



## THE STUDY OF SEPTIC TANK EMPTYING STRATEGY IN URBAN AREAS CASE STUDY OF PADANG CITY, WEST SUMATRA

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DOI: 10.22373/ljee.v6i2.8686

### Abstract

*Septic tank emptying in Padang City has not been effectively implemented. Low public participation and illegal disposal of fecal sludge into drainage systems and water bodies remains common. This study aims to assess how the households manage septic tank emptying and offers strategic recommendations using a SWOT analysis. The data obtained from questionnaires given to 100 households across all sub-districts, as well as interviews with stakeholders from the Dinas LH of Padang City about current desludging programs. The emptying practices were grouped into safe and unsafe emptying. Results show that only 26,33% of households manage septic tanks properly in terms of construction, emptying, and knowledge. Based on the SWOT analysis result, the household fecal sludge management in Padang City's is situated in the quadrant II, meaning existing opportunities can be used to deal with internal weaknesses. Recommended strategies include regulatory development, capacity building, community engagement, and regular monitoring and evaluation to support the implementation of safe emptying practices.*

**Keywords:** *Fecal Sludge Management; Padang City; Safe Emptying; Sanitation; Septic Tank Emptying; SWOT Analysis.*

**How to cite this article:** *Andrizar, Nadya Khairannisa, Rizki Aziz, and Puti Sri Komala. 2025. "Study of Septic Tank Emptying Strategy in Urban Areas: Case Study of Padang City, West Sumatra." Lingkar: Journal of Environmental Engineering 6 (2): 1-17. Doi: 10.22373/ljee.v6i2.8686*

### 1. Introduction

The lack of adequate sanitation services remains one of the world's most persistent public health and environmental challenges, affecting billions of people globally (Sisay, Gari, and Ambelu 2024). This problem is also present in Indonesia, where access to adequate sanitation remains below the targets established in the National

Medium-Term Development Plan (RPJMN). As of 2024, only 7,4% of the population had access to adequate sanitation. This number is much lower than the national goal, which is 15%. According to the sixth target of the Sustainable Development Goals (SDGs), all Indonesians should have access to safe sanitation by 2030 (Bappenas and UNICEF 2024). Inadequate sanitation can lead to a variety of consequences, including loss of productivity, increased healthcare costs, premature death, loss of water and fisheries resources, decreased land value, loss of tourism, and, in some cases could trigger social conflict (Jenkins, Cumming, and Cairncross 2015; Maria Rusca, Cecilia Alda-Vidal 2018; The World Bank 2015).

Most Indonesian households rely on on-site sanitation systems, with an estimated 90% using septic tanks. However, improper septic tank construction and unregulated emptying practices can lead to serious soil and water contamination (Paramita et al. 2025). Studies show that sludge is often disposed of without treatment, further harming the environment (Bao et al. 2020). By 2020, only 21% of residents in Padang City, the capital of West Sumatra Province, had emptied their septic tanks. Some private operators illegally discharge sludge into drainage systems or bodies of water (Dinas PUPR Kota Padang 2023). These actions contribute to *E. coli* contamination, which increases the public health risk (Moningka, Kumurur, and Moniaga 2015). There is still a lack of awareness about proper septic tank management in urban settings (Gunawan, Schoebitz, and Strande 2015).

Although previous studies have examined the general effects of inadequate sanitation, few have investigated how septic tank emptying is managed or regulated. For instance, Mondal (2018) studied emptying practices in Bangladesh and found significant variations between settlement types, but similar studies in Indonesia are scarce. The study examined septic tank emptying practices in different types of settlements in Bangladesh. It found that slum areas practiced "unsafe emptying," while residential and mixed settlements practiced "partially safe" emptying (Mondal 2018). Most research conducted in Indonesia has focused on general sanitation access and safe sanitation infrastructure, rather than on the specific issue of safe septic tank emptying practice.

