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THE IMPLEMENTATION OF POLICY OF WATER WASTE TREATMENT PLANT ON HOUSING ACTIVITY IN BANJAR REGENCY OF KALIMANTAN PROVINCE

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Abstract: *The growth of population will be followed by the provision of residential housing which will increase the environmental burden and the increase of domestic waste generated from the activity of life in the housing environment. This study aims to: i) identify the actual condition of the Waste Water Treatment Plant (WWTP) in the area of subsidized housing, ii) Evaluate and analyse the implementation of communal WWTP policy in the area of subsidized housing in Kertak Hanyar District and Gambut District, South Kalimantan. The data were collected using semi structured interview method and literature study. Data analysis was done by descriptive approach and presented through tabulation matrix. The evaluation of communal WWTP policy implementation is done by GAP analysis method. The results are known that the housing developers only provide a septic tank made of ironwood and coated with cement on the top. Based on the result of gap analysis that all housing have cumulative index value 2,4. This value indicates that many developers do not implement the rules on communal WWTP which has been required by the Government of Banjar Regency. The non-implementation of communal WWTP in residential areas is due to the lack of knowledge of housing developers on communal WWTP. Other problems include technical matters concerning the making of communal WWTP in flat topographic wastes (plates). Housing developers have not yet mastered the technology in the application of communal WWTP for housing growing in wetlands. The huge cost requirements also complicate the application of communal WWTP in subsidized housing areas.*

Keywords: *Implementation, Policy, Communal WWTP, Houses*

I. INTRODUCTION

The population in Banjar Regency is quite large. The Central Bureau of Statistics of Banjar Regency stated that this region has a population of 563,062 people divided into 286,058 men and 277,004 women, with sex ratio of 103. Gambut and Kertak Hanyar districts are dominated by wetlands. Population growth in the distric of Gambut and Kertak Hanyar are relatively fast compared to other areas in Banjar Regency, because these two areas are very close to the city center. Population density in Gambut Distric are 310 peoples/km^2, while in Kertak Hanyar District 955 people/km^2 (Central Bureau of Statistics Banjar, 2017). The addition of this population will be followed by the provision of residential housing that will increase the

environmental burden, in the form of loss of green space availability and rising domestic waste resulting from life activities in the housing environment.

Based on the data of environmental documentation application (environmental permit) for housing activities to the Environment Agency of Banjar Regency of 2015 until the year 2016 has increased 24 data developers, with the land area for settlements ranging from 1-3 Ha. This indicates that housing demand is getting bigger. On average, each request builds about 100 units of type 36. The rapid development of housing by developers can degrade the quality of the environment, if the housing activities are not equipped with the installation of waste water treatment. Environmental protective instruments are required to prevent environmental degradation or environmental pollution.

According Siahaan (2004) environmental documents into an instrument to prevent environmental damage or pollution because it can minimize the negative impacts resulting from housing activities. The prevention efforts are carried out through the active role of the initiator reporting the management and monitoring the environment to the Environment Agency of Banjar Regency every six months as the initiator's responsibility, in environmental management in accordance with the statement of the capability to carry out environmental management signed on stamp duty. Although every implementation of environmental management must be based on the existence of environmental documents that have been made, but this is still very far as expected. Most of the initiators did not implement the technical recommendations required in the environmental management and monitoring documents approved by the technical team, consequently the environment became polluted (Soemarwoto, 1989).

Environmental problems in the District of Gambut and Kertak Hanyar have indicated a water pollution problem, so it needs special attention. The largest pollutant source is donated by the activities of the residents intentionally or not by disposing of their domestic waste into the environment. The amount of waste produced will be in line with the number of population growth in the region.

The population in both districts combined will reach 79,501 inhabitants. It is assumed that every person produces sewage waste of 0.5 kg/person/day, it will produce household waste of 37,750.5 kg of waste/day. The amount of human waste in 1 (one) month will result in waste of 1,132,515 kg. This phenomenon leads to the need of wastewater treatment plant (WWTP) which can prevent the occurrence of water pollution.

