

# Lubuk Larangan Local Wisdom Based on Disaster Mitigation in Bukit Lawang Plantation Village, Bahorok District, Langkat Regency

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**Abstract.** This study aims to describe the form of local wisdom and governance of Lubuk Larangan in anticipating floods in the Bahorok River, Bukit Lawang Plantation Village, Bahorok District, Langkat Regency. The research method was carried out using a qualitative descriptive approach to five informants. Data collection techniques through observation, interviews, and documentation, and analyzed through data triangulation. The results of the study show that the Bukit Lawang Tourism Awareness Group manages the Bahorok River area through the local wisdom of Lubuk Larangan by limiting the upstream and downstream areas. Management is limited to three villages, namely the Bukit Lawang Plantation Village, Sampe Raya Village and Timbang Jaya Village. The management is regulated by the three village heads by compiling rules, sanctions, and agreements on the fish harvest period. After Lubuk Larangan activities took place, the act of polluting the river has decreased.

**Keywords:** Local Wisdom, Lubuk Larangan, Bukit Lawang

## 1 Introduction

Indonesia has geographical conditions that make it an archipelagic country with diverse cultures [1]. However, it is also a country with very high hazard potential (Minister of Home Affairs Regulation Number 33 of 2006). These potentials include vulnerability to earthquakes, floods, volcanic eruptions, tsunamis, landslides, forest fires, hurricanes, and other natural disasters. However, the ancestors have created various local wisdom as an effort to anticipate natural disasters that may occur. The cultural diversity that has been created has produced a way of life as an effort to adapt humans to nature. The life guidelines implemented have high values, especially from a cultural perspective, such as religious values, love of the country, cooperation, etc. Not only in intangible form, local wisdom is also visible in tangible form in various forms of traditional houses, which, after being scientifically tested, can be a disaster mitigation effort for the local community, such as the Nias ethnic omo hada, which did not collapse in the earthquake. Apart from that, there are other forms of local wisdom, such as

implementing various traditional rituals/ceremonies intended to help ethnic groups understand the natural surroundings.

Local wisdom is an effort that can reduce the impact of disasters. Considering that local wisdom is created from humans' ability to understand the environment to survive [2], it can be understood that local wisdom created from the experience and understanding of traditional communities towards the natural environment has the opportunity to reduce the impact of natural disaster losses.

A natural disaster is a situation that threatens and causes environmental damage [3]. Disaster mitigation can be the basis for developing and preserving local wisdom. The National Disaster Management Agency (BNPB) defines local wisdom or local knowledge as a set of knowledge that local communities believe over a certain period through accumulated experience, community relations with nature, community practices and institutions and passed on between generations." The explanation of the potential strength of local communities can be studied in the local cultural wisdom of ethnic groups in North Sumatra, especially ethnic groups that inhabit spatial areas such as mountains, river areas, valleys, hills, and forests. Various local wisdoms are applied and have philosophical meaning, including understanding the disaster concept.

Through this research, community knowledge was explored in applying local wisdom based on disaster mitigation, one of which is Lubuk Larangan in the community in Bukit Lawang Plantation Village, Bahorok District, Langkat Regency. Langkat Regency is spatially dominated by river and forest areas. The final results of the research are used as material in the North Sumatra Institutional/Local Wisdom and Culture course. This aims to create students who are critical and provide solutions from an anthropological and environmental perspective in responding to socio-cultural problems, including potential natural disasters that often occur in the North Sumatra region.

Research related to disaster mitigation was carried out by Rahmatullah and Saraswati [4], namely disaster mitigation based on local cultural wisdom in the Naga traditional village, Neglasari Village, Salawu District, Tasikmalaya district. The results of this research are disaster mitigation, which has traditionally been inherent in the Naga village community due to the village's philosophy. Naga village has the Tri Tangtu philosophy on Earth, which includes territorial governance (space management), wayah (time management), and lampah (behavior). This traditional wisdom pattern is implemented through mandates and taboos and can mitigate disasters.

