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Effect of Bathroom Waste Management and Septic Tank on the Quality of Water Quality in Nanggalo District, Padang City

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***Abstract* - This study aims at the management of bathroom waste and Septic Tank against the water quality in Nanggalo district, Padang City. This type of research is causative where the respondent is a household in Naggalo sub-district. Determination of the number of samples using proportional random sampling technique with the number of respondents in this study is 64 respondents who are divided into six urban villages. Analytical technique used is multiple regression analysis know the amount of waste bathroom management and Septic Tank to the quality of Water Quality population. The result of research shows that Waste Bathroom Management has no significant effect to Water Quality; (2) Septic Tank has significant effect on Water Quality; (3) Bathroom Waste Management and Septic Tank simultaneously have a significant effect on Water Quality in Nanggalo District of Padang City.**

***Keywords* - bathroom waste management, septic tank, water quality.**

I. INTRODUCTION

Rapid and increasing population growth due to the development process in a region, as one of the consequences of human activities, the development process of exploiting the natural resources, this exploitation can cause negative impacts and problems for the environment.

In meeting the needs of water, people always pay attention to the quality and quantity of water. Sufficient quantity is obtained easily because of the hydrological cycle, the scientific cycle that regulates and allows the availability of water on the surface and ground water (Sutrisno, 2004: 65). The need for water for everyday purposes is different for every place and every level of life. Usually the higher the standard of living, the higher the amount of water demand (Apriliana, 2014).

In Indonesia, access to clean water is still a problem, most of the fresh water used comes from river water, lakes, reservoirs and wells (Hansen, 2017). However, the increasing number of population and the growing rate of water demand also increase, so the burden of water contamination also accelerate in accordance with the rapid growth of the population so that to obtain good quality and meet the requirements difficult to obtain.

One of the causes of water pollution is waste water discharged without processing into a water body. Wastewater is a combination of liquid and liquid waste

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coming from residential, commercial, office and industrial areas, along with groundwater, surface water and rain water that may exist (Arif, 2010: 85).

Currently, the main problems faced by water resources include the quantity of water that has been unable to meet the increasing demand and decreased quality of water for domestic purposes. Industrial, domestic, and other activities have a negative impact on water resources. This condition may cause interference, damage, and harm to all living things that depend on water resources. Therefore, it requires careful processing and protection of water resources (Effendi, 2003: 11).

One source of water in Indonesia is from shallow wells. There are still many wells around which there is a source of groundwater contamination. According to Arif (2015) the wells are in the upstream of the groundwater flow and at least 10-15 meters from the source of the contamination. It is estimated that up to 3 meters of soil still contains germs.

According to Arif (2010: 27) Water surface or shallow water that includes water bodies such as rivers, lakes, ponds, reservoirs, swamps, plunge, and surface wells, mostly from rain water that falls to earth surface. This rain water will then experience pollution either by land, garbage, or other.

The most common problem in Nanggalo district is clear water with sediment, smelling and color. There are several problems affecting water quality such as the effect of waste, the distance of septic tanks with water sources, and other factors that may affect water quality. Utilization of Water Quality to meet the needs of everyday life should be paid attention to whether the water is healthy and clean so it can be consumed or in a dirty condition so it must go through the screening process first. According Pelczar (2009) water may look clear, odorless, and tasteless, but not safe to drink.

One form of household waste is bathroom waste. Bathroom waste is all the waste generated in the process of existing activities in the bathroom. Waste generated in the form of solid and liquid waste. Solid waste has not yet felt the impact on the environment because it can be used for cattle feed, but liquid waste will result in foul odor and when disposed of directly to the ground will cause contamination of ground water. Water pollution is caused by the entry of contaminants that can be gases and soluble materials. Pollution enters water bodies in various ways, for example through atmosphere, soil, agricultural runoff, domestic and urban waste, and industrial waste disposal (Effendi 2003: 195).