According to Silaban (2007), the management of urban scale ideally uses a piping system in which each building is connected to a pipeline, which then is collected for further processing on the WWTP. The analogy is like the opposite of the PDAM pipeline network. If PDAMs distribute water to homes through pipes, wastewater systems collect from houses, collect waste and then process it in WWTP, called communal WWTP or integrated WWTP.

The Regional Government of Banjar Regency has issued regulations on waste management for residential areas. Housing developers are required to make a communal wastewater treatment plant (WWTP). Based on the Regulation of Banjar Regent Number 57 of 2017 about Guidelines for Housing Development in Banjar Regency,

Article 16 Paragraph 2 Letter b. If the housing area is not passed by the household waste network (assertion) or not, and has the number of plots ≥ 40 units of the house is obliged to make the communal Waste Water Treatment Plant (WWTP) as for this purpose to prevent the occurrence of water pollution both surface and underground water.

The results of field observations inform that some residential sites in the Districts of Gambut and Kertak Hanyar, waste water treatment plants (WWTP) made by Housing

Developers are not water-resistant, thus potentially polluting the water environment. WWTP is also made locally per unit of the house and made of ironwood that is not waterproof, so that the resulting waste is out of septic tank. Causing water pollution.

Based on the problem of wastewater management of housing in both districts, this study aims to: i) Identify the actual condition of the Waste Water Treatment Plant (WWTP) in the Housing area in Kertak Hanyar District and Gambut District, South Kalimantan; ii) Evaluate and analyze the Policy Implementation of Waste Water Treatment Plant (WWTP) in the communal area of Housing in Kertak Hanyar District and Gambut District, South Kalimantan.

II. METHOD

This research was conducted on housing located in Kertak Hanyar District and Gambut District (Figure 1). The housing that is being studied is Dinar Mas 3, Bumi Permata Belayung, Gambah Lestari, Permata Dinar, and Bumi Wahyu Utama 8. The selected housing as research sample are subsidized housing type 36. This research is conducted for 6 (six) month, from January 1st 2018 to April 30th 2018.

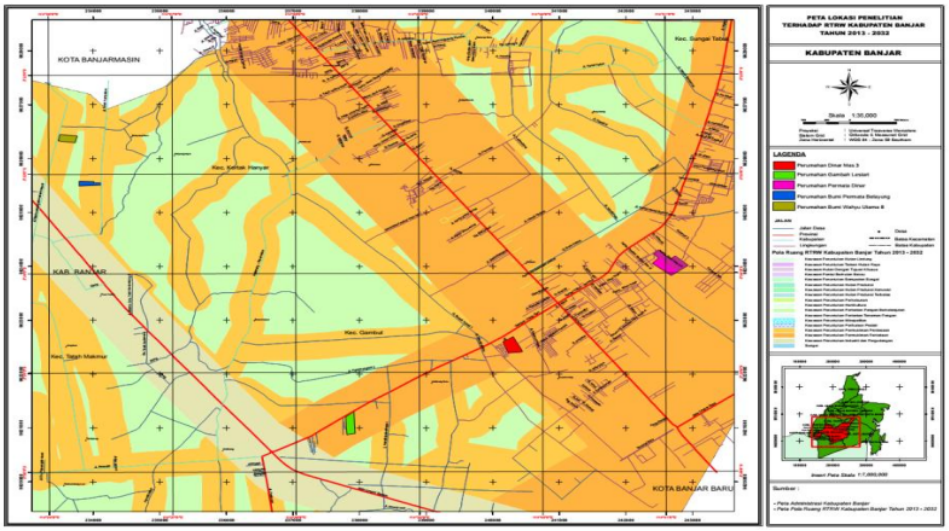

Figure 1. Sketch of Research Location

2.1 Object and Sample of Research

The object of this research is housing area and housing developer in Kertak Hanyar District and Gambut District. The number of housing samples is 5 housing. Technique of sampling of research done by purposive sampling. According to Prasetyo (2005) purposive sampling is a technique of sampling by determining the specific criteria of the sample. Preferred housing is housing that already has environmental documents as mandatory guidance to implement environmental management especially Implementation of communal WWTP policy.

