



Local Wisdom for Conservation and Anticipation of Climate Change in Kandri Semarang

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Abstract. Kandri Village is one of the villages in the Gunungpati District, Semarang City, geographically located on the outskirts of Semarang City. The purpose of this research is to analyze the forms and meanings of local community wisdom as an effort to adapt to climate change and conservation efforts. This research employs qualitative methods to gather data on local wisdom. A phenomenological approach is also chosen to uncover the meanings of concepts or phenomena based on the community's consciousness. This study was conducted in Kandri Village, Semarang. The focus of this research is on the forms and meanings of local wisdom in the Kandri Village community related to climate change and conservation. The sources of data in this study include phenomena, symptoms, informants, activities, behaviors, locations, and documents. The data obtained were analyzed descriptively and qualitatively through data reduction, data display, and conclusion. There are several forms of local wisdom in Kandri Village, each with different objectives. The local wisdom in Kandri Village includes Nyadran Kali or Sendang, Nyadran Desa or Kubur, Sesaji Rewandra, Nyadran Kreo, Mahakarya Legenda Goa Kreo, Arak-Arakan Lampu Obor, Apitan Goa Kreo, and Barikan. Nyadran Kali is performed to preserve water sources. Sesaji Rewanda is aimed at conserving the biosphere, specifically the preservation of the monkey population in Goa Kreo. The local wisdom in Kandri Village must be preserved through generations using a contextual approach by involving young people in every village activity.

Keywords: Conservation, climate change, local wisdom.

1 Introduction

Local wisdom is an invaluable treasure that plays a crucial role in environmental conservation in Indonesia. Traditions such as Nyadran Kali or Sendang, Nyadran Desa, Sesaji Rewandra, Nyadran Goa Kreo, and Barikan are examples of local wisdom in Kandri Village related to water and environmental conservation, maintaining cleanliness and sustainability of sacred places, respecting ancestors and spirits, and sustainable natural resource management [1].

Climate change is a global phenomenon that has become a major concern over the past few decades. Its impact is felt not only at the macro level but also at the local level, including in remote villages like Kandri Village. Located in the Gunungpati Subdistrict, Semarang City, Kandri Village is rich in culture and tradition, with characteristics that set it apart from other villages in terms of local wisdom. This local wisdom has been

practiced in the daily lives of Kandri Village residents for a long time. It encompasses agricultural practices, natural resource management, and social systems that are adaptive to environmental changes.

Climate change is a long-term alteration in global weather patterns, primarily caused by human activities. Greenhouse gases such as carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) come from the burning of fossil fuels, deforestation, and intensive agricultural practices, significantly contributing to global warming [2]. Studies show that global temperatures have risen by about 1°C above pre-industrial levels, and if this trend continues, global temperatures are predicted to increase by more than 1.5°C between 2030 and 2052 [3]. Research indicates that the impacts of global warming already include an increase in extreme weather events, polar ice melt, and rising sea levels threatening coastal areas [4]. Moreover, Xu et al. (2020) highlight that climate change directly affects biodiversity [5]. Other studies have found that many species face the risk of extinction due to rapid habitat and climate changes. Additionally, climate change affects migration patterns and reproductive timing of various species, leading to ecosystem imbalances [6].

In Indonesia there are indigenous communities of Baduy in Banten also have local wisdom that plays a role in mitigating climate change. The Baduy community uses sustainable farming and indigenous forest management methods that preserve biodiversity and prevent deforestation. They plant different kinds of crops in turn and keep the forest as a conservation area that should not be exploited [7][8].

One important example of local wisdom in anticipating climate change is the "Ngitili" farming practice in Tanzania. Ngitili is a traditional system of cattle feed storage and land conservation carried out by the Sukuma tribe. This practice involves closing certain areas for the restoration of natural vegetation during the rainy season, which is then used as cattle feeding during the dry season. This system has proven to be effective in improving food sustainability, improving soil quality, and improving biodiversity [9][10][11].

