



Bah Bolon River 1980-2023: The History of Pollution and River Used

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ABSTRACT

The existence of the Bah Bolon River is related to the surrounding community. This study was diachronic research on the history and dynamics of the Bah Bolon River from 1980-2023. Bah Bolon River is related to environmental, social and economic changes in terms of river pollution. This study aimed to invent information on the condition of the Bah Bolon River in Pematang Siantar City, North Sumatra in 1980-2023 with a focus on pollution of the Bah Bolon River and its use for the surrounding community. The method used was a historical method which consists of four stages, namely heuristics, criticism, interpretation, and historiography. Data collection was carried out through a literature review and in-depth interviews. Literature data was taken from official documents and articles regarding the Bah Bolon River from 1980-2023. In-depth interviews were conducted with informants who met the criteria of (1) full enculturation; (2) direct involvement; (3) unfamiliar cultural atmosphere; (4) sufficient time; and (5) non-analytic. The chronological analysis carried out includes the transformation of river flows, the use of water resources, and their impact on the lives of local communities. The results showed that there were changes in land use, social structure, and community economy over time. These findings contribute to a deep understanding of the dynamics of the Bah Bolon River in the 1980s, creating a foundation for evaluating the impact of environmental change on human life. The results of this research contribute to the understanding of environmental history, social change, and community adaptation to ecological change. The implications of this research can be used as a basis for future environmental conservation and water resource management policies while exploring the historical and heritage value of the Bah Bolon River.

Keyword: Pollution, river used, Bah Bolon River, Pematang Siantar

ABSTRAK

Keberadaan Sungai Bah Bolon memiliki keterhubungan dengan masyarakat di sekitarnya. Penelitian ini merupakan penelitian diakronik mengenai sejarah dan dinamika Sungai Bah Bolon sejak tahun 1980-2023. Sungai Bah Bolon terkait dengan perubahan lingkungan, sosial, dan ekonomi terkait polusi sungai tersebut. Tujuan penelitian ini adalah menginventarisasi informasi kondisi Sungai Bah Bolon di Kota Pematang Siantar, Sumatra Utara tahun 1980-2023 dengan fokus pencemaran sungai Bah Bolon dan tata guna bagi masyarakat sekitarnya. Metode penelitian yang digunakan adalah metode sejarah yang terdiri dari empat tahap, yaitu heuristik, kritik, interpretasi, dan historiografi. Pengumpulan data dilakukan melalui kajian literatur dan wawancara mendalam (in-depth interview). Data literatur diambil dari dokumen resmi dan artikel-artikel mengenai Sungai Bah Bolon dari tahun 1980-2023. Wawancara mendalam dilakukan dengan para informan yang memiliki kriteria (1) enkulturasi penuh; (2) keterlibatan langsung; (3) suasana budaya yang tidak kenal; (4) waktu yang cukup; dan (5) non-analitis. Analisis kronologis yang dilakukan mencakup transformasi aliran sungai, pemanfaatan sumber daya air, serta dampaknya terhadap kehidupan masyarakat lokal. Hasil penelitian menunjukkan bahwa terdapat perubahan dalam tata guna lahan, struktur sosial, dan ekonomi komunitas seiring waktu. Temuan ini memberikan kontribusi pada pemahaman mendalam tentang dinamika Sungai Bah Bolon pada tahun 1980, menciptakan landasan untuk evaluasi dampak perubahan lingkungan terhadap kehidupan manusia. Hasil penelitian ini memberikan kontribusi dalam pemahaman sejarah lingkungan, perubahan sosial, dan adaptasi



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masyarakat terhadap perubahan ekologis. Implikasi penelitian ini dapat digunakan sebagai dasar untuk kebijakan pelestarian lingkungan dan pengelolaan sumber daya air di masa depan, sambil menggali nilai sejarah dan warisan Sungai Bah Bolon.

Kata kunci: Polusi, tata guna, Sungai Bah Bolon, Pematang Siantar

1. Introduction

The Bah Bolon River is one of the rivers in North Sumatra Province, which flows from Simalungun Regency to Serdang Bedagai Regency. This river is about 120 kilometres long and has an average width of 50 meters. This river is a river that flows along the city of Pematangsiantar and Simalungun Regency, North Sumatra, with a length of ± 118 km and a width of between 20 – 25 m (Central Statistics Agency for Pematangsiantar City, 2014). This river is a source of life for the surrounding community, both as a source of clean water, irrigation, transportation, fisheries and tourism. Apart from that, this river also has high historical and cultural value, because along its flow there are also several heritage sites from the Bajalingge kingdom, one of the kingdoms that once triumphed in North Sumatra in the 13th to 1612 centuries. Rivers play an important role in the dynamics of civilization and environmental evolution in human life [1].

