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Research Paper

The Role of Housewives's on Sanitation of Management in Slum Area, Palembang

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Abstract

Various environmental health diseases can arise as a result of slum settlements which indicate that environmental sanitation management inadequate and unhealthy, where housewives play an essential role in improving the health status of their families. This study aims to analyze the role of housewives in sanitation management in the slum areas of Palembang, which include the provision of clean water/drinking water, disposal of human waste (feces/latrines), garbage disposal, and wastewater disposal. Sampling method used Non-Probability Sampling with purposive sampling technique. The univariate data analysis technique was then carried out to determine the category level of the role of housewives, including active, participatory, and passive roles. The respondents consisted of 67 housewives from 37th neighbourhood (RT), RT 44, and RT 61 of the Lima Ulu Urban. The analysis of the role of housewives in environmental sanitation management shows a participatory role with a role achievement level of 57%. This role is considered not maximal enough in the management of basic sanitation in their area.

Keywords

Slum Area, Enviromental Sanitation, Role of Housewives, Gerbage Disposal, Wastewater Disposal

1. INTRODUCTION

Decree of the Ministry of Public Works and Public Housing of Republic of Indonesia Number 110 of 2016 concerning the Location of the City Without Slum Program establishes Palembang City as the fourth slum city/district in Indonesia. Decree of the Mayor of Palembang Number 488 of 2014 concerning the location of slum areas for the city of Palembang, stipulates 59 locations of urban villages included in the slum areas of Palembang. The location is divided into three categories, namely light slum, moderate slum, and heavy slum. Based on data from Statistics of Palembang Municipality (BPS) in 2019, The District of Seberang Ulu Satu has the highest population density in Palembang of 10.854 people/km^2. It is very high-risk area for solid waste and drainage. Meanwhile, the Urban of Lima Ulu is the third-highest residential location for the heavy slum category with a slum area of 36.99 hectares with the largest area in the District of Seberang Ulu Satu. The Urban of Lima Ulu has the highest population of 27,297 people and the highest population density in the District of Seberang Ulu Satu of 8.108 people/km^2.

Based on the criteria for slum settlements, 57.67% of the Urban of Lima Ulu has an irregular building density with a high building density area and the distance between meeting buildings. Access to clean, high-quality, potable water comes from the Regional Company of Water Supply of Tirta Musi Palembang (PDAM). Still, its availability is insufficient for the Urban Lima Ulu people. 65.26% of wastewater treatment in the Urban of Lima Ulu is not following standard technical requirements, 63.63% of waste management in the Urban of Lima Ulu is not transported to temporary dumpsite (TPS) and the landfill (TPA) 2 times a week, and 100% of these residential areas do not have fire protection facilities and infrastructure. TPS is a place to collect the trash from sources (household) located close to residential or commercial areas (Aryenti and Kustiasih, 2013). Waste in temporary dumpsite is moved to landfills which are for final disposal trash, reference of trash, garbage collection, garbage transportation, sorting trash, recycling trash, processing trash, and disposal trash (Idowu et al., 2019). Besides, a problem that often arises and is crucial in slum areas is health. The emergence of various diseases such as dengue hemorrhagic fever, malaria, diarrhea, stunting, and various other infectious diseases. A study conducted

by Kasim and Rivai (2020) shows that may the diseases may arise from slum areas include diarrhoea, cholera and typhus. Furthermore, Budi et al. (2018) found a risk factor for pulmonary tuberculosis incidence in the slum areas in the District of Seberang Ulu Satu, Palembang City. Palembang City BPS data in 2019 also showed that there were 2,927 cases of diarrhoea, 53 cases of dengue fever, and 587 cases of pulmonary tuberculosis in the District of Seberang Ulu Satu.

The most straightforward environmental sanitation management comes from the house itself. In one family, the role of women, in this case, housewives, has a crucial role in environmental sanitation management. The research results by Sopamena (2019) show that domestic workers or domestic roles, including work in household maintenance and environmental sanitation management, are the domestic roles of a housewife. Another study by Ganing and Hairuddin (2016) shows that 100% of the Tande Timur Village population uses a latrine to defecate, while 80.90% of the population in Adolang Dhua Village also uses a latrine and 19.10% conducts defecation in gardens and rivers. This shows that housewives behave less healthy because there are still housewives who practice open defecation. Besides, there are facilities and infrastructure for wastewater management that do not comply with technical standards. The aspects of clean/drinking water supply and waste management have not been found in the research. Therefore, it is necessary to research the role of housewives in environmental sanitation management as input in the formulation of strategies for improving hygiene and healthy living behaviour in Palembang, especially in slum settlements, to achieve zero slum areas in Palembang. This study aims to analyse the role of housewives in sanitation management in the slum areas of Palembang by looking at the role of housewives in managing fundamental sanitation aspects.

