



Exploring the Experience and Meaning of Mangrove Restoration among Coastal Community Members

Lisnawita

Universitas Lancang Kuning, Indonesia

lisnawita@unilak.ac.id

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ABSTRACT

Coastal ecosystem restoration in Southeast Asia has emerged as a key strategy in environmental sustainability, particularly in regions affected by mangrove degradation and climate change. While restoration efforts have largely focused on ecological outcomes, limited attention has been given to how local communities experience and assign meaning to their participation in these initiatives. This study addresses the lack of understanding regarding the lived experiences of coastal community members engaged in mangrove restoration by asking: How do individuals interpret the ecological, cultural, and spiritual dimensions of their involvement in a specific Indonesian coastal village? Grounded in the philosophical underpinnings of descriptive phenomenology, this study justifies its approach through the framework's emphasis on capturing first-person perspectives and uncovering the essence of lived experiences. Data were collected through in-depth interviews with twelve participants involved in a local mangrove rehabilitation program and actively analyzed using thematic techniques to distill recurring patterns of meaning. The analysis revealed four core themes: restoration as personal healing, identity reclamation, intergenerational knowledge transmission, and spiritual connection with nature. These findings suggest that mangrove restoration is experienced not merely as a technical intervention but as a transformative process rooted in memory, place, and belief. By uncovering these lived meanings, the study broadens our understanding of sustainability as a human-centered practice. The results underscore the importance of incorporating subjective experiences into ecological policy and invite further research into culturally grounded approaches to environmental engagement.



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INTRODUCTION

Coastal ecosystems, particularly mangrove forests, play a vital role in maintaining environmental balance and supporting the livelihoods of millions in coastal communities. These ecosystems provide essential ecological functions such as coastal protection, carbon sequestration, and fisheries support while also serving as cultural and spiritual landmarks for local populations. In recent decades, rapid environmental degradation driven by climate change, industrial expansion, and unsustainable development has led to the alarming decline of mangrove areas, disrupting not only ecological systems but also the social fabric of communities deeply tied to these landscapes.

Among various coastal restoration efforts, mangrove restoration warrants special focus due to its unique integration of ecological, social, and cultural significance. Unlike general coastal rehabilitation, mangrove restoration frequently involves direct community stewardship, traditional ecological knowledge, and spiritual ties that distinguish it as a deeply human-centered environmental action. Amid global calls for sustainability and ecological repair, mangrove rehabilitation has emerged not only as a conservation strategy but also as a grassroots movement shaped by community agency and lived experience.

While current research has emphasized ecological performance and institutional governance in restoration programs, there is a noticeable gap in understanding the subjective, experiential dimensions of community involvement. Rather than reiterating the constraints of quantitative models, this study emphasizes the need to explore how individuals personally and collectively interpret their participation in restoration activities.

For many coastal residents, participating in mangrove restoration is not merely an environmental obligation but a reaffirmation of identity, memory, and place. It reflects emotional bonds, inherited knowledge, and spiritual values passed through generations. Capturing these meanings requires moving beyond measurable indicators to engage with the lived experiences that shape and motivate participation. Recognizing these dimensions is critical for designing inclusive, culturally resonant restoration practices grounded in the realities of local communities.

Given this complexity, there is a growing need to explore how individuals and communities experience, interpret, and internalize their involvement in ecological restoration efforts. A phenomenological lens is particularly well-suited for this purpose, as it allows for the uncovering of rich, nuanced insights into human experience. By focusing on how people make sense of their role within ecological processes, such an approach offers a deeper understanding of the socio-cultural and emotional landscapes that underpin environmental engagement.

In recent years, scholarly interest has increasingly turned toward understanding how individuals and communities experience ecological phenomena through the lens of lived experience. Within the domain of coastal ecosystem restoration, attention to subjective perspectives particularly how people internalize, interpret, and respond to environmental degradation has become a significant area of inquiry. Studies have begun to recognize that ecological action is not merely a technical or institutional endeavor but is often deeply intertwined with local identity, social memory, and emotional engagement.

