ICOHESPE (2026): 377–381 QRCBN 62-6861-1753-250
International Conference on Health Science, Practice, and Education https://proceeding.unnes.ac.id/icohespe

Impact of Occupants' Behaviour on Environmental Health of Urban Wetland Settlements in Banjarmasin

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Abstract. Located on wetland area, Banjarmasin residential area is mainly resided on swamp area and riverbank. Rapid growth of residential area development resulted in the decreasing area of wetland. This condition leads to the declining quality of the environment. Another factor that contributes to the environmental deteroriation is inhabitants' behaviour. Subsequently, environmental deteroriation produce negative impact on environmental health of the residential settlements. The objective of this study is to define the impact of the occupants' behaviour and habit ed in this study to describe the relationship between behaviour/habit and environmental health. Field observation is used to collect primary dain using river resources on environmental health of the settlements on Alalak riverbank. Descriptive method is used. This study shows that there is a major impact of bad behaviour/habit in using resources on the river ecology, such as declining water quality. Initially, this leads to decreasing quality of environmental health of the settlement.
Keyword*:* Alalak riverbank, environmental health, housing settlement, occupants' behaviour, urban wetland

1 Introduction

Wetland is an essential biotop. The importance of wetland becomes higher when located in urban area. Urban wetland is essential in increasing surface water quality and purifying precipitation process. Subsequently, both can reduce the level of phosphat, nitrate, solid materials, and heavy metals in rain water and surface water [1]. Ramsar Convention 2008 states that urban and peri-urban wetland provides several ecosystem benefits [2].

Banjarmasin is a city resided on wetland area, swamp and river. Thus, the city embraces water culture. Saleh (1984) described the riverside settlements of Banjarmasin City in the past as following: "The village in the Banjar area has been located along the river since ancient times. These houses are built always facing the river or above along the river, or if on land it is built facing the road, then the back must be on the river to make it easier to get water. Every house has water latrine, namely a small room on the river for bathing, washing, toileting and so on. Meanwhile, the villages that are outside the riverside route are a group of scattered houses that are separated on land and far from the riverbank. It was not until the 19th century in the 1860s and above that the Dutch made solid land roads, for the purposes of moving infantry and horse-drawn cannons. To maintain this road, the Banjarese were forced to build new villages, in the form of houses along the road opposite, or rows of houses along the road facing the river [3].

All residential area in Banjarmasin are built on wetland. The total area of residential area in Banjarmasin is approximately 3,522 hectares, located on swamp area or along riverbanks. The development of these residential areas has significantly reduced wetland area and deteroriate river environment. Establishing settlements along river is part of Banjarese culture. The daily life of Banjarese people is closely knitted to rivers. They use river as water resource, transportation means, as well as social and economic activities. Alalak river is a tributary of Barito river. Many residential areas reside along its bank. The oldest residential settlements occurred along this area.

The transformation of wetland area into residential area has initiated environmental devastation. The construction of houses cover wetland area. Mutisi and Namo (2015) state that landuse activities, especially housing and its infrastructure, has put sensitive and fragile ecosystems such as wetland in vulnerability. These activities happens as the result of urbanism. Feresu (2010:112) said "wetland mismanagement has also led to land degradation and siltation of rivers." [4]

In Alalak riverbank, some occupants filled riverbank with soil to make it dry to be used as front yard. This means the reduction of wetland area, also means the reduction of surface water quality. The buildings prevents sunlight to reach water surface. This leads to the obstruction of photosynthesis process for several water vegetations. The behaviour of the occupants of wetland sttlements also cause several environmental destruction. They use river water for their daily needs such as washing, bathing, and laundry. These activities result in water polution caused by human waste, soap, and other substances used by the occupants. At the end, the environmental deteroriation also leads to the decline of environmental health of the area. The objective of this study is to define the impact of the occupants' behaviour and habit in using river resources on environmental health of the settlements on Alalak riverbank.