Bathroom waste, especially liquid waste discharged directly without processing can affect the quality of water. According to Budiman (2006), household wastewater is waste water that comes from residential area consisting of three fractions namely faeces (faeces), urine (urine), and greywater.

Another factor that affects water quality is septic tank. Septic Tank system has the potential to contaminate the water due to seepage or leakage of the tank due to poor maintenance or quality of manufacture Masthura (2017). Pushing wells that occur in the District of Nanggalo, from the components and nature of the physical pollution, water pollution that occurs may be the influence of Septic Tank such as distance septic tanks, septic tanks, and septic tank problems that allow residents of surrounding areas to consume water contaminated by human waste.

Based on the above phenomenon then conducted a study on the consequences of the disposal of waste bathroom and Septic Tank on water quality in the District Nanggalo with the title "The Effect of Waste Management Bathroom and Septic Tank Against Water Quality in Nanggalo District, Padang City ".

II. THEORETICAL REVIEW

A. Environmental conditions

Environment is the sum of all the existing state of things in the space we occupy that affect our lives. Theoretically the environment is infinite in number, for example the sun and the stars are included. But practically we always put a limit on the environmental space. According to our needs the limit can be determined by natural factors such as ravine, river or sea, economic factors, political factors or other factors. Human behavior is also part of our environment, therefore the environment must be interpreted widely, not only the physical and biological environment, but also the economic, social and cultural environment (Otto, 2005: 48).

B. Water quality

The definition of clean water is water that is tasteless, colorless, and odorless which is found and needed in the life of humans, animals, and plants that chemically contain hydrogen and oxygen (Santoso, 2001: 71). Water in nature is very rare / difficult to find in pure state even though rainwater, although originally pure, has been reacting with gases in the air on its way to earth and then contaminated as it flows over the earth's surface and in the soil. Water quality states the water suitability of certain uses in meeting the immediate needs of drinking water, bathing, and washing, irrigation or aerial water, livestock, recreation and biology

(Suripin, 2001: 148).

In terms of quality (Quality) water directly or indirectly pollution will affect the water quality. In accordance with the basic consideration of drinking water quality determination, water management efforts used by humans as drinking water are guided by water quality standards, especially in the assessment of the drinking water products it produces, as well as in planning the systems and processes to be carried out on water resources (Razif , 2001).

The quality of drinking water should be higher than the quality of clean water in terms of several supporting components. The provision of water should also pay attention to the quality because if the disturbance will endanger the community, especially on the health of the population. Therefore the water requirement must be both physically and chemically and free of disease. Water quality must meet health requirements that include physical, chemical and biological requirements.

C. Septic Tank

Septic Tank is one part of the toilet. Family latrines are a building used to remove and collect dirt so that the dirt is stored in a certain place and does not cause disease and does not pollute the surface (Kusnoputranto, 1997). Septi tanks are a satisfactory way of excreting disposal for a small group of households and institutions that have sufficient water supplies, but have no connection with the community waste distribution system (Budiman, 2010: 131). Septic tanks, according to WHO, are the best method to manage wastewater even though the cost is expensive, complicated, and requires extensive land (Budiman, 2010: 139).

Meanwhile, according to Josep Soemardi (1999) the definition of latrines is the collection of human feces in a place so as not to cause seeds of disease that exist in human feces and disrupt the aesthetics. Factors that cause the quality of dug well water is not good that is Septic Tank distance with dug wells less than 11 meters, Septic Tank conditions are not waterproof and located on sandy soil. So that the well water dig contaminated by feces containing Coliform bacteria and resulted in the quality of the well water dug no longer in accordance with the standard designation as a source of clean water (Munif, 2008).

D. Bathroom waste

Water pollution is the entry or inclusion of living things, substances, energy and other components into the water by human activities, so that water quality down to a certain level that causes water can not function in accordance with its allocation (Government Regulation No. 82 of 2001 on Management Water Quality and Water Pollution Control).