This study aims to address this gap by categorizing septic tank emptying practices in Padang City as either safe or unsafe, and by developing strategic recommendations through a SWOT analysis. The discussion flows from identifying current practices and their impacts to analyzing the internal and external factors that influence them. The study is expected to offer practical recommendations for improving fecal sludge management and supporting Indonesia's progress toward SDG 6 targets.

## **2. Method**

### *2.1 Data Collection*

The data collection consist of primary and secondary data collection. The primary data collection consisted of household-scale interviews and interviews with operators. This research was conducted in Padang City, the capital of West Sumatra Province.

Padang City covering 694,96 km<sup>2</sup> areas at the coordinates 0,95556° S and 100.36056° E. The administrative map of Padang City can be seen in Figure 1.

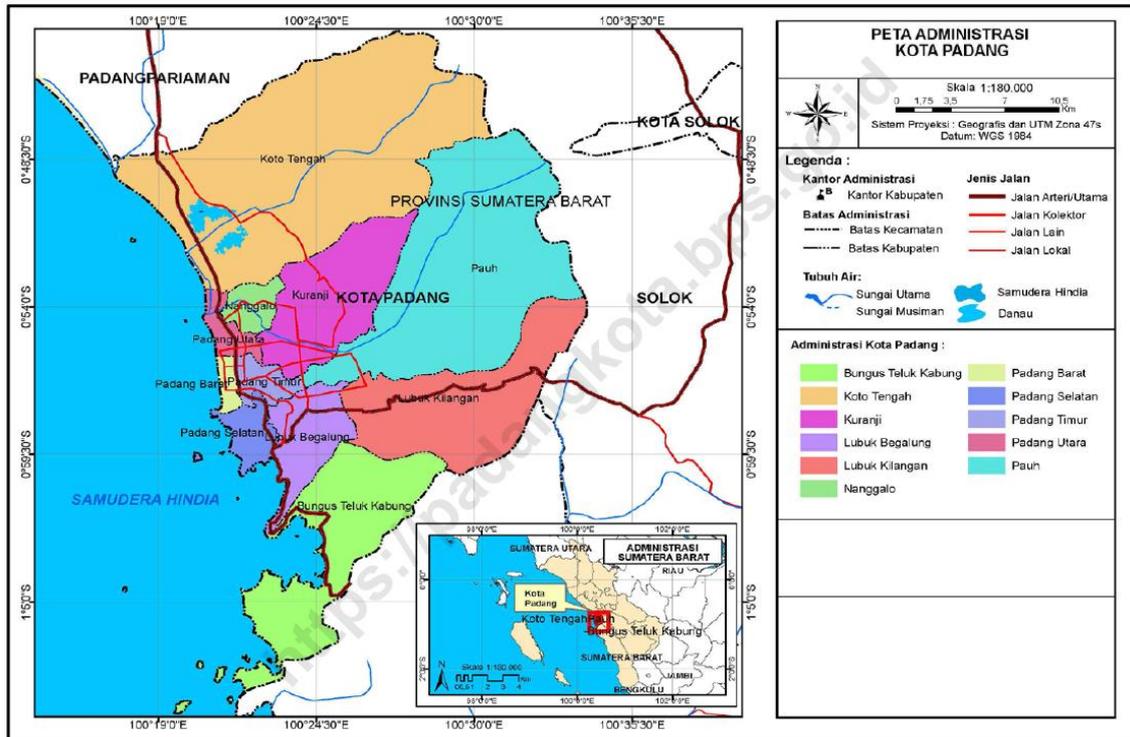


Figure 1. Administrative Map of Padang City  
Source: (Badan Pusat Statistik 2023)

In 2023, the population of Padang City was 919.145. This research was conducted in March until July 2024. The respondents selected were people who live in Padang City. The calculation of the number of samples in the study was determined using the Slovin formula:

$$n = \frac{N}{1+Ne^2} \quad (1)$$

Description:

- n : number of sample sizes
- N : number if population
- e : Percentage allowance for accuracy due to tolerable sampling error (10%)

