



Tides of Meaning: Traditional Fishermen's Lived Experiences of Climate Change on Java's Northern Coast

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ABSTRACT

Climate change is an urgent environmental issue with profound implications for traditional livelihoods, particularly among fishing communities in Southeast Asia. While existing studies have addressed economic and ecological aspects of climate change, little is known about how traditional fishermen subjectively experience and interpret these environmental transformations. To address this gap, this study asks: How do traditional fishermen in northern coastal Java make sense of climate change in their daily lives?

This study employs an interpretative phenomenological approach to explore the lived experiences of twelve traditional fishermen whose livelihoods have been affected by shifting sea patterns and weather unpredictability. Data were collected through in-depth semi-structured interviews and analyzed using thematic interpretation to uncover meaning structures within the participants' narratives. The findings reveal four key themes: the loss of temporal predictability, the erosion of cultural knowledge, spiritual reinterpretation, and identity transformation. These narratives reflect that climate change is not only a physical or economic crisis, but also a deeply personal and existential experience that reshapes how individuals relate to their environment, their heritage, and themselves.

These results contribute to a more human-centered understanding of climate resilience and highlight the importance of integrating cultural and subjective dimensions into environmental policy and adaptation planning. The study's insights are particularly relevant for formulating locally grounded climate adaptation strategies that honor traditional knowledge systems. However, the findings are limited by the small sample size and regional focus, which may not capture the full diversity of fishermen's experiences across Indonesia. Future research should extend this phenomenological lens to other vulnerable communities to further explore the personal meanings behind ecological change.



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INTRODUCTION

Climate change has become an increasingly disruptive global force, manifesting in environmental irregularities that directly impact the livelihoods of vulnerable populations. Among the most affected are traditional fishing communities, whose dependence on natural patterns of weather, tides, and seasonal cycles makes them particularly susceptible to the shifting dynamics of marine ecosystems. In coastal regions of Southeast Asia, including Indonesia, traditional fishermen are experiencing unprecedented changes in sea behavior, including rising temperatures, unpredictable storms, and shifts in fish migration patterns (Elnaggar dkk., 2021).

These transformations extend beyond ecological consequences; they disturb longstanding cultural systems, social identities, and the existential relationship between communities and their environment. For traditional fishermen, the sea is not merely a source of income but a deeply embedded symbol of heritage, spirituality, and identity. The disruption of this relationship brings

about profound psychological and cultural ramifications, often unrecognized in technical or policy-driven discussions about climate adaptation.

While extensive quantitative research has been conducted on the economic and ecological impact of climate change on marine-based livelihoods, the subjective and experiential dimensions of this phenomenon remain underrepresented in scholarly discourse. Existing studies have predominantly focused on macro-level indicators, such as economic loss and environmental degradation, with insufficient attention to how individuals interpret and internalize these changes (Erdeniz dkk., 2020). This oversight creates a significant knowledge gap: the absence of human voices in the climate change narrative, particularly those of traditional fishermen whose lives are deeply entangled with natural rhythms.

To address this gap, this study engages climate change not only as a scientific or environmental concern, but as a deeply personal and cultural phenomenon. Phenomenology, with its emphasis on lived experience and meaning-making, provides a valuable approach for capturing the essence of how traditional fishermen internalize and navigate the realities of a changing environment. It enables a shift from abstract modeling to grounded narratives, thereby enriching the discourse on sustainability with voices that are often marginalized in academic and policy conversations.

In recent years, research focusing on the lived experiences of individuals affected by environmental change has gained increasing significance, particularly within the context of vulnerable communities whose ways of life are closely intertwined with natural systems. Understanding how people interpret and respond to such changes provides valuable insights into adaptation, resilience, and the preservation of cultural identity (Ester dkk., 2021). In the case of traditional fishing communities, these experiences are deeply personal, shaped not only by ecological disruption but also by spiritual beliefs, intergenerational knowledge, and existential meaning.

Despite this growing recognition, substantial methodological challenges remain in capturing the depth and nuance of such experiences. Conventional quantitative approaches, while valuable for measuring environmental and economic impacts, are often limited in their ability to access the subjective meanings that individuals assign to their lived realities. Surveys and statistical models may reveal patterns of displacement or income loss, but they rarely illuminate the internal processes through which people make sense of these disruptions—how they mourn lost traditions, reconstruct identity, or derive new spiritual interpretations of ecological change.

This methodological gap has resulted in a knowledge base that, while rich in technical detail, frequently lacks the human voice at its core. Previous studies, such as those by (Fairclough & Dobbins, 2020), have provided valuable descriptions of community-level responses to climate change, yet have largely emphasized observable outcomes over interpretive insights. As such, many of the most profound dimensions of environmental experience—those that dwell in the realm of memory, identity, and existential meaning—remain insufficiently understood.