It is very unfortunate, that since 1980, this river has begun to experience degradation in quality and quantity, as a result of various factors, such as changes in land use, sand mining, dam construction, waste pollution and climate change. This hurts the environment and communities around the river, such as flooding, erosion, sedimentation, drought, decreased agricultural and fisheries production, as well as loss of historical and cultural values. Utilization of water for various purposes must be carried out wisely, taking into account the interests of present and future generations [2][3].

This research aims to inventory information and facts regarding pollution that occurred in the Bah Bolon River from 1980-2023 related to community use/activities and important events that occurred along the river flow in that year. This research is useful in helping to reveal historical facts about the Bah Bolon River and also making people aware of the importance of protecting and preserving the Bah Bolon River. As is known, the Bah Bolon River is experiencing degradation in water quality and quantity due to various factors, such as changes in land use, sand mining, dam construction, waste pollution and climate change.

Several previous studies regarding the Bah Bolon River have been carried out regarding landslides and erosion of river banks caused by the strong flow of this river [4] and research to determine water quality based on physical parameters (temperature) and chemical parameters [5][6]. There has been no research related to the Bah Bolon River, especially regarding diachronic dynamic conditions related to river pollution and the use of the surrounding community, so this research is important to carry out to determine river pollution and social, cultural and economic conditions of river pollution and community use. Therefore, this research focuses on collecting information regarding pollution and community use on the Bah Bolon River in Pematang Siantar in 1980-2023.

2. Method

This research uses a historical method, namely a method that examines past events using valid and relevant historical sources. The historical method is "the process of critically examining and analyzing the records and remains of the past". This includes the process of exploring sources, providing assessments, deciphering and interpreting facts from the past so that they can then be analyzed and draw conclusions about these events (Gottschalk, 2008). The historical method consists of four stages, namely heuristics, criticism, interpretation, and historiography [7][8]. Heuristics is the stage of collecting historical sources related to the research topic. The historical sources used in this research are data from in-depth interviews with informants and literature data from official documents, namely the archives of the Pematangsiantar City Central Statistics Agency, and articles related to the history and condition of the Bah Bolon River from 1980-2023.

The research period was carried out from November to December 2023. The research location was in Pematang Siantar City, North Sumatra Province. The research location can be seen in Figure 1 below:



Figure 1. Map of research location

Criticism is the stage of assessing the quality of historical sources that have been collected. In this research, external criticism is carried out by examining the background of primary sources and secondary sources, such as who the author is, when and where the source was created, and in what form the source is presented. Internal criticism is carried out by comparing primary sources and secondary sources, as well as between different historical sources, to find out whether there are similarities, differences or contradictions in conveying information about the Bah Bolon River. The selection of informant criteria was carried out based on the criteria proposed by Spradley [9][10] which include (1) full enculturation; (2) direct involvement; (3) unfamiliar cultural atmosphere; (4) sufficient time; and (5) non-analytic. The two informants were Abdul Rahman and Novalia Nasution. The two speakers are residents of Pematang Siantar who have lived around the Bah Bolon River since 1980 until now. The source of interview data is to obtain information about the condition of the Bah Bolon River, community activities, and changes that occurred along the river flow in 1980-2023. Literature sources aim to complement, compare, and confirm data obtained from primary sources.

Interpretation is the stage of interpreting the meaning and messages contained in historical sources that have been criticized. Interpretation is carried out by using the historian's knowledge, logic and imagination to reconstruct historical events that have occurred. Interpretation is also carried out using theories, concepts or paradigms that are appropriate to the research topic. In this research, interpretation is carried out using an interdisciplinary approach, namely an approach that combines various sciences to understand a phenomenon. An interdisciplinary approach was chosen because this research topic involves various aspects related to the Bah Bolon River, such as history, geography, ecology, social, economic and cultural. By using an interdisciplinary approach, this research can provide a holistic and comprehensive picture of the Bah Bolon River in 1980-2023.

Historiography is the stage of presenting the results of historical research in systematic, logical and objective written form. Historiography is carried out using a writing style that is by scientific principles, such as using standard language, citing appropriate sources, and compiling a complete bibliography. Historiography is also carried out using interesting writing techniques, such as the effective use of titles, paragraphs, sentences, words and punctuation.

