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Submission date: 15-Jun-2023 02:48PM (UTC+0700)
Submission ID: 2116494429
File name: rtikel_Identification_of_Environmental-Based_Health_Problems.pdf (1.89M)
Word count: 4206
Character count: 22220

TECHNIUM
SOCIAL SCIENCES JOURNAL

Vol. 27, 2022

A new decade for social changes

ISSN 2668-7798

www.techniumscience.com

TECHNIUM SOCIAL SCIENCES JOURNAL

Technium Social Sciences Journal
Vol. 27, 815-823, January, 2022
ISSN: 2668-7798
www.techniumscience.com

Identification of Environmental-Based Health Problems in the Coastal Area of Banyuasih Village, Pandeglang Regency, Indonesia

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Abstract. Sanitation is still a problem for most Indonesians who have below average welfare status, especially in coastal areas where the fishing profession is dominant. The purpose of this study is to identify environmental-based health problems in the coastal area of Banyuasih Village, Pandeglang Regency, Indonesia. The method used is cross-sectional, with the unit of analysis being the household. A sample of 157 respondents was the head of the family which was taken by simple random sampling. The results of the study indicate that environmental health factors have not met good sanitation standards. These factors are garbage disposal sites, clean water sources, family latrines, and houses to live in. The conclusion of this study is that the majority of people in this coastal area still have poor sanitation knowledge and behavior.

Keywords. Environmental engineering, environmental health, basic sanitation, coastal areas

1. Introduction

Indonesia is an archipelagic country, so the coastal area is the most dominant area. As an archipelagic country, many areas in Indonesia are in great demand as tourist destinations. Ironically, the majority of people in this coastal area still have very little knowledge about basic sanitation and hygiene which are important elements to support tourism activities. So the welfare and health of residents of coastal areas must be the main concern of the Government

Technium Social Sciences Journal
Vol. 27, 815-823, January, 2022
ISSN: 2668-7798
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and expressed in the SDGs (sustainable development goals) program which is a development agenda in many countries around the world, aimed at human welfare and the preservation of the planet earth. SDGs are development agreements in all countries around the world that encourage change to shift towards sustainable development, based on human rights and equality to encourage social, economic and environmental development.[1]

The World Bank stated in a report on the water sanitation program (WSP) that Indonesia ranks second in the world as the country with the worst sanitation. Data from the United Nations (UN) shows that as many as 63 million people in Indonesia do not have latrines and there are still many people who defecate in gardens, rivers, or even in the sea for coastal communities.

The Ministry of Health of the Republic of Indonesia has even issued a Community-Based Total Sanitation (STBM) policy through KepMenKes Number 852/MENKES/SK/IX/2008 concerning the national STBM strategy which has the main target of reducing morbidity or morbidity for environmental-based diseases, including in coastal areas. Environmental health efforts are aimed at realizing a healthy environmental quality, both physical, chemical, biological, and social so that everyone has the opportunity to achieve the highest degree of health. [2]

Sanitation is an important factor for supporting health, it is closely related to environmental health. Residents who have access to proper sanitation are categorized if they have sanitation facilities that meet health requirements, which are equipped with goose neck latrines, septic tanks or a Waste Water Treatment System (SPAL) that can be used alone or communally. Based on data, the coverage of population access to proper sanitation facilities in West Java Province in 2018 was 72.39%.[3]

The term Community-Based Total Sanitation (STBM) is an approach to changing hygiene and sanitation behavior which includes 5 pillars, namely: not defecating (BAB) carelessly, washing hands with soap, managing drinking water and food that are safe for health, managing waste properly, manage household liquid waste safely through community empowerment. An area can be called “has implemented STBM” if it already has a follow-up plan towards total sanitation. And it can be called “STBM Village” if the entire population (100%) has implemented all the principles in the five STBM pillars.[2][4]

The Clean and Healthy Behavior Program (PHBS) has also been launched by the Government to encourage public awareness to live a healthy life. PHBS is translated as a household where all of its members behave in a clean and healthy life, including 10 indicators, namely delivery assistance by health workers, babies are exclusively breastfed, toddlers are weighed every month, use clean water, wash hands with clean water and soap, use healthy latrines, eradicate larvae at home once a week, eat vegetables and fruit every day, do physical activity every day, and don't smoke in the house. If in the household there are no mothers who give birth, no babies and no toddlers, then the definition of a household with PHBS is a household that meets 7 indicators.[1]

