

Environmental Anthropology Study: The Relationship of the Sentani People with the Lake

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Abstract

This article describes the cultural traditions of the Sentani people, an ethnic group that supports water and lake culture, as implied in the phrase "ra phu, ra wally" (I have water, I have life). This phrase states that water, specifically Lake Sentani, is their life. The lake is crucial to their survival, so they practice cultural conservation to preserve it. However, the lake's ecosystem has been disrupted by environmentally unfriendly development. People no longer care for the lake's environment. This occurs because they do not understand the philosophical significance of Lake Sentani for the Sentani people. This research was conducted in Sentani using descriptive qualitative methods with observation and interview techniques.

Keywords: Ra phu; Ra Wally; Ecosystem; Lake Sentani

1. Introduction

Local culture represents a system of values, norms, and patterns of behavior developed by local communities through long-term interaction with their natural environment. Local wisdom reflects accumulated knowledge and lived experience that guide communities in maintaining harmony between human life and nature (Hudayana, 2017). As cultural beings, humans construct their social and ecological relations based on culturally embedded worldviews that shape attitudes, behaviors, and collective practices.

In indigenous societies, local wisdom functions not only as a moral guideline but also as a strategy for survival and environmental management. Indigenous knowledge systems regulate the use of natural resources through customary norms, beliefs, and institutions that promote sustainability. However, in contemporary contexts, local wisdom increasingly encounters tension with modernization and development processes that prioritize economic growth over ecological balance. This tension often results in social transformation and environmental degradation, particularly in indigenous territories.

The Sentani people, who refer to themselves as *Phuyakha*—meaning "the stretched water"—are an indigenous community inhabiting the area surrounding Lake Sentani in Jayapura Regency, Papua, Indonesia. Geographically, Lake Sentani covers approximately 9,360 hectares and is situated at an elevation of 75–85 meters above sea level, with depths reaching 140 meters. The lake is surrounded by the Cycloop Mountains, forming a unique ecological landscape that strongly influences the cultural identity and livelihood systems of the Sentani people (Suroto, 2016). As a water-oriented culture, the Sentani community's social organization, subsistence practices, and belief systems are deeply embedded in the lake ecosystem.

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The relationship between the Sentani people and Lake Sentani is embodied in the philosophy *ra phu, ra wally*—"my water, my life." This philosophy expresses an integral worldview in which water is perceived as the foundation of life, culture, and identity. It serves as the ethical basis for traditional environmental management practices, particularly in the sustainable use of aquatic resources. One of the most important manifestations of this philosophy is the tradition of *bhurekhang* (lake sasi), a customary conservation system that regulates access, timing, and methods of fishing to protect fish stocks and maintain ecological balance.

Traditional environmental governance among the Sentani people is closely linked to the authority of *ondofolo*, the customary leader who holds control over communal land and natural resources. Supported by a structured system of customary functionaries, *ondofolo* plays a central role in regulating fishing, forestry, agriculture, and other subsistence activities based on customary law. Traditional livelihoods such as fishing, sago processing, gardening, and hunting are conducted within a subsistence-oriented economic system that emphasizes collective labor, moderation, and environmental sustainability.

In recent decades, however, the Lake Sentani ecosystem has undergone significant environmental changes. Rapid population growth, migration, urban expansion, pollution, and the introduction of non-native fish species have contributed to ecological degradation. These changes have led to declining water quality and the depletion of endemic fish species, particularly the Sentani snakehead fish (*khahabey*), which holds both ecological and cultural significance for the indigenous community. Environmental degradation has directly affected the livelihoods of the Sentani people and has weakened the effectiveness of traditional conservation practices.

In response to these challenges, the Sentani community has developed various adaptive strategies that combine local knowledge with new economic opportunities. These adaptations include small-scale aquaculture, the utilization of lake resources for traditional products, the cultivation of culturally significant crops, and the development of community-based tourism. Such adaptive practices demonstrate the resilience of indigenous knowledge systems while also highlighting the need for institutional support and policy recognition.

Based on this context, this study aims to examine the role of Sentani local wisdom in the utilization and management of the Lake Sentani ecosystem, as well as to analyze the adaptive strategies employed by the community in response to ecological change. This research contributes to broader discussions on indigenous environmental governance and emphasizes the importance of integrating local wisdom into sustainable development and natural resource management policies.

