

## The Meaning of Risk Communication Among Stakeholders: A Phenomenological Study of Slow-Onset Coastal Disasters through Mangrove Conservation

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### Abstract

This study aims to explore the meanings of risk communication constructed by stakeholders in responding to slow-onset disasters in the coastal areas of the North Coast of West Java through marine conservation initiatives in the form of mangrove planting. Gradual coastal abrasion has affected living spaces, livelihoods, and the sustainability of coastal environments; however, it has not been uniformly interpreted as a disaster by the actors involved. The study employs a qualitative approach using a phenomenological research design. Research informants include representatives from the North Coast Regional Office of Marine and Fisheries of West Java (CDKPWU), the Regional Forestry Office II (CDK Wil II), the Regional Disaster Management Agency (BPBD), coastal communities, experts, and community-based groups (*Pokmas*). Data were collected through in-depth interviews and observation and analyzed based on the subjective experiences and risk perceptions of each actor. The findings indicate that risk meanings vary and are influenced by the actors' positions and roles. Government actors tend to interpret slow-onset disasters as issues of environmental management and long-term development, while coastal communities perceive them as direct threats to livelihoods and living spaces. Community-based groups view risk as an opportunity to strengthen collective, conservation-based action, whereas experts emphasize ecological vulnerability and long-term sustainability. These differences highlight the importance of contextual and adaptive risk communication in fostering shared perceptions and strengthening collective preparedness.

**Keywords:** Risk Communication, Slow-Onset Disaster, Coastal Stakeholders, Phenomenology, Mangrove Conservation

### Introduction

Coastal areas constitute spaces where ecological, social, and economic functions are closely interconnected. At the same time, these areas are among the most vulnerable to environmental change, particularly disasters that evolve gradually, known as *slow-onset disasters* (Bhokaleba & Erfin, 2022). Unlike *sudden-onset disasters*, which occur abruptly, *slow-onset disasters* develop over extended periods and often lack signals that are immediately perceived as threatening. As a result, the risks they pose tend to be overlooked until their impacts are felt significantly by both communities and the environment (Alam et al., 2025).

The northern coast of West Java is one of the regions experiencing serious ecological pressure due to gradual coastal abrasion. Over an eight-year period, from 2013 to 2021, coastal abrasion resulted in an expansion of seawater areas amounting to 105,804 hectares (BIG Report, 2021). These changes have led to shoreline retreat, loss of living space, and disruptions to coastal livelihoods. Despite their significant scale, gradual abrasion processes have not been fully understood or interpreted as disasters by stakeholders (Okunola, 2024; Mikoš, 2011; Rusadi et al., 2024). This condition indicates that gradual ecological threats are not automatically translated into urgent disaster risks.

This situation demonstrates that the primary challenge in addressing *slow-onset disasters* lies not only in the characteristics of the hazard itself, but also in how risk is communicated and interpreted by the actors involved. Risk communication plays a strategic role in shaping understanding, perception, and preparedness for disasters (Nuriman et al., 2022). In the context of *slow-onset disasters*, risk communication becomes more complex because threats do not emerge instantaneously or dramatically. The gradual nature of change may reduce the *sense of urgency* and encourage the perception that such conditions are part of normal environmental dynamics (Hapsari & Farabi, 2019).

In practice, coastal management along the North Coast of West Java involves multiple actors with differing backgrounds, mandates, and experiences. These actors include the North Coast Regional Office of Marine and Fisheries of West Java (CDKPWU), which is responsible for coastal and fisheries resource management; the Regional Forestry Office II, which oversees mangrove areas; and the Regional Disaster Management Agency (BPBD) of Karawang Regency, which focuses on disaster management. In addition, community-based groups such as *Pokmas Kreasi Alam Bahari* are directly involved in mangrove conservation activities, alongside coastal communities who experience the impacts of abrasion firsthand, and experts who understand risk from scientific and ecological perspectives.

The presence of these diverse actors suggests the potential for differing understandings and interpretations of *slow-onset disaster* risk. Each actor engages with coastal abrasion through distinct interpretive frameworks: bureaucratic institutions tend to understand risk through institutional mandates and programmatic planning; coastal communities interpret risk through lived experiences of livelihood disruption and loss of living space; community groups frame risk through collective conservation practices; and experts emphasize long-term ecological vulnerability. These differences in position and role may generate diverse and sometimes misaligned risk meanings (Fiona, 2022).