The number of households in West Java recorded 13.075.231 households, while those who received PHBS behavior were 8,878,859 families (67.91%). From this training, 5.360.052 families behaved in PHBS behavior (60.4%). The coverage of PHBS households from year to year shows an increase, in 2018 it reached 58.4% and in 2019 it reached 60.4%.[3]

Indicators of healthy homes, namely those that have implemented PHBS well can be seen from access to clean water, use of family latrines, type of house floor and type of house walls. Nationally, the percentage of households with adequate drinking water sources is 70.97% and 52.72% of households have a distance of more than 10 meters from the water source from the

Technium Social Sciences Journal
Vol. 27, 815-823, January, 2022
ISSN: 2668-7798
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pump/well/spring to the final feces storage place, and 22% of households in Indonesia still have bad habits in terms of disposing of waste.[5]

Only 21% of households that have disposed of their waste properly, and as many as 57% of households are known to have a fairly good way of disposing of waste. The percentage of households that have their own defecation facilities is 59.86%, households that have shared latrines are 12.95%, have public latrines at 4.33% and no latrines at all are 22.85%. Households that have this type of floor meet the health requirements only 47.2%. This situation illustrates that the overall coverage of healthy homes in Indonesia is still low, so that it has an impact on public health.[6]

Based on the level of family expenditure per capita, the more prosperous the socioeconomic level of the family, the greater the proportion of achieving clean and healthy families. The implementation of PHBS in households is expected to reduce the risk of infant mortality due to not being helped by health workers and the possibility of insufficient breastfeeding. The availability of clean water, latrines and house floors that are not damp will reduce the risk of environmental-based diseases such as diarrhea, skin diseases, respiratory disorders and others. [7]

People's alternatives to obtain drinking water sources in West Java are very varied. Most urban communities have used clean water services from the Regional Public Water Company (PDAM) to meet the needs of consumption water sources. Meanwhile, people in rural areas are relatively more varied, ranging from those using dug wells, pumping wells, springs, rainwater to those using water bodies such as lakes, rivers to meet the needs of clean water sources. What is meant by protected clean water sources are sources of family drinking water sourced from clean water facilities that have met the requirements of both biological, chemical and physical.

The coverage of drinking water facilities meets the requirements based on the examination of samples of drinking water facilities as many as 525.871 samples from drinking water providers/operators, examined 66.376 samples (88.7%) met the physical, bacteriological and chemical requirements. Based on regencies/cities for West Java Province, the highest coverage was Bandung City at 96.36% while the lowest coverage was in Tasikmalaya City at 31.00%. There are 2 districts/cities for which there is no data on drinking water coverage that meets the requirements, including in Cigeulis District.[3]

This study aims to identify risk factors for environmental-based health problems in the coastal community of Banyuasih Village, Cigeulis District, Pandeglang Regency.

2. Research Method

This study was conducted using a descriptive-observational method, with a cross-sectional study design. The study location is in Banyuasih Village, Cigeulis District, Pandeglang Regency, West Java. The study was conducted from February 2020 to November 2020.

The population is the house of Banyuasih residents with a total of 1.943 houses, while the sample taken or the unit of analysis is the house as many as 157 houses taken by simple random sampling with the following formula.

$$n = \frac{\left[Z_{1-\frac{\alpha}{2}} \sqrt{2P(1-P)} + Z_{1-\beta} \sqrt{P_1(1-P_1) + P_2(1-P_2)} \right]^2}{(P_1 - P_2)^2}$$

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ISSN: 2668-7798
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3. Result and Discussion

From observations and data collection in the field as well as data analysis, it is known that the majority of respondents are adults (38 – 42 years) as many as 34 respondents or 21.66% and the least number of respondents aged over 58 are 9 respondents (5.73%). The proportion of respondents' age reflects the proportion of the population in Banyuasih because the respondents were taken by random sampling. It is known that the majority of the population of adolescent and productive age leave the village to go to school or work in another city. The proportion of the population is dominated by elderly adults and children, as shown in Table 1.

Table 1. Distribution of Respondents by Age

Respondent's Age (years)	Frequency	Percentage
23 – 27	9	5.73
28 – 32	21	13.38
33 – 37	28	17.83
38 – 42	**34**	**21.66**
43 – 47	27	17.20
48 – 52	18	11.46
53 – 57	11	7.01
> 57	9	5.73
Total (N)	157	100.00

The proportion of the population by sex is balanced between men and women. From 157 respondents in Banyuasih, 83 respondents were male (52.87%) and 74 respondents (47.13%) were female, as shown in Table 2.