Furthermore, studies on disaster mitigation are based on local wisdom [5]. The research results reveal that three concepts of local wisdom are developing in disaster mitigation in society: local knowledge, local wisdom, and local genius. Meanwhile, local knowledge is implemented by the people of Brau Hamlet, East Java, in the Cok Bakal ritual. Furthermore, the people of Way Krui, Lampung, preserve local wisdom or policies through the Rempong Damar tradition. Lastly, local genius was developed by the Simeuleu Community, Aceh, through the Nandong Smong tradition. Cultural activities can minimize the fatalities and damage caused by natural disasters.

Similar studies were also conducted regarding mountain alms ceremonies as a means of disaster mitigation [6], socialization of disaster mitigation through disaster education based on local wisdom [7], disaster education based on local wisdom in strengthening character [8], and environmental disaster prevention mitigation in Central Kalimantan. [9].

Local wisdom that grows and develops in social and cultural life through human experience with the environment is for the sake of finding long-term constructive solutions. Based on natural disasters, humans try to anticipate the worst possibilities when natural disasters occur in a concept, namely disaster mitigation.

Disaster mitigation also means a form of community resilience in facing difficulties. According to Grotberg [11], resilience is the human ability to face, overcome, and become strong over the difficulties they experience. Resilience is not magic, is not only found in certain people, and is not a gift from an unknown source. Life is filled with experiences of suffering (adversity), as adversity originates from external situations such as fires, earthquakes, floods, dry seasons, bombs, family divorce, abuse, neglect, loss of work and housing, or loss of loved ones. Although most external pressures cannot be controlled, evidence shows that people's internal thought processes can simultaneously reduce the impact of adversity and prepare valuable resources to move forward by focusing on things that can be controlled [12]. Resilience is the human ability to recover from negative experiences and even become stronger during overcoming them [13].

## **2 Method**

This research uses qualitative descriptive research with an empirical approach, namely by revealing the direct experiences of informants in preserving Lubuk Larangan. The research was located in Bukit Lawang Plantation Village, Bahorok District, Langkat Regency. Lubuk Larangan, which is the local wisdom of the Bahorok River community in mitigating flood disasters. The research team determined informants with several conditions to become informants, namely Full enculturation, a person who masters and passes on a culture. Direct involvement is a person directly involved in the research topic or local culture and enough time. Based on the informant requirements that had been determined, the researcher determined several informants, namely village elders, a secretary caring for the Bahorok River, a Trash Bank Guide, a Trash Bank Manager, and a Head of the Leuser youth community.

Data collection techniques are through observation, interviews, and observations in March – April 2023. Documentation techniques are also applied to obtain data regarding the appeal to take fish in rivers according to predetermined times, which river flows are included in Lubuk Larangan, planting trees, and waste processing. The data analysis technique based on Miles and Huberman [14] is data triangulation, starting from data reduction, data presentation, and verification/drawing conclusions.

## **3 Result and Discussion**

### **3.1. General Description of Bukit Lawang Plantation Village**

Bukit Lawang Plantation Village, Bahorok District, Langkat Regency, has an area of 32.26 km<sup>2</sup>, with around 740 families. The people of Bukit Lawang Plantation Village are adjacent to Timbang Jaya Village and Sampe Raya Village. The village was formed based on the Langkat Regent's decision No.656/26/K/2022 concerning establishing a tourist village. Bukit Lawang Plantation Village upholds customs, namely Malay, Karo and Javanese culture, as well as other tribes. Bukit Lawang Plantation Village has many natural resources, flora and fauna, such as primates and rafflesia flowers. Apart from the flora and fauna, the environment is

beautiful and clean. The people of Bukit Lawang also have a form of local wisdom that is implemented and strictly maintains environmental cleanliness and utilizes used goods and household waste to become products with economic value.