Additionally, in India, indigenous communities in the Himalayan region practice an agroforestry system called "Baranaja." This system involves planting various crops simultaneously on the same land to enhance resilience against climate variability. Baranaja helps improve soil fertility, reduce the risk of crop failure, and provide diverse food sources that are more resilient to climate change [12][13][14].

In the context of climate change, the local wisdom of Kandri Village plays a crucial role in mitigation and adaptation efforts. Local wisdom for environmental conservation includes anticipatory measures for climate change. Traditional agricultural practices emphasizing sustainability, wise use of natural resources, and strong social systems all contribute to community resilience against climate change. This study aims to explore the local wisdom possessed by the Kandri Village community in facing the challenges of climate change. Through a qualitative and participatory approach, this research will identify and analyze various local practices effective in anticipating the impacts of climate change and explore their potential application on a broader scale [15].

By understanding and appreciating local wisdom that has proven resilient to environmental changes, we can learn how to integrate traditional knowledge with modern technology to create more holistic and sustainable solutions. Therefore, this

research not only contributes to scientific knowledge but also has the potential to provide practical benefits for local communities and policymakers in facing the increasingly evident threats of climate change.

2 Method

This research employs qualitative methods to gather data on local wisdom. A phenomenological research approach is also chosen to reveal the meaning of concepts or phenomena of experiences based on the consciousness of a community. The study was conducted in Kandri Village, Semarang. The focus of this research is the forms and meanings of local wisdom present in the Kandri Village community and its relation to climate change and conservation. The data sources for this research include phenomena, symptoms, informants, activities, behaviors, locations, and documents [16]. Informants in this study consist of village residents, the village head, village officials, tourists to Kandri Village, and the general public. Informants were selected using purposive sampling techniques. They were chosen from the community as they are directly involved in knowing, understanding, and applying local wisdom [17]. The key informant in this study is the village head, selected due to their important role and understanding of local wisdom activities in Kandri Village. Data collection was conducted through observation, interviews, and documentation. The data obtained were analyzed descriptively and qualitatively through reduction, data presentation, and conclusion [18].

3 Result and Discussion

3.1 Forms of Local Wisdom in Kandri

Local wisdom is a cultural heritage passed down through generations, reflecting knowledge, values, and practices that have proven effective in maintaining the balance between humans and their natural environment. Kandri Village, located in Gunungpati Subdistrict, Semarang City, is bordered administratively by Sadeng Village to the north, Pongangan and Nongkosawit Villages to the east, Jatirejo Village to the west, and Cepoko Village to the south. It is an example of a community that has successfully preserved its local wisdom amidst the currents of modernization. The diverse traditions and cultural practices in Kandri Village not only reflect the cultural identity of its community but also play a significant role in natural conservation efforts and sustainable resource management.

