

ASSESSMENT OF ACCESS TO SANITATION FOR COMMUNITIES IN TAPIN REGENCY, SOUTH KALIMANTAN PROVINCE

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ABSTRACT

Assessment Of Access To Sanitation For Communities In Tapin Regency, South Kalimantan Province. Providing access to sanitation is one of the global and national commitments in order to improve people's welfare. Inadequate sanitation results in a number of health risks such as diarrhea, malnutrition, stunted growth, and several other health problems. The purpose of this study was to identify the accessibility of proper sanitation for the people of Tapin Regency. The scope of this study was the condition of sanitation facilities and infrastructure available in homes in Tapin District. The methods used in this research were interviews, field observations, and documentation. Data sources were determined using purposive sampling techniques. Based on the findings in the field, some people still practice open defecation even though they have a toilet at home. A more economically viable alternative for the community for a sustainable sanitation system is to concentrate on safe fecal disposal for those using latrines rather than building a new large-scale wastewater system. There are 5 indicators studied to determine the level of access to community sanitation, namely the availability of handwashing with soap and clean water facilities, access to proper sanitation, open defecation behavior, access to household wastewater management systems, and access to septage management systems. This study highlights the importance of using comprehensive sanitation indicators beyond basic latrine access, especially in rural areas where data is limited, local governments should prioritize investment in fecal sludge treatment infrastructure and strengthen community engagement in sanitation behavior change programs.

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INTRODUCTION

Sanitation is a basic human right and a key target in the Sustainable Development Goals (SDGs), particularly Goal 6.2, which calls for access to adequate and equitable sanitation for all by 2030 ^[1]. Providing access to sanitation is a global and national commitment to improving community well-being. Measurements of access to adequate and safe sanitation and open defecation practices are conducted to determine the level of community provision for domestic wastewater management and to obtain an overview of the sources of air pollution from domestic wastewater ^[2].

In Indonesia, access to sanitation remains a challenge, especially in rural areas. Studies investigating the drivers of inequality in Indonesia are also limited ^[3,4]. The government uses five national indicators to measure sanitation access, covering both facilities and waste treatment. However, the

provision of sanitation facilities and infrastructure in Indonesia currently faces several challenges, both technical and non-technical. 10.41% of the Indonesian population still Open Defecation Practices (ODP), and 32.1% lack proper sanitation management ^[5]. Population growth without adequate sanitation facilities leads to a decline in environmental quality ^[6]. Improper sanitation leads to a number of health risks, such as diarrhea, malnutrition, stunted growth, and several other health problems ^[7].

Tapin Regency, located in South Kalimantan Province, faces varied levels of sanitation development. However, limited research has assessed sanitation access in rural districts using all five national indicators, particularly in Tapin Regency. This study aims to fill that gap. Based on the strategic environment assessment of the Tapin Regency for Regional Long-term Development Plan 2018-2023, the percentage of households with access to adequate and sustainable sanitation services as of 2017 was 71.1%. Compared to the target of Peraturan Presiden RI No. 111 of 2022, which targets a 90% percentage of households occupying housing with access to proper and safe sanitation, regional achievement of this regulation remains unmet. Furthermore, only five of 135 villages/sub-districts in Tapin Regency have stopped open defecation ^[8]. Based on this background, research related to adequate sanitation for the people of Tapin Regency, South Kalimantan Province, was conducted. This study aims to assess household sanitation access in Tapin Regency based on five national indicators to identify gaps and inform local policy.

MATERIALS AND RESEARCH METHODS

The case study assessment was conducted for 2 months, August-September 2023 in Tapin District, South Kalimantan Province. The purpose of this study was to identify the accessibility of proper sanitation for the people of Tapin District. The scope of this study was the condition of sanitation facilities and infrastructure available in homes in Tapin District. The methods used in this research were interviews, field observations, and documentation. Interview questions were customized to the sanitation conditions required by Bappenas (2020). Determination of data sources was done using purposive sampling technique. The number of samples in this study was determined using the Slovin formula. The Slovin formula is commonly used for research that has a very large object ^[9]. The sample size according to Slovin is determined based on the following formula:

