

Strategy Towards 100% Open Defecation Free in Murung Keraton Village, Martapura District, Banjar Regency

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Abstract— Indonesia is targeting Universal Access 100% of Open Defecation Free (ODF) in 2019 along with Medium-term Regional Development Planning Document (RPJMD) target of Banjar Regency to be Open Defecation Free in 2021. The latrine access in Martapura District in 2018 was 72.84%, the remaining was 27.16%, or as much as 5,317 households included practice open defecation. In Murung Keraton village, there are 598 houses, including landed houses and floating houses, which do not have latrines. Then, improvement efforts for sanitation services to accelerate in stopping open defecation targets are needed according to the regional condition. Martapura District with a river flows through, makes the houses divided into two regions namely floating houses and landed houses. The research was conducted using a literature study, field observation, and interviews. The final fecal management can be applied on the river area in Martapura District with the floating houses using T-Pikon-H, while for the land house area using a septic tank. The planning was conducted in two stages for each house, there were 383 landed houses and 215 were floating houses condition so that the 100% ODF (Open Defecation Free) target can be obtained in 2021 in Murung Keraton Village Banjar.

Keywords— Open defecation free, latrines technology, t-pikon-h, septic tank

I. INTRODUCTION

Murung Keraton Village is one of the 26 villages in Martapura District, Banjar Regency has the area of 0.56 km², the population is 3,346 people with a population density of 1755 people/km² (Kecamatan Martapura Dalam Angka, 2018). Murung Keraton Village still has the status of open defecation village with the latrine access as much as 34.50% or as many as 598 householders who still perform open defecation behavior [1].

Murung Keraton Village still experiences sanitation problems which are the habit of disposing of household wastewater directly into the river and open defecation behavior. One of the causes is the condition of latrine owned by the Martapura District community for the houses in the river bank are trench latrines and floating latrines [2]. The condition of the area which has many rivers flowed so that many people live on the banks of the river. Its practicality and ease of access from the residence make it performed by many people.

Banjar Regency Government regulations in Medium-term Regional Development Planning Document (RPJMD) 2016-2021 is targeting 100% Open Defecation Free [3]. One of the improvement efforts in sanitation access is through Community-Led Total Sanitation (STBM) activities to create village/sub-district for ODF (Open Defecation Free). The program is intended to direct the community to changed behavior of open defecation to a designated place (latrine/toilet) [4].

The description of the village condition based on the field observation is densely populated, village roads are relatively narrow, difficult to access on 4-wheeled vehicles, and several villages where the rivers flow have some bridges as the connectors between villages. The community uses the river-bank latrine in a floating boat shape as the open defecation place. On the floating boat, the community also use that as a place for other disposal activities, such as doing laundry and other sanitary activities. The floating latrines are used jointly by several householders. The latrine condition stands on the floating boat in the form of wooden or zinc walled rooms, roofs, wooden flooring with holes directly into the river. The house conditions in the river-bank area village have the construction of floating wooden house. There is also a community whose houses are on the land area. The population density < 200 people/Ha and inhabited by the most community with middle to lower income.

Open Defecation Free (ODF) is the condition when each individual does not perform defecation in the open area, including fecal disposal. The final fecal management technology is needed to achieve the village of Open Defecation Free. The fecal management will be adapted to the condition of the village are which is the river area. Based on the guide book of *Opsi Sanitasi yang Terjangkau untuk Daerah Spesifik* published by WSP [5], there is an option of technology appropriate for a specific region which is for landed houses namely septic tank (Figure 1), floating houses use biofiltration septic tank (Figure 2), while the stilt house use Tripikon-S system (Figure 3).

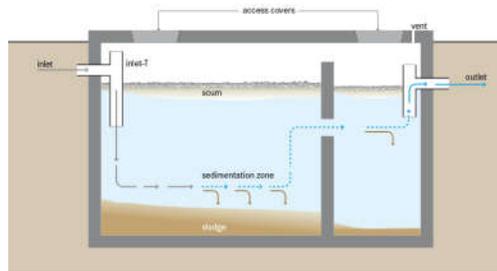


Fig. 1 Septic Tank Design [6]