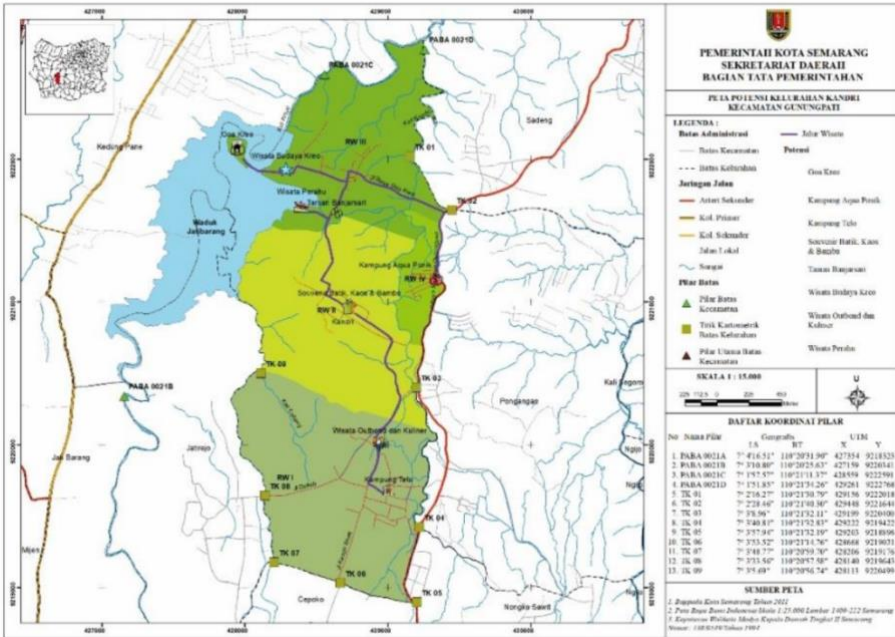


Fig. 1. Map of Kandri sub-district
Source: <https://kandri.semarangkota.go.id/>

The various traditions and cultural practices in Kandri Village not only reflect the cultural identity of its community but also play a crucial role in environmental conservation efforts and sustainable resource management. Traditions such as Nyadran, Barikan, and harvest thanksgiving celebrations demonstrate how the local community integrates spiritual and ecological values into their lives. Through these practices, the people of Kandri Village can maintain ecological balance, enhance food security, and preserve harmonious relationships with their surrounding nature.

Kandri Village is situated in an area rich in natural resources, and its community has developed various methods to manage these resources sustainably. The local wisdom they practice not only aids in environmental conservation but also in facing the challenges of modernization and climate change. By utilizing time-tested traditional knowledge, the Kandri Village community shows that local wisdom can provide a strong foundation for sustainable development and community welfare.

Overall, Kandri Village serves as an inspiring example, particularly in the Semarang City area, of how local wisdom can be preserved and developed to support environmental conservation and community well-being amid the dynamics of changing times. This local wisdom is not only crucial for the local community but also offers valuable lessons for the global community in striving to balance development and nature conservation. The following **Table 1 and Figure 2 - Figure 7** summarize the various forms of activities or local wisdom that exist in Kandri Village and the meaning of conservation and anticipation related to climate change..

Table 1. Forms of Activities Or Local Wisdom In Kandri

Form of Activity	Meaning for the Community	Meaning of Conservation	Meaning of Anticipating Climate Change
Nyadran Kali or Sendang	An annual tradition held in Kandri Village every Thursday Kliwon of the month of Jumadil Akhir at Sendhang Gedhe	a form of gratitude of Kandri residents for the availability of abundant water (nature conservation and ancestral culture)	Community efforts to maintain water quality and quantity
Village Nyadran	Send prayers to the ancestors at the Siwarak Village Tomb	Preservation of local culture with performing arts	people can better understand the importance of protecting the environment
Rewandra offerings	a form of gratitude to God Almighty for gifts and safety by carrying four gunungan (crops) in procession.	By keeping these places sacred and free from destruction, these rituals indirectly aid nature conservation. People are less likely to damage or exploit places that are considered sacred.	By making offerings, people show gratitude and respect for nature, which indirectly encourages more environmentally friendly and sustainable behavior.
Nyadran Gua Kreo	Kreo Cave area cleaning event every Sunday Pahing of Muharram month.	Prevent the accumulation of waste that can damage the local ecosystem and threaten the life of flora and fauna around the cave.	The cleanliness of the environment around Kreo Cave supports the health of the local ecosystem. Healthy ecosystems, such as small forests or vegetation around caves, can absorb more carbon dioxide from the atmosphere, helping to reduce greenhouse gas concentrations.
Legend of Kreo Cave	Event (theater) that tells the story of Goa Kreo during the time of Sunan Kalijaga	Understanding the history and values inherited by figures such as Sunan Kalijaga, people can be more appreciative by taking care of historical sites such as Goa Kreo.	cerita sejarah dikaitkan dengan pesan-pesan lingkungan, penonton dapat memahami pentingnya menjaga alam dan bagaimana perubahan iklim dapat mempengaruhi situs bersejarah seperti Goa Kreo.
Barikan	A form of community gratitude for the crops of Kandri Village is carried out in the month of Zulhijah.	Through this barikan celebration, cultural values and local wisdom related to the management of natural resources (crops) can be preserved and continued.	Barikan in Kandri Village is not only a cultural and spiritual tradition, but can also serve as a platform to educate, remind, and motivate the community to take more environmentally friendly and sustainable steps in the face of climate change.