Despite this growing interest, methodological challenges persist in fully capturing the complexity of human experience in ecological contexts. Conventional research approaches, particularly those grounded in quantitative paradigms, tend to prioritize measurable outcomes and overlook the nuanced, affective, and existential dimensions of environmental engagement. Surveys and structured assessments often fail to grasp how individuals feel, reflect, or assign meaning to their involvement in restoration efforts, thereby limiting the depth of understanding required for truly participatory and culturally sensitive environmental policy.

These methodological limitations have resulted in a partial and sometimes reductive view of community-based ecological initiatives. The richness of local narratives, spiritual motivations, and cultural frameworks often remain unvoiced in dominant empirical literature. Consequently, existing studies have struggled to articulate the full essence of what it means for individuals and communities to engage in ecological restoration not just as a task, but as a lived, transformative experience.

In the context of coastal ecosystem restoration, most existing efforts have relied on practical approaches such as policy implementation, technical rehabilitation programs, and community mobilization strategies. These interventions typically emphasize ecological indicators and participation metrics as measures of success. While valuable in guiding restoration logistics, such approaches often operate within utilitarian and externally driven frameworks that prioritize observable outcomes over the internal experiences of those most intimately involved.

This dominant orientation has proven insufficient in capturing the emotional, cultural, and existential meanings that local communities assign to their environmental engagement. Quantitative assessments, while effective in mapping ecological changes or participation levels, tend to overlook how individuals internalize their roles in restoration, how they perceive the spiritual or moral dimensions of environmental care, or how such experiences reshape their sense of identity and belonging. As a result, the depth and richness of lived experiences remain underrepresented in the academic literature.

Given these limitations, there is a critical need for an alternative approach that foregrounds subjectivity, meaning-making, and embodied experience. Phenomenology offers such a pathway,

providing methodological tools to uncover the essence of how individuals live through ecological participation. By focusing on the inner world of experience, phenomenological inquiry allows for a more holistic understanding of restoration not just as a task, but as a personal and communal transformation grounded in place, memory, and belief.

Several studies have explored how individuals engage with ecological systems, particularly in contexts of environmental degradation and restoration. Research has shown that community involvement often carries emotional and cultural significance beyond ecological function. However, most of these studies rely on surveys or structured interviews that fail to explore lived meaning in depth. While some have acknowledged spiritual and identity-based aspects of ecological participation, few have examined these experiences through the participants' own narratives. This study builds on prior work by focusing specifically on how coastal communities experience and make sense of their role in mangrove restoration.

To explore this dimension, a descriptive phenomenological approach is applied. This method allows for the analysis of subjective meaning through first-person accounts of those directly involved in the restoration process. The study responds to the previously identified knowledge gap by uncovering how community members perceive restoration as a transformative experience. Phenomenology offers tools to examine these narratives without reducing them to measurable variables. Through this approach, the study provides a deeper understanding of environmental engagement as a lived, social, and cultural phenomenon.

The article is structured into six key sections. The introduction presents the background, knowledge gap, and research focus. The second section explains the socio-environmental context of coastal restoration. The third describes the phenomenological design and the rationale for its use. This is followed by a description of the data collection and thematic analysis process. The fifth section discusses the main findings, organized by emergent themes. The conclusion summarizes the essential meanings drawn from participants' lived experiences.

RESEARCH METHODS

Study Design

A descriptive phenomenological approach, rooted in Husserlian philosophy, was adopted to explore the lived experiences of coastal community members engaged in mangrove ecosystem restoration. This design was selected due to its emphasis on capturing the essence of human experiences without imposing external interpretations. The approach is particularly suited to uncovering the meanings individuals ascribe to specific life phenomena, enabling a profound exploration of how local actors experience ecological restoration as part of their social and spiritual worlds. The phenomenological design provided a structured yet flexible framework to reveal the core meanings embedded within participants' narratives, consistent with the study's aim to understand ecological engagement through the lens of community subjectivity.