Based on its properties, the characteristics of waste are divided into three, namely physical, chemical, and biological characteristics. Physical characteristics include total solids, turbidity, odor, temperature, and color. Biological characteristics by looking at the class of microorganisms (pathogens or not) contained in organic waste. Chemical characteristics in organic wastes are proteins (containing carbon, hydrogen, and oxygen and forming cells and cell nuclei), carbohydrates (sugar, starch, cellulose and wooden yarns comprising elements C, H, and O), oils are fats which are liquid, detergent, and phenol which have water-soluble properties of Milasari and Ariyani (2010). The waste in this study focused on wastewater from bathroom waste.

E. Conceptual framework

Based on the theories that have been described previously, the conceptual framework in this study as follows:

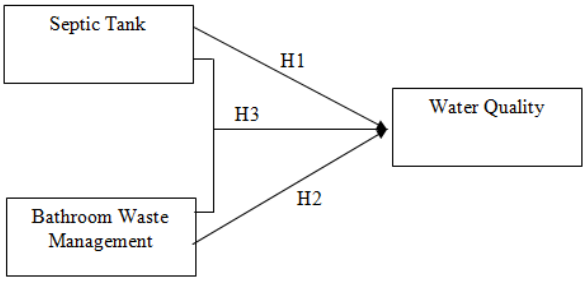

Figure 1. Conceptual Framework

F. Hypothesis

Based on the study of theory and framework of thought, then put forward some hypothesis as follows:

H1: There is influence of Bathroom Waste Management to the water quality of the population wells in Nanggalo district, Padang City
H2: There is a Septic Tank influence on the water quality of the population wells in Nanggalo district, Padang City
H3: There is influence of Bathroom Waste Management and Septic Tank to Water Qualityof the population in Nanggalo district, Padang City

III. Research Methods

This type of research belongs to the causative research that determines the extent of influence of Bathroom Waste Management and Septic Tank to Water Qualityof the

population in Nanggalo District, Padang City. Causative research aims to find the influence of an independent variable that is in this research is Waste Bathroom Management and Septic Tank to dependent variable that is Water Quality of resident in Nanggalo District, Padang City.

Sampling technique in this study using proportional random sampling. In using proportional random sampling method, the sampling of population members is done randomly and done by taking a percentage of the total population based on certain criteria. So the number of samples for each characteristic is as follows:

Table 1. Number of Samples

No	Areas	Population (p)	Proportion (p)	Sample (n)
1	Surau Gadang	46	0.20	14
2	Kurau Pagang	62	0.27	19
3	Gurun Laweh	33	0.14	10
4	Kampung Lapai	18	0.08	6
5	Kampung Olo	29	0.13	9
6	Tabiang banda gadang	20	0.09	6
Total		208	1	**64**

Source: Primary Data, 2018

IV. Results And Discussion

A. Research result

Multiple linear regression analysis is used to determine the direction of the influence of independent variables to the dependent variable. Requirements that must be met is a significant correlation between the variables involved. Correlation between variables is calculated by correlation coefficient. Results of correlation coefficient calculation can be seen in the following table:

Table 2. Matrix of Variable Correlation Coefficient

Variables	Bathroom Waste Management	Septic tank	Water Quality
Bathroom Waste Management	1	0,426**	0,482**
Septic tank	0, 426**	1	0,472**
Water Quality	0,482**	0,472**	1

* = Significant at level ∝ = 0,05

Source: Primary Data, 2018

From the table above shows there is a correlation or correlation between research variables. The next step is to use further calculations according to the steps in the multiple linear regression process. To know the relation of independent variable with dependent variable (Bathroom Waste Management and Septic Tank to Water Quality) as follows:

Table 3. Coefficient of Determination

Model	R	*R Square*	*Adjusted R Square*	*Std. Error of the Estimate*
1	.288[a]	083.	.053	7.173

a. Predictors: (Constant), X3, X1, X2

Source: Primary Data, 2018

The Coefficient of Determination measures the extent of the model's ability to explain the variation of the dependent variable. A small R Square value means the ability of independent variables to explain dependent variables is very limited. Adjusted Value R^2 = 0.083 or 8.3%. This means that the variable of Bathroom Waste Management and Septic Tank has contribution equal to 91,7% to Water Quality while the rest is explained by other variable outside variable used in this research.