The total population of Padang City is 919.145 people. Assuming an average household size of four, there are 229.786 households in Padang City. The calculation for the proportional sample size is as follows:

$$n = \frac{229.786}{1 + 229.786(0,1)^2}$$

$$n = 99,956 \approx 100 \text{ sample}$$

The sample calculation with an even composition in each sub-district can be seen in Table 1. A simple random sampling technique was used to select household user questionnaires randomly. This technique obtains a sample with random characteristics from a population regardless of the population's strata. The sample size cannot be affected by any outside factors (Sugiyono 2019). Questionnaires were collected from household respondents in the study area through an interview method. The questionnaire contained a series of structured inquiries designed to ascertain the prevailing conditions with regard to fecal sludge management.

Table 1. Ratio of Sample Size by Sub-district

No	Sub-District	Number of Household	Number of samples
1	Bungus Teluk Kabung	7.023	3
2	Lubuk Kilangan	14.681	6
3	Lubuk Begalung	31.177	14
4	Padang Selatan	15.256	7
5	Padang Timur	19.241	8
6	Padang Barat	10.630	5
7	Padang Utara	13.652	6
8	Nanggalo	14.546	6
9	Kuranji	37.165	16
10	Pauh	15.547	7
11	Koto Tengah	50.869	22
<b>Total</b>		<b>229.786</b>	<b>100</b>

Source : (Badan Pusat Statistik 2023)

The questionnaire is divided into three sections: storage tank management, emptying practices, and user knowledge, Table 2 for a detailed overview.

Table 2. Questionnaire Outline

Type of Data	Indicators	Safe emptying	Unsafe emptying
Containment	1. Size	Adequate for a household	Inadequate
	2. Condition	Well maintained	Damaged containment
	3. Location and accessibility	Accessible location	Inaccessible location
	4. Containment outlet (directly flows into drainage/water body)	No direct discharge into drainage/water body	Direct discharge into drainage/water body

Type of Data	Indicators	Safe emptying	Unsafe emptying
Emptying process	1. User has ever emptied the containment	Emptied	Never
	2. Emptying Frequency	Regularly	Not regularly
	3. Emptying Costs	Affordable cost	Higher cost
	4. Occupational Safety and Health	Operator uses Personal Protective Equipment (PPE)	Operator does not use PPE
	5. Transport and Discharge	Understanding the fecal sludge treatment process	Not understanding
User Knowledge and Perception	1. Regulations	Understanding relevant regulations	Not understanding
	2. Emptying	Understanding the importance of regular emptying	Not knowing

Source : (Mondal 2018)

The questionnaires disseminated to respondents were initially subjected to validity and reliability tests. Reliability is defined as the instrument's capacity for consistent measurement, while validity is defined as the instrument's ability to measure a concept accurately (Heale and Twycross 2015). IBM SPSS 26 software. The validity test of the questionnaire in the study was carried out on twenty participants who were included in the survey. The objective of the test was to obtain a distribution of measurement values that closely resembles a normal distribution (Sugiyono 2019).

The r value is the critical aspect in determining the validity of test results. The result, the r value, was greater than r table, which is greater than 0,444 (implying significance at n=20). The reliability test indicates that all questionnaire items exhibit high reliability, as evidenced by Cronbach's Alpha value ranging from 0,81 to 1,00, with a specific value of 0,905. However, items that were determined invalid or unreliable were subjected to a comprehensive evaluation. In order to ensure the quality and validity of the data, it is necessary to revise or delete items (Heale and Twycross 2015).

The secondary data collection consist of data required to support primary data such as demographic, condition of sewage and septage management in Indonesia as well as Padang City. This data was obtained from articles and reports by relevant agencies in Padang, such as Padang City Environmental Office (Dinas LH), Padang City Public Works and Spatial Planning Office (Dinas PUPR), Central Statistics Agency (BPS), and Ministry of National Development Planning (Bappenas/PPN).