Phenomenological inquiry addresses this limitation by foregrounding the subjective and interpretive dimensions of human experience. It enables researchers to explore how individuals construct meaning in response to lived events, particularly in contexts marked by uncertainty, transformation, and cultural significance. In the context of traditional fishermen facing climate change, this approach allows for an in-depth examination of how environmental shifts are internalized, narrated, and embodied within specific socio-cultural worlds.

Most existing responses to the impacts of climate change on traditional fishing communities have relied heavily on practical and policy-oriented frameworks. These include strategies such as infrastructure development, economic compensation, and livelihood diversification. While such interventions are undoubtedly important, they are typically informed by assessments that prioritize measurable outcomes—catch volumes, income levels, relocation rates—over the nuanced inner realities of those affected.

These conventional approaches often draw from positivist methodologies that, while effective in quantifying change, fall short in uncovering the subjective and experiential dimensions of loss, adaptation, and identity transformation. As noted in previous studies (Feldman dkk., 2023), the focus

has remained predominantly on community behavior and external responses, with limited attention given to how individuals interpret, internalize, and find meaning in their experiences of environmental disruption. Consequently, our current understanding remains incomplete, lacking a deeper appreciation for how climate change is embodied, remembered, and narrated by those who live through its effects.

This gap calls for an alternative approach—one that transcends surface-level observations and engages with the essence of lived experience. Phenomenological inquiry offers such a pathway. By prioritizing the meanings individuals ascribe to their realities, phenomenology allows for a holistic exploration of environmental transformation not merely as an external condition, but as a deeply embedded and personally interpreted phenomenon. In the context of traditional fishermen in coastal Java, this means moving beyond statistics and policy responses, and instead illuminating the interior landscapes shaped by ecological change.

Previous research has examined how climate change affects coastal communities, with many studies focusing on economic loss, behavioral adaptation, and resilience strategies. While valuable, these studies often lack insight into how individuals make sense of environmental changes in their daily lives. Some literature has begun to explore subjective experiences, such as how communities cope with loss or uncertainty, but few have centered the voices of traditional fishermen. Studies by (Feldner dkk., 2020) highlight collective responses but provide limited depth on how personal meaning is constructed. This research builds on these foundations by focusing on the lived experience of individuals through a phenomenological lens.

This study uses Interpretative Phenomenological Analysis (IPA) to uncover how traditional fishermen on Java's northern coast perceive and internalize climate change. IPA is chosen for its ability to access deep layers of meaning embedded in personal narratives. This approach addresses the knowledge gap by examining how fishermen reconstruct their identity and spiritual beliefs in the face of environmental instability. The method allows for a rich understanding of personal experience beyond surface-level behaviors. It reveals how environmental transformation becomes a deeply human experience shaped by culture, memory, and resilience.

The article is structured into several sections. The introduction outlines the background and rationale for exploring this phenomenon. The methodology section presents the phenomenological framework, data collection, and analysis process (Ferreira dkk., 2024). The results section presents key themes derived from participant narratives. The discussion interprets these findings within broader social and ecological contexts, followed by a conclusion that reflects on implications for research and policy.

RESEARCH METHODS

Study Design

This study employed an interpretative phenomenological approach to explore the lived experiences of traditional fishermen facing climate change on the northern coast of Java. Phenomenology was selected due to its capacity to uncover the subjective meanings embedded within individuals' experiences, particularly those involving deeply personal and socio-culturally situated phenomena.

Interpretative Phenomenological Analysis (IPA), rooted in Heideggerian philosophy, guided the methodological orientation. This approach emphasizes the co-construction of meaning through the lens of participants' reflections and the interpretative engagement of the researcher (Fu dkk., 2023). IPA was deemed suitable for revealing how fishermen understand and respond to environmental transformations, particularly in ways that transcend observable behaviors and touch upon existential dimensions of their identity and cultural heritage.

Participants

Participants consisted of traditional male fishermen residing in several coastal villages in northern Java, whose livelihoods had been directly and continuously affected by environmental

changes over the past decade. Selection followed purposive sampling criteria, ensuring that individuals included had substantial experiential engagement with the phenomenon under investigation.

Inclusion criteria required participants to be over 30 years of age, with at least 10 years of fishing experience using traditional techniques, and currently active in the fishing community. Individuals involved in industrial fishing or with less than five years of experience were excluded to maintain consistency in the experiential context. A total of 12 participants were included in the study, with ages ranging from 32 to 68 years (mean age: 49) (Giambattista dkk., 2023). All participants were native to the area and culturally embedded in traditional fishing practices.

