Identification of Sanitation and Public Health’s Condition in Densely Populated Settlement at Coastal Area (Case Study: Kangkung, Bandar Lampung)

Yuni Lisafitri¹*, Endang Setiawati¹, Mutiara Fajar¹, Muhammad Syafrizal¹

¹Environmental Engineering Program, Institut Teknologi Sumatera, South Lampung, Indonesia
²City and Regional Planning Program, Institut Teknologi Sumatera, South Lampung, Indonesia

*email: yuni.lisafitri@tl.itera.ac.id

Abstract. Environmental Sanitation is the health status of an environment which includes sewerage disposal facilities (include septic tank), waste disposal facilities, the provision of clean and drinking water, drainage. Environmental sanitation is requirements for a healthy environment. Sanitation of densely populated settlement in coastal area especially in Indonesia are mostly not in good condition. Sanitation conditions are closely related to public health. Sanitation that does not meet the requirements is the cause of environmental-based diseases like waterborne diseases, one of which is diarrhea. The purpose of this study is to identify the sanitation and public health conditions of people that living in densely populated settlements in the coastal areas of Kangkung sub-district, Bandar Lampung City. Surveys, observations, questionnaires and interviews were conducted to obtain the expected data in this study. The results of this study show that some sanitation conditions in densely populated coastal areas did not meet the requirements of good sanitation (based on SDGs) because the conditions of the houses are so tight that there are poor condition of drainage and the unavailability of waste disposal facilities. There are still The number of diarrhea and another deaseses was high. There are still have diarrhea cases in Kangkung even though they already have a good clean water supply. however, this may be related to the poor condition of garbage disposal and drainage in Kangkung.

Keywords: Sanitation, public health, coastal area

1. Introduction

The seventh goal of the Millennium Development Goals (MDGs) is to ensure environmental sustainability life, including household access to proper sanitation facilities. Indonesia has strategy to develop sanitation. Through the Decree of the Minister of Health (Kepmenkes) no. 852 / Menkes / SK / IX / 2008 which was later strengthened into Minister of Health Regulation (Permenkes) Number 3 of 2014, Community Based Total Sanitation (STBM) was confirmed as a national strategy for sanitation development in Indonesia. STBM is an approach to change hygiene and sanitation behavior through community empowerment using
the triggering method. In order to achieve these objectives, the STBM implementation strategy focuses on creating a conducive environment (enabling environment), increasing sanitation needs (demand creation) and increasing the provision of sanitation access (supply improvement). There are five community-based sanitation pillars, namely stop open defecation, managing household wastewater, drinking water and food, washing hands using soap and waste management [1, 2].

The 2015-2019 National Medium Term Development Plan (RPJMN) stipulates the achievement of universal access to 100% drinking water, 0% slum settlements and 100% free open defecation (ODF). Based on data released by the STBM secretariat, up to 2015 as many as 62 million or 53% of the rural population still do not have access to proper sanitation. 34 million of them still practice open defecation [3].

The results of a study on the Indonesia Sanitation Sector Development Program (ISSDP) 2006, showing 47% of people still have a habit of defecating great to rivers, rice fields, ponds, gardens and places open [4]. According to UNICEF, washing behavior hand soap can reduce the risk of exposure diarrhea up to 44% through water management safe reach 39%, improved sanitary conditions up to 32 percent and with clean living behavior and being healthy can reduce the risk of disease diarrhea up to 28% [5].

Health development is directed at improving the quality of human resources, the quality of human life, improving human welfare and increasing public awareness of the importance of healthy living. Housing development facilities and policies today are felt in low-income, slum, urban, rural and remote areas. Sanitation is defined as a means of collecting and disposing of feces and waste water in a hygienic manner so that it does not endanger the health of a person or society as a whole.

Law Number 23 of 2014, states that the provincial area consists of land and sea areas as far as 12 nautical miles measured from the coastline towards the high seas and / or towards archipelagic waters: while the regional authority / city as far as one third of the provincial sea boundary. Through this delegation of authority, regions can more freely plan and manage coastal area resources, including other environmental services for the benefit of regional development itself [6].

