
Ethnoecology Local Communities on Kasboyo Lake: Exploration of Conservation Values Using the Ethnoscience Approach as a Source of Natural Science Learning

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Abstract

Local wisdom has noble values that apply to community life, such as protecting and managing the environment in a sustainable manner. Human efforts in adapting, managing, and living in harmony with their environment are known as ethnoecology. The study aimed to analyze the conservation values of the Kasboyo lake ecosystem in Kampar district, Riau. This study used a case study design with a qualitative approach. Data collection was carried out in the Simpang Petai Village, Rumbio Jaya District, Kampar Regency, Riau Province. The research subjects consisted of six people consisting of traditional leaders, village officials, and local communities with snowball sampling. Data collection techniques using interviews, observation, and documentation. Data analysis uses the Miles-Huberman model, including data reduction, display, and concluding. The results showed that the local community had an agreement with the prohibition of fishing, waste disposal, and environmental destruction. The local communities around the Kasboyo Lake area have applied conservation principles. Local community knowledge contains conservation values, including environmental care, creativity, and humanism. So it is hoped that this local wisdom can be used as a source of science learning to foster students' conservation character

Keywords: ethnoecology; Kasboyo lake; local wisdom; science learning

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INTRODUCTION

Humans and their environment are essentially a unit that always occurs adaptation-interaction. The complexity of human-environment interactions is influenced by biotic and abiotic elements (Hilmanto, 2010). The interaction between humans and their environment creates a community characteristic called a culture (Simbiak, 2016). Humans have creativity, taste, and intention so that they can adapt to their environment. Through their abilities, humans can manage and utilize all the local potentials around them. The environment provides resources to maintain human survival. So, we can use an ethnoecological approach to learn about the interaction between humans and their environment.

Ethno-ecology is how local people interpret their environment and live in harmony with their natural and social environment (Hilmanto, 2010; Simbiak, 2016). In general, traditional community life is very close to nature. Humans observe nature well and recognize its characteristics to reconstruct the results of their observations into traditional knowledge. Perkiömäki (2020) suggests that ethnoecology or cultural ecology as science can explain how humans adapt to a particular geographic environment. Thus, ethnoecology involved human efforts to adapt to the environment, use the environment, and harmonize. Ethnoecological research utilizes data derived from the local wisdom of the local community, so the data is used to understand aspects of the environment.

Local wisdom is a way of life of society. They carry out life strategies in overcoming problems and fulfilling their needs. Local knowledge is often also conceived as a local intelligence local genius (Khusniati, 2014; Sudarmin, 2014). The local community carries out various strategies to maintain their culture. Local knowledge (indigenous science) is sometimes ignored by the scientific community even though this knowledge is essential in the development of science (Winarto & Choesin, 2014). The community knows natural resource management, especially in supporting the sustainability of an ecosystem. On the other hand, local knowledge also changes due to social, cultural, physical, political, and religious changes.

Local wisdom is a characteristic that is by their respective regions. Society passed down from generation to generation to the next generation. It positively impacts the environment

because it directly or indirectly protects the environment and prevents environmental damage (Pawarti, Purnaweni, & Anggoro, 2012). One of the issues to be considered at present and in the future concerns the quality of environmental management through the re-actualization of local wisdom in community empowerment (Sinapoy, 2018). As a collective product of society, local wisdom is functioned to prevent human arrogance and greed in exploiting natural resources without destroying the sustainability of life. Improving the quality of environmental management requires the ethical commitment of local communities and stakeholders in adaptive behavior in utilizing natural resources supported by pro-environmental development policies.

Then in Law Number 32 of 2009 concerning Environmental Protection and Management, Article 1 paragraph 30 explains the meaning of local wisdom and customary law communities. Local wisdom is a noble value that applies in the community's life, including protecting and managing the environment in a sustainable manner. Next, paragraph 31 explains customary law communities, namely groups of people who have lived in some geographic regions for generations because of ties to ancestral origins, a strong relationship with the environment, and a value system that determines economic, political, social, and legal institutions.

Natural Science is a systematic effort to create, organize and build knowledge from natural phenomena (Kemendikbud, 2016). Science learning is very relevant to local wisdom because it is about the surrounding environment. Learning to use the environment as a source and object of learning can lead students to link academic lessons with real-life contexts. Science learning uses science to achieve educational goals that expect students to understand the problems that exist in their environment. The expected output of science learning is that students have scientific literacy and environmental literacy. Research shows that The environmental context is related to science learning . (Aldeva Ilhami, Riandi, & Sriyati, 2018).