2. EXPERIMENTAL SECTION

2.1 Study Location
This research was conducted from October 2020 to November 2020 in three Lima Ulu Urban locations consisting of RT 37, RT 44, and RT 61. RT 37 has characteristics close to a causeway, while RT 61 has characteristics in the middle of a settlement (Figure 1.). The two sampling locations are in lowland typology. Then the last one, RT 44, has a typology on the water's edge and is located near the Ogan River.

2.2 Data Collection and Techniques
Primary data collection in the form of a questionnaire using a Likert scale. Sampling using non-probability sampling with purposive sampling technique, where this decision is based on the researcher's conclusion (Sugiyono, 2015).

2.3 Population
Respondents in this study were housewives at RT 37, RT 44, and RT 61 in the Lima Ulu Urban Village. The population
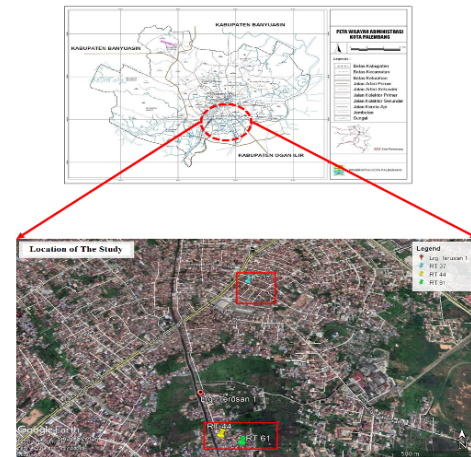

Figure 1. Location of the study

of housewives in RT 37 was 66 people, and RT 61 was 70 people aged 18 to $\geq$ 65. Hence, the total population of this study was 201 people. Determination of the sample in this study using the Slovin formula as follows (Eq. 1):

$$n = \frac{N}{1 + Ne^2} \tag{1}$$

2.4 Sample
Where n and N are the number of samples and the population, while e^2 is the percentage of inaccuracy tolerance due to tolerable sampling error, namely 10% ($e^2 = 0.01$), after calculating the sample using the Slovin formula, the sample size is 67 housewives. The RT location sample size includes RT 37 as many as 22 respondents, RT 44 as many as 21 respondents, and RT 61 as many as 24 respondents.

2.5 Research Variable
The variables in this study are the role of housewives, including an active role, a participatory role, and a passive role in environmental sanitation management, in this case, basic sanitation, namely the provision of clean water/drinking water, waste disposal, disposal of human waste (feces), and removal of wastewater.

2.6 Research Instruments and Data Analysis
Hypothesis analysis used research instruments based on the role of housewives, which consisted of 23 question items. For each question item, the score is 1-4 positive question categories. After obtaining the results of the univariate analysis, the level of the role of housewives was grouped into three criteria, namely, active role (76-100%), participatory role (56-75%), and passive role ($\leq$ 55%).

3. RESULTS AND DISCUSSION

3.1 Distribution of Respondents by Education
The questionnaire analysis result was found that most housewives in the study locations had primary and high school

education levels, with 33% each. Next are a secondary high school with an equivalent of 27%. Respondents with the last education of Non-completing Primary School were at 4%, and the least were respondents with the lastest Academy/University equivalent of 3%. The number of respondents based on education level is presented in Table 1.

3.2 Percentage Distribution of Housewives' Role in Environmental Sanitation Management

3.2.1 Percentage Distribution of Housewives' Role in Provision of Clean Water/Drinking Water

Almost all respondent families (95%) use clean water sourced from PDAM for bathing, washing, and toileting (MCK) (Figure 2.). On the other hand, there are still 5% of housewives who use well water or river water, such as in RT 44, located close to the Kedukan River. Jauhari (2018) states that the water pollution index (WPI) in the Kedukan River is in the low polluted category with a WPI of 4.69. The physical parameters of water exceeding the river water quality standard threshold with a TDS of 20.6-198.4 mg/L and TSS 5-47 mg/L mean that the Class I Quality Standard's quality has exceeded. This means that the Kedukan River's water is polluted and unfit for consumption because it can endanger public health. Nevertheless, all housewives in the three study locations confirmed the availability of clean water for toilets and water consumption at home.