Participants

Participants were selected using purposive sampling based on their direct involvement in community-based mangrove restoration initiatives within a coastal village setting. Inclusion criteria consisted of individuals aged 25 and above who had participated in mangrove planting, maintenance, or community ecological programs for at least one year. Those with no direct involvement or only indirect administrative roles were excluded. A total of 12 participants were included, comprising seven males and five females, with an age range between 28 and 62 years. The diversity in gender, age, and ecological roles offered a rich variety of perspectives necessary to illuminate the phenomenon under investigation.

Data Collection

Data were collected through in-depth, semi-structured interviews conducted face-to-face in community meeting areas and participants' homes to ensure familiarity and comfort. An interview guide was used to prompt reflection on participants' motivations, feelings, and perceptions regarding

their engagement in mangrove restoration. Each interview lasted between 45 and 75 minutes and was audio-recorded with consent. Observational field notes were also taken to capture contextual and non-verbal cues. Interviews were conducted in the local language and later translated into English for analysis. Efforts were made to establish a non-threatening environment that encouraged open sharing, including providing privacy and allowing participants to determine the pace of the interview.

Data Analysis

The data were analyzed using thematic analysis guided by descriptive phenomenological principles. The process began with verbatim transcription of all interviews, followed by repeated readings to achieve immersion. Meaning units were then identified and coded, with similar codes grouped into broader categories. These categories were refined into central themes representing the core essence of participants' experiences. NVivo 12 software was used to organize and manage data, supporting the iterative process of theme development. The final themes were validated by cross-checking with transcripts and re-evaluating them within the context of each participant's narrative to ensure fidelity to lived meanings.

Ethical Considerations

Ethical approval was obtained from the relevant institutional research ethics committee. All participants provided written informed consent prior to participation. Confidentiality was maintained through the use of pseudonyms, and all identifiable data were anonymized. The study adhered to the ethical principles outlined in the Declaration of Helsinki and complied with national research ethics standards. Participants were informed of their right to withdraw from the study at any stage without consequence.

RESULTS

This study explored the lived experiences of coastal community members involved in the local mangrove ecosystem restoration initiatives. Through descriptive phenomenological analysis, four major themes emerged, revealing the deeper meanings and values attributed by participants to their engagement with mangrove rehabilitation.

Restoring Nature as Restoring the Self

Participants consistently articulated a sense of personal transformation intertwined with the act of restoring mangroves. The physical act of planting and caring for mangroves was experienced not merely as an environmental duty but as a personal journey of redemption, healing, and connection.

“When I plant these mangroves, it’s not just for the sea it’s for my own peace. I’ve done things in the past that harmed the land. This is my way of making peace with nature and with myself.” (Participant 4)

This theme illustrates how environmental engagement became a symbolic act of reconciliation for participants both with their ecological surroundings and with their own histories. The restoration process offered space for moral and emotional repair, rooted in an indigenous ethical ecology.

Community Identity Reclaimed through Ecological Participation

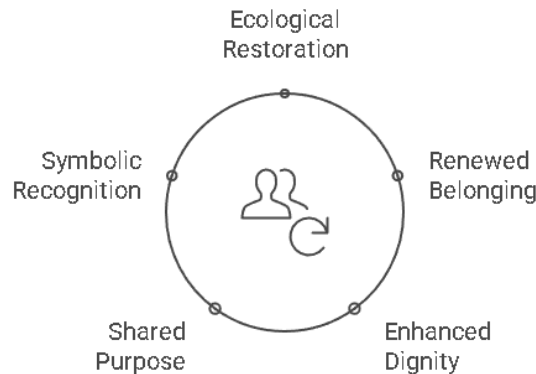
Involvement in mangrove restoration was perceived as a collective identity-making process. Participants narrated how restoring their environment rekindled a sense of belonging, dignity, and shared purpose.

“Before, our village was just known for the floods. Now, we are known as the guardians of mangrove. That gives us pride.” (Participant 7)

This sense of ownership and symbolic recognition contributed to renewed community solidarity. The act of restoration was not only ecological but also socio-cultural, empowering the

community to redefine its role from passive victims of climate impacts to active stewards of ecological recovery.