2 Methods

This study is conducted in RT 10 Kelurahan Alalak Utara Kecamatan Banjarmasin Utara (Figure 1). There are 21 houses reside along Alalak riverbank in this area. All the houses are taken as the sample of this study. Field observation is used to collect primary data such as infrastructure conditions, allocation of water usage, environmental condition, and behavioural pattern. This study is a preliminary research for a wider area of research related to the transformation of wetland area into human settlement. Descriptive method is used in this study to describe the relationship between behaviour/habit and environmental health.

Figure 1. Study area in RT 10 Kelurahan Alalak Utara Kecamatan Banjarmasin Utara, Banjarmasin
Source: Google Map, 2024

Data analysis uses empirical approach based on analytical method introduced by Miles and Hubberman (2007). The analysis is devided into three steps: 1) Data reduction, 2) Data Presentation, and 3) Conclusion deduction. The qualitative data analysis is used to reveal and understand the realities that exist in the field according to the real conditions which describe in depth factual and accurate background of observations, actions and discussions to find patterns of interactive relationships, to describe complex realities, and to gain an understanding of values held by the inhabitants in the area [5].

3 Results And Discussion

Environmental damage that occurs due to the conversion of wetland into residential areas has widely occurred. Rijal and Aldy (2012) stated that in the city of Dumai in Riau, the development of

settlements in wetland areas has caused hydrological impacts which include changes in vegetation, sedimentation, and river capacity. This has also happened in Banjarmasin area including in Alalak riverbank, which is marked by the increasing difficulty of finding local native vegetation and the increasing water level of the swamp and rivers due to sedimentation and reduced river capacity [6].

The decreasing number of vegetation along Alalak riverbank gives negative impact on the environmental health of the area. Vegetations has a function to produce oxygen. Decreasing vegetation quantity also means the decreasing of oxygen level. Vegetations can also function as barrier toward dust and noise. Unavailability of vegetations makes the air and noise polution in the area cannot be reduced. The results of a study conducted by Zubair, Wei Ji, and Weilert (2017) on three wetlands in the United States, namely wetlands in the Missouri Shoal-Creek River, Little Blue River, and Blue River watersheds, showed that the impermeable surface and the forest land are two classes that replace wetland vegetation. Therefore, it is clear that wetland covered with vegetation requires more attention than open wetland due to its vulnerability to change as a result of urban development [7].

Increasing water level of Alalak river suggest that the area is more prone to flood.the occurrence of flood may cause some environmental heath disturbance. Flood can bring dirty water, mud, and garbage to the residential area. Subsequently, this polluted condition can attract disease vectors such as rats, flies, and mosquitos. Some infectuous diseases can be easily spread. Sithole and Goredema (2013) shows similar negative impact of development on wetlands in Harare, Zimbabwe. Due to the conversion of wetlands into residential areas, residents are vulnerable to water-borne diseases, such as cholera, typhus, dysentery, and diarrhea. Settling in wetlands creates a situation that provides a conducive and willing environment for the spread of disease [8].

Houses built on wetlands are prone to flooding and collapse through structural damage, cracks, and bending of the structure which reduces the life of the structure being built. It is the norm that during heavy rains, buildings built on land with such poor drainage cannot withstand the natural currents and end up being filled and flooded with storm water and the overflow of sewage enters the houses located in the wetlands. This condition also occurs in Alalak riverbank settlement. Many infrastructures are built of timber. Figure 2 shows some timber and wood planks are deteriorated due to continuos exposed to water. As a result, safety becomes a major concern in the area.

Figure 2. The deteriorated condition of some infrastructures in area of study.
Source: Personal document, 2023

Wetlands have been turned into illegal dumps. In the area of study, the occupants still have a negative behaviour of disposing garbage to river. Alalak river becomes poluted with garbage disposal. Furthermore, the occupants also use the river as sewage disposal. Household and human waste are directly disposed into river. Some of the inhabitants are still reluctand to use toilet, the prefer to use traditional latrine reside above the river as shown in Figure 3. This condition contributes

to water polution process. Some inhabitants use river water for daily needs, such as as washing, bathing, and laundry. Poluted water causes the declining of environmental health quality in the area.