Several studies indicate that risk perception is strongly influenced by how threats are framed and communicated. *Slow-onset disasters* framed solely as environmental issues tend to receive less attention than those linked to impacts on livelihoods, living spaces, and economic stability (Ruslie & Surya, 2021). Thus, urgency does not necessarily arise from the nature of the disaster itself, but can be constructed through risk communication strategies that emphasize long-term consequences and their relevance to everyday life.

However, research on disaster risk communication remains dominated by studies of *sudden-onset disasters*, while investigations of *slow-onset disasters*, particularly in Indonesia's coastal regions, remain limited. Moreover, studies that explicitly explore how stakeholders construct risk meanings based on subjective experience and social position are still scarce. This gap is significant, given that differences in actors' roles and responsibilities can produce varied and potentially unaligned interpretations of risk, with implications for coordination, policy effectiveness, and collective preparedness (Comfort & Chang, 2025).

Within this context, mangrove conservation is widely regarded as a key adaptation and mitigation strategy for coastal abrasion. Nevertheless, the effectiveness of mangrove conservation is determined not only by technical and ecological factors, but also by how *slow-onset disaster* risks are communicated and collectively understood by CDKPWU, the Regional Forestry Office II, the BPBD of Karawang Regency, community-based groups, coastal communities, and experts.

Therefore, this study aims to explore the meanings of risk communication constructed by stakeholders in responding to *slow-onset disasters* along the North Coast of West Java through mangrove conservation. A phenomenological approach is employed to understand actors'

subjective experiences in interpreting risk, urgency, and disaster, providing a basis for developing more contextual and adaptive risk communication to strengthen collective preparedness (Thomas et al., 2022).

## **Methods**

### **Research Approach**

This study employs a qualitative research approach aimed at gaining an in-depth understanding of the meanings of risk communication constructed by stakeholders in responding to slow-onset disasters in the coastal areas of the North Coast of West Java. The qualitative approach was selected because this study does not focus on quantitative measurement of variables, but rather on exploring subjective experiences, perceptions, and interpretations of risk as experienced by the actors involved (W & J, 2023).

### **Research Design**

The research design adopted in this study is phenomenological, with the objective of exploring the lived experiences of stakeholders in interpreting slow-onset disaster risks and the communication processes surrounding them. A phenomenological approach enables the researcher to understand how risk, disaster, and urgency of action are perceived, experienced, and framed by actors based on their positions, roles, and interactions within the context of mangrove conservation (Mubarok, 2023).

### **Data Collection Techniques**

Research data were collected primarily through in-depth interviews as the main technique, in order to obtain comprehensive narratives regarding each informant's experiences and interpretations of risk. The interviews were conducted using a semi-structured format with open-ended guiding questions, allowing informants to freely articulate their perspectives, experiences, and interpretations (Monika & Kusumawardhani, 2023). In addition, the study was supported by participant observation and document analysis, including policy documents, mangrove conservation program reports, and documents related to coastal area management, which served as supplementary data and provided contextual support for the analysis (Riyantie & Barizki, 2020).

### **Informant Selection Technique**

Informants were selected using a snowball sampling technique, taking into account their involvement, knowledge, and experience in coastal area management, mangrove conservation, and disaster mitigation. The selection process began with key informants from relevant institutions and subsequently expanded through referrals to additional informants considered to possess relevant understanding and experience regarding the phenomenon under investigation. Research informants included representatives from the North Coast Regional Office of Marine and Fisheries of West Java, the Forestry Office, the Regional Disaster Management Agency (BPBD), coastal communities, experts, and community-based groups (*pokmas*). This technique was employed to obtain rich and layered information, as well as to ensure interconnected perspectives among actors in understanding the meanings of risk communication within the context of slow-onset disasters (Rijali, 2018).

### **Data Analysis Technique**

Data analysis was conducted qualitatively by following the stages of phenomenological analysis, which include data reduction, meaning clustering, and the identification of essential themes (Purnomo, 2022). Interview data were transcribed verbatim and subsequently analyzed to identify patterns of risk interpretation, differences in perception among actors, and the

construction of risk communication processes (Rabe et al., 2024). The analytical process was carried out iteratively and reflectively to maintain interpretive depth and to ensure that the research findings authentically represent the experiences and perspectives of the informants.