## 2.2 Data Analysis Method

The quality of emptying was determined using a quantitative method based on a household user questionnaire. The assessment of emptying quality consists of septic tank construction, standards, emptying process, type of service, and user knowledge of

the septic tank emptying process. Emptying quality was then classified into safe and unsafe emptying. The lowest assessment result is categorized as unsafe emptying, while the highest assessment result is categorized as safe emptying. The following values are assigned to each response using the Guttman scale (yes or no): 0 for an unsafe response and 1 for a safe response. The weighted value (WV) is then calculated (Mondal 2018). The quality of septic tank emptying is determined by calculating the emptying quality.

$$EQ = \frac{\sum PVW}{n} \times 100 \quad (2)$$

Where:

- EQ : Emptying Quality Score variable i
- PVW : Prioritized Weighted Value
- N : Number of indicators

Furthermore, emptying quality is determined in accordance with the emptying quality index (Campos et al. 2015). See Table 3 for the desludging quality index.

Table 3. Desludging Quality Index Value

Emptying Quality	Average Weighted Value (AVW)	Prioritizing Value
Unsafe emptying	0 – 67	0
Safe emptying	67 – 100	1

The data obtained from questionnaires and interviews then used as a reference in compiling a SWOT analysis with relevant stakeholders from government institutions. Recommendations are formulated based on the results of the SWOT analysis. The SWOT analysis can help determine the suitable management strategy (Ramadhan, Indah, and Helard 2023). Effective strategies are achieved through stakeholder collaboration, ensuring decisions remain inclusive and actionable (Knox, Marin-Cadavid, and Oziri 2025).

### 3. Result and Discussion

The research was conducted in 11 subdistricts in Padang City, with a total of 100 respondents. After collecting questionnaire data, Table 4 evaluates user characteristics.

Table 4. User Characteristics

User Characteristics	Percentage (%)
Outlet connection	
Direct discharge into drainage/ water body	56,00
No direct discharge	44,00
Knowing	56,00

User Characteristics		Percentage (%)
Understanding outlet connection	Not knowing	44,00
Containment age	0-5 years	5,00
	6-10 years	21,00
	>10 years	57,00
	Not knowing	17,00
Ever emptying of containment	Ever	35,00
	Never	65,00
Reason for emptying the containment	Containment was full	77,00
	Periodically	23,00
Facing problems from the emptiers	Yes	5,00
	No	95,00
PPE	Use PPE	10,00
	Not using PPE	95,00
Understanding the fecal sludge treatment process		
Reuse	Knowing	19,00
	Not knowing	81,00
The location of IPLT in Padang City	Knowing	37,00
	Not knowing	63,00
Fecal sludge treatment process	Knowing	40,00
	Not knowing	60,00
Knowledge about septic tank regulation		
Construction requirements	Knowing	32,00
	Not knowing	68,00
Regulation	Knowing	37,00
	Not knowing	63,00

56% of septic tank outlet pipes flow directly into water bodies or drainage systems. 57% of users have septic tanks that are over 10 years old. Only 35% of users have had their septic tanks emptied. Users only empty their septic tanks if there is a problem, such as a leak. During the emptying process, users reported that 90% of operators do not wear adequate PPE. Users commonly lack understanding of septic tank regulations and the fecal sludge treatment process. 37% users know the regulations but do not properly implement them. Many users were unaware of the final treatment process, including wastewater reuse and Fecal Sludge Treatment Plant (IPLT) locations in Padang City. Meanwhile, 68% of users were unaware of septic tank construction requirements.

In terms of user aspects, the causes of unsafe emptying include directly discharging septic tank drains into drainage ditches (56%) and emptying septic tanks at low rates. Another cause is septic tanks that are poorly constructed. Emptying a septic tank does not guarantee proper construction (i.e., watertightness). Often, these septic tanks are built without adhering to applicable standards or regulations which makes

them prone to soil and groundwater pollution (Trieputra 2017). A non-compliant septic tank cannot be classified as such, but rather as a pit (Conaway et al. 2023).