All housewives use clean water and boil water for daily household needs. Most housewives (63%) sometimes drain the water reservoir regularly (2-3 times a week) at least once a week, even more than a week (Figure 2). This can cause the proliferation of diseases and microorganisms, especially mosquito eggs, to run fast. Majida and Pawenang (2019) add that it is good to drain the water reservoir once a week to minimize Aedes aegepty mosquito eggs' breeding. However, only 12% of housewives constantly drain the water reservoir regularly (2-3 times a week). The case of dengue hemorrhagic fever itself, which occurred in the District of Seberang Ulu Satu in 2019, was ranked third in Palembang with a prevalence of 53 people. Research in the last six months in the three locations shows no family member has dengue hemorrhagic fever. Most housewives (61%) always store treated water safely and closed, while the other 39% often keep treated water in a safe and secure place (Figure 2).

3.2.2 Percentage Distribution of Housewives' Role in Disposal of Human Feces (Latrine/Feces)

One of the causes of contamination of clean water sources consumed daily is the distance between the water sources and latrines that do not meet the requirements. Based on the questionnaire results, 67% of housewives in the three study locations never used a latrine with a water source distance of ≥ 10 meters. Only 20% of other housewives used a latrine with a water source distance of ≥ 10 meters
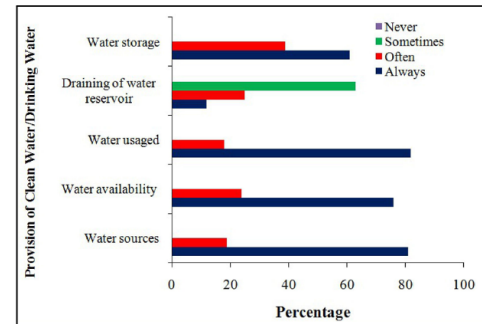

Figure 2. Percentage of the Role of Housewives in Provision of Clean Water/Drinking Water

(Figure 3.). On average, households in RT 44 and RT 61 have a latrine distance of 3-5 meters from a water source, while in RT 37, several houses have a latrine distance of almost 10 meters. The distance between the latrine and the water source of fewer than 10 meters allows pollution, and the latrine does not meet health requirements. According to Sapulete (2013), 83% of the distance between dug wells and human waste toilets or 25 wells has a length of fewer than 11 meters and is categorized as not meeting health requirements. Its location is not under places such as latrines, dug holes for dirty water, and ponds. Ownership of latrines in RT 44 and RT 61 is 87%, and 13% of other households do not have private latrines, where these households use shared latrines with other households who are still related.

Most housewives (72%) taught their family members to use the MCK in their place, while 28% of other housewives sometimes taught their family members to do the MCK in their home (Figure 3.). 83% of housewives provide utensils and clean toilets such as soap, brushes, and others, while 17% of other housewives sometimes provide equipment and tools to clean the latrine (Figure 3.). The toilet cleaning equipment is essential to maintain the latrine's cleanliness and health (Putranti and Sulistyorini, 2013).

Housewives often ensure that the latrine in their house is not smelly and dark and ensure that the final waste of feces in the latrine is excellent and smooth as much as 79%, while 21% of other housewives sometimes do this (Figure 3.). Based on observations at the research location, one household uses a slung toilet and does not have a septic tank. Several other households in RT 44 and RT 61 have toilet types of aid containers from the Japanese Government, usually emptied every six months of use. Nearly half of the respondents, or 47%, perform latrine desludging or use a septic tank desludging service regularly once a year (Figure 3.). The housewives show this role in RT 37, located in a typology of lowland slum settlements adjacent to the causeway. Meanwhile, 45% of other housewives sometimes empty the septic tank (Figure 3.). However, based on observations in the field, housewives who sometimes and never do desludging septic tanks are in RT 44, and RT 61 with a ty-