## Results and Discussion

The findings of this study indicate that risk perception regarding *slow-onset disasters* in the coastal areas of the North Coast of West Java is not understood uniformly among stakeholders. Clear variations in risk meaning emerge among bureaucratic actors, technical implementers, environmental experts, community-based groups, and coastal communities. These differences indicate that coastal abrasion and changes in coastal ecosystems are not interpreted as a single or linear reality, but rather are socially constructed through actors' experiences, social positions, expertise, and scopes of responsibility. In the context of *slow-onset disasters*, such diversity of perceptions constitutes a reasonable and expected consequence. Threats that develop gradually tend not to generate collective awareness simultaneously, resulting in misalignment between actors who experience impacts directly and those who understand risk through administrative or policy frameworks. This finding is consistent with the view that risk perception is inherently subjective and strongly influenced by what individuals and institutions experience, feel, and understand.

In this section, findings related to risk perception of *slow-onset disasters* are interpreted through theoretical and conceptual lenses within risk perception studies, ecological disaster research, and the social construction of threats. Accordingly, the discussion does not merely describe what informants stated, but rather interprets why such perceptions are formed, how perceptual differences emerge, and the extent to which these findings align with or diverge from the theoretical frameworks employed in this study. The variation in risk perception identified among bureaucratic actors, technical implementers, experts, and coastal communities demonstrates that *slow-onset disaster* risk is not understood uniformly. This diversity illustrates that meanings attached to abrasion and coastal ecosystem change are neither singular nor linear, but are shaped by social position, experience, expertise, and institutional responsibility. In the context of *slow-onset disasters*, such perceptual differences are not only expected but are a natural outcome, given that slowly evolving threats tend to produce perceptual misalignment between those who directly observe impacts and those who interpret risk through policy frameworks or administrative reports (Khumairoh et al., 2023).

These findings align with Slovic's argument that risk perception is inherently subjective and strongly determined by what individuals see, experience, and feel (Sjöberg, 2020). According to Slovic, risks that are not directly visible, develop gradually, or lack dramatic focal events tend to be ignored or perceived as less severe by certain actors. This perspective is reinforced by Renn's view that risk perception is shaped through the interaction of personal experience, social context, and technical knowledge. Consequently, it is reasonable that bureaucratic actors, communities, experts, and technical implementers assess threat levels differently. The combination of these theoretical perspectives demonstrates that perceptual diversity is not a sign of inconsistency, but rather a defining characteristic of *slow-onset risks*, whose impacts are indirect, cumulative, and often only recognized after they have expanded significantly.

At the bureaucratic level, this study finds that *slow-onset disaster* risk is interpreted through a highly administrative framework. Government officials perceive abrasion as part of ecological impacts inherent to coastal activities, and mitigation is therefore regarded as an institutional obligation that must be implemented routinely on an annual basis. This mindset indicates that risk perception is shaped not by direct proximity to the threat, but by how institutions define their duties and mandates (Aziz, 2023). As a result, risk is viewed as part of the organizational

work cycle incorporated into annual work plans, formulated as proposals, aligned with planning and budgetary documents, and implemented when funding becomes available.

This perspective is consistent with Slovic's notion that risk is perceived differently by actors who maintain physical and emotional distance from the threat (Putra & Ardianto, 2022). For bureaucratic actors, abrasion is not an everyday phenomenon and therefore does not generate a strong sense of urgency. Instead, it is interpreted as an "issue of coastal area management" rather than as an unfolding disaster threat. This structured perspective also resonates with Renn's argument that institutions often construct risk perceptions based on institutional capacity, operational regulations, and procedural logic, rather than on empirical experience with the risk itself.

Within the findings of this study, bureaucratic perceptions tend to be rational, measurable, and confined within the boundaries of formal responsibilities. Abrasion is acknowledged as an important phenomenon, yet it is not positioned as a threat requiring new approaches or responses beyond existing programmatic mechanisms. This reflects what is referred to as *bounded rationality*, whereby organizational actors process risk according to the capacities permitted by structural and procedural constraints, rather than according to the magnitude of the threat in the field (Morgan et al., 2025).

In contrast to technical implementers and coastal communities who directly experience shoreline change, bureaucratic actors tend to perceive risk through data, reports, and planning documents. This distance results in perceptions that are more stable, less emotional, and less likely to frame *slow-onset disasters* as ecological emergencies. In the risk communication literature, such patterns are commonly observed in large organizations particularly government institutions which frequently frame risk as an administrative issue due to hierarchical, standardized mechanisms and strong dependence on budgetary cycles. In other words, risk is understood not through proximity to threat, but through formal coordination instruments.

This bureaucratic approach to risk reflects what institutional risk framing theory describes as the tendency of institutions to interpret risk according to their mandates and organizational structures (Wachinger et al., 2013). Risks processed through annual program planning, activity scheduling, and budget mechanisms tend to lose their sense of ecological urgency. Within the framework of *bounded rationality*, bureaucratic responses remain constrained by structural capacity; actors respond only to the extent that the system allows, not to the extent that the threat escalates. Consequently, abrasion despite its ecological urgency is not always treated as a priority threat, but rather as part of routine coastal management.

In risk perception studies, the bureaucratic tendency to organize risk within formal frameworks also aligns with the work of Mary Douglas and Wildavsky, who argue that institutions consistently interpret risks according to internal values, rules, and organizational logic (Khumairoh et al., 2023). For government agencies, risk is inseparable from procedure; it becomes categorized as an "activity" or "program" rather than as a "crisis." This linguistic shift shapes decision-making processes and determines levels of urgency. While technical implementers employ language of emergency having witnessed mangroves being eroded by tidal flooding or land being lost annually bureaucratic actors tend to use more neutral, regulatory language.

The perspectives of environmental experts further reinforce these findings. From an academic standpoint, experts explain that perceptual misalignment among actors is common in slowly evolving disasters due to their non-dramatic nature, limited predictability, and absence of "shock events" that typically trigger institutional attention. Environmental experts emphasize that bureaucratic awareness often fluctuates because risk information is not internalized

through repeated exposure. This observation aligns with the concept of *risk attenuation*, whereby ecological risks are perceived as less severe due to limited communication frequency and the absence of situational pressure. In addition, experts highlight that-bureaucratic institutions experience *epistemic distance* a gap between knowledge and ecological realities on the ground. Bureaucratic actors understand abrasion through reports and administrative indicators, whereas technical implementers and communities understand it through physical changes experienced daily. This epistemic separation produces two forms of perception: documentation-based perception and experience-based perception.

Within *experiential versus analytical processing theory*, field actors rely on intuitive knowledge and sensory experience, while bureaucratic institutions employ more abstract analytical processing. These differing cognitive processes generate differing levels of urgency. At this point, it becomes clear that perceptual variation between bureaucratic and field actors is not merely a difference in viewpoints, but a consequence of differing information structures, psychological distance from the threat, and divergent operational logics. This finding aligns fully with modern risk perception theory, which emphasizes that risk is never understood objectively. The way actors interpret threats is always filtered through institutional contexts, work cultures, knowledge capacities, and physical and emotional proximity to sources of risk. Within coastal communities, patterns of risk interpretation cannot be separated from cultural values that shape relationships with the sea. This framework aligns with Cultural Theory of Risk (Douglas & Wildavsky, 1983), which explains that communities possess specific cultural patterns for understanding threats (Khumairoh et al., 2023).

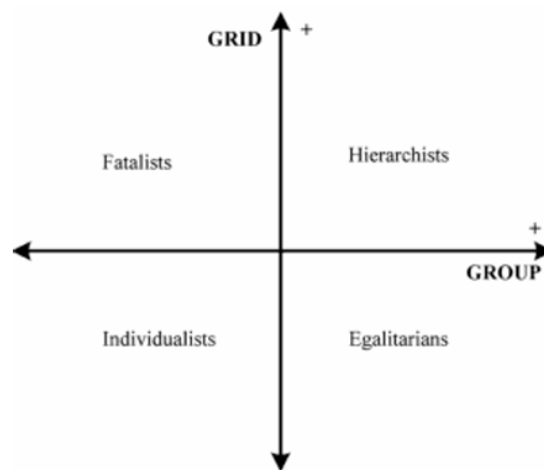


Figure 1. The Cultural theory of Risk

Source : National Institute Of Health (NIH, 2025)

Within the context of coastal communities, patterns of risk interpretation cannot be separated from cultural values that shape how communities relate to the sea. This perspective aligns with the *Cultural Theory of Risk* (Douglas & Wildavsky, 1983), which explains that communities possess specific cultural patterns in understanding threats. Within this framework, risk perception is determined not only by objective information, but also by social relationships that shape how groups interpret the world. The four cultural orientations fatalist, hierarchical, individualist, and egalitarian provide an analytical lens for understanding why coastal communities respond differently to the threat of abrasion. Among some coastal communities, a fatalistic orientation is evident in the way abrasion is accepted as “part of life on the coast.” Expressions such as “sea levels naturally rise and fall” or “nature follows