2. Methods

This study employed a qualitative research approach with an ethnographic perspective to explore local wisdom and environmental management practices among the Sentani indigenous community surrounding Lake Sentani, Papua, Indonesia. A qualitative design was chosen to capture indigenous knowledge, values, and cultural practices that shape the relationship between the Sentani people and their environment.

Data were collected through in-depth interviews, participant observation, and document analysis. Key informants were selected purposively, including customary leaders (*ondofolo*), traditional functionaries, fishermen, women fishers, sago processors, and community elders who possess extensive knowledge of customary practices and environmental management. Participant observation was conducted in several indigenous villages around Lake Sentani to understand daily livelihood activities such as fishing, sago processing, gardening, and customary conservation practices (*bhurekhang*).

Secondary data were obtained from academic publications, government reports, customary documents, and previous ethnographic studies related to the Sentani people and Lake Sentani. Data analysis was conducted using thematic analysis, involving data reduction, categorization, interpretation, and verification. The analysis focused on identifying patterns of local wisdom, customary institutions, environmental change, and community adaptation strategies.

3. Discussion

3.1. Local Wisdom and Environmental Management of Lake Sentani

The findings indicate that the Sentani people possess a sophisticated system of local wisdom that governs the utilization and management of Lake Sentani's ecosystem. The philosophy *ra phu, ra wally* ("my water, my life") reflects an

ecological worldview that places water at the center of cultural identity and survival. This philosophy underpins customary conservation practices that regulate access to aquatic resources and encourage sustainable use.

One prominent form of traditional conservation is *bhurekhang*, a customary system similar to *sasi* practiced in other parts of Papua. Through *bhurekhang*, fishing activities are temporarily restricted in designated areas, allowing fish populations to regenerate. This practice demonstrates indigenous ecological knowledge and functions as an effective community-based resource management mechanism.

3.2. Role of Customary Leadership (*Ondofolo*)

Customary leadership plays a crucial role in enforcing environmental norms. The *ondofolo*, supported by a structured system of customary officials, regulates fishing, forest use, agriculture, and land tenure. This governance system ensures that natural resources are managed collectively and that violations of customary rules are sanctioned. The authority of *ondofolo* legitimizes conservation practices and reinforces communal responsibility toward environmental sustainability.

3.3. Livelihood Practices and Subsistence Economy

Traditional livelihood activities such as fishing, sago processing, gardening, and hunting are carried out within a subsistence-oriented economic system. These practices emphasize moderation, collective labor, and respect for ecological limits. Women play a central role in fishing and household economies, highlighting the gendered division of labor embedded in Sentani culture. Such subsistence practices contribute to ecological resilience by limiting overexploitation of natural resources.

3.4. Environmental Change and Ecological Degradation

Despite strong customary institutions, Lake Sentani has experienced significant ecological degradation in recent decades. Pollution, sedimentation, urban expansion, population growth, and the introduction of non-native fish species have reduced water quality and threatened endemic species, particularly the Sentani snakehead fish (*khahabey*). These changes have weakened traditional conservation mechanisms and reduced the availability of natural resources essential for indigenous livelihoods.

3.5. Community Adaptation Strategies

In response to ecological change, the Sentani community has developed adaptive strategies that combine local knowledge with new economic opportunities. These include small-scale aquaculture, cultivation of culturally significant crops, utilization of lake resources for traditional products, and community-based tourism. While these strategies enhance household income, they also reveal the limitations of adaptation when not supported by strong environmental policies and institutional recognition of indigenous rights.

4. Conclusion

This study demonstrates that local wisdom plays a vital role in the sustainable management of Lake Sentani's ecosystem. The philosophy *ra phu, ra wally*, and customary practices such as *bhurekhang* represent indigenous ecological knowledge that promotes balance between human needs and environmental preservation. Customary leadership under the authority of *ondofolo* has historically ensured effective regulation of natural resource use.

However, rapid environmental change driven by modernization, migration, and weak regulatory frameworks has undermined both the ecosystem and traditional conservation systems. The resulting ecological degradation has forced the Sentani people to adopt adaptive strategies that, while economically beneficial, may not fully compensate for the loss of environmental sustainability.

Therefore, integrating indigenous local wisdom into formal environmental governance and development policies is essential. Recognizing customary institutions and strengthening collaboration between indigenous communities and government agencies can contribute to sustainable environmental management and the preservation of indigenous cultural heritage.

Compliance with ethical standards

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Disclosure of conflict of interest

No conflict of interest to be disclosed.

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