$$n = \frac{N}{1 + (N \times e^2)}$$

Where n is the sample size, N is the population size, and e is the percent allowance for sampling error that can still be tolerated. The value of N used in this study is the number of households. The number of households is obtained from the total population divided by the average number of people in 1 house. It is known that the population of Tapin Regency based on BPS (2023) is 194,628 people, so assuming 1 house consists of 4 people, the number of households in Tapin Regency is 48,657 ^[10]. Based on the results of calculations using the Slovin formula, the number of samples in this study was 100 samples. To determine the level of access to sanitation for the community, 5 indicators were studied, namely the availability of handwashing facilities with soap and water, access to proper sanitation, open defecation practices, access to domestic wastewater management systems, and access to septage management systems^[11]. The results of the study were used to find strategic issues for the implementation of target 6.2 of Tapin District and the findings of the issues will be used as the basis for the preparation of strategies for target 6.2 of the SDGs in the preparation of the KLHS RPJPD Tapin Regency 2025-2045.

RESEARCH RESULTS AND DISCUSSION

Globally, more than 60% of people live without sanitation services ^[12]. Most of the wastewater produced is directly discharged without proper treatment ^[13]. Consequently, domestic wastewater becomes a significant source of water pollution due to its large volume and minimal treatment ^[14]. An integrated approach is needed to address this issue and mitigate its negative impacts ^[12]. Access to safe and adequate sanitation affects life expectancy for people in Indonesia ^[15]. Access to sanitation facilities is key to socio-economic well-being and sustainable development ^[16]. The

percentage of households with access to adequate and sustainable sanitation services reached 71.1% in 2017 [8]. Compared to the target of Peraturan Presiden RI No. 111 Tahun 2022, which targets a 90% percentage of households occupying housing with access to proper and safe sanitation, regional achievements regarding this regulation have not yet been met.

Respondent Characteristics

The number of respondents used in this study was 100 people. Respondents were people who owned houses in Tapin Regency. The sociodemographic characteristics described consisted of gender, education level, and age of the respondents. The sociodemographic characteristics of respondents are presented in Table 1. Table 1 shows that based on gender, respondents consisted of 45% men and 55% women. There were more female respondents than male respondents because the sampling was conducted during working hours, namely from 08.00 to 16.00, where the majority of men work during these hours. However, some of the male respondents encountered during the research hours came from men who work as farmers, traders, or have retired. Based on the education level of the respondents, it is known that the respondents consisted of 2% with elementary school, 8% Junior High School, 24% Senior High School, 3% Diploma, 1% Professional, 56% Bachelor's Degree, and 6% Master's Degree. Based on the respondent's education level, the majority of respondents are Bachelor's Degree. Based on the age characteristics of the respondents, it is known that the percentage of respondents' ages consists of 11% aged <25 years, 32% aged 25-35 years, 23% aged 36-45 years, 20% aged 46-55 years, and 14% aged >55 years. Based on age characteristics, the majority of respondents are in the 25-35 year range.

Table 1. Socio-demographic characteristics of respondents

Characteristics	Category	Frequency (F)	Percentage (%)
Gender	Male	45	45
	Female	55	55
Total		100	100
Age	<25	11	11
	25-35	32	32
	36-45	23	23
	46-55	20	20
	>55	14	14
Total		100	100
Level of education	No school	0	0
	Elementary School	2	2
	Junior High School	8	8
	Senior High School	24	24
	Diploma	3	3
	Profession	1	1
	Bachelor's Degree	55	55
	Master's Degree	7	7
Total		100	100

Access To Proper Sanitation

Sanitation development in Indonesia refers to the Sustainable Development Goals (SDGs) which by 2030 are targeted to ensure the availability and sustainable management of clean water and sanitation for all [17]. Access to proper sanitation is determined based on 5 indicators, including:

Availability of Handwashing Facilities

The availability of handwashing facilities is one of the indicators that describe access to proper sanitation for the community. Hand washing facilities consist of taps, soap, and waste disposal channels [18]. The results showed that the percentage of ownership of hand washing facilities for respondents was 98% had and 2% did not have. The majority of respondents explained that the habit of washing hands has been taught by their parents and continues to be passed on to their descendants. Some respondents had handwashing facilities at home because it was an appeal by the local government. Handwashing behavior in Tapin Regency increased especially during the covid pandemic. There were 2% of respondents who did not have handwashing facilities at home.