Table 1. Distribution of Respondents by Education

Educational Level	Frequency	Percentage (%)
Non-completing Primary School	3	4
Primary School	22	33
Secondary School	18	27
High School	22	33
Academy/University	2	3
Total	67	100
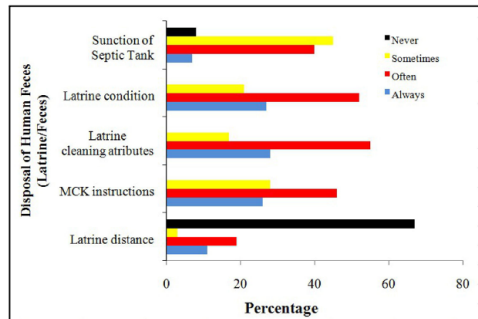
Figure 3. Percentage of the Role of Housewives in Disposing Human Feces (Latrine/Feces)
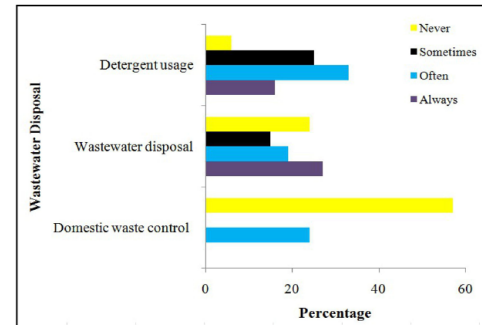
Figure 4. Percentage of the Role of Housewives in Disposing Wastewater

pology of slum settlements on the water's edge and lowlands with densely populated settlement conditions environmental roads are more or less 1 meter. Most have a septic tank that blends in with the marshland.

3.2.3 Percentage Distribution of Housewives' Role in Wastewater Disposal

Most of the water pollution in rivers comes from household waste discharged directly into the river flow. This pollution can undoubtedly reduce the quality of river water. Based on the results of the study, some or 57% of the housewives of RT 44 near Kedukan River and RT 61 who are in the middle of settlements with typologies on the water's edge, never control the disposal of domestic wastewater by storing it in a particular place so that it is not disposed of directly to the ground (Figure 4.). This is due to the condition of the settlements that do not have environmental drainage channels. In contrast to RT 37, 43% of housewives admitted to controlling domestic wastewater disposal (Figure 4.). Although wastewater is not collected in advance and is immediately discharged into residential drainage, wastewater is not contained in advance.

Most of 43% of housewives in RT 37 avoid throwing their wastewater in ditches or rivers (Figure 4.). This is because RT 37 still has drainage channels to dispose of domestic sewage and people's houses in the lowlands. Despite the reality on the ground, all housewives in RT 37 still dispose of their wastewater in the ditch. Meanwhile, 33% and 24% of housewives in RT 44 and RT 61 occasionally do not avoid

throwing their wastewater in ditches or rivers (Figure 4.). Observations in the field are different from the respondents' answers to the questionnaire. This is evidenced by the absence of wastewater management and not supported by environmental drainage in the three research locations. A study conducted by Juliantina (2011) states that almost all or 91% of Lima Ulu Urban Village households dispose of household wastewater into rivers. There is no drainage in the Urban of Lima Ulu. Most of 60% of housewives in RT 44 and RT 61 never reduce the use of detergent so as not to increase the volume of wastewater, while 25% of housewives in RT 37 sometimes and there are 15% other housewives in RT 37 who often reduce the use of detergents so as not to increase the volume of wastewater (Figure 4.).

3.2.4 Percentage Distribution of Housewives' Role in Waste Disposal

Some or 55% of housewives teach their family members to dispose of garbage in their place, and only 6% of housewives do not do this role (Figure 5.). Meanwhile, 54% of housewives have never taught waste sorting to their family members, and only 3% of housewives do this role (Figure 5.). Most of 70% of housewives provide trash cans at home, and only 9% of housewives do not do this role. 9% of these housewives are located in RT 44 and RT 61, the Urban of Lima Ulu (Figure 5.). The housewives in RT 44 dispose of garbage directly into the Kedukan River. In RT 61, debris disposal under non-permanent residents' houses with poor settlement conditions is in a swampland. This shows

that housewives still have low awareness of household waste disposal. This statement is supported by Juliantina (2011) who states that 80% of households in the Urban of Lima Ulu still dispose of their household waste into the river.