Science learning is essentially about the surrounding environment (Tillery, Enger, & Ross, 2011). Science learning expects junior high school graduates to understand the surrounding environment or environmental literacy because science learning is closely related to events or phenomena in the surrounding environment. One of the outputs of science learning should be

to form students who have the character of caring for the environment. In line with the science education curriculum, students can apply the science competencies learned in school and utilize the environment as a learning resource (Kemendikbud, 2016). Then, local cultural contexts can improve students' environmental literacy (Edsand & Broich, 2020; Fang dkk., 2018; A. Ilhami, Riandi, & Sriyati, 2019).

As research by Wijana (2015) shows, the integration of local wisdom-oriented character education in environmental science courses can improve the soft skills of biology students. The local culture integrated with the learning model is called the local culture-based learning model. This model is quite effective in improving junior high school students (Suastra, 2013). The use of local wisdom contexts is essential for science teachers to use in the classroom. Students find it easier to construct their knowledge. Teachers also take part in preserving the local potential to not become extinct over time (Pieter, 2016). We hope students have a conservation character.

Conservation is an effort to protect and preserve cultural values and human behavior in interacting with the environment (Yulhendri, Hamdi, & Ritonga, 2019). Conservation character can maintain environmental stability for the future. There are eight conservation character values, namely Inspirational Values, which means ideas or ideas to do something intentionally or unintentionally without knowing any place, time, or condition. Humanist values, namely the attitude of someone who respects others and fights for social life based on humanitarian principles. The value of caring is the ability to pay attention and an attitude that always tries to prevent environmental damage and strives to repair environmental damage. Innovative value, namely the ability to utilize thought and imagination in producing new products (renewal). Sportive values, namely being chivalrous and willing to admit the opponent's superiority and his own mistakes. Creative values, the ability to think or act to solve problems intelligently. Honesty values are behaviors based on efforts to make themselves people who can always be trusted in words and actions. Justice values, namely the nature of actions that are impartial towards or only has a tendency to side with the right (Purnomo, 2014; Saddam, 2019).

Indonesia has a diversity of local knowledge related to patterns of adaptation to the environment and continues to be passed down from generation to generation for the next

generation. This local knowledge becomes a guide in utilizing natural resources and the environment. Therefore, local wisdom is essential to be studied and preserved in a society in order to maintain a balance with its environment and at the same time be able to preserve its environment (Suhartini, 2007). Many local pearls of wisdom that until now continue to be role models for the community, among others in Java, such as *pranoto mongso*, *nyabuk gunung* who suggest that agricultural areas be planted with plants to prevent erosion and make swales to follow contour lines (Suhartini, 2007); water resource management (Aulia & Darmawan, 2010); management of fisheries resources in Riau (Aldeva Ilhami dkk., 2020); The Bedouin community in the form of great-grandfather and pikukuh and the tenets of precepts (Suparmini dkk., 2013).

Kasboyo Lake is one of the lakes located in Kampar district, Riau Province. This water area is a forbidden area for fish or other biotas to be taken. The community in the village agreed not to take anything in the lake, either catching fish or throwing garbage into the lake. If there are still people who catch fish or throw garbage in the lake, it will be a disaster. The tradition has been around for a long time and is still true today.

Based on the explanation above, it is essential to analyze the values of local wisdom to be used as a source of science learning. Then the integration of the values contained in local wisdom is expected to contribute to cultivating students' character who cares about the environment. The purpose of this study is to analyze the conservation values of the Kasboyo lake ecosystem.

METHOD

This study used a qualitative approach. According to Moleong (2015) qualitative method is a research procedure that produces descriptive data in the form of written and spoken words from people and observable behavior. The research design used is a case study commonly referred to as CSR (Case Study Research).

This research was conducted in Simpang Petai Village, Rumbio Jaya sub-district, Kampar Regency, Riau Province. Collecting data was conducted in May. The subject of this study used six respondents consisting of elements of traditional leaders, village officials, and local communities in Hamlet III Kubucubadak Simpang Petai Village, Rumbio Jaya District, Kampar Regency. Subject selection was carried

out using snowball sampling, a method for identifying, selecting, and taking samples in a continuous chain of relationships based on information from previous respondents.