The reason was due to limited funds to provide such facilities. The condition of respondents' handwashing facilities is presented in Figure 1. Some respondents' handwashing facilities were located inside the house and some were located outside the house.



Figure 1. Condition of Handwashing Facilities

Handwashing with Soap is the behavior of washing hands using clean running water and soap. Handwashing with Soap is one of the pillars of Community-Based Total Sanitation which is proven to reduce the risk of disease ^[19]. The results showed that 98% of respondents washed their hands with soap and 2% did not wash their hands with soap. This is because most respondents think that washing hands with water alone is enough to clean the dirt on their hands. Washing hands with soap takes a little longer than washing hands with water alone. Whereas washing hands with soap is a simple, convenient, and cost-effective way to prevent disease transmission ^[20].

The most important times to implement Handwashing with Soap are before eating, before processing and serving food, before breastfeeding, before feeding infants/toddlers, after defecating, and after handling animals/poultry ^[18]. The results showed that 96% washed their hands before eating, 87% washed their hands before processing and serving food, 12% washed their hands before breastfeeding, 24% washed their hands before feeding babies/children, 97% washed their hands after defecating, and 70% washed their hands after handling animals/poultry. Based on the findings in the field, the majority of respondents wash their hands most often, especially after defecating. This is a habit that has been implemented for a long time by the people of Tapin Regency. The least frequent activity of handwashing was breastfeeding at 12%. This is because the majority of respondents who were female did not breastfeed.

Availability of access to proper sanitation

The provision of sanitation facilities such as toilets plays an important role in improving household sanitation and reducing open defecation practices ^[21]. The availability of access to proper sanitation based on Bappenas (2022) can be seen from the condition of toilets and landfills. Field observations were conducted with 100 respondents. In this study, there are several conditions described, namely the status of toilet ownership, people's habits in defecating, toilet conditions (top, middle, and bottom). Based on toilet ownership status, the percentage of private ownership is 100% and the percentage for shared ownership is 0%. A healthy toilet must be built, owned, and used by the family with placement inside or outside the house that is easily accessible to the occupants of the house. The description of toilet conditions refers to Permenkes No. 3 Year 2014 which divides toilet buildings into upper, middle and lower parts. The upper part of the toilet is defined as the roof/wall that serves to protect the user from weather and other disturbances. The middle of the toilet building includes the toilet floor and the feces and urine disposal pit. The lower part of the toilet is the part that serves as a collection, processing, and decomposition of feces that serves to prevent pollution or contamination from feces through disease-carrying vectors either directly or indirectly.

Based on the results of the study, the top of the toilet in the respondent's house consists of 97% inside the house and is equipped with walls and roofs. The other 3% are semi-permanent toilets outside the house. The majority of respondents explained that the presence of a toilet inside the house was to facilitate respondents' access when urinating / defecating. Interviews were also conducted with respondents who use toilets outside the house. Respondents explained that they actually wanted to build a permanent toilet inside the house. However, the main reason is the limited funds for toilet construction. The social and economic conditions of the community are the main determinants of their sanitation facilities ^[22]. In addition, respondents also explained that their houses did not originally have toilets, but received toilet construction assistance from the government. Therefore, the toilet was added in a semi-permanent form outside the house. A picture of the condition of the toilet superstructure is presented in Figure 2.