The practice of sorting organic and inorganic waste before disposal was never carried out by 73% of housewives in the three research locations (Figure 5). Only 2% of other housewives often did this role (Figure 5). The study by Rosnawati et al. (2018) reveals that almost all or 90% of housewives in the District of Kota Ternate do not practice household waste sorting. This shows that most housewives in the three research locations still did not understand waste selection practices and lack education on waste sorting. However, this is not an obstacle in knowing the method of sorting waste, given the ease of access to information and technology that is increasingly advanced and on average housewives in the three locations already have such access so that the obstacle of this role is due to the absence of habits and practices of sorting waste that is practiced in everyday life. Some or 63% of housewives in RT 44 and RT 61 never ensure the trash cans' condition to avoid flies, mosquitoes, rats, and other insects, while 30% of housewives in RT 37 still do this role (Figure 5).

Families and housewives in the three locations have never avoided purchasing products that produce inorganic waste. In reducing instant food consumption using plastic and cans, almost all or 85% of housewives have never done it (Figure 5). Only 15% of housewives in RT 37 sometimes do that role (Figure 5). Most of 73% of housewives in the three study locations never brought their shopping bags to reduce plastic use (Figure 5). Only 24% of housewives in RT 37 sometimes did this role (Figure 5). 88% of housewives in the three locations have never seen a reduction in disposable cutlery (mineral water bottles, food in plastic packaging, and cans), while 10% of housewives in RT 37 sometimes do this role (Figure 5.). Almost all housewives in the three research locations, or 94%, have never recycled organic and inorganic waste (leaf waste and food scraps into compost, plastic bottles, and cups into handicrafts), only 6% of housewives in RT 37 do that role (Figure 5.). A study conducted by Kinasih and Aries (2019) shows that only 7% of the District of Seberang Ulu Dua people know about managing household waste with the 3R principle (Reduce, Reuse, Recycle), and almost all or 93% of the other people do not know this. This shows that the people in the District of Seberang Ulu Dua have not played a role in recycling waste because 91% of the community stated that there was still a lack of education from the local government regarding waste banks. The District of Seberang Ulu Dua is the highest rank of heavy slum settlements in Palembang, which is considered a typology of slum areas and a population density similar to that of Seberang Ulu Satu District.
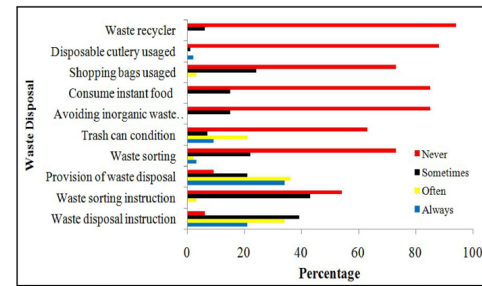

Figure 5. Percentage of the Role of Housewives in Waste Disposal

3.3 Role Level of Housewives

Determining the level of achievement of the role of housewives in environmental sanitation management by categorizing the roles into three categories, namely active role, participatory role, and passive role, is presented in the following table (Table 2).

Housewives played an active role in providing clean water/drinking water with a role level of 87% for the five role statements (Table 2.). This shows that housewives in the three locations have actively participated in providing of clean water/drinking water, including the use of pure water sources from PDAM, MCK, boiling water for daily consumption, and storing treated water in a safe and secure place. The four activities were carried out by almost >90% of housewives in the three study areas, which align with the research results by Dan et al. (2018) which revealed that 89% of housewives use closed containers to store drinking water at home. Also, there are 62% of housewives regularly drain water reservoirs (Figure 2). Although there is one activity rarely carried out by housewives, the level of the role can be categorized as active because it is supported by the other four roles that are often performed. It can be concluded that the whole item statement of the role of housewives in providing clean water/drinking water is active.

All households in the study location played a participatory role in disposing of human waste (feces/latrines) with a role percentage rate of 68% for the five role statements (Table 2). Based on this statement, housewives in the three study sites had sufficient participation in disposing of human waste (feces/latrines), including teaching toilets in place, providing toilet cleaning equipment, and ensuring latrines and suctioning the septic tanks. The four activities were carried out by more than half of the housewives in the three sampling locations. In RT 44 and RT 61, several houses have received toilets provided by the Japanese Government, where these toilets are in the form of emptied containers every six months. This allows the role of human waste disposal (feces/latrines) to have a participatory role. A study conducted by Santosa et al. (2020) shows that 82% of housewives have never emptied their septic tanks in either one year or more than one year. Only a few housewives in

Table 2. The Category Level of the Role of Housewives in Environmental Sanitation Management