The lack of public interest in emptying septic tanks is also due to the relatively expensive cost of this service (Jenkins, Cumming, and Cairncross 2015). The cost charged by private operators ranges from IDR 150.000 to more than IDR 500.000. 37% of respondents stated that the desludging cost was too expensive, particularly for those living far from the IPLT location and the city center. Due to the expensive cost, users tend not to empty the septic tank and do not use it. This has an impact on public health, especially in low-income communities (Lerebours et al. 2021; Opel and Khairul Bashar 2013). The cost of emptying septic tanks should be determined according to Regional Regulation No. 11/2011 of Padang City on Retribution for Public Services, which outlines the structure and amount of septic tank emptying fees.

The tariff amount in Article 63 paragraph (2) is IDR 150.000 per time for the non-commercial sector and IDR 200.000 per time for the commercial sector. There is an additional fee for distances of more than 20 km, which is IDR 4.150 per km (Pemerintah Kota Padang 2011).

The lack of proper Occupational Safety and Health (OHS) implementation, such as the failure to PPE leads to unsafe emptying practices. Operators have been observed disregarding PPE for a variety of reasons. These reasons include the unavailability of PPE, the perception that PPE hinders mobility during work activities, and the desire to demonstrate that fecal sludge does not pose a threat to public safety (Gautam et al. 2021). The process of handling septic tanks is highly susceptible to risks related to safety, health, and environmental pollution (Islam 2016).

### 3.1 Septic Tank Emptying Quality

The calculation results of each indicator: containment, emptying process, and user knowledge and perception, as well as parameters, can be seen in Table 4. Then, EQ is calculated using Equation (2) by using the multiplication index in Table 3.

$$\begin{aligned} EQ &= \frac{(0,790 \times 1) + (0,568 \times 0) + (0,603 \times 0)}{3} \times 100 \\ &= \frac{0,790}{3} \\ &= 26,33 \end{aligned}$$

The emptying quality in Padang City is 26.33, which, according to Table 3, is categorized as unsafe emptying. This means that only 26.33% of the population properly manages septic tanks in terms of construction, the emptying process, and related knowledge. Unsafe emptying is the lowest emptying quality assessment, as it ignores safety, hygiene, and potential environmental pollution. The difficulty in achieving safe emptying quality is due to users' and operators' limited knowledge, especially regarding occupational safety and health (Mondal 2018). A lack of knowledge about the importance of regularly emptying septic tanks is an obstacle to implementing safe emptying practices (Cookey et al. 2020).

### 3. 2 Strategy for Safe Emptying in Padang City

Implementing a suitable and sustainable sludge management strategy could help stakeholders make better decisions, which could lead to fewer inappropriate discharges to the environment and society (Paramita et al. 2025). Based on the results of the internal and external factor analysis in the SWOT matrix, strategy proposals and recommendations were prepared. A comprehensive investigation was conducted to identify the relevant internal and external factors. Relevant stakeholders were interviewed and the results were complemented by a thorough review of the related literature. The SWOT analysis can be seen in Table 5.

Table 5. The SWOT analysis

Strength	
<ol style="list-style-type: none"> <li>1. Desludging must be conducted at least once every two years (Municipal Regulation of Padang City No. 11/2015 about domestic wastewater management).</li> <li>2. The Municipality of Padang provides facilities and infrastructure for the collection, transportation, and disposal of fecal sludge from the desludging basin to IPLT.</li> <li>3. Padang City has an IPLT (capacity of 81 m<sup>3</sup>/day)</li> <li>4. The Landfill Technical Implementation Unit (UPT TPA) manages the IPLT in Padang City.</li> <li>5. The IPLT of Padang City is equipped with desludging trucks consisting of local government assets and private assets (22 trucks).</li> </ol>	<ol style="list-style-type: none"> <li>6. Desludging truck for emptying services owned by Dinas LH of Padang City.</li> <li>7. The availability of IPLT operational services in Padang City.</li> <li>8. The Open Defecation Free (ODF) program related to sanitation which is organized inter-institutionally.</li> <li>9. 77,4% of household own gooseneck toilets and septic tanks (self-fabricated or constructed).</li> <li>10. Dinas LH of Padang City is committed to supervise and take strict action to private desludging services that dispose of fecal sludge directly in the environment or in water bodies.</li> </ol>
Weakness	