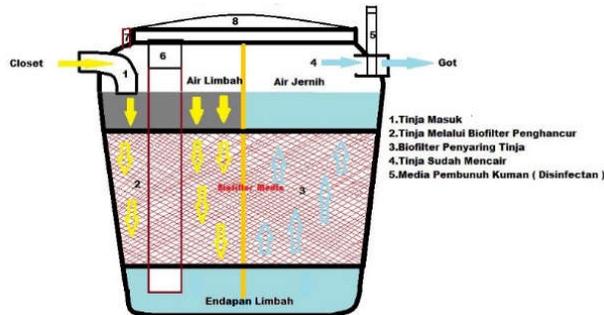


Fig. 2 Work Process of Biofilter Septic Tank

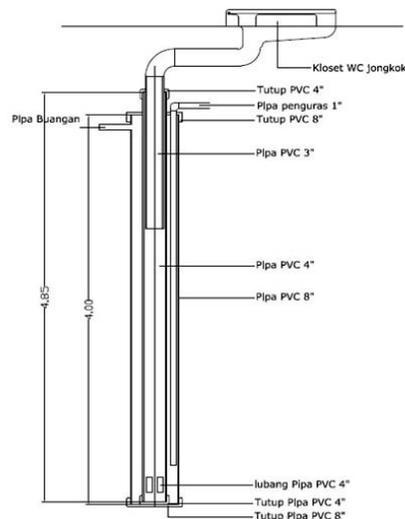


Fig. 3 Tripikon-S Tool Design [7]

The sanitation target of 100% Open Defecation Free needs an improvement effort with the target achievement strategy. The determination of fecal final management can support the acceleration of the sanitation target in the form of ODF in Banjar Regency by 2021. The final fecal management will be adjusted with the conditions of the villager's residence area which are landed houses, floating houses, and stilt houses. The final fecal management technology adapting to the specific area of Murung Keraton Village in the river area is divided into three house parts namely landed houses, floating houses, and stilt houses.

II. RESEARCH METHOD

The research was conducted using a field observation in Murung Keraton Village in the area of Martapura river, Martapura District, Banjar Regency, South Kalimantan. The respondents were the community who did not have private latrines or included in open defecation behavior. The data used included the primary and secondary data. The primary data were obtained from the survey results, field observation (observation), and interviews. The secondary data were the public data from archives, reports, literature, standard or technical guidance, in the form of the data from the Department of Public Works, Department of Health, literature, and technical guidance book of a liquid waste management.

The observation was conducted to see the sanitation condition in the community, in the form of the community's habit on the sanitation activities. As well as the environmental condition in the form of physical illustration of the community residential area. From the observation result, it showed that the community residence location was spread in the floating houses and landed houses.

III. RESULT AND DISCUSSION

The river-bank and backyard latrines become an issue since the disposal is performed directly to the river. The constraints of achieving stop open defecation target in Murung Keraton Village was the environmental condition where the river flows between the people's residence. The location of a floating houses in the river makes their latrines are also located in the back of the house. Accordingly, the sanitation and defecation activities were also disposed of directly to the river. The people's residence in Murung Keraton village was also categorized into landed houses. However, during the interview, the people did not know about the draining of the septic tank from their water closet. Therefore, it can be stated that the final fecal management is septic tank. Meanwhile, from the observation results, there were water closets which did not have a septic tank, all disposal went to the river.

Murung Keraton village has a population of 3346 people, and there are 598 houses which do not have the latrine access. From the data, there were 383 landed houses, and the rest of 215 were floating houses and stilt houses. Therefore, there needs an ODF achievement strategy, one of them was by determining the final fecal management for each house.

Several things become the consideration in fecal final management for landed houses region, namely:

- The respondents' knowledge of sanitation is adequate. Therefore, it was easier for them to receive the teaching on the management and maintenance of a liquid waste management system.
- Respondents expected a private latrine facility.
- The community gathered in one residential area so that it becomes densely populated. However, the density is categorized as low (17 people/Ha). The existence of empty land can be utilized for a liquid waste management system in the form of communal IPAL.
- There is no private or public sanitation site available with proper waste management. The house is equipped with a septic tank, but the residents do not know about the fecal sludge drainage. There are also houses unequipped with a septic tank so that the waste is disposed of directly to the river.
- The planning of the septic tank system based on SNI 2398:2017.

Several aspects which become the consideration in fecal final management for floating house and stilt house areas, namely:

- Sanitation and defecation activities are performed in the floating latrines located in the river bank in the back of the house.
- Respondents' willingness to change the habit can be the motivation so that they do not perform open defecation or dispose the liquid waste into the river.
- Respondents' knowledge of sanitation is relatively adequate so that it is easier for them to receive the teaching on the management and maintenance of a liquid waste management technology.