No.	Variable	Statement	Respondent	%	Role Category
1	Provision of Clean Water/Drinking Water	5	67	87	Active
2	Disposal of Human Feces (Latrine/Feces)	5	67	68	Participative
3	Waste Disposal	10	67	38	Passive
4	Wastewater Disposal	3	67	54	Passive
Total	Basic Sanitation Management	23	67	57	Participative

the three study areas have a distance from their house to a water source/reservoir of more than 10 meters (Figure 3.), so that the role category is in a passive role. This result is supported by Soboksa and Yimam (2017), showing that 74% of housewives do not have latrines more than 6 meters from their house due to the lack of information provided by health educators to households. Although there is one activity that is very rarely owned or carried out by housewives, the level of the role of housewives in disposing of human waste (feces/latrines) is categorized as participatory because it is supported by four other roles that are sufficiently performed.

Housewives play a passive role in waste disposal with a role rate of 38% for the ten role statements (Table 2). This means that housewives in the three research locations behave passively in teaching waste disposal, teaching waste sorting, waste sorting practices, trash conditions, avoiding inorganic waste products, consuming instant food, using shopping bags, and using disposable tools and recycling practices garbage repeat. Only a few of these nine activities were carried out by housewives in the three research locations. Such as waste sorting activities that are only a few housewives. A study conducted by Soboksa and Yimam (2017) shows that only 40% of housewives practice waste sorting. Furthermore, Wang and Mangmeechai (2021) stated that only 16% of women separated organic and inorganic waste before disposal. Housewives in the three study areas also only slightly recycled waste practices, in line with a study conducted by Sarah et al. (2018) showing that only 10% of housewives recycled waste frequently. Although the nine role statements indicate the passive role of housewives, one statement shows an active role, namely in terms of providing trash cans where most or 85% of housewives in the three study areas provide trash cans at home (Figure 5). This role can be concluded as passive because it is supported by the other nine roles that few housewives do in the three study areas.

The role of housewives in wastewater disposal shows a passive role with a role level of 54% for the three statements (Table 2). This indicated that housewives in the three research locations behave passively in wastewater disposal, including controlling the domestic waste, disposing of wastewater, and using detergents. The three activities were carried out a little by housewives in the three research

locations. This is in line with a study conducted by Mafazah (2013) which shows that 67% of housewives do not have a wastewater disposal facility. Although the information on wastewater management is currently easily accessible and accepted at all levels of society, housewives in the three research locations are often ignored in terms of application in their daily lives. Supported research conducted by Shahzadi et al. (2018) shows that 71% of housewives know that improper waste disposal can affect human life, cause pollution, and the emergence of germs. However, 71% of housewives do not play an essential role in managing their household waste.

Based on the category of the roles of each essential sanitation variable which includes the provision of clean water/drinking water, disposal of human waste (latrines), waste management, and wastewater disposal, it is found that the role of housewives in environmental sanitation management in RT 37, RT 44, and RT 61 the Urban of Lima Ulu has a participatory role with a role percentage of 57%. According to Soekanto (2014), participatory roles are roles given to group members with other members where these members have provided valuable contributions to the group. However, the percentage of this role is considered not optimal in essential sanitation management because housewives' role in wastewater disposal and waste management shows a passive role in the three research locations. According to Kozier et al. (2004), factors that can affect individuals' role include age, education, occupation, and income. Prosper et al. (2019) added that individuals with higher education (college) have strong analytical skills and can solve problems critically. Meanwhile, the reality in the field is that education does not affect the role of housewives because all roles of housewives in the three study locations are passive in waste management and wastewater disposal. Age, occupation, and income do not affect housewives' participatory role because the behaviour and habits and environment of the settlement are more supportive of the role of housewives in managing basic sanitation in slum settlements.

4. CONCLUSIONS

The role of housewives in environmental sanitation management in the slum areas of RT 37, RT 44, and RT 61 the Urban of Lima Ulu, District of Seberang Ulu Satu, Palembang, shows a participatory role in the provision of

clean water/drinking water, disposal of human waste (feces/latrines), garbage disposal, and wastewater disposal with a role percentage of 57%. The participation of housewives in the waste disposal and wastewater disposal, which is not yet maximised, is the main factor affecting the status of housewives' role in participatory environmental management.

5. ACKNOWLEDGEMENT

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