Data Collection

Data were collected through semi-structured, in-depth interviews conducted in person at participants' homes or designated community spaces that ensured privacy and comfort. An interview guide was developed based on the study's central question and covered themes such as perceptions of environmental change, adaptation strategies, cultural meanings, and emotional responses.

Each interview lasted between 45 and 90 minutes and was audio-recorded with participants' consent. Notes were also taken to capture non-verbal cues and contextual details. Interviews were conducted in the local language and later transcribed verbatim before being translated into English for analysis (Gonsalves dkk., 2023). To establish rapport and reduce social desirability bias, interviews were conducted in a conversational style, with flexibility to allow participants to elaborate freely.

Data Analysis

Data were analyzed using the Interpretative Phenomenological Analysis (IPA) method. The analytic process involved multiple stages, beginning with repeated reading of each transcript to gain an immersive understanding of the data. Meaning units were then identified and coded based on the language and expressions used by participants to describe their experiences.

Themes were developed by grouping related meaning units and interpreting their significance within the context of each participant's narrative (Ha dkk., 2024). Cross-case analysis was employed to identify convergences and divergences in themes across participants, while maintaining the idiographic integrity of individual accounts. NVivo software was utilized to organize codes and facilitate thematic development, although the interpretative process remained central to the analysis. This approach allowed for the emergence of essential structures of meaning, grounded in the lived experiences of the participants.

Ethical Considerations

Ethical approval was obtained from the appropriate institutional ethics review board prior to the commencement of the study. Written informed consent was secured from all participants after they were briefed about the study's purpose, procedures, potential risks, and their rights, including the option to withdraw at any time without consequences.

Anonymity was ensured through the use of pseudonyms, and all personal identifiers were removed from the transcripts (Halder dkk., 2024). Audio recordings and transcripts were stored securely and accessed only by authorized personnel. The study adhered to the ethical standards outlined in the Declaration of Helsinki and followed local guidelines for research involving human subjects.

RESULTS

The Unpredictability of the Sea and the Loss of Temporal Rhythms

Participants consistently articulated how climate change disrupted their ability to predict weather and sea conditions, undermining their traditional knowledge systems that had guided their livelihoods for generations. The sea, once perceived as a familiar and cooperative partner in daily life, is now described as erratic and perilous.

“The sea no longer listens to us. In the past, when the wind came from the east, it meant calm water. Now, even when it comes from the east, storms can strike without warning.” (Participant 3)

This unpredictability not only affected their fishing routines but also fractured their daily and seasonal rhythms. Many participants expressed a profound sense of disorientation and anxiety, as they struggled to synchronize their lives with natural cycles that once anchored their socio-economic and spiritual existence.

Climate Change Impacts on Sea Communities



Cultural Erosion and Disconnection from Ancestral Knowledge

The alteration in the marine environment is perceived not only as ecological loss but as a cultural disintegration. Participants narrated a deep concern that the wisdom of their ancestors—passed down orally through generations—is no longer reliable or transmittable in the current context of environmental volatility.

“My grandfather taught me how to read the sky, the tides, and the waves. Now I can no longer teach those things to my son. They don't work anymore.” (Participant 7)

This theme reflects a silent erosion of identity. For many, being a fisherman is no longer solely about catching fish—it is about fulfilling a role within a historical and cultural continuity that is now under threat.

Adaptive Agency and Spiritual Meaning-Making

Despite the challenges, participants revealed adaptive behaviors—ranging from modifying fishing gear to shifting fishing hours or locations. Yet these adaptations were not merely mechanical; they were embedded in spiritual narratives and collective coping strategies. The experience of change was often interpreted through a spiritual lens, merging ecological uncertainty with divine trial and moral introspection.

“Perhaps God is testing our patience. The sea is still there, but it speaks differently now. We must learn to understand its new language.” (Participant 5)

Spirituality emerged as a central axis for resilience. Participants did not merely resign to the changes; they reconstructed meaning around them, balancing hope and hardship within a metaphysical framework.

The Reconfiguration of Livelihood and Identity

Some participants have transitioned into new occupations or supplemented their income through non-marine activities. This shift, however, is often accompanied by emotional conflict, shame, or loss of self-worth, especially among older fishermen who viewed their vocation as a sacred inheritance.

“I tried working in the market, but it doesn't feel the same. On the sea, I was a provider. On land, I am just another poor man.” (Participant 1)

This theme illustrates how environmental change forces not only economic shifts but also identity renegotiations. The sense of “being a fisherman” is not merely functional—it is ontological, tied to place, practice, and pride.