2.2 Collecting Data Method

Data were collected by semi structured interview method (Rahayu et al., 2008). Interviews were conducted on residential developers who became research samples. The

collection of supporting data is also done in the form of data in government about housing and environment, housing documents from developers and other references.

2.3 Data Analysis

2.3.1 Actual Condition of Communal Waste Water Treatment Plant (WWTP) in Housing Area

Analysis of the actual condition of the observation area is by descriptive analysis. This analysis is done by recording the actual condition and comparing with the policy that has been made by the Local Government of Banjar Regency, especially about the implementation of the communal wastewater treatment plant (WWTP). Data is displayed in a tabulation matrix (Kissinger et al., 2016).

2.3.2 Policy Evaluation of Communal WWTP in Housing Area

The approach used to perform this evaluation is GAP analysis. According to Muchsan, et al (2011), GAP analysis is an analysis to identify the differences (disparity) or the gap between one thing with another. GAP analysis is calculated based on a simple formula as follows:

GAP = Actual Condition – Standart Condition

This test is done to test whether there are differences (gaps) with expectations. After the gap value is calculated, each profile is assigned a weighted value with a benchmark weighted Table of gap value, as shown in Table 1 (Kusrini, 2007).

Table 1. Weight of Gap Value

No.	Difference (Gap)	Weight Value	Info
1	0	5	No gap (as expected)
2	1	4,5	Implementation of 1 level excess
3	-1	4	Implementation of 1 level shortfall
4	2	3,5	Implementation of 2 level excess
5	-2	3	Implementation of 2 level shortfall
6	3	2,5	Implementation of 3 level excess
7	-3	2	Implementation of 2 level shortfall
8	4	1,5	Implementation of 3 level excess
9	-4	1	Implementation of 2 level shortfall

Kusrini (2007) stated that after the calculated gap, the next step is to calculate Core Factor and Secondary Factor from each aspect of assessment. Core Factor is the main factor that has higher value than Secondary Factor (supporting factor) for each aspect of assessment. The Core Factor calculation formula is:

$$NCI = \frac{\sum NC}{\sum IC}$$

Information :

NCI : Average value of *Core Factor*.

NC : Total Value of *Core Factor*.

IC : Total Item of *Core Factor*.

While for calculation of Secondary Factor can be shown in the formula below :

$$NSI = \frac{\sum NS}{\sum IS}$$

Information :
NSI : Average value of *Secondary Factor*.
NS : Total Value of *Secondary Factor*.
IS : Total Item of *Secondary Factor*.

The calculation od total value can be shown in the following formula :

N= (x)%NCI + (x)% NSI

Information :
N : total value of an aspect assesment
NCI : Average value of *Core Factor*.
NSI : Average value of *Secondary Factor*.
(x) % : the number of perceent input with the condition the number of Core Factor 60% and Secondari Factor 40% for all assesment aspect.

After the total value index is determined (Kusrini, 2007), the next step is determining the scale, whether the cumulative index is very good, good, fair, poor or bad.

4,2 ≤ IK< 5 : very good
3,4 ≤ IK< 4,2: Good
2,6 ≤ IK< 3,4: fair
1,8 ≤ IK< 2,6: poor
1 ≤ IK< 1,8: bad

III. RESULT AND DISCUSSION

3.1 Actual Condition of Communal WasteWater Treatment Plant (WWTP) in Housing Area

The results of identification of actual conditions on the implementation of communal WWTP in housing areas are listed in Table 2.