<ol style="list-style-type: none"> <li>1. There is no Domestic Wastewater Management Master Plan document.</li> <li>2. There is no specific regulation/technical guidance on household septic tank handling.</li> <li>3. The number of desludging trucks owned by the Padang City Government is limited/insufficient.</li> <li>4. Insufficient budget of IPLT operational causing lack of maintenance.</li> <li>5. The ratio of the sanitation budget to the Regional Revenue and Expenditure Budget (APBD) is relatively modest.</li> </ol>	<ol style="list-style-type: none"> <li>6. The UPT, TPA, and IPLT are still merged, which causes the budget ratio for IPLT operations and maintenance to remain unoptimized.</li> <li>7. The lack of maximized inter-institutional coordination.</li> <li>8. There are people unaware of the septic tank emptying period, construction and related regulations.</li> <li>9. 22.53% of households still have septic tanks that do not meet technical standards and lack of fecal sludge management system.</li> <li>10. Private desludging operators lack understanding of OHS during septic tank emptying (not using adequate PPE).</li> </ol>
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### Opportunities

<ol style="list-style-type: none"> <li>1. Support from the Housing and Settlement Working Group (Pokja PKP) at the regional level and Settlement, Drinking Water and Sanitation Working Group (Pokja PPA) at the national level.</li> <li>2. There are municipal laws and regulations related to domestic wastewater management.</li> <li>3. The SDGs' target 6 is integrated into the RPJMN 2020-2024.</li> <li>4. Potential funding from the private sector, Specific Allocation Fund (DAK), Provincial APBD, and international funding sources.</li> <li>5. Padang City is one of five pilot cities in the Sanitation Infrastructure and Institutional Program by the Ministry PUPR and the Indonesia - Australia Partnership for Infrastructure.</li> </ol>	<ol style="list-style-type: none"> <li>6. Local revenue may increase through desludging retribution fees collected from private operators disposing of fecal sludge at the IPLT.</li> <li>7. There are proposals to separate the UPT, TPA, and IPLT into two different UPTs. This potentially improving their respective operational and maintenance budgets.</li> <li>8. Most households recognize the importance of regular septic tank emptying.</li> <li>9. Byproducts from IPLT treatment have potential for use as fertilizer, opening opportunities for fecal sludge management businesses.</li> <li>10. Improvements in sanitation quality in Padang City through increased community knowledge on household septic tanks.</li> </ol>
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### Threats

<ol style="list-style-type: none"> <li>1. A significant budget is required for sanitation.</li> <li>2. A higher population means a higher budget is needed.</li> </ol>	<ol style="list-style-type: none"> <li>6. There are still people who practice open defecation.</li> <li>7. Only 21% of the community had desludging and emptied septic tanks.</li> </ol>
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3. Limited number of trucks available (only one unit).	8. Some private desludging services dispose of the sludge directly into the environment/water bodies.
4. Public awareness and attention is still lacking.	9. Soil and groundwater are polluted due to non-standard septic tank construction.
5. Some households still discharge their septic tank outlet directly into drainage ditches or gutters.	

The results of the SWOT calculation can be seen in Table 6.

Table 6. The SWOT calculation

No	Description	Value
1	<b>Internal Factors</b>	
	Strength	0,104
	Weakness	0,105
2	<b>Factor Factors</b>	
	Opportunities	0,114
	Threats	0,111
3	<b>Coordinate</b>	
	X = Strength – Weakness	- 0,001
	Y = Opportunities – Threats	0,003

The quadrant plot of the calculation results can be seen in Figure 2.