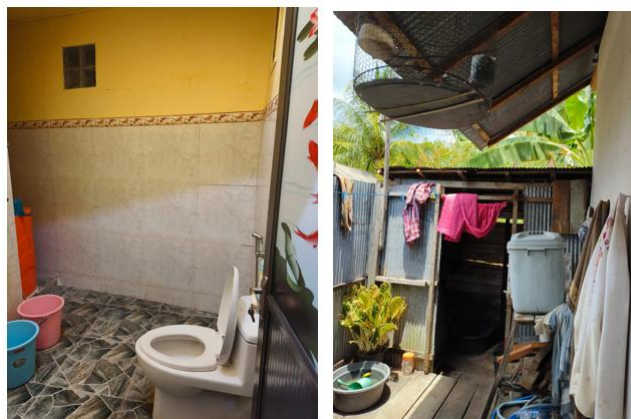


Figure 2. Top condition of the latrine

The central toilet building in 100% of the respondents' houses has a cement foundation with a swan neck. The types of toilets owned by respondents' houses varied, with some having squat toilets, some sitting toilets, and some having both types in one house. Respondents with squat toilets explained that this type was chosen because the people of Tapin Regency have always been accustomed to squat toilets. Based on the respondent's explanation, the type of toilet is also adjusted to the culture of the local community. Especially during religious events such as Eid al-Fitr, many families visit and they are more comfortable using squat toilets. As for respondents who have a sitting toilet, they explained that they are more comfortable with the condition of the sitting toilet, especially for those who have elderly people in their house, then the sitting toilet will make it easier for all members of the house to urinate / defecate. For respondents who choose to provide 2 types of toilets in 1 house, this is based on the needs and habits of family members when urinating / defecating.

The toilets in respondents' homes consisted of 12% earthen pits, 2% earthen pits with perforated masonry, 30% earthen pits with ironwood masonry, 53% with septic tanks, and 4% with other forms. In the majority of communities in Tapin District, the toilet's lower structure is equipped with a septic tank. Another form of under toilet building is an earthen pit with tires and also leads directly to the river. The type of toilet structure is influenced by the income level, geographical conditions, and culture of each respondent. For houses located along the river, direct disposal of fecal waste into the river is preferred. Respondents explained that the construction and maintenance of septic tanks is very difficult if the house is located along the river. Septic tanks are preferred by people who are on land and far away from the riverbanks. Simple septic tank with ulin wood pairing is the type that is widely used by the people of Tapin District. Besides being easy to obtain in Kalimantan, ulin wood is also classified as wood with strength class I and durability class I ^[23]. It is also suitable for unstable soil conditions such as peatlands ^[24]. In addition, ironwood is also resistant to wood destroying organisms ^[25]

Access to sanitation in Tapin Regency when compared to Bappenas requirements (2022) can be categorized as access to proper sanitation itself, namely that the user of the sanitation facility is the household itself, the toilet uses a gooseneck, and the bottom is at least a hole in the ground. This is

in accordance with the approach to sanitation development policy which still accommodates simple/basic sanitation facilities built by the community on a self-help basis in areas with low population density. Households that do not have sanitation facilities or that have sanitation facilities but do not use them are included in open defecation behavior ^[2].

Open Defecation Practice (ODF)

Open defecation is one of the indicators that describe access to proper sanitation for the community. Open defecation is a voluntary or forced practice. This choice is closely related to personal preferences, cultural norms, and traditions of the people in an area ^[26]. Based on (KLHS RPJMD Tapin District 2018-2023), only 5 out of 135 villages in Tapin District have stopped open defecation. Research on open defecation practices among 100 respondents in Tapin District showed that 98% of respondents never defecate in the river and the remaining 2% of respondents admitted that they still practiced open defecation. Interviews revealed that there were respondents who used to use river latrines to urinate/defecate. However, now that they have private toilet facilities at home, these respondents prefer to switch to using private toilets. Respondents revealed that the quality of river water when used for bathing, washing, and toileting is no longer possible, because the water is dirty unlike in the past. Tapin River water is currently classified as lightly polluted river water ^[27]. Manganese (Mn) metal content in Tapin River was detected and exceeded the threshold in the upstream and downstream parts of the river ^[28].