The country of Indonesia is also known have a high biodiversity, and has a very potential coastal area for various development options between land and sea which form a diverse and highly productive ecosystem and provide extraordinary economic value to humans. However, the increasing population growth and the rapid development of development activities in coastal areas as well as various designations such as settlements, fisheries, ports, tourist attractions and others, the ecological pressure on this coastal and marine resource ecosystem is increasing. So that this increased pressure will certainly threaten the existence and sustainability of the ecosystem and coastal marine resources and the small islands around it become damaged and cause various kinds of pollution such as; pollution of sea water due to disposal of waste in the sea and waste water in the sea, death of coral rock, abrasion, and various kinds of human activities that can damage the environment so that these impacts can result in disruption of existing health problems such as environmentally based health.

Basically, the coastal area is developing into an insight with a fairly rapid growth, considering that the coastal area can provide space with high activity relatively cheaply
compared to the land space above it, therefore the coast becomes the destination for population movement. Most population in big cities, such as Jakarta, Surabaya, Semarang, Medan and Makassar, which spreads to coastal areas, in relation to easy access and connections between islands and between areas of some big cities in Indonesia - Asia is in a coastal area so that if the environment is not properly maintained, it can result in the rapid spread of environmentally based diseases in coastal areas.

In terms of residence from the observation, the physical condition of the coastal area of Kangkung is densely settlement with the condition of the houses that are not good, the area is far from being said to be healthy especially on the beach. Based on the background, the problem of this research is how the description of community sanitation facilities in the coastal area of Kangkung village including Clean Water Facilities, Toilets, and Community Waste Disposal Sites for the Coastal Area of Kangkung village, Bumi Waras, Bandar Lampung.

2. Methods

Data collection techniques in this study are observation, questionnaire, and documentation. Data analysis used in this study was descriptif qualitative. The data used in this study were an assessment of the environmental sanitation conditions of the head of the household and the level of public health. The location of this study was Kangkung, Bumi Waras, Bandar Lampung (Picture 1). There are 14766 (in 2019) total population and 3291 of family in Kangkung village. Slovin’s methods was used to measuring how many samples for questionnaire sanitation facilities, margin of error 5% (72 family).
3. Result and Discussion

The results of this study are expected to be a source of information and guidance on coastal sanitation conditions in the surrounding communities, which can contribute to knowledge in the health sector as well as reference material for further research. Sanitation is defined as a means of collecting and disposing of feces and wastewater in a hygienic manner so that it...
does not endanger one's health or the community as a whole. The result of this research was showed the sanitation facilities of the coastal communities in Kangkung village from resident perspective and the results showed in table 1.

Table 1. The number and condition of sanitation facilities

| Location | Number of Facilities | Condition of Facilities |
|----------|----------------------|-------------------------|
|          | Clean Water Supply   | Toilet facilities       | Toilet facilities | Drainage | Waste Disposal |
| local water company | artesian well | Privately owned toilets have been used for more than 10 years and communal toilets for more than 3 years | Poor | 69 (waste was transported) and 3 (throw their waste on the ground) |
| Kangkung | 65                   | 7                       | 70               |         |               |

Note : there are randomly 72 houses questionnaire
Source : Questionnaire (2020)

3.1. Clean Water Supply Facilities

Based on the results of the study, it was said that the clean water supply facilities in the community of Kangkung village, most of them had meet the requirements. All the samples questionnaire (Table 1) was had clean water supply (100% of 72 samples). There are two type of clean water supply in Kangkung, such as clean water facilities granted in 2017 (local water company/PDAM, Figure 2) and artesian well. From the questionnaire, the source of drinking water comes from artesian well water and commercial drinking water. For those who have an artesis well, the source of drinking water is from the artesis well, while the source of clean water is from the regional water company will buy drinking water.

Figure 2. Clean water facilityies granted in 2017

3.2. Toilet Facilities

Based on the results of the research (Table 1), all samples (100% of 72 sample) had meet the requirements of sanitation (have an acces of toilet facilities). But, from the observation and questionnaire, It was said there are people in Kangkung likely to defecate on the coast. That has been done and has been a bit difficult to change since a long time ago. It is due to some of respondents do not have private toilet and they are use communal toilet (Figure 3). The poor
condition of the toilet due to the source of water. They must brought the clean water if they want to used it.