Multiple linear regression analysis used to see the effect of independent variables in this research is Bathroom Waste Management and Septic Tank to Water Quality in Nanggalo district of Padang City. From the results of research and data processing can be seen results in the following table:

Table 4. Results of Multiple Linear Regression Analysis Bathroom Waste Management and Septic Tank on Water Quality

Variable		Regression Coefficient	t-value	Sig.
1	(Constant)	47.206	3.198	.002
	X1	.030	.146	.884
	X2	.281	2.035	.046
R Square = 0.083 F Value = 3.897 , Sig. 0.048[a]				

Source: Primary Data, 2018

From the results of multiple linear regression calculations as shown in the table above shows the value of R square of 0.083 which means that the contribution of independent variables to the dependent variable of 8.3% while the rest of 91.7% is determined by other variables that are not contained in the model.

From the results in the table above we get the following multiple regression equation:

$$Y = 47{,}206 + 0{,}030X1 + 0{,}281X2$$

B. F Test

F test or model reliability test is the first step in identifying the estimated regression model is feasible or not. It is worth (reliable) that the model is feasible to be used to explain the effect of independent variables which in this research is Bathroom Waste Management and Septic Tank to dependent variable that is Water Quality. If the value of sig. <0.05, then the independent variables simultaneously affect the dependent variable.

Based on the results shows that the value of sig. 0.048 <0.05. this indicates that the multiple regression equations obtained are reliable or the model can be used to do t test.

C. Hypothesis testing

Hypothesis test in this research use t-test. The t-test in multiple regression is intended to test whether the parameters (regression coefficients) used to estimate multiple regression equations are either appropriate parameters or able to explain the behavior of the independent variables in influencing the dependent variable. If the value is sig. less than 0.05 then the variable has a significant effect, otherwise if the value of sig. greater than 0.05 then the variable has no significant effect.

Hypothesis 1: Bathroom Waste Management has no significant effect on Water Quality in Nanggalo District, Padang City. This can be seen from the significance value of 0.884> 0.05. Means that there is no influence between Bathroom Wastewater Management to Water Quality of Nanggalo district of Padang City.

Hypothesis 2: Septic Tank have a significant effect on Water Quality of Nanggalo district of Padang City. This can be seen from the significance value of 0.046 <0.05. It means that there is significant influence between Septic Tank to Water Quality of Nanggalo district of Padang City.

Hypothesis 3: Bathroom Waste Management and Septic Tank simultaneously have a significant effect on water quality of Nanggalo District, Padang City. This can be seen from the significance value of 0.048 <0.05. It means that there is influence of Bathroom Waste Management and Septic Tank simultaneously to water quality.

Thus it can be stated that Bathroom Waste Management and Septic Tank is very influential in influencing Water quality in Nanggalo district of Padang City.

D. Discussion of Research Results

1. Effect of Bathroom Waste Management on Water Quality.

From the results of the first hypothesis testing it is known that there is no significant effect of Bathroom Waste Management on Water Quality in Nanggalo district, Padang City. Bathroom Wastewater Management Variables have no significant effect on Water Quality, meaning that the findings indicate that Waste Bathroom Management does not contribute to Water Quality.

Thus it can be said that in the presence of a storage basin, there is a bathroom drainage in the house, the water used bathrooms are not stagnant, bathroom waste stagnant does not smell, bathroom waste does not flow to the source of clean water, wastewater the bath does not flow directly into the body of water, the bathroom waste is processed before it is discharged into the water body, the waste of the former stagnant rooms is still growing ganging and algae, and the dependent bathroom waste no brown sediment does not give a significant effect on water quality .