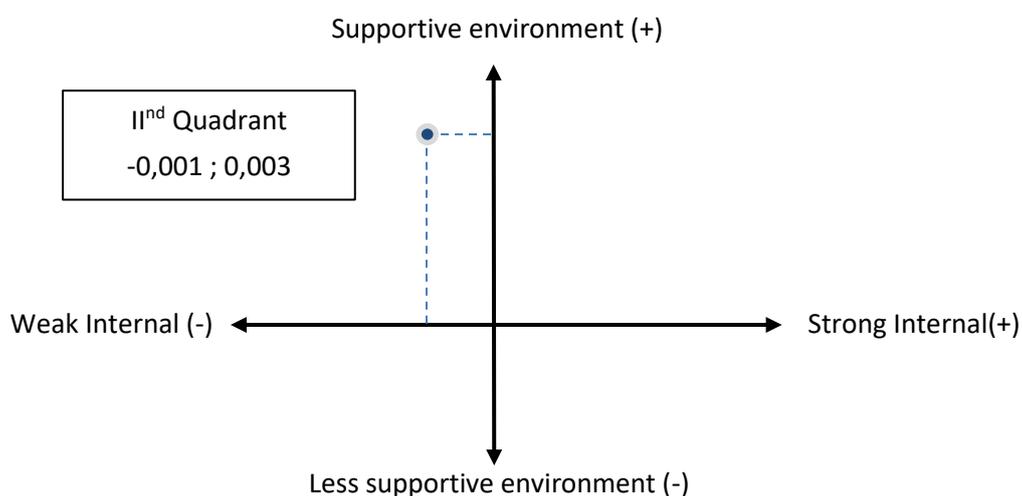


Figure 2: SWOT Quadrant

According to Figure 1, the analysis shows that the management of household septic tank emptying in Padang City is in quadrant II. This position indicates external opportunities and internal weaknesses. Consequently, the septic tank emptying field in

Padang City offers numerous potential funding and infrastructure partnership opportunities, as well as fecal management business opportunities. However, these opportunities are not being utilized efficiently. An appropriate strategy is the weakness-opportunity (W-O) strategy. This strategy utilizes opportunities and minimizes organizational weaknesses. It is necessary to design a turnaround strategy (Alwan 2022). The W-O strategy is implemented by increasing synergy across stakeholders, as well as through training, education, and evaluation of ongoing programs (Hidayat, Ophiyandri, and Tudi 2019). The results of the SWOT strategy preparation are presented in Table 7.

Table 7. SWOT Strategy

		<b><u>Strength (S)</u></b>	<b><u>Weakness (W)</u></b>	
<b><u>Opportunities (O)</u></b>	<b><u>SO Strategy</u></b>	<ol style="list-style-type: none"> <li>1. Local regulation serves as the foundational element in the implementation of domestic wastewater management;</li> <li>2. The IPLT functions as the operational unit for desludging management, supported by APBD and potential funding from domestic and international sources;</li> <li>3. Sanitation promotion, such as ODF requires coordination across institutions.</li> </ol>	<b><u>WO Strategy</u></b>	<ol style="list-style-type: none"> <li>1. The establishment of regulatory frameworks and Standard Operating Procedure (SOP) related to the management of household septic;</li> <li>2. A further investigation is necessary to assess the institutional effectiveness of UPT TPA and IPLT, which are currently merged;</li> <li>3. The uniformity of perception among government institutions;</li> <li>4. Enhance the public's awareness.</li> </ol>
	<b><u>ST Strategy</u></b>	<ol style="list-style-type: none"> <li>1. Monitoring and awareness-raising activities within the community;</li> <li>2. Community participation is encouraged to facilitate the monitoring of private desludging services.</li> </ol>	<b><u>WT Strategy</u></b>	<ol style="list-style-type: none"> <li>1. The initiative to develop a comprehensive wastewater management master plan;</li> <li>2. The establishment of regulations and technical guidelines for the management of household septic tanks aligned with local, national, and global regulations and agendas.;</li> <li>3. The implementation of good governance and capacity-building principles in</li> </ol>
<b><u>Threats (T)</u></b>				

<u>Strength (S)</u>	<u>Weakness (W)</u>
	household sludge management.