The Experienced Constraints

Based on the observation results, the technical constraints which will be experienced if there is planning on the construction of septic tank, Tripikon-S, and biofiltration on each house are:

- Changing the habit of the community who perform the sanitation and defecation activities in the river bank to private latrines.
- Conducting counseling on the fecal sludge drainage from the septic tank.
- Tripikon-S by far does not have a standard design and model which can be applied to each house. It only refers to the prototype design on the previous research
- The efficiency of Tripikon-S as a domestic a liquid waste management system has not been proven scientifically on the final results of disposal to the environment.
- The economy factor of the villagers which will make it difficult for them to spend their money to build the final management system.

ODF Achievement Strategy

Based on the observation results and its constraints, the ODF achievement strategy in Murung Keraton Village can be performed by planning on septic tank procurement in landed houses and t-pikon-h on stilt houses. Accordingly, it is expected that the 100% ODF target is achieved in Murung Keraton village. According to Banjar Regency RPJMD which determines the target of 100% ODF in 2021, then there needs a strategy in the planning. The planning of 100% target achievement is divided into several stages, which are the construction of a septic tank in landed houses, Tripikon-S tool in stilt houses, and biofiltration septic tank in floating houses. The table of planning latrine distribution can be seen in Table 1.

Table1. The Assumption of Facility Development Planning

Types of Technology	Number of Houses Served			
	2019	2020	2021	Total
Septic Tank	183	100	100	383
Biofiltration	15	50	50	115
Tripikon-S	20	40	40	100

On the first stage, the planning of septic tank refers to the SNI 2398:2017. The general requirement on the land provision can be overcome with the density of 26 people/Ha still has an empty land for septic tank and advance processing in the form of absorption field. With the standard in the septic tank planning, it can enable the septic tank construction.

The next stage is the planning of biofiltration septic tank in the floating houses. The biofiltration septic tank can be applied to the tentative condition of floating houses, or the height of the houses follows the surface of river water. The installation of biofiltration septic tank is light, floating, and able to adapt to the height of the river water. The fiber septic tank can be applied to the latrine construction or connected to the defecation hole. The effluent from the septic tank management should be processed with the chlorination system available within the system. The water-proof fiber septic tank and the excrement are not directly disposed to the river can decrease the potential of river water pollution. The fiber septic tank can be supported with wooden construction to support the loads.

Furthermore, it is the planning of Tripikon-S tool installation on the latrine. Referring to the previous research [8], since the efficiency of Tripikon-S tool is not yet scientifically proven, then a test on the existing condition of the river water quality first before installation. The test was intended to find out the existing condition by looking at the parameter showing the less feasible condition of sanitation. Besides that, the use of Tripikon-S tool is still new, there needs counseling first to the community on the management and maintenance of the tools. The planning if fecal final management system in Murung Keraton village for the landed houses, floating houses, and stilt houses is in Figure 4.

Observing the stages of sanitation facility construction planning (Table 1) and referring to the cost unit of the management processing system, then it obtained the needed cost indication in Table 2 using the example of simple calculation for septic tank construction with the size of 2 x 2 m with the depth of 2 m. Furthermore, the job conducted and the unit cost from work including the needed materials were described. It obtained the result that the simple septic tank construction required the total cost of IDR 1,900,000 per unit/house.

The biofiltration septic tank has various types and specification depending on the container capacity. The assumption per house was inhibited by one householder with four family members; then, the needed biofiltration capacity was the smallest type with the maximum capacity of 6 people. The type with the capacity of 6 people and the volume of 800 m³, the price per unit equals to IDR 1,800,000.

The construction of tripikon-s refers to the research [8] with the specification of materials in the forms of pipes with various diameter and length sizes, the foundation uses the wooden material, and the smallest capacity was 1-5 people, then the cost needed was IDR 2,567,000 per unit.

Table 2
Indications for Sanitation Development Costs

Types of Technology	Indication for Cost (x IDR 1000)			
	2019	2020	2021	Total
Septic Tank	347,700	190,000	190,000	727,700
Biofiltration	27,000	90,000	90,000	207,000
Tripikon-S	51,340	102,680	102,680	256,700



Fig. 4 Fecal Sludge Final Management System Plan

IV. CONCLUSIONS

Based on the existing condition of the community in Murung Keraton Village, it can be concluded that in the acceleration of stop open defecation target are:

- Observing the distribution of landed houses, floating houses, and stilt houses by an appropriate provision of the final fecal management facility, then 100% ODT can be achieved according to the target.
- The final fecal management is adapted with the house locations namely septic tank in the landed houses, biofiltration septic tank for floating houses, and Tripikon-S tool for stilt houses.

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