Table 2. The implementation of Communal WWTP on Housing Area in Research Area

No.	Housing	Existence of Communal WWTP	Government Standart	Info
1	Dinar Mas 3	None	Has Communal WWTP	Developer doesn't know the obligation
2	Bumi Permata Belayung	None	Has Communal WWTP	Ignorance
3	Gambah Lestari	None	Has Communal WWTP	Difficult to implement
4	Permata Dinar	None	Has Communal WWTP	Ignorance
5	Bumi Wahyu Utama 8	None	Has Communal WWTP	Ignorance

The treatment of liquid waste either from the toilet, bathroom, or other activities carried out on a processing plant or commonly referred to as WWTP. Simple WWTP for treating feces

is often known as a septic tank. While the WWTP for the processing of stool on a large scale is named as communal WWTP. The WWTP is centered on an area. The communal WWTP components include processing units, pipes network complete with control and treatment holes, and household connections. Based on the results of the observation data that has been done is known that all the developers do not do housing and make communal WWTP with information and the reasons mentioned.

Based on the results of the study also known that the developer only provides a septic tank made of ironwood and coated with cement on the top. There are several opinions expressed by developers or housing developers who do not carry out the construction of communal WWTP such as lack of knowledge about the communal WWTP. There are also those who already know and understand that there is a developer obligation to provide communal WWTP, but for its application it is difficult to do in lowland and wetlands with flat topography (plate). The huge cost requirements make it difficult to implement communal WWTP.

Installation of the septic tank with a cube base material made of ulin wood is modified in order to qualify, it needs special skill to be able to casting by using cement to all parts of the surface of the ulin septic tank to be waterproof, this work will be more difficult considering the position of septic tank is located in the water. In a septic tank that has been installed this can not be done, the condition of septic tank already filled must also be made into waterproof, so a more realistic step is to choose one of the options for managing the stool by: 1) integrating with a communal septic tank; or 2) establishing an individual septic tank that meets the SNI requirement with a choice of tripikon septic tank / manufacturer made of fiberglass (Zuraini, 2017). Associated with the adoption of innovation technology including in this case the use of floating septic tanks can be associated with the technologies proposed by Rogers et al. (2007). As an alternative to sloping areas, Tripicone-S Technology (Tri / Three Concentric-Septic Pipes) can be used.

3.2 Policy Evaluation of Communal WWTP in Housing Area

The determination of the questionnaire attribute is important in GAP analysis. The questionnaire attributes used in the study are listed in Table 3.

Table 3. Questionnaire Attribute and Standart Value Score

No.	Attribute	Name of Attribute	Standart Value Score
1.	PSL1	Treatment of document	5
2.	PSL2	Purpose of documents forming	5
3.	PSL3	Regulation on WWTP	5
4.	PSL4	Plan Aspect/Alternatif communal WWTP	5
5.	PSL5	Budget for waste water treatment	5

The actual condition value in the above explanation is the value obtained from the filling questionnaire that contains 5 kinds of attributes Based on the attributes that have been determined, and then got the score of the actual value of each housing in Table 4 as follows.

Table 4. Score of the actual value

No.	Housing	Variable				
		PSL1	PSL2	PSL3	PSL4	PSL5
1.	Dinar Mas 3	2	2	1	4	3
2.	Bumi Permata Belayung	2	2	1	4	3
3.	Gambah Lestari	2	2	1	4	3
4.	Permata Dinar	2	2	1	4	3
5.	Bumi Wahyu Utama 8	2	2	1	4	3

The calculation results obtained difference between the actual condition and standard conditions. The results of the calculations can be seen clearly in Table 5.