Figure 3. Water lantrine in Alalak river
Source: personal document, 2022

Wetlands remove and store greenhouse gases from the earth's atmosphere thereby slowing global warming. Therefore, building on wetlands has severe environmental implications which if left untreated could cause future generations to fail to utilize the wetlands as we do today. The Florida Department of Environment Protection [FDEP] illustrates this by saying that "changing flow patterns can also concentrate pollutants, cause erosion, cause sedimentation, and reduce valuable shallow water habitats" [7].

Some studies conclude that other impacts that occur are the reduced ability of groundwater absorption, loss of water storage areas, clogged drainage channels, and confinement of water. All of this also began to occur in the study area, generally also occur in Banjarmasin. This condition began to occur in the study area with more and more changes in the use of wetlands into residential areas without paying attention to the sustainability of the existence of the wetlands themselves.

A study conducted by Fianko and Dodd (2018) shows that in the Songor Ramsar and UNESCO Man and Biosphere Reserve in Ghana, there are two key factors that influence the degradation of environment. The first is improper waste disposal in the communities and the second one is the poor attitude of residents toward environmental conservation [9].

4 Conclusion

The transformation of wetland into settlement areas is inavoidable due to the increasing demand of houses in Banjarmasin. This has negative impacts on environment. Some environment deterioration occurs, such as water polution, land polution, vegetation lost, river sedimentation, and decreasing air quality. This condition is caused by the development process of the infrastructure of the settlement areas and also by negative behaviour of the inhabitants.environmental degradation will affect environmental health condition of the area. Development process should be controlled in order to restraint the occurence of environmental degradation. Meanwhile, the inhabitants also need to change their way of life and their behaviour to a more healthier lifestyle in order to prevent more environmental degradation.

This study is a mere preliminary study. Further study needsto be conducted to heve more quantitative data to be able to have a more measurable problems existed in the area.

References

[1] J. G. Ehrenfeld, "Evaluating Wetland within An Urban Context," *Urban Ecosystem,* vol. 4, no. January, pp. 69-85, 2000.

[2] M. Finlayson, "The Ramsar Convention and Urban Wetlands: An Opportunity for Wetland Education and Training," in *Workbook for Managing Urban Wetlands in Australia*, Sydney, Sydney Olympic Park Authority, 2013, pp. 34-51.

[3] I. Mentayani, "Identity and Existence Riverside Settlement of Banjarmasin," Banjarmasin, 2019.

[4] L. Mutisi, "Blue in The Green Economy: Land Use Change and Wetland Shrinkage in Belvedere North and Epworth Localities, Zimbabwe," *Journal of Public Administration,* vol. 50, no. 1 - March 2015, pp. 108-1024, 2015.

[5] M. B. Milles, Analisis Data Kualitatif, Jakarta: Universitas Indonesia, 2007.

[6] M. Rijal, "Dampak Perubahan Hidrologis dan Perkembangan Tata Guna Lahan pada Permukiman Lahan Basah di Kota Dumai," *Jurnal Arsitektur Universitas Bandar Lampung,* vol. 1, no. 3 - Desember 2012, pp. 36-39, 2012.

[7] O. A. Zubair, "Modeling the Impact of Urban Landscape Change on Urban Wetlands Using Similarity Weighted Instance-Based Machine Learning and Markov Model," *Sustainability,* vol. 9, no. 2017, pp. 22-23, 2017.

[8] A. Sithole, "Building in Wetlands to Meet the Housing Demand and Urban Growth in Harare," *International Journal of Humanities and Social Science,* vol. 3, no. 8, pp. 193-201, 2013.

[9] J. R. Fianko, "Sustainable Management of Wetlands: A Case of The Songor Ramsar and Unesco Mand and Biosphere Reserve in Ghana," *Journal of Wetlands Environmental Management,* vol. 6, no. 1, pp. 45-53, 2018.