally considered to be low. However, for the proportion of the population who do not have access to piped supply, it is estimated that there is a significant risk of groundwater pollution from sanitation containers that infiltrate to the ground. For the purposes of this report, it is estimated that half of the population using lined tanks with open bottoms and half of the population using toilets connected directly to soak pits (known locally as cesspools) are in areas where there is significant risk of groundwater pollution (T2A4C10 = 13% and T2A1C5 = 3% on Table 1),

4.4 SFD Graphic

Based on ADB (2020) and the SFD PI methodology (as described above), Figure 2 and the subsequent paragraphs summarise the service outcomes, which indicate 49% of excreta are safely managed.

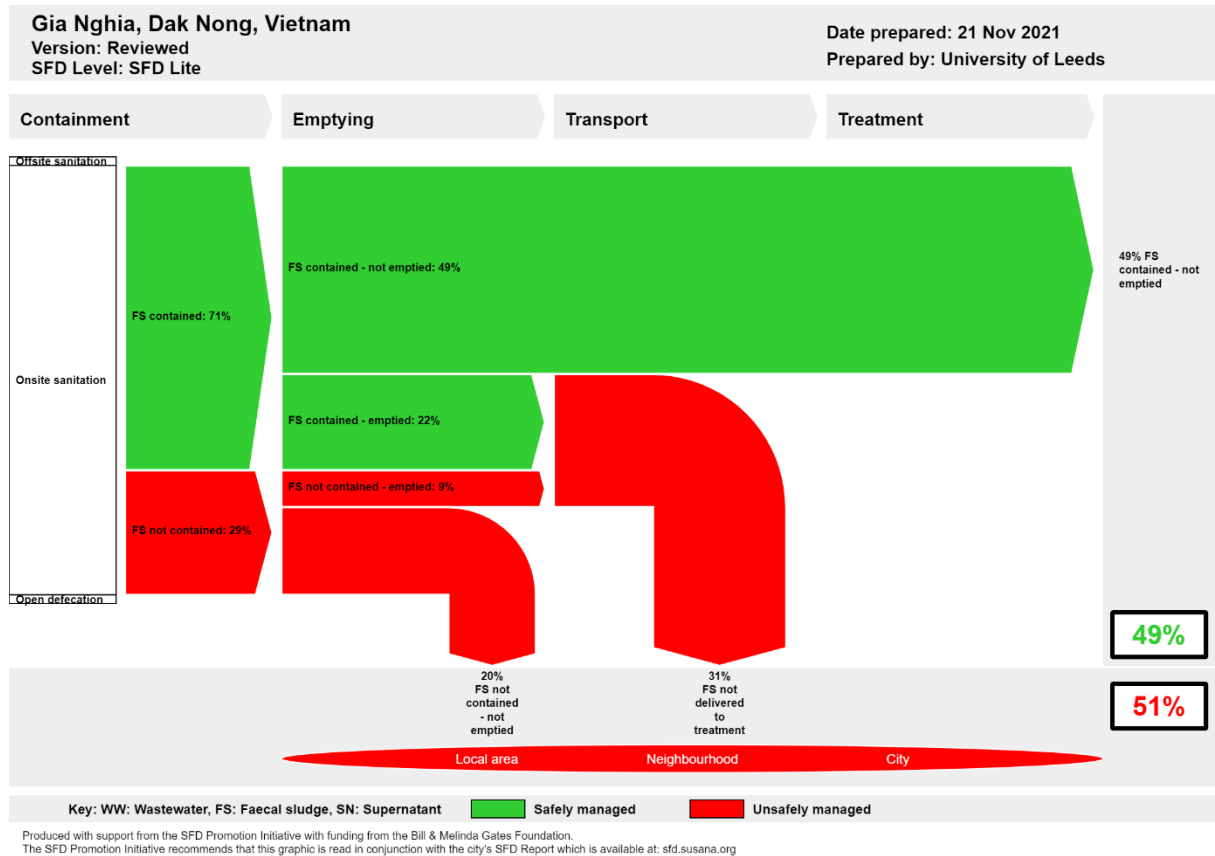


Figure 2: SFD Graphic for Gia Nghia

The whole population (100%) use some form of onsite sanitation, there is no offsite sanitation or open defecation.

An estimated 51% of the sanitation waste is not safely managed. Three fifths of this is faecal sludge that has been emptied but is then dumped on fields and in the local environment (31% FS not delivered to treatment on Figure 2). The remaining 20% is faecal sludge that has not been emptied from permeable tanks and pits in city locations where their use may result in a significant risk of groundwater pollution (FS not contained – not emptied = 20% on Figure 2).