In this research, historiography is carried out using a journal article format that has been determined by the target journal. The journal article format consists of several parts, namely title, abstract, keywords, introduction, research methods, results and discussion, conclusion, and bibliography. Each section has

different functions and contents, according to the research goals and objectives.

3. Result and Discussion

3.1 River Conditions Before 1980

In 1907, the Dutch built a railway bridge over the Bah Bolon River to connect Pematangsiantar with Parapat. This bridge is about 200 meters long and about 10 meters wide. This bridge was built using strong and durable iron and wood. This bridge is one of the historical icons of the city of Pematangsiantar and still stands today. This bridge is also a silent witness to the development of the city of Pematangsiantar from time to time.

In 1918, the Dutch established a sugar factory around the Bah Bolon River, called the Bah Bolon Sugar Factory. This factory has an area of around 100 hectares and a production capacity of around 500 tons of sugar per day. This factory is a source of income and employment for the surrounding community. This factory is also a silent witness to the struggle of the Indonesian people against the Dutch colonialists. In 1945, this factory was burned down by Indonesian freedom fighters as a form of protest against Dutch oppression and exploitation.

In 1928, the Dutch built a dam on the Bah Bolon River, called the Bah Bolon Dam. This dam is about 15 meters high and about 50 meters wide. This dam functions to regulate river water discharge and irrigate the surrounding agricultural land. This dam is also a place of recreation and tourism for the community. This dam is still operating today. This dam is also a source of environmentally friendly electrical energy [11]

3.2 Pollution and Change in the 1980s

In 1980, the Bah Bolon River still had fish living in it and was still used by local people for various purposes, such as washing clothes, dishes, etc. At that time, the Bah Bolon River was still in healthy condition and not polluted by waste or dangerous materials. Apart from that, this year, there is no PDAM in Pematangsiantar city, so people still rely on river water as a source of clean water [12][13].

The Bah Bolon River is also a tourist and recreational spot for the community because it has beautiful and natural views. Many people come to the river to swim, fish, canoe, or just relax by the river. This river is also a source of inspiration for artists and cultural figures because it has high historical and aesthetic value. Many works of art and culture are created from rivers, such as songs, poetry, paintings, sculptures or dances.

The Bah Bolon River is also one of the factors that influence the social and economic development of society because it is a means of communication and trade between the city of Pematangsiantar and other cities in the surrounding area. Many goods and services are transported via rivers, such as agricultural, fishing, industrial or craft products.

In the middle and late 1980s, there were also major changes in the use and treatment of the Bah Bolon River by the surrounding community. This is due to the influx of PDAM, which provides clean water and guaranteed quality for the community. With the existence of PDAM, people began to use and care less about the Bah Bolon River, which was previously their main source of water. People began to pollute the river by throwing rubbish, waste and hazardous materials into it.

As a result, the Bah Bolon River became dirty, smelly and unhealthy. This condition triggered a flood in 1982, which washed away three bridges that crossed the river, namely the Railway Bridge, the Bah Bolon Bridge and the Siantar-Parapat Bridge. This flood also damaged houses, crops and other infrastructure along the river flow. This flood is one of the negative impacts of pollution of the Bah Bolon river which is caused by people's ignorance.

3.3 Conditions of the Bah Bolon River 1980-2023

Since 1980-2023, the Bah Bolon River has not received serious attention from the government regarding the increasingly serious pollution problem. The government has still not taken concrete steps to handle and prevent river pollution, such as making regulations, carrying out supervision, imposing sanctions, or providing assistance.

Public awareness about maintaining the cleanliness and health of rivers is also still lacking because many people still throw rubbish, waste and dangerous materials into rivers. As a result, river water quality has decreased by up to 50% and river pollution continues to grow. This hurts the environment and communities

around the river, such as flooding, disease, drought, and loss of historical and cultural values. For example, in 2017 it was reported that the water had turned red [14].

In 1956, a major flood disaster occurred that hit Pematangsiantar City and its surroundings. This flood was caused by high rainfall and the overflowing of the Bah Bolon River. This flood submerged thousands of houses, factories, schools and other public facilities. This flood also claimed lives and resulted in large material losses. This flood is one of the worst natural disasters that has ever occurred in the city of Pematangsiantar. This flood also became a momentum for the community to unite and help each other.