Table 5. GAP Value

No.	Housing	Variable				
		PSL1	PSL2	PSL3	PSL4	PSL5
1.	Dinar Mas 3	-3	-3	-4	-1	-2
2.	Bumi Permata Belayung	-3	-3	-4	-1	-2
3.	Gambah Lestari	-3	-3	-4	-1	-2
4.	Permata Dinar	-3	-3	-4	-1	-2
5.	Bumi Wahyu Utama 8	-3	-3	-4	-1	-2

The gap value obtained by reducing the actual condition with the standard condition. After the gap value is calculated, the next step is weighting the gap value based on Table 3. The following presents the evaluation results after being weighted (Table 6).

Table 6. The evaluation value after being weighted

No	Housing	Variable				
		PSL1	PSL2	PSL3	PSL4	PSL5
1	Dinar Mas 3	2	2	1	4	3
2	Bumi Permata Belayung	2	2	1	4	3
3	Gambah Lestari	2	2	1	4	3
4	Permata Dinar	2	2	1	4	3
5	Bumi Wahyu Utama 8	2	2	1	4	3

Analysis to the value of core factor and secondary factor follows the condition below :

Core factor PSL1+ PSL3 + PSL4

Secondary factor PSL2+ PSL5

The result of calculation can be listed on Table 7

Table 7. The Value of Cumulative Index

No.	Housing	Variable		Value	Criteria
		Core	*Secondary*		
1.	Dinar Mas 3	2.3	2.5	2.4	Less
2.	Bumi Permata Belayung	2.3	2.5	2.4	Less
3.	Gambah Lestari	2.3	2.5	2.4	Less
4.	Permata Dinar	2.3	2.5	2.4	Less
5.	Bumi Wahyu Utama 8	2.3	2.5	2.4	Less

Based on the results obtained that all housing have a cumulative index value of 2.4, with less criteria according to the classification described by Kusrini (2007). This value indicates that many of the developers do not implement the rules on communal WWTP that has been required by the Government of Banjar Regency. Based on Banjar Regent's Regulation No. 57 of 2017 on guidelines for housing development in Banjar Regency. Article 16 paragraph 2 letter b.

Based on the results of interviews with respondents, non-compliance with this policy is due to a lack of knowledge about communal WWTP by housing developers, the difficult implementation of lowland and wetland areas and the enormous cost involved in implementing communal WWTP. This problem was conveyed to the researchers that they expect government assistance programs to implement communal WWTP.

The results of additional interviews conducted with various related agencies are obtained by the following information: that:

1. Ignorance of housing developers relates to the process of making environmental documents (UKL & UPL) that are not attended and followed by developers directly. The developers always represent their staff to attend technical team meetings in order to stipulate environmental management obligations that must be done and set forth in environmental documents as guidelines for environmental management. This resulted in the dissolution of the implementation liability information in the field from the housing staff to the owner of the housing so that the initiator is not aware of the obligations of the communal WWTP.
2. The awareness of the developer on environmental health is so low that environmental documents as a means of preventing pollution and environmental damage have never been used as guidelines in the housing development process (indifference). Environmental documents are regarded as a condition of the completeness of the administering contract in the first place so they do not implement it.
3. The developers have never studied the relevant regulation of housing development activities so that they are not aware of the obligations of making the communal WWTP.
4. Monitoring and evaluation and supervision activities are not running optimally because this institution was only established in 2017 so that housing development activities under 2017 are not supervised because many housing developers do not perform their obligations.

IV. CONCLUSSION

a. There is no housing developer in the research location that makes Communal WWTP
b. The existing waste treatment unit in all housing is by using a septic tank of ironwood made on each housing unit.
c. The gap analysis results show the value of the cumulative index 2.4 (less criteria). This value indicates that many of the developers do not implement the rules on communal WWTP that have been required by the Government of Banjar Regency.
d. Some factors causing non-compliance with the implementation of communal WWTP in housing areas include: lack of knowledge or ignorance of housing developers about communal WWTP policy, the lack of technology in the application of communal WWTP for housing that develops in wetlands, large cost requirement to implement communal WWTP in subsidized housing areas, lack of care from developers, and poor supervision.

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