Data collection techniques were carried out using observation and interviews. The information extracted in the interview is history, management rules & strategies, indigenous knowledge of the community, and community leaders' role related to the local wisdom of Kasboyo lake. Data analysis used the Miles-Huberman model, namely data reduction, display data, and concluding. The results of interviews, observations, and documentation will organize the data into categories, describing them into units, synthesizing, arranging into patterns, choosing which ones are important, and making conclusions

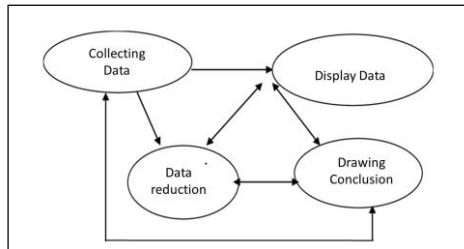


Figure 1. Data Analysis

RESULT AND DISCUSSION

Lake Kasboyo is located in Hamlet III Kubucubadak Simpang Petai Village, Rumbio Jaya District, Kampar Regency, Riau Province. This Kasboyo lake area is one of the local cultures managing waters resources found in Riau. Other regions do not widely know this area because it has not been widely promoted. This area is only familiar to people in the Kampar district, especially the Simpang Petai village



Figure 2. Danau Kasboyo

Based on interviews with traditional leaders regarding the history of Kasboyo Lake,

the name comes from the wrong name of the community,

“Dulu du ado kisabnyokan terjadi banjir bandang bapo taun yang lewat lah yo pokoknya ado dulukan taun bilo terjadi banjir bandang sudah tu ado namo seorang pemuda namonyo kasboyo, jadi pas terjadi banjir bandang tu inyokan alur jalan tu putus dek gara-gara banjirkan, pas dijembatan tu inyo nekat lewat situ, tulah anyuik nyo tebok dek arus makonyo dipakan namo danau du namo inyo danau kasboyo dai situlah muncul bahwa masyarakat du alah sepakat samo perangkat desa samo sodo-sodo bagian adat dikampuong kokan, petamo ndak bulio menangkap ikan disitu, kedua ndak membuang sampah itu larangannyo, ikan apojulab ndak bulio menangkap hewan-hewan yang ado disitu”.

The local community gave the name of the area as Kasboyo Lake because of the flash flood. However, the disaster caused one of the villagers named Kasboyo to die and disappear in the lake. Since then, the village people have agreed not to take anything in the lake, either catching fish or throwing garbage into the lake.

People believe that there is a mystical disturbance if there are people who violate the agreement.

“Larangan ko lebih kemistis, menurut uang siko kalo diambiok bongi penghuni yang ado disitu, kalo sanksi atau hukuman kalo disiko mdak ado do mungkin percayaan-percayaan urang siko inyo akan mendapek musibah melanggar aturan itu kepada diyinyo sendiri, musibahnya mungkin bisa jadi tibo-tibo sakik gitu”.

(Interview with Mrs Fatimah)

The rules that bind the community are in local customary rules, and there are no legal rules.

“kalo sanksi gak ada ya, kan karna ini sudah menjadi kepercayaan masyarakat ya kao ada aja orang yang menangkap ikan orang itu akan menjadi sakit, kaya jadi diikuti sama penunggu danau” dari pernyataan di atas alasan, apabila melanggar dampaknya adalah akan diikuti oleh penunggu danau kasboyo dan mendapat musibah bisa berupa sakit

(Interview with Mrs. Heni)

Based on the explanation above, this prohibition can make people not catch fish and throw garbage in Kasboyo Lake. It is closely related to environmental conservation in the Kasboyo lake area. Mystical beliefs cause no local community to dare to catch fish and litter or damage the lake environment. Thus, the existence of mystical beliefs of the local community affects maintaining its sustainability and not being polluted by fish populations and other aquatic biotas.

The local community understands the impact of environmental pollution on environmental sustainability.

“danau du jadi loda, tu ikan-ikan di dalam tu ndak bisa bebas, ndak bisa leluasa dek banyak sampahkan, tercemar lo lingkungan.

From the explanation given by the respondent, throwing garbage in Kasboyo lake could pollute the lake so that it would disturb the lake ecosystem, such as fish and other aquatic plants could become extinct. Then these actions affect the quality of the water to be wrong and cause flooding. This is due to the lake being shallow, causing water to overflow into people's homes during heavy rains. Therefore, the community understands the meaning of the ban on Kasboyo Lake as a form of preserving the

lake's preservation of fish, plants, water, soil and preserving local customs.

The village government has also contributed to ecosystem preservation. it is shown in the form of persuasive invitations to the community through the pamphlet

“ Dai uang desanyo ado membuek pamphlet aturannyo disekitar danau”

This action is a form of community effort in inviting the surrounding community to protect the lake ecosystem. Collective agreements must be adhered to by the local community. Reconstruction of knowledge of local communities around Lake Kasboyo into related knowledge about environmental management, environmental resources, regulations, and their use is presented in Table 1.