The Bahorok River is located in Langkat Regency, North Sumatra Province, Indonesia and is a tributary of the Wampu River. This river is usually used for body rafting. Bukit Lawang is the name of a tourist spot in Bahorok District, Langkat Regency. Part of this sub-district is located within the Gunung Leuser National Park, including Bukit Lawang. This river flows in the northern region of the island of Sumatra, which has a tropical rainforest climate (according to the Köppen-Geiger climate classification). The average temperature a year is around 23 °C. The warmest month is February, with an average temperature of 24 °C, and the coldest is December at around 22 °C. The average annual rainfall is 2,918 mm. The month with the highest rainfall is December, with an average of 352 mm, and the lowest is June, with an average of 125 mm.

### **3.2. Forms of local wisdom of the Bukit Lawang community in mitigating flood disasters**

#### **3.2.1. Lubuk Larangan**

Lubuk Larangan is a form of local wisdom of the people in the Bahorok River area in flood mitigation efforts. The Bukit Lawang Tourism Awareness Group initiated the initial formation of Lubuk Larangan in Bukit Lawang. To start, the group sowed koi carp seeds. The Lubuk Larangan was initially formed because of people's behaviour towards fish in the river, which were often poisoned and electrocuted, and there were concerns that the habitat of small fish would be depleted. Then, the Village Head, as the administrator of Lubuk Larangan, coordinates with village elders in managing Lubuk Larangan. The process of forming Lubuk Larangan is to coordinate with the local community. If the local community agrees, Lubuk Larangan is created using upstream and downstream boundary requirements so that fish in the river cannot leave.

The village head directed them to make prohibited pits in the villages adjacent to Lawing Hill. Therefore, three villages were determined where the Bahorok River flows: Bukit Lawang Plantation Village, Sampe Raya Village and Timbang Jaya Village. Regulations between village heads were drawn up to provide sanctions if people violated them by giving 40 sacks of cement distributed to three villages and having to buy 2000 fish seeds sprinkled into the river.



**Fig. 1.** Advisory Board of Lubuk Larangan

Pak Sidik, as a village elder, said:

"Once a year, when the fish are harvested, the fish will be big and ready to be harvested, so we can harvest using fishing rods or nets. You will be charged IDR 100,000 for one fishing rod from 09.00 – 12.00. A.M."



**Fig. 2.** Four month old fish

Harvesting will be carried out together within a year or two years using fishing rods or nets. A fee of IDR 100,000 is charged for each fishing rod or net. The proceeds from harvesting fees are handed over to the mosque for construction. The harvesting process is carried out once a year, and the fish are suitable for harvest. One fishing rod costs IDR 100,000 from 09.00-12.00 A.M, with as many fishing rods as possible being allowed on condition that the size of the fish must be appropriate. Since Lubuk Larangan was opened until now, there is no longer any rubbish that pollutes the river, and people are aware that rubbish that is thrown into the river can cause fish to die and speed up the overflow of water, which can cause flooding.



**Fig.3.** Sowing fish seeds

### 3.2.2. Tree Planting

Tree planting is one of the efforts of the Bahorok River community to mitigate floods because trees can absorb water through their roots and slow down water on the surface. Planting trees reduces the volume of water entering the water system and the speed of surface water flow, which can trigger flooding in tree planting. The Bahorok River community collaborates with Project Wings, which is held every Saturday, involving the local community and its management. Tree planting is carried out on riverbanks or riverbanks with species found in the national habitat, such as matoa trees and red rambung banyan trees, which are considered vital. The community and administrators work together to help each other create a society that cares about the environment in the context of environmental conservation, which is used as an effective flood mitigation strategy because it can provide sustainable benefits in the long term.

### 3.2.3. Trash Bank

Trash Bank is a form of wisdom from the Bahorok River community in flood mitigation efforts. The Trash Bank was founded in 2020. Initially 2018, it carried out actions, but the waste was still taken to the landfill. But if it is taken to the landfill, it means just moving it. Therefore, they want the waste to be of economic value and help the community recycle it without burning it. The trash bank was established to protect the environment because Langkat is a tourist area often visited by the public and tourists. Therefore, it must maintain natural preservation to anticipate that existing disasters will not happen again, such as in 2003, namely the flood. Large flashes that result in loss of life.