The findings of this study are supported by the results of the analysis of the description of the Bathroom Waste Management variable which shows that there are some problems in the Management of bathroom waste in Nanggalo District, Padang City. This is not a factor affecting Water Quality in Naggalo Sub-district.

From the research activity conducted obtained the results on the sample 20 the number of coli bacteria as much as 75 colonies while the allowable threshold of 50, it is obtained based on the results of field activities in the know respondents have a sink Bathroom Waste Management Room but have not had filtering inside, will but the four-square building is made in order to absorb the ground so it is not stagnant so that from the results of microbiological examination found there are 75 colonies of bacteria originating not from human feces, so that this water can not be used as the fulfillment of the need for water resources by homeowners, for can be reused first need disposal of waste well managed bathroom means having a simple processing first, and the results of water need to be tested again first

before in use almost the same as respondents on sample 46 From research activities undertaken the results obtained on the sample 46 Coli form bacteria amount as much as 88 colonies while the allowable threshold of 50, it is obtained based on the results of field activities in the know respondents have a sink Bathroom Waste Management but have not had filtering inside, but the building is made to can absorb the ground so it is not stagnant so that from the results of microbiological examination found there are 88 colonies of bacteria originating not from human feces, so this water can not be used as the fulfillment of the need for water resources, to be re-use first need disposal from waste well-managed bathrooms mean having simple processing first, and the water results need to be tested again before re-use.

The results of this study are not in line with the results of research Pipin (2015) which shows that waste can affect water quality. According to Endar (2014) water quality is caused by pollution from household waste disposal and industrial waste that ignores the proper waste disposal and treatment rules. Based on the results of the study of Ekha (2015) the activities of surrounding communities who do not pay attention to the cleanliness of the river environment such as piling up garbage on the banks of the river and disposing of waste water can affect water quality. According to Edy (2009) the amount of domestic waste discharged directly without treatment can affect water quality. Based on research results Ristie (2017) household waste and industrial waste can affect water quality. According to Alfrida (2016) Concentration of several parameters in the waste water in the direct discharge of drainage drainage requires processing so as not to overload the river as the receiving body. Based on the results of research Alex (2011) showed that the presence of settlements can affect the high waste that can then affect water pollution.

2. Effect of Septic Tank on Water Quality

Based on the results of the second hypothesis testing it is known that Septic Tank has a positive and significant effect on Water Quality in Nanggalo District, Padang City. Septic Tank significant effect on Water Quality, meaning that the findings indicate that Septic Tank contribute or meaning to Water Quality.

These findings prove that water quality in Nanggalo District, Padang City is determined by Septic Tank. The better Septic Tank then contribute to water quality. Septic Tank seen from Septic Tank never suction in the last 5 years, Septic Tank no smell, Septic Tank not leak, Septic Tank no seepage, Not include inorganic materials such as detergent, shampoo, toothpaste, and soap in Septic Tank, Not include organic waste material organic material The Septic Tank is used by a maximum of 5 family members, the Septic tank is functioning, the Septic tank is sealed, and the Water at the closet does not exceed the average limit of the closet basin to contribute or meaning to the water quality.

Based on result of descriptive analysis of Septic Tank variable showed that there are problems in septic tank variable. This is not a factor that affects Water Quality, if the better Septic Tank in District Nanggalo Padang City will affect the Water Quality.

Based on the findings of the field shows there are problems on water quality that is on the respondent number 24, from all criteria items observation Septic Tank not have penghawaan, automatic floor tub will experience leakage even though it has been separated due to the pressure of large gas stool, no air drain to get out so the stench was out, because the leak is not only floors can also go up because the shelves have been streamed into 2 tubs. This affects water quality.