The strategies can be grouped into several aspects, as follows:

#### 1) *Regulation*

Currently, there is no specific regulation or technical guideline governing household septic tank management, and desludging operators often lack understanding of OHS, particularly in the use of PPE. The proposed strategy includes developing a dedicated regulation, technical guideline, or SOP that would be mandatory for both communities and service providers involved in septic tank emptying. The SOP is intended to provide a comprehensive framework for the execution of routine procedures. It should outline routine procedures such as the proper utilization and removal of PPE, managing toxic gases, and addressing operational challenges during desludging activities (Gautam et al. 2021). Relevant institutions, such as Dinas LH of Padang City, play an instrumental role in periodic monitoring to ensure the SOP is properly implemented. The implementation of comprehensive regulations, such as the Regional Regulations on Domestic Wastewater Management, and the imposition of direct sanctions on wastewater generators, are essential for achieving effective wastewater management (Asmara et al. 2021).

#### 2) *Institutional*

The UPT TPA as a landfill management, and IPLT, as a fecal sludge treatment, currently operate under a single institutional structure in Dinas LH of Padang City. This results in a shared operational budget for landfill management and fecal sludge treatment. This limits the budget available for each function, particularly reducing the effectiveness of IPLT's operation and maintenance, such as sediment dredging in treatment units. The proposed strategy involves conducting an institutional review to assess the effectiveness of the current arrangement and explore the potential for more efficient budget allocation through structural separation.

#### 3) *Coordination Accross Institutions*

Insufficient coordination and understanding among institutions impede effective regulatory enforcement and public outreach. It is crucial to align institutional perspectives, strengthen coordination through good governance, and build capacity in desludging management to overcome these challenges.

#### 4) *Public's Knowledge*

A significant portion of the population is unaware of the proper protocols for septic tank emptying and system design, as well as the relevant regulatory standards. Many domestic septic tanks do not comply with established technical standards, such as lacking a standard toilet or fecal sludge management system. The noncompliance rate

was found to be 22.53% (Dinas PUPR Kota Padang 2023). The proposed strategy emphasizes continuously enhancing community knowledge by raising awareness, fostering interest, generating demand, and promoting active participation. Since behavioral change is gradual and evolving, a sustainable approach is essential for long-term effectiveness (Zuraini 2017).

To ensure the safe emptying of septic tanks, comprehensive implementation requires regulatory enforcement, appropriate outlet design, alternative desludging methods for inaccessible areas, and sustained behavioral changes through public awareness initiatives (Mondal 2018). The effective implementation of safe emptying strategies requires a strong commitment from the government and active engagement from the community. This study suggests that future research should focus on respondents with prior emptying experience to identify priority areas and high-risk zones, with the goal of improving safe sanitation practices in Padang City.

#### 4. Conclusion

This study concludes that the quality of household septic tank emptying in Padang City remains categorized as unsafe, which is inadequate and poses significant health risks. Public awareness and understanding of proper septic tank maintenance are still limited, with most users only performing desludging after visible failures such as leaks. In the field, many private operators do not comply with occupational health and safety standards, including the use of personal protective equipment. Furthermore, investigations revealed the presence of private desludging trucks that were found to dispose of fecal sludge directly into drainage systems and nearby water bodies. The implementation of safe emptying in Padang City is a collaborative effort that involves several stakeholders. A systematic approach is recommended to ensure the success of this initiative. The following steps are proposed: The development of clear and comprehensive regulations and SOPs for septic tank management is imperative. Furthermore, enhancing coordination across relevant agencies through principles of good governance is crucial. Additionally, it is essential to improve the capacity and skills of sanitation workers. Finally, promoting community awareness and behavior change programs.

#### 5. Acknowledgment

Authors thank Dinas LH of Padang City and Dinas PUPR of Padang City who provided insight and expertise that greatly assisted the research

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