Establishment of a Trash Bank, which focuses on clean action, to anticipate disasters. Anticipating is done by combing rivers, mountainsides, and residential areas of village communities, where all the waste will then be transported to the Trash Bank to be managed. Waste is turned into economic value for the community by saving or buying products from the Trash Bank, done once every six months so that they don't just look at the money they make but see how vital the waste is.

The Trash Bank management process starts with collecting waste and distinguishing between hard and ordinary plastic. These two plastics are made into products from recycled materials such as pots and key chains, which are melted down to become economically valuable craft products that can be bought and sold. Activities at the Trash Bank start at 08.00 - 16.00, and waste transportation is carried out three or twice a week.

The structure for managing Trash Bank is that each person has their duties. Managers, supervisors, and eight teams carry out waste selection and collection from customers. Some people sort the rubbish from their homes and the division helps take it to the houses. The tools used in the waste management process are plastic washing machines, plastic chopping machines, press machines and melting machines (to become a product).

### **3.3. Governance of Lubuk Larangan**

Lubuk Larangan is managed by indigenous peoples who aim to preserve and protect the Lubuk Larangan tradition. Management is a term that originates from the word manage, namely as a series of efforts to use potential as efficiently as possible to achieve planned goals. Management is a series of activities that aim to improve the welfare of the entire community sustainably. Lubuk Larangan are managed through regulations that have been approved and established and are binding. Cultural values are customary codes of conduct that function as a code of ethics to regulate, guide, and direct the actions of indigenous peoples by mutual agreement. The regulations that have been established are then passed down from generation to generation and implemented by levels of society so that they become local wisdom. Local wisdom is a positive human behaviour to interact with nature through religious values, customs, ancestral advice and local culture, which are organized into a community group so that they can adapt to the environment.

Nature is an inseparable part of humans, and natural resources fulfil the basis of life, so society's most important task is to continue to protect and preserve them. The Lubuk Larangan on the Bahorok River, which was just implemented in the 12th month of 2022, was formed by village officials, involving the entire community in the three villages, namely Perkebunan Bukit Lawang Village, Sampiraya Village, and Tunggal Jaya Village, as well as the help of elders.

### **3.4. Values contained in the local wisdom of the Bukit Lawang community in mitigating flood disasters**

#### **3.4.1. Economic value**

A Trash Bank program helps manage waste well, ultimately providing economic benefits for the community. In this program, the collected waste is grouped by type and calculated by weight. Types of inorganic waste such as paper, plastic bottles and glass are sold to waste collectors or recycling factories to be processed into new products. The proceeds from this sale are then distributed back to the community, who donate waste to the Trash Bank. Throw garbage allows the community to earn additional income from waste management. Apart from that, Trash Banks also play a role in increasing public awareness about sorting waste and managing it well to help reduce the amount of waste thrown away carelessly and maintain the cleanliness and health of the environment. Even though the income generated from the Trash Bank is not significant, this program still provides benefits to the community in reducing waste that is thrown away carelessly.

#### **3.4.2. Value of Solidarity**

Disaster mitigation can utilize the vital Value of local wisdom, namely solidarity. Solidarity is an attitude of solidarity, a sense of togetherness in the group's interests, and a feeling of sympathy for a particular group. Solidarity in local wisdom can be interpreted as mutual assistance and cooperation between residents in overcoming their problems, including disaster situations. Solidarity can be done by helping each other and jointly preparing ourselves to face disasters. Apart from that, solidarity can also strengthen coordination and communication

between residents in facing disasters. In disaster situations, communities that have strong solidarity more easily take appropriate action and are organized effectively to reduce the disaster's impact.

Solidarity in the Bukit Lawang Plantation village community can be seen in the togetherness of the village residents in protecting the environment, starting from protecting the river, sorting waste, and planting trees. The community carries out these efforts based on their awareness of the environment and preventing flood disasters.