The findings of this study are not in line with the results of research Margaret (2010) which shows that the septic tank seen from the distance septic tank beprengaruhi on water quality seen from the content of e-coli in the well. Then according to Betantri (2011) the quality of water is determined by waste pollution from the former bathroom sir and septic tank seepage. According Sudaryanto (2008) human activities that produce household waste, especially from Septic Tank can seep into the ground water with poor sanitation that affects water quality. Furthermore, the results of research Patricia (2016) showed that septic tank can affect the quality of water seen from the total content of coliform.

3. Effect of Bathroom Waste Management and Septic Tank on Water Quality.

Based on the results of the third hypothesis testing it is known that the variables of Bathroom Waste Management and septic tank together significantly influence the Water Quality in Nanggalo District, Padang City. This means that the high quality of water in Nanggalo District, Padang City is influenced by the variable Waste Management Bathroom and septic tank together.

The findings of this study prove that Water Quality is simultaneously influenced by Bathroom Waste Management and citizen septic tank in Nanggalo District, Padang City. This proves that if the better or lower the Bathroom Waste

Management and supported by the better septic tank it will affect the quality of water in Nanggalo District, Padang City.

The results of this study indicate that Waste Management Bathroom and Septic Tank together affect the quality of water. The results of this study are in line with Betantri (2011) research results that indicate that Water Qualityis affected by domestic wastes such as waste water used for washing, bathing and water disposal from septic tanks. Furthermore, according to Margareth (2010) the quality of water is influenced by many things namely the physical construction of wells, well the well wall, well lips, well floor, and waste water disposal facilities, and the distance septic tank with dug wells. Betantri research (2011) shows that water quality can be influenced by domestic waste and Septic Tank.

V. Conclusions And Recommendations

Based on the results of the research described in the previous chapter, it can be drawn some conclusions as follows:

1. Bathroom Waste Management has no significant effect on Water Quality in Nanggalo District, Padang City. This means that the management of bathroom waste does not contribute to Water Quality in Nanggalo Sub-district, Padang City.
2. Septic Tank significant effect on Water Quality in Nanggalo District, Padang City. This means that the better the Septic Tank then the better the quality of water in the District Nanggalo Padang.
3. Bathroom Waste Management and Septic Tank simultaneously have a significant effect on Water Quality in Nanggalo District, Padang City. This shows that if the waste management is done well supported with good Septic Tank, it will have good effect on water quality in Nanggalo District, Padang City.
4. From the result of examination of water quality sample of Well Population in Nanggalo District, Padang City, got the result of 2 samples of excellent water quality, 51 samples, 8 medium quality samples, and 3 samples of water quality is enough.

In an effort to improve water quality in Nanggalo district of Padang City to make various efforts as follows:

1. It is suggested that in order to improve the Water Quality it is necessary to adopt policies related to Bathroom Waste Management as follows:
   a. The existence of a storage basin for bathroom waste so there is no stagnant water that allows environmental pollution.
   b. There is a bathroom drain in the house so there is no bad smell in the neighborhood.
   c. Bathroom waste management should function properly so as not to allow the risk of pollution to the environment.
2. Suggested in order to improve the quality of water needs to be noticed things as follows:
   a. Septic Tank should be sucked once every 5 years.
   b. Seeking Septic Tank that is waterproof so it does not leak, and seeps.
   c. Do not include inorganic materials such as detergent, shampoo, toothpaste, and soap into septic tanks.
   d. Do not include organic matter of leftover food of organic waste material into Septic Tank.
   e. Attempting a Septic Tank is used by a maximum of 5 family members.
   f. Seeking every Septic Tank has a tub of decomposition and a tub of absorption.
3. Microbiology from the results of the quality check of the well water of the population in the Nanggalo district, well water Residents can be used as an alternative source of clean water community other than PDAM and other piping for the daily needs of the community.
4. Further research is needed for water chemistry checks so as to better fulfill all the water quality requirements that are suitable for the community in Nanggalo district in fulfilling the community water resources needs because there are other factors that have more influence on Water Qualityin Nanggalo district.

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