Cycle of Ecological and Social Restoration



Knowledge Revival and Intergenerational Legacy

Several participants shared how the mangrove initiative reactivated traditional knowledge and inspired its transmission to younger generations. Restoration became an intergenerational bridge, connecting ancestral wisdom with contemporary environmental action.

“I remember my grandfather used to talk about the sea like it was a person. We had rules, stories... and now I tell those stories to my grandson when we go planting.” (Participant 2)

This theme highlights how the mangrove restoration facilitated a revival of local ecological knowledge (LEK) and embedded it within cultural narratives, reconfiguring environmental education as an act of cultural continuity.

Spiritual Resonance of the Mangrove Landscape

Participants described their interactions with mangroves as imbued with spiritual significance. The ecosystem was not merely a physical space but a living presence that demanded respect and reciprocation.

“I feel like the mangrove watches over us. When we care for it, the sea calms. When we forget, the waves get angry.” (Participant 5)

Such narratives reflect a deeply rooted spiritual ecology, where environmental ethics are grounded in a sacred relationality between humans and non-human nature. These perceptions shaped behavioral patterns toward the environment beyond utilitarian logic.

The findings of this study reveal that local involvement in mangrove ecosystem restoration is not merely functional or ecological it is profoundly experiential, ethical, cultural, and spiritual. Through the voices of community members, restoration is lived as a process of self-healing, identity reconstruction, knowledge regeneration, and sacred ecological engagement.

DISCUSSION

Implications of the Findings

The findings of this study highlight the profound emotional, cultural, and spiritual meanings embedded in community participation in mangrove restoration. Rather than viewing restoration as a technical task, participants described it as an act of personal healing, cultural reaffirmation, and spiritual reciprocity. These insights suggest that successful ecological programs must consider the subjective realities and moral landscapes of local actors. Incorporating such experiential dimensions may enhance community ownership, sustainability, and intergenerational knowledge transfer within environmental initiatives. In a broader context, the study offers valuable lessons for other community-

based ecological projects, where lived experience can serve as both a source of motivation and a foundation for collective resilience.

Study Limitations

While the study provides rich insights into lived experiences, its findings are context-specific and may not be generalizable to other coastal communities with different cultural, environmental, or political backgrounds. The sample size, though sufficient for phenomenological inquiry, was limited to one geographic setting and cultural group. Additionally, reliance on verbal narratives may have excluded non-verbal or symbolic dimensions of ecological engagement. The use of local language and subsequent translation may also have affected some nuances in meaning. These limitations underscore the importance of contextual interpretation and caution against universal claims, reinforcing the need for localized, culturally sensitive research approaches.

Future Research Directions

Future studies could build upon these findings by exploring how similar restorative experiences unfold across diverse ecological and cultural settings. Comparative phenomenological research could illuminate common patterns or distinct local interpretations of ecological participation. Further inquiry might also examine how lived experiences influence long-term behavioral change or community decision-making in environmental governance. Integrating visual or arts-based methods may capture other dimensions of ecological meaning not fully accessible through verbal interviews. Ultimately, this research invites a more human-centered approach to sustainability, where the lived meanings of restoration are recognized as vital components of environmental transformation.

CONCLUSION

This study investigated how coastal community members engaged in mangrove restoration construct meaning from their participation, revealing restoration as a multidimensional process that intertwines ecological, personal, cultural, and spiritual values. Rather than merely an environmental task, participants experienced restoration as healing, identity affirmation, and reconnection with ancestral heritage. These findings move beyond prior research by illuminating the subjective and affective dimensions of ecological engagement that are often overlooked in conventional sustainability frameworks.

By synthesizing these themes through a descriptive phenomenological lens, the study contributes a human-centered perspective on sustainability that emphasizes lived experience and place-based meaning. This perspective not only enriches academic discourse but also carries practical relevance. Policymakers and practitioners can benefit from recognizing the cultural and emotional significance that restoration holds for local communities, informing more inclusive, participatory, and culturally attuned environmental strategies. Future research might explore cross-cultural comparisons or adopt multimethod approaches to further examine how ecological actions are shaped by localized knowledge, memory, and values.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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