#### 3.4.3. Adaptation value

Adaptation is a behaviour change to suit the environment, while changing the environment to suit behaviour is called adjustment. Adaptation in preventing disasters leads to the community's ability to adapt to environmental changes that occur due to disasters, including post-disaster handling and recovery. Local wisdom often has wisdom in adapting to changing environments and situations, which can be implemented in disaster mitigation. For example, in local wisdom in riverbank areas, people have developed various adaptation techniques to disaster threats such as floods. The Bukit Lawang community created groups and policies to prevent flood disasters, such as preserving Lubuk Larangan and creating a Trash Bank.

#### 3.4.4. Value of Openness

The Value of openness is the Value of knowledge that the truth of a mathematical statement or idea is open to be investigated by anyone as long as they have related knowledge. In local wisdom, there are several ways to create openness, such as sharing information between community members, attending training and workshops on disaster mitigation, and adopting new technology to help disaster mitigation efforts. To prevent disasters, openness can help improve society's ability to face disasters by providing access to information needed for planning, action and preparation in facing disasters. Openness can also strengthen solidarity and cooperation between the community and various related parties in disaster mitigation efforts. One example of applying the Value of openness in disaster mitigation is providing access to information about disasters, such as evacuation routes, types of disasters that may occur, and how to deal with disasters. In addition, by being open to information about new technology or methods in disaster mitigation, people can learn and adopt this technology to improve their ability to face disasters. The people of Bukit Lawang village are aware of the importance of this openness, which has resulted in the community's local wisdom leading to efforts to prevent flood disasters. The community knows the function of trees as a soil binder, so people go through Lubuk Larangan to plant trees.

#### 3.4.5. Environmental conservation value

The value of environmental conservation is closely related to local wisdom because local people usually have good knowledge and practices about protecting the surrounding environment. For example, the local wisdom of the Lubuk Larangan community can help preserve fish in the river by maintaining the irrigation river wisely and sustainably. In this case, the value of environmental conservation is significant to preserve natural resources and a healthy environment for future generations. Conservation was born as a result of a need to preserve natural resources that were felt to threaten the environment, such as potential flooding. Conservation of local wisdom can help increase community resilience to disasters. For example, communities can obtain their living needs independently and sustainably by maintaining local wisdom in using natural resources. Lubuk Larangan local wisdom plays a vital role in river conservation in Bukit Lawang. It can be seen from the condition of the river, which is clean, well-maintained, and still popular with tourists.



#### 3.4.6. Spiritual values

Spiritual values are an understanding that refers to values related to aspects of life that are not physical or material, such as beliefs, morals, ethics, beliefs, and relationships with God or a higher power. Many consider spiritual values higher or more profound than material or physical values. The spiritual value of Lubuk Larangan local wisdom is said to be highly respected by the local community. Spiritual values in Lubuk Larangan local wisdom are reflected in efforts to maintain harmony and balance between humans and nature, as well as religious values applied in everyday life. One example of spiritual values in Lubuk Larangan local wisdom is the belief in ancestral spirits from the rituals performed. The community believes that there is a role for spiritual matters in the local wisdom of Lubuk Larangan. Therefore, it is also one of the supporting factors for preserving Lubuk Larangan in Bukit Lawang.

## 4 Conclusion

Based on the research results, there is local wisdom in the Bukit Lawang Plantation Village, namely Lubuk Larangan. Tree planting is also routinely and continuously carried out, and waste management is carried out through the Trash Bank. Lubuk Larangan has a management structure: Chairman, Secretary, and Treasurer. There are also related parties, such as the village head, elders, community, and Bhabinkatibmas and Bhabinsa, who have their respective duties. Governance in the form of local wisdom based on Lubuk Larangan involves the entire structure. Governance in tree planting involves stakeholders in the three villages to be involved in their maintenance and upkeep. Trash Bank has a governance structure: Director, Secretary, Treasurer, and Division. The values contained in local wisdom in efforts to mitigate flood disasters in Bukit Lawang Plantation Village are economic, solidarity, adaptation, openness, environmental conservation, and spiritual values.

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