Table 1. Reconstruction of knowledge of the community around Lake Kasboyo into scientific knowledge

Indigenous Knowledge	Scientific explanation	Character
1. People are prohibited from taking fish.	Kasboyo Lake was formed to prohibit taking fish to preserve the lake ecosystem, and as a form of conserving resources, aquatic	environmental care
2. People should not throw garbage	Garbage disposed of in rivers will cause river water to be polluted, both in color, smell and taste. Furthermore, if there are people who are still bathing in the river, it will cause itching. The accumulation of garbage will block the flow of rivers and cause river water to overflow and eventually flood	Environmental care
3. There is a disaster such as illness caused by "lake guards" or genie for those who violate the prohibition on Kasboyo Lake	A form of stimulation for the community to obey the rules, with the primary objective of protecting Kasboyo Lake from fishing and littering. It is an effort to save and preserve the aquatic environment and environmental resources	Humanism
4. The existence of a signboard containing orders prohibiting fishing and throwing garbage in Kasboyo lake.	Form of community agreement not to catch fish. Mutual agreement without any sense of compulsion affects preserving the environment and preserving natural resources to be a shared responsibility. It also illustrates the nature of cooperation between each other.	Creative
5. People may visit to enjoy the beauty of Kasboyo lake, but they are not allowed to catch fish and litter.	There is an element of utilization that the community can enjoy. Kasboyo lake has a clean environment and an ecosystem that is still maintained; because of the wisdom in the use of aquatic resources that must be limited so that it is balanced with the ecology, fisheries diversity is maintained and sustainable with an awareness of a harmonious attitude and is also very good to visit and as a learning resource	Environmental care

The local wisdom of the community around the Kasboyo lake area has conservation values. The prohibition on catching fish and other biota has led to environmental conservation, such as maintaining the food chain. Then there is a ban on throwing garbage to avoid environmental pollution due to household waste. It keeps the lake water from being contaminated with harmful substances that can affect the ecological balance.

Local people who live in balance and side by side with nature have knowledge passed down from generation to generation about how to fulfill their needs without destroying nature. It is supported by the opinion of Nelson & Shilling (2018) namely "a local community who lives in ecological balance with nature, is regarded as an environmental expert and the keeper of the wisdom of an equitable and sustainable traditional resource management system."

The quality of environmental management is one issue to be considered at present and in the future. It can be realized through the actualization of local wisdom in community empowerment. As a collective product of society, local wisdom is functioned to prevent human arrogance and greed in exploiting natural resources without destroying the sustainability of life. Therefore, improving the quality of environmental management requires the ethical commitment of local communities together with stakeholders in adaptive behavior in utilizing natural resources supported by pro-environmental development policies (Nurhadi Santosa, St. Budi Waluya, 2013).

Local wisdom can be integrated into science learning by reconstructing the original science in the local community. Kasboyo lake, located in Rumbio Jaya, Kampar, has the potential to learn science. Local communities have conservation principles based on hereditary beliefs. However, from a scientific perspective, this area is a breeding zone for fish, thereby preventing fish from extinction. This area is an area for spawning and spawning fish to continue their offspring. The use of the Kasboyo lake context can strengthen the science concepts that students have learned with the phenomena around them. So, the role of the teacher is crucial to help students obtain the concepts to be studied. Teachers as facilitators in learning can encourage students to develop critical thinking skills. Students not only follow traditions but can take scientific meanings that are stored in local traditions or culture.

Educators have realized the use of the environment as a learning resource, as explained earlier, for a long time. However, this awareness does not mean that the environment has been used optimally as a learning resource in schools in supporting teaching and learning activities themselves. The learning process is influenced by various factors, including teacher factors, funding factors and institutions. In relation to the use of the environment as a learning resource, it depends on the teacher's creativity, the teacher's ability, the available time and funds, and other policies (Rapi, 2012).

The surrounding environment stores almost unlimited types of learning resources and media. In this study, the environment used as a learning resource is the Kasboyo Lake area. One of the potentials of Lake Kasboyo that is very useful for learning is being used as a source of science learning, namely to cultivate the character of caring for the environment in students so that they can maintain and preserve Lake Kasboyo. Human awareness and concern for the environment can grow naturally but must be continuously formed from an early age.

CONCLUSION

The Kasboyo Lake area applies conservation based on local community knowledge. A ban on fishing, garbage disposal, and environmental destruction causes the Kasboyo Lake area to be maintained. The conservation character contained knowledge of the local community, namely the value of caring for the environment, humanism, and creativity. So it is hoped that the Kasboyo lake area can be used as one of the sources of science learning to foster the conservation character of students

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