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### Hazardous Effect of Raw Sewage Disposal from Indigenous Housing Settlement on Natural Water Bodies

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#### A B S T R A C T

One of the problems that are causing a threat to public health is a sanitation system of indigenous houses built on water. The traditional way of life of indigenous society living in housing settlements over rivers or the sea is becoming a source of environmental pollution. These houses did not actually have a proper sanitation system for disposing wastes from toilets. The sanitation systems for these houses unfortunately dispose wastes directly into natural water bodies. The centralization of the waste disposal may cause problem to the public due to technical and financial different faced by the authorities. This research requires gathering relevant data source based on direct observation and indirect observations. Also this project will utilize on qualitative data collection tools, but is rooted in a qualitative epistemological position that recognizes the importance of locating the research within a particular social, cultural, and house settlement. This paper surveys the literature on problems that arise from raw sewerage disposed into natural water bodies before any sanitation is proposal to solve the problem. Also the potential solutions to the problem were discussed too.

### Introduction

Indigenous houses are made of wood and foliage and they have a simple structure. These houses can be built everywhere. Some of them are built on the water at the beach and some of them on the ground. Due to the need of indigenous people living along the water, these homes can be found surrounding waters. It is estimated that are about 370 million of the world's indigenous populations to use in 70 countries. These figures show that a significant number of indigenous people like around the world.

On the other hand, they are different in retaining social, cultural, economic and political characteristics compared with the dominant society in which they live(10).

Today, indigenous houses are found in all parts of the world and many indigenous people still live in these homes. Due to the geographic location and climate conditions in different countries, these homes have a structure that is consistent with the conditions. So the indigenous house is

different in different parts of the world in shapes and materials(4).

As mentioned, due to the simple structure of these types of homes, they have the primary features and basic amenities only. For example, most indigenous houses are without toilets. A toilet is a sanitation system that controls wastewater. Indigenous people, whose homes do not have sanitation system, prefer to use the nature water for washing. On the other hand, the indigenous houses that have the basic facilities such as toilets do not have a sewerage system for transferring the waste water to the treatment plant and the hazardous transfer into the natural water directly(6).

Because of the lack of proper basic facilities Indigenous people build their houses along natural water. Finding food is another benefit of living near natural water. The governments provide the other basic facilities such as electronic and piped water supply, these basic facilities is helping the Indigenous people to have a normal life. The existence of indigenous housing on the water is causing problem to the environment and human(5).

The domestic wastewater coming from kitchens and bathrooms and of indigenous houses is also termed as sewage or gray water. In areas of high population density, wastewater can pose a serious public health threat. Good sanitation system for domestic wastewater includes treatment, disposal of solid, and light wastewater. All these wastes have negative effects on the environment and transfer the disease to human and animals. Population is growing more wastewater is disposed into the environment and polluted natural, environmental bodies. Therefore, sewages or waste water and managing them play an important part in the people's life. Today, the toilet filtering system is the best way for managing and

control sewages at houses. Two types of toilet filtering system are used in the world; traditional way and central system of toilet filtering(14).

In most countries, indigenous peoples' use of natural water for drinking. Statistics have shown that 14 countries around the world encounter have sanitation problem. For example, nearly 51% from 300 million people who living in the in sub-Saharan countries, they are lack of the safe water and 41% have lack of adequate sanitation and the house next to natural water increase pollution(4).

Drinking water is one of the important human need, 778 million of the population in 1997 have diseases that have spread from the natural waters and this statistic show that the higher number of these are women and children. More than 10,000 people had the cholera during outbreaks in 2001(10).

In addition, natural waters are a very good source of food for people and most indigenous people depend on the aquatic animals for their food. When raw sewage has been transferred into natural waters, this will cause a hazard to aquatic organisms(3).

This research requires gathering relevant data source based on direct observation and indirect observations. Also this project will utilize on qualitative data collection tools, but is rooted in a qualitative epistemological position that recognizes the importance of locating the research within a particular social, cultural, and house settlement. It also takes seriously the social construction of these contexts and the identities participants construct within them. The source of data is conducting field studies from the specified documents and compiling databases in order to analyze the material and arrive at a more complete understanding through literature review. In addition, this research covers two major problems that arise from the

sanitation system of indigenous houses close natural water and tries to explain the disadvantages of sewerage disposed into the natural water directly.

### **Cholera**

Today, the use of advanced wastewater treatment systems around the world is common and important and the emphasis is in the standardization of process wastewater treatment. In some parts of the world and due to unique geography of the area, the wastewater undergoes changes (13). Houses on water are one of the important cases that do not have the standard of wastewater treatment plant. In this type of houses, and because of the high cost and difficulty of installation of wastewater treatment plant, wastewater disposed with water directly. In fact, domestic wastewater treatment plants required large area to dispose wastewater from indigenous houses and since such areas are not easy to find, so wastewater is disposed directly to water bodies. The raw sewage presence in the environment is causing problems. These problems can also be dangerous for humans and environment (1).