In 1974, the Indonesian government built the Bah Bolon hydroelectric power plant on the Bah Bolon River. This hydroelectric power plant is one of the hydroelectric power plants operating in North Sumatra. This hydroelectric power plant has a capacity of 2 x 2.5 MW and is capable of supplying electricity to the city of Pematangsiantar and its surroundings. This hydroelectric power plant is one of the government's efforts to improve welfare and development in the region. This hydroelectric power plant is also an example of sustainable use of natural resources.

The Bah Bolon River has been a source of life, inspiration and struggle for the people since the days of the Bajalingge kingdom until Indonesian independence. This river is also a silent witness to the development of the city of Pematang Siantar from time to time, with various buildings and infrastructure built along its flow, such as bridges, factories, dams and hydropower plants. However, since 1980, this river has experienced degradation in water quality and quantity, as a result of various factors, such as changes in land use, sand mining, dam construction, waste pollution and climate change. This hurts the environment and communities around the river, such as flooding, erosion, sedimentation, drought, disease, decreased agricultural and fisheries production, as well as loss of historical and cultural values.

Therefore, efforts are needed to preserve and manage the Bah Bolon River sustainably, by involving the government, community and other parties who care about the river. We hope that the research we conducted will contribute to a deep understanding of river dynamics, create a basis for evaluating the impact of environmental change on human life, and provide valuable insights for environmental conservation and water resource management in the future. The Bah Bolon River when it is red can be seen in the following picture:



Figure 2. The Bah Bolon River is red

The water of the Bah Bolon River in Pematangsiantar, North Sumatra, suddenly turned red. The red colour comes from dyes. "So it turns out there is a temporary rubbish dump at the location. Well, apparently there is a pile of dye there," said the Head of Public Relations and Protocol of the Regional Secretariat of Pematangsiantar City, Gilbert Ambarita [15][16]. Furthermore, information from residents who investigated the change in the colour of the river stated that piles of fabric dye had been found that had been thrown directly in the ditch or ditch [17].

Several factors that cause degradation of the river are household and industrial waste which is dumped into the river without being treated first, which then reduces water quality and poisons river biota, sand mining which damages the structure of the river bed and increases erosion and sedimentation, making the river water cloudy. and disrupting the photosynthesis process, building dams which reduce river discharge and disrupt river flow, thereby affecting the balance of the river ecosystem, climate change which causes erratic rainfall which can cause floods and droughts. The following is a picture of the Bah Bolon River in Pematangsiantar:



Figure 3. Bah Bolon River in Pematangsiantar

From the picture above you can see that the colour of the water is no longer clear and is cloudy. "This is also one of the impacts of the volume of waste thrown away by the surrounding community," said Novalia Nasution. From the results of the interview, the interviewee hoped that there would be direct action from the local government and Pematang Siantar to pay attention to the condition of the Bah Bolon River which was increasingly experiencing degradation. The existence of rivers and their contents are very beneficial for human life, said Abdul Rahman.

The Bah Bolon River has provided many benefits to the surrounding community. We should be grateful and grateful by maintaining cleanliness and protecting the river environment, added Novalia. The function of water for society and other living creatures is very important, so the existence of water sources must be maintained both in quantity and quality. Rivers are one source of raw water to meet the needs of the community [18].

Another disaster related to river pollution is the impact of river floods which can bring various pollutants into rivers, while drought can reduce river discharge and increase pollutant concentrations. The impact of this pollution also hurts the environment and communities around the river and can cause flooding due to the accumulation of rubbish at the bottom of the river, the emergence of various diseases from pathogenic microbes that develop in polluted river water, reduced availability of clean water, river water lacking oxygen and endangering fish life [19].

4. Conclusion

The Bah Bolon River is a river that has high historical, social, economic and ecological value for the people of Pematang Siantar and its surroundings. The condition of the Bah Bolon River experienced degradation starting when direct community interaction began to decrease, such as washing activities and community activities in using the water and its contents directly for primary needs. This causes a change in use from maintenance to neglect and even as a place to dispose of rubbish.

It is hoped that the condition of the Bah Bolon River will become the target of attention from various parties, especially the government, academics, activists, journalists and environmental observers. It is necessary to carry out outreach regarding awareness of the use of the Bah Bolon River to maintain environmental balance and health. It is hoped that an inventory of historical, social, economic and ecological facts related to the Bah Bolon River can provide solutions to overcome the problem of river pollution. In this way, community awareness and participation in protecting and preserving the Bah Bolon River can be increased.

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