Fig. 2. Nyadran Kali or Sendang.
Source: <https://jadesta.kemenparekraf.go.id/>



Fig. 3. Village Nyadran
Source: <https://inilahjateng.com/>



Fig. 4. Village Nyadran
Source: jatengtravelguide



Fig. 5. Rewandra offerings
Source: <https://www.ayosemarang.com/>



Fig. 6. Nyadran Gua Kreo
Source: jateng.tribunnews.com



Fig. 7. Barikan
Source: <https://pariwisata.semarangkota.go.id/>

3.2 Local Wisdom for Conservation

Local wisdom is a priceless treasure for people in many parts of the world. Behind the cultural heritage that has been passed down from generation to generation, there are also deep values about the relationship between humans and their natural environment [9][10][11]. Especially in Indonesia, local wisdom not only reflects spiritual and cultural richness, but also has a crucial role in environmental conservation [22]. Traditions such as religious rituals, traditional ceremonies, and daily practices of communities are often rooted in the principles of sustainable natural resource

management. In this context, every action to maintain local wisdom is not only a preservation of cultural identity, but also a strategic step to preserve the ecosystems that support our lives [13][14]. Through respecting the heritage of the ancestors, the current generation not only continues the tradition, but also takes care of life on earth that is increasingly vulnerable to climate change and human activities. Some concrete examples of the application of local wisdom in Kandri Village in environmental conservation efforts are the Nyadran Kali or Sen-dang tradition, Nyadran Desa, Sesaji Rewandra, Nyadran Goa Kreo, and Barikan.

Nyadran Kali or Sendang is a local wisdom practiced around a river or spring and has a close relationship with water and environmental conservation. This tradition is not only a spiritual effort to honor water sources as life, but also teaches people the importance of keeping water sources clean and sustainable [15][16]. By performing periodic cleaning and respecting rituals, such as those in Nyadran Kali or Sendang, the community maintains the quality of water and the surrounding ecosystem.

Nyadran Desa conducted at the village level often involves cleaning and honoring the graves of ancestors and other sacred places. These activities not only strengthen the cultural identity of village communities, but also promote awareness of the importance of keeping the environment clean. By maintaining the Nyadran Desa tradition, communities are not only preserving spiritual and cultural values [27], but also participating in the conservation of the environment that surrounds and protects holy places and their surroundings.

Rewandra offerings are a form of respect for the spirits of ancestors or respected figures in the Kandri Village tradition. This tradition is not only a spiritual expression, but also reflects respect for Sunan Kalijogo's history at Kreo Cave and local heritage. By making offerings on a regular basis, the community maintains a connection with the past as well as the inherited values of courage, wisdom and prudence [28]. This provides awareness of the importance of preserving cultural heritage and local history in the context of conserving cultural identity and cultural values.

Nyadran Goa Kreo performed in Goa Kreo is not only a religious ritual, but also has implications in nature conservation. Kreo Cave is often considered a historical place that needs to be kept clean. Through Nyadran Goa Kreo, the community maintains the cleanliness of the cave and its surroundings, which is important for maintaining the natural habitat, especially the long-tailed macaque and the biodiversity around the cave.

Goa Kreo legends or stories about Goa Kreo are not only part of the community's oral heritage, but also enrich understanding of the importance of environmental conservation. The stories about Sunan Kalijaga and the monkeys that guard Kreo River can reflect the relationship between humans and the surrounding nature and the importance of maintaining harmony between the two. By maintaining and promoting these stories, the community is helping to preserve the natural and cultural treasures [29] surrounding Kreo Cave.