Transmitting dangerous diseases is one of the problems that arise from human raw sewage. Cholera is a disease that is transmitted to humans through raw sewage. Cholera is an infectious disease that is transmitted through contaminated water and food. Cholera bacterium has the ability to move from place to place and it can have different reactions in different situations (7).

Cholera bacterial transposable through humidity and environment and it is not restricted to the displacement. It is in this sense that the Cholera bacteria can move long distances and can be transmitted to humans through food and water. For

example: If the plants are fed from water that carry the Cholera bacteria, the plant is a carrier of cholera bacteria and it can transfer to human or animals (11).

One of the modes of transmission of cholera bacteria in water is faecal, health and environmental conditions play an important role in the transmission of the Cholera bacteria. In poor countries, the risks of further spread of the disease are high. This is because these countries do not have true wastewater treatment plant and raw sewage transfer to environment directly. In 1994 in a refugee camp in Goma, Democratic Republic of the Congo, a major epidemic took place and 23800 deaths occurred within one month (12).

According to the cholera epidemic of wastewater, It was among the first in the list (IHR) of diseases related to modern hygiene regulations. According to regulations established by the UN General Assembly, All countries need to control raw sewage and avoid disposed of raw sewage into nature without treatment (2).

So, the spread of the disease must be prevented from entering the water with bacteria. Also this hypothesis is coming true for indigenous houses or water village houses that transfer the raw sewage into water directly (2). Unfortunately, most of these types of homes in countries that are considered tourist attraction do not follow the standards set forth in the IHR List. In fact, there are several reasons that a house does not have purification system; one of them could be the cost and the second one is the problem of transferring of sewage to the location of treatment plant. These two reasons make these homes do not have a sewage system or treatment plant and causing outbreaks of disease (7).

### **Alga or Water plants**

The second problem comes from the raw wastewater uncontrolled growth of aquatic plants. Actually, human fecal has organic matter that containing phosphates and nitrates. These organic materials are considered as fertilizer. When raw sewage enters the water without treatment, phosphates and nitrates in raw sewage are the best food for growing plants in water and cause excessive growth of aquatic plants in water (9). Excessive growth of aquatic plants in the water can cause problems that can be divided into three types and these are:

1. Uncontrolled growth of plants is covered by water levels and impairs recreational activities such as swimming, fishing and boating.
2. Excessive growth of aquatic plants creates shelter for small fish that is causing the fish population.
3. The excessive aquatic plants can help reduce the amount of oxygen and can cause the death of aquatic plants. Water has standard oxygen that excessive growth of aquatic plants causes disruption of this balance. During the day, plants produce oxygen through photosynthesis and those requiring oxygen during the night like day plants need oxygen to be bigger in summer. When plants take in the oxygen and water oxygenation cycle disturb, consequently the fish come to the surface to get oxygen and die. Therefore, these two Problems (Cholera and oxygen) are two major problems that come from the the disposal of raw sewage without treatment (8).

There is no doubt that improving the water quality for water village is the most important in people's life. Therefore,

keeping a clean water and the environment can give a better life for people. This study shows that keeping a good water quality is difficult. This study also shows that contamination moves in the water easily and it can be transmitted to humans and the environment from this way. Wastewater treatment is the most important way that stops the water contamination and give a better life for people with good environment. Water is the sensitive liquid that human, animal and plant need.

Therefore, wastewater treatment is the best way to stop any contamination of water from indigenous house settlement on water. Most of the house settlement is facing wastewater treatment problem. These types of house are built on the water or around the water and they do not have any central system for transferring wastewater to a control treatment plant to eliminate water contamination. There are different method to control contaminated wastewater from houses.

One method is sewage drying in which the, human solid waste is dried and use devices that can separate it from the liquid. This separation allows dry solid waste easily, the liquid can be used as fertilizer. For example, in North Vietnam, the rice fields are fertilized with raw sewage from homes. The Health authorities encouraged this method that is widely used in Vietnam, but this method can transfer any diseases to human of animals. Unfortunately, this method is also used to some extent in central America, Mexico and Sweden.

Today, there are three methods commonly used in most parts of the world. These three methods of the wastewater treatment include the huge process and take time in removing contaminated. For example, physical treatment is one method of wastewater treatment. This treatment can remove the suspended solid from wastewater and it is

method is a sedimentation or the flotation method for removing solids. These two ways can remove the suspended solid from wastewater. On the other hand, another method of wastewater treatment that can be effective for reducing contamination from wastewater is biological treatments. A biological treatment is a method that is used for removing bacteria from wastewater. This treatment is the best way to remove contamination from the wastewater and usually it is usually used after the physical treatment. This method is used in different size and it transfers oxygen to waste water. Chemical treatment is another method that is used for wastewater treatment. Sometimes this method is useful in the physical treatment to shorten treatment time. Actually, Chemical treatment is the last stage of treatment in the treatment processes. This type of method is an expensive method, but is be more effective than other methods. Sometimes this treatment is used singly in wastewater treatment. If sewage from house settlement transferred to another area and chemical treatment is used, the bacteria of wastewater died in a short time.

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