Respondents who still practiced open defecation were those whose houses were close to the riverbanks. Respondents revealed that they practiced open defecation under duress. This coercion can be in the form of economic coercion that forces them to save money on regional water supply company fees and because the water in the respondent's house often turns off. Similar practices also occurred in a study conducted by Bhatt et al. (2023), where rural communities in Nepal who have toilets in their homes but do not use them and prefer to defecate. The reason is because the toilet in their house is only used for guests and if there is a certain event. This is also in line with the definition of open defecation practices by Bappenas (2022), namely users who do not have facilities and those who have facilities but do not use them. The river latrines commonly used by the people of Tapin Regency are presented in Figure 3.



Figure 3. River latrine

Access to domestic wastewater management system

Domestic Wastewater Management System is divided into two management systems, namely Decentralized Domestic Wastewater Management System and Centralized Domestic Wastewater Management System. The selection of the type of Domestic Wastewater Management System is carried out by considering population density, depth of groundwater table, land slope, soil permeability, and financing capability ^[29]. Currently, the Domestic Wastewater Management System implemented by Tapin Regency is Decentralized Domestic Wastewater Management System. The consideration given is because the population density of Tapin Regency is only 89 people/km² ^[10]. When compared with Permen PUPR No. 04 tahun 2017, this is appropriate because the requirement for Centralized Domestic Wastewater Management System is a minimum of

15,000 people/km². A more economically viable alternative for sustainable sanitation systems is to concentrate on the safe disposal of excreta for those using latrines rather than building new large-scale wastewater systems^[30]. Decentralized Domestic Wastewater Management System is a local treatment subsystem that functions to collect and treat domestic wastewater such as black water and gray water at the source location. Based on the results of interviews and field observations with 100 respondents, the majority of people in Tapin Regency use individual-scale Decentralized Domestic Wastewater Management System. Individual scale can be in the form of twin septic tank, septic tanks with infiltration fields, biofilters and fabricated wastewater treatment units^[29].

Based on the results of the study, respondents' houses consisted of 12% with earthen pits, 2% with earthen pits with perforated masonry, 30% with earthen pits with ironwood masonry, 53% with septic tanks, and 4% with other forms. The largest percentage was the use of septic tanks. The majority of people using septic tanks explained that the basis for choosing this unit was because they had sufficient funding and to preserve the environment. Septic tanks are used in order to maintain groundwater quality from pollution and maintain public health^[31]. The second largest percentage is the use of earthen pits with ironwood pairs. This form of septic tank uses ironwood as a support with a depth of several meters and is covered with a concrete slab on the top. It is also accompanied by a gas exhaust pipe that leads to the outside.

Access to septage management system

A septic tank is categorized as safe access when the desludged septage ends up at the Septage Treatment Plant (STP). The location of the Tapin Regency STP is in Bitahan Baru Village, Lokpaikat District, Tapin Regency. A septic tank that is desludged at least once in the last 5 years and disposed of at the STP^[2]. Based on interviews with 100 respondents, it was found that 6% of respondents desludged at least once in 5 years, 87% of respondents never desludged, and 7% desludged but more than 5 years. Respondents who desludged at least once in 5 years revealed that this was a maintenance measure for their feces storage. Respondents who have never desludged their feces revealed that they still do not need to desludge their feces. Various reasons were expressed by respondents such as the respondent's house is a new residence, the shelter has never been full despite 20 years of living there, and even some respondents prefer to dismantle their feces shelter, rather than desludging it. Community participation in desludging in the study area is influenced by several factors such as septic tank type, community finances, and geographical location. In addition, the frequency of desludging is also related to the level of community knowledge on septic tank maintenance^[32]. The dismantling of the septic tank is usually done by respondents who own a house with a simple septic tank with an ulin wood foundation.

CONCLUSIONS AND RECOMMENDATIONS

The accessibility of the people of Tapin Regency to sanitation facilities based on a study with 5 indicators showed that all parameters were accessible to respondents. These findings underscore the importance of localized sanitation planning, with emphasis on sustainable sludge management and behavior change communication. This study highlights the importance of using comprehensive sanitation indicators beyond basic toilet access, particularly in rural settings where data are scarce. Local governments should prioritize investments in sludge treatment infrastructure and strengthen community engagement in sanitation behavior change programs. Limitations of this study include the small sample size and limited access to all villages. Therefore, sanitation conditions may not reflect the study area as a whole.

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