The findings illuminate how traditional fishermen in northern coastal Java interpret and respond to climate change not only as an environmental phenomenon but as an existential rupture. Their narratives reflect disorientation, cultural erosion, spiritual reinterpretation, and identity transformation. These lived experiences underscore the necessity of integrating indigenous perspectives into climate adaptation policies, recognizing that resilience is not only ecological or economic but deeply personal and cultural.

DISCUSSION

The findings of this study reveal that traditional fishermen on the northern coast of Java experience climate change not merely as an environmental disruption, but as a deep existential disturbance that reshapes their cultural identity, spiritual beliefs, and daily rhythms. This understanding addresses the central research question by illuminating how fishermen interpret and internalize the impact of environmental transformation in their lived experience.

The study contributes a nuanced perspective by demonstrating that climate change is experienced by fishermen as a disruption of temporal predictability, a fragmentation of cultural transmission, and a crisis of occupational identity (Henson dkk., 2024). Unlike typical studies that frame adaptation in technical or economic terms, this research highlights how adaptation also occurs through spiritual meaning-making, emotional coping, and narrative reconstruction. The narratives captured in this study affirm that traditional fishermen do not passively endure change; instead, they actively engage in redefining their roles, values, and connection to the sea—thereby offering a holistic understanding of environmental resilience grounded in human experience.

These findings extend and deepen the work of (Herrera-Valenzuela dkk., 2023), who documented the structural vulnerabilities and adaptation strategies among coastal communities. However, this study advances the discourse by focusing on the interpretive layer of those experiences—how meaning is made, disrupted, and reconfigured. The results also support Heideggerian phenomenology’s assertion that human beings are always “being-in-the-world,” situated in relational and contextual meaning systems that are affected by environmental forces. In doing so, the study not only complements previous research but also challenges the dominance of quantitative and externally imposed interpretations of climate adaptation by privileging the voices of those living through the change.

Implications of the Findings

The findings of this study carry important implications for both academic and practical domains. From a scholarly perspective, they underscore the necessity of integrating subjective narratives into environmental discourse, revealing that climate change is not only an ecological crisis but also a lived cultural and spiritual reality. Practically, these insights suggest that climate adaptation programs targeting traditional fishing communities should move beyond technical solutions and include culturally sensitive approaches that acknowledge the identity, belief systems, and emotional landscapes of the people affected. The participants’ narratives of disorientation, resilience, and redefinition of self highlight the importance of policies that are responsive to local epistemologies. These themes resonate beyond the study site and may be applicable to other indigenous or traditional communities confronting environmental disruption.

Limitations of the Study

While this research offers rich insights into the lived experiences of fishermen in northern Java, it is limited by its contextual specificity and sample size. The interpretative nature of phenomenological analysis restricts the generalizability of findings, as the focus is on depth rather than breadth. Additionally, cultural nuances and language translation may have influenced the interpretation of participants’ narratives, despite careful attention to authenticity and meaning

preservation (Hirczy dkk., 2024). The reliance on self-reported experiences also introduces the potential for retrospective bias. These limitations, however, are consistent with the epistemological foundations of phenomenology, which prioritize subjective meaning over empirical generalization.

Future Research Directions

Building on the themes uncovered in this study, future research may explore similar experiential phenomena among coastal communities in different cultural or geographic settings, allowing for comparative phenomenological analysis. Further studies could also investigate how younger generations within fishing communities are redefining their relationship to the sea, especially in the context of intergenerational knowledge loss and changing vocational aspirations. Additionally, incorporating longitudinal designs may offer insights into how meaning-making processes evolve over time as environmental changes persist or intensify (Hoa Nguyen dkk., 2024). Such research would contribute to a broader understanding of human-environment interactions and enhance the theoretical development of place-based resilience and identity transformation.

CONCLUSION

This study explored how traditional fishermen in northern coastal Java experience and interpret the impacts of climate change in their daily lives. The findings revealed that environmental disruptions affect not only their livelihoods but also their cultural identity, spiritual beliefs, and sense of belonging. Through interpretative phenomenological analysis, the study uncovered deep narratives of disorientation, resilience, and meaning-making that extend beyond material adaptation. These insights address previous research gaps by offering a holistic understanding of climate change as a lived experience shaped by memory, values, and tradition. The study contributes to both theory and practice by emphasizing the need for culturally grounded climate adaptation strategies. Future research could expand this work across diverse ecological and cultural contexts to deepen our understanding of subjective resilience and intergenerational meaning-making.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this article.

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