The Barikan tradition involves the people of Kandri Village bringing food from the crops, followed by prayers and eating the food. Barikan has a meaning as a form of gratitude of the Kandri community for the abundance of sustenance given by God. By asking for blessings and safety, the community also indirectly realizes the importance of maintaining ecological balance. It is also associated with conservation in the context of sustainable natural resource management. The maintenance of natural beauty as an effort to obtain blessings [30] and abundant sustenance is a reflection of the awareness

of the relationship between environmental conservation and the spiritual well-being of the community.

Thus, each of the above traditions not only plays an important role in the spiritual and cultural life of the community, but also contributes to the conservation of nature and the environment around them.

3.3 Local Wisdom for Climate Change Anticipation

Nyadran Kali or Sendang: The Nyadran tradition around the river or spring shows a close relationship with water conservation. The community not only cleanses and honors water sources as life, but also understands the importance of maintaining critical water quality and availability in the face of climate change, which can affect rainfall patterns and the water cycle [31].

Nyadran Desa involves the whole community in cleaning and honoring sacred places and ancestors. This practice is not only a spiritual endeavor, but also reflects a commitment to safeguarding the surrounding environment, such as forests and agricultural land, which play a role in climate change mitigation and biodiversity preservation.

Sesaji Rewandra This offering ceremony emphasizes respect for ancestors and spirits who are revered in Javanese tradition. Through the offerings, the community not only maintains a spiritual connection with the universe, but also builds awareness of the importance of maintaining ecological balance as a response to the increasingly apparent climate change.

Nyadran Goa Kreo conducted at Goa Kreo, a sacred place, has a deep spiritual and ecological meaning. By keeping the cave and its surrounding environment clean and pristine, the community contributes to the conservation of natural habitats and the protection of species threatened by climate change.

The legend of Goa Kreo or the stories surrounding Goa Kreo are not only local historical narratives, but also contain values about the importance of maintaining harmony between humans and nature. Through nurturing this legend, the community continues to pass on ecological values that form the basis for conservation efforts in the face of global climate change.

The Barikan tradition, which involves giving offerings as an expression of gratitude and asking for blessings from nature, encourages sustainable agricultural practices. By understanding natural cycles and honoring nature through Barikan, communities not only improve food security but also strengthen efforts to mitigate and adapt to climate change.

Overall, the local wisdom reflected in these traditions not only preserves the cultural and spiritual heritage of the communities, but also plays an important role in their efforts to anticipate and adapt to the increasingly significant impacts of climate change [22][23]. By maintaining and practicing this local wisdom, the people of Kandri Village are not only investing in the sustainability of their culture, but also in the sustainability of the environment that is a legacy for future generations.

4 Conclusion

Nyadran Kali or Sendang is a spiritual effort to honor water sources as life and teach the community the importance of maintaining the cleanliness and sustainability of these sources. Nyadran Desa promotes awareness of the importance of keeping the environment clean and participates in the conservation of the surrounding environment and sacred places.

Sesaji Rewandra reflects an appreciation for the history of Sunan Kalijaga's journey and local heritage, fostering awareness of the importance of preserving cultural heritage. Nyadran Goa Kreo maintains the cleanliness of the cave and its surroundings, preserving the natural habitat and biodiversity around the cave.

The legend of Goa Kreo enriches understanding of the importance of environmental conservation and maintaining harmony between humans and nature. Barikan symbolizes the gratitude of the community for the abundance provided by God, indirectly recognizing the importance of maintaining ecological balance.

These traditions play an important role in the spiritual and cultural life of the community and contribute to environmental conservation efforts around them. They are also essential in anticipating and adapting to climate change by maintaining water quality and availability, protecting the surrounding environment, building awareness of the importance of maintaining ecological balance, contributing to the conservation of natural habitats, preserving legends and stories, and encouraging sustainable farming practices.

In practicing this local wisdom, the Kandri Village community invests in the sustainability of their culture and environmental sustainability for future generations.

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