Table 2. Distribution of Respondents by Gender

Gender	Frequency	Percentage
Man	83	52.87
Woman	74	47.13
Total (N)	157	100.00

The final education for the community in Banyuasih is known to be mostly junior high school graduates and below. Table 3 below shows that of the 157 respondents, most of the respondents had the last education graduated from elementary school as many as 62 respondents (39.49%) and the least was a D3/S1 graduate, namely 3 respondents (1.91%). From the average education level of the community, it can be predicted that their level of general knowledge will also have an impact on their health and environmental behavior.[7]

Table 3. Distribution of Respondents Based on Last Education

Last Education	Frequency	Percentage
No school	14	8.92
Elementary school	62	39.49
Junior high school	67	42.68
Senior High School	11	7.01
Graduated 3-year diploma/Bachelor degree	3	1.91
Total (N)	157	100.00

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Vol. 27, 815-823, January, 2022
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Garbage is the rest of human activities that are no longer used, can be in the form of organic or non-organic. Domestic waste from household activities is dominated by food scraps, food wrappers, plastic bags, and packaged products.

Trash cans are important and must be in every household and other public places where many people have activities. A good trash can is one that is made of materials that are easy to clean, and has a lid so it doesn't invite the arrival of flies, vector animals and pets that are likely to carry disease to humans.[8]

The behavior of caring for the surrounding environment can be seen from the trash cans owned by each resident's house. Table 4 shows that of 132 respondents (84.08%) who have garbage disposal sites that meet health and hygiene requirements, while the remaining 25 respondents (15.92%) have garbage disposal sites that do not meet the requirements. This can be understood from the proportion of public education in Banyuasih, that most of them only received basic education up to elementary school and some up to junior high school, so they have limited knowledge about health and hygiene as well as ethics.

Waste management is important so that waste does not become a source of spreading diseases to humans. It's not the garbage that causes illness, but the vector animals that usually come to the trash can spread the disease to humans around them. Garbage which is a residual material and will be degraded by decomposing microbes, will become a medium for other microbes to grow which may also be pathogenic. So waste management is an important factor to assess environmental quality.[9]

In addition, the aesthetic impact is also another important consideration, especially if the place is a tourist area visited by many visitors from outside the city and even from abroad. Poor waste management will also cause a bad assessment of the place, because it is related to the habits and behavior of the community.[8]

Table 4. Distribution of Respondents by Disposal Site

Garbage dump	Frequency	Percentage
Not eligible	132	84.08
Qualify	25	15.92
Total (N)	157	100.00

Water is very important for all living things. The human body consists mostly of water (55-60% of body weight is water). Water is also vital for the needs of human life, namely for cooking, bathing and washing so that water quality is of particular concern. In developing countries, including Indonesia, the need for clean water is 30-60 liters per day.[1]

A clean water source that meets the requirements means a closed and hygienic water source in accordance with the provisions of the Ministry of Health, free from environmental pollution, especially from the feces of various livestock. In addition, clean water sources must be an important concern because they are related to disease patterns in the community. Sources of drinking water that are close to the septic tank will be at greater risk of containing greater coli bacteria than if the water source is located far from the septic tank. The minimum distance from the water source to the septic tank is >10 meters. In addition, the media for taking clean water must be a concern because the tools used to collect water will determine the quality of the clean water.[10]

The results of the study in Banyuasih Village revealed that all residents used shallow groundwater wells. The depth of the well is known to be about 6-meters with adequate water quality for use which is tasteless, odorless and colorless. But the clean water they consume,

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Vol. 27, 815-823, January, 2022
ISSN: 2668-7798
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even though it comes from good water sources, is managed very poorly. They do not care about the quality of the water they will consume. Table 5 shows that most of the water sources used by respondents did not meet health requirements, namely as many as 141 respondents (89.81%) while those who met the requirements were 16 respondents (10.19%).

A more integrated management of water resources is needed so that water resources can be used sustainably according to their designation. One of the management steps that can be taken is the continuous monitoring and interpretation of water quality data that includes physical, chemical, and biological qualities in accordance with the Minister of Health's regulations on Drinking Water Quality.[6]

Table 5. Distribution of Respondents by Water Source

Source of clean water	Frequency	Percentage
Not eligible	141	89.81
Qualify	16	10.19
Total (N)	157	100.00

Community behavior related to cleanliness is the ownership of latrines. There are still many residents in Banyuasih Village who do not have latrines, so they defecate in gardens or on the beach, the presence of a well close to the place of defecation indicates that poor ethical behavior, health and hygiene are very at risk of contamination of clean water sources, which in turn can have an impact on public health status.[11]