All of the safely managed sanitation is sludge and effluent contained in tanks that have not yet been emptied ('FS contained, not emptied' = 49% on Figure 2). Eventually these tanks will need to be emptied and, as there are no operational treatment plants, any emptied faecal sludge will have to be dumped in the local environment where it is considered 'unsafely managed'. Clearly, although this SFD presents a reasonably good short-term situation, until

actions are taken to provide suitable treatment facilities, it is very likely to deteriorate in the medium to long term.

5 Data and assumptions

The ADB (2019) report uses data from a household and commercial property EGIS survey, gaining answers from 1401 private households, and 108 commercial properties. This provides a good basis for the data used for the SFD.

The data shows that 87% of households have piped water on premises, but it is important to consider that if this supply is particularly intermittent then the population may be forced to rely on multiple water sources. In this city it is particularly significant as almost all sanitation systems here are discharging liquid fraction to the ground, and therefore any untreated use of the ground water could potentially be unsafe.

As highlighted, there are differences in the ADB SFD methodology and the SFD PI methodology – particularly in the classification of sanitation technologies and the risk of groundwater pollution from permeable sanitation technologies as shown in Table 1. However, despite these differences, the resulting percentages for total safely managed sanitation shown on the two graphics are very similar (ADB =50%, SFD PI = 49%). Both graphics highlight the same issue that the lack of an operational treatment plant and continued use of the currently safely contained, not emptied septic tanks and open bottom tanks is a short-term situation.

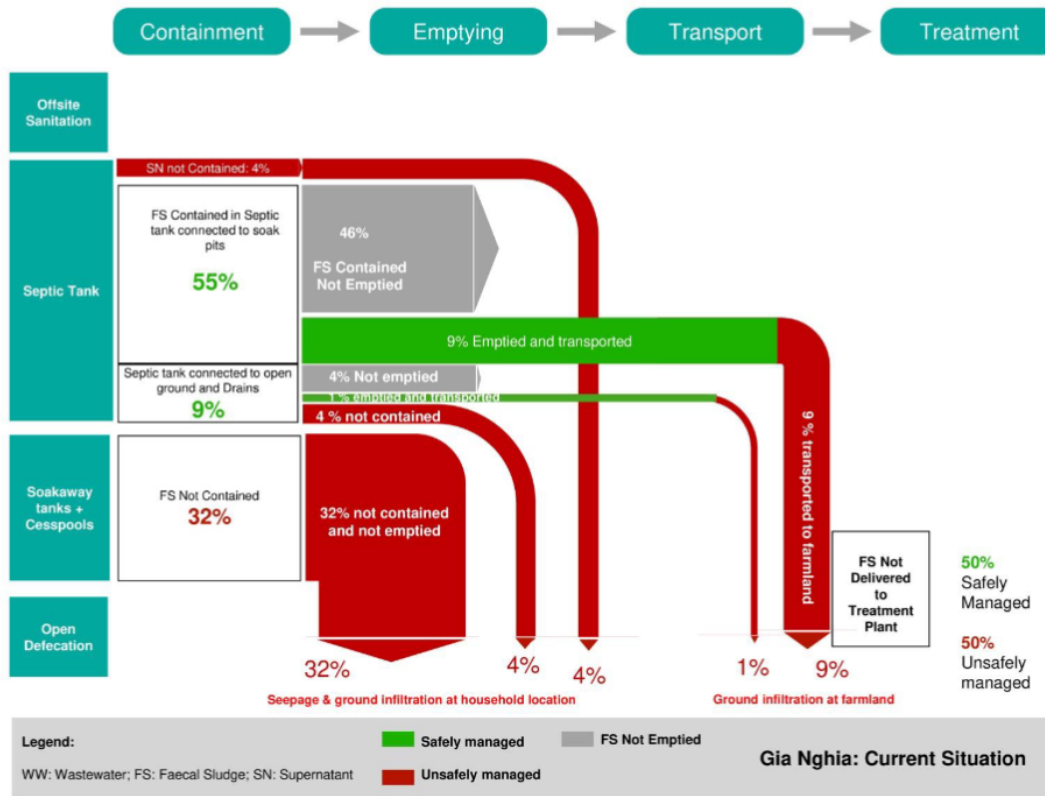


Figure 3 – Original ADB Shit Flow Diagram for Gia Nghia (ADB, 2019)

6 List of data sources

Asian Development Bank (ADB), EGIS and BORDA Vietnam. 2019. Gia Nghia, Vietnam FSM Report.

Gia Nghia, Vietnam, 2021

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