![Communal toilet in Kangkung](image)

**Figure 3.** Communal toilet in Kangkung

### 3.3. Drainage

Based on the results of the study, it was said that there are drainage in Kangkung but the condition was poor (Table 1, Figure 4). All waste water from the toilet flow to drainage and that water flow to the coast.

![Drainage in Kangkung](image)

**Figure 4.** Drainage in Kangkung

### 3.4. Waste Disposal

Based on the results of the research (Table 1), it is said that the waste disposal in Kangkung village did not meet the requirements, there is no waste disposal site in this village but there is one disposal site in the market. But, there are respondents that disposed their waste on the ground and coastal specially some respondents that lived near the coastal (Figure 5). This is because the community has no awareness of owning their own garbage dump.
Figure 5. Waste disposal on the ground and coastal

3.5. Public Health Condition

The number of diarrhea cases can be related to facilities of sanitation in the location. Unsupportive facilities could be the reason to the number of waterborne diseases like diarrhea. Table 2 showed Kangkung had total diarrhea cases in 2019 are 896 which 714 in all ages (4.84% of total population) and 182 cases in ≤ 5 years old (12.32% of total babies ≤ 5 years old). In 2020, there are 302 diarrhea cases, which 248 in all ages (1.65% of total population) and 54 cases in ≤ 5 years old (3.6% of total babies ≤ 5 years old). There are decreasing the number of diarrhea cases from 2019 to 2020. More study required to find the reason for this decreasing.

| Year | Total Population | Total Babies (≤ 5 years old) | Total of Cases |
|------|-----------------|-----------------------------|----------------|
| 2019 | 14766           | 1477                        | 714 182 896    |
| 2020 | 15011           | 1501                        | 248 54 302     |

Source: Public health center of Sukaraja, Bumi Waras, Bandar Lampung (2021)

There are so many environmental problems that must be faced and very disturbing to the achievement of environmental health. There is so much influence on the environment that to improve health status it is necessary to make environmental health efforts which are efforts to prevent diseases related to the environment. Environmental health can have a positive impact on the condition of living and non-living elements in the ecosystem. If the environment is not
healthy then the elements hurt, but on the other hand, if the environment is healthy then the ecosystem will be healthy too.

Poor human behavior has resulted in changes to the ecosystem and a number of sanitation problems. Sanitation includes the provision of good household water, sufficient in quality and quantity, regulating the use of family latrines, garbage disposal, disposal of waste water, building healthy houses, and eradicating disease-spreading animals such as flies, mosquitoes, fleas, and other diseases. Environmental sanitation is an effort to achieve a healthy environment through controlling physical environmental factors, especially those that have a detrimental impact on the physical development of health and human survival. Health problems are a very complex problem, which interrelated with other problems outside of health itself. Likewise, the solution to public health problems, not only in terms of one's own health, must be seen from all aspects that have an impact on these health problems.

In this case sanitation is an important factor in public health. One of the areas that has a high level of difficulty in managing its territory is the coastal area. Coastal areas are areas that are located between land and sea areas where the environment is influenced by conditions on land and in the ocean. Coastal areas have their own complex issues, problems, opportunities and challenges that are different from other regions. In fact, the existing sanitation in the coastal area of Kangkung, Bumi Waras is still insufficient to meet the needs of the community there. There are still many health problems, especially in the spread of diseases around the community.

4. Conclusions

The conclusions of this study was most of sanitation facilities in the Kangkung village was meet requirements, like people has acces to toilet, clean water supply, drainage and waste disposal. All respondents in this study had acces to clean water supply, toilet and drainage. But, some of respondents still defecate on the coast and disposed their waste on the ground and coastal. Kangkung had total diarrhea cases in 2019 are 896 and in 2020, there are 302 diarrhea cases. There are still have diarrhea cases in Kangkung even though they already have a good clean water supply. however, this may be related to the poor condition of garbage disposal and drainage in Kangkung.

5. Conflict of interest

The authors declare that they have no conflict of interest.

6. Acknowledgements

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