The existence of family latrines in every house is an important indicator for clean and healthy living behavior. Family latrines are the simplest and easiest model for managing domestic wastewater by the community independently or what is called basic sanitation. The basic sanitation requirements are sewage disposal that follows health rules, namely not polluting the ground surface, not polluting the surrounding surface water, not polluting ground water, convex shape with a cover or goose neck, and non-slippery floor and has a sloping floor towards the drain hole and 10 meters from the water source. A good latrine is odorless, inexpensive to manufacture, easy to use, clean and maintain.[10]

The knowledge of the Banyuasih community about clean and healthy latrines is known to be very poor. The results of the study show that out of 157 respondents with family latrines, 136 respondents (86.62%) have latrines that do not meet the requirements, while 21 respondents (13.38%) have latrines that meet the requirements, as shown in Table 6 below. It is known that the majority of residents in Banyuasih defecate in their yards, gardens and even on the beach. Only residents who are economically capable will have healthy latrines in their respective homes. Of the 136 respondents, all of them reasoned that they did not have a latrine at home because the cost of making it was expensive, especially if it was equipped with a septic tank, so they defecated outside the house or if they were at home the situation was very minimal, a kind of primitive latrine. The main reason is that people still lack knowledge about the importance of family latrines, especially from the health aspect.[12]

Most residents in Banyuasih Village are fishermen with an average monthly income of 2 to 3 million rupiah, depending on marine products and weather. The low level of community welfare is known from the indicators of the quality of their environment and houses. A bad environment can be identified from the factors that affect the quality of housing, namely access to clean water services, drainage, waste management and family latrine facilities.[13][14]

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Table 6. Distribution of Respondents by Family Latrine

Family latrine	Frequency	Percentage
Not eligible	136	86.62
Qualify	21	13.38
Total (N)	157	100.00

The results of the study in Banyuasih Village showed that out of 157 respondent's houses, 119 houses (75.80%) did not meet the health requirements, namely having thatched roofs, the walls of the houses still using boards and braided bamboo skin (gedeg), the floor of the house was earth or only a layer of cement. There are 38 respondents' houses (24.20%) which are considered to have minimum health requirements, namely roofs made of clay or zinc tiles, some houses have ceilings, walls and floors using tiles or ceramics, as shown in Table 7 below.

Table 7. Distribution of Respondents by Housing

House	Frequency	Percentage
Not eligible	119	75.80
Qualify	38	24.20
Total (N)	157	100.00

The criteria for a healthy house in accordance with health standards are if the roof is made of tile or zinc and has a ceiling, permanent house walls or walls, and the floor is made of water-resistant and not damp materials with ceramic or tile materials.[12]

According to the Indonesian Ministry of Health, a healthy house is a house that meets the minimum criteria, namely guaranteed access to drinking water, access to healthy latrines, non-earth floors, adequate ventilation, and lighting. Meanwhile, house construction and the environment that do not meet health requirements are risk factors for transmission of various types of diseases, especially environmental-based diseases.[5]

Apart from the reason that it is expensive to build a house, the community also has very minimal basic knowledge about healthy and livable houses. So that the impression of slum and dirty dominates the area in this village. In terms of the environment around the village being a tourist destination, because not far from Banyuasih there is the Tanjung Lesung tourist spot which has been managed as a resort area.[15]

The Banyuasih area is also actually very potential to become a tourist spot because the beach is close to the Tanjung Lesung tourist spot. The waves on the beach are very calm and have a view to the sea off the Indian Ocean with the rocks on the beach are very beautiful so that it attracts tourists. Several private investors are known to have reviewed the village of Banyuasih which will be managed as a tourist spot.

4. Conclusion

The study concludes that environmental health factors in Banyuasih Village are still far from the good category. People do not have the habit of placing trash in public places, including in their own homes. The waste generated from their activities is only collected using simple containers or plastic bags, some are even dumped in the yard or in the sea. The management of the clean water they consume, even though it comes from good water sources, is vulnerable to contamination. They are less concerned about the quality of the water they consume. Another worrying factor is that there are still many residents in Banyuasih Village who do not have latrines, so they defecate in gardens or on the beach. This is all because apart from the reason

that the cost of constructing sanitation facilities is expensive for them, the community also lacks basic knowledge about a healthy environment for their place to live.

To overcome this, the local government should invite the tourism industry in the area to implement CSR programs by building basic sanitation facilities that are needed by the community. In addition, the local government also invites universities to hold community service activities, namely providing counseling on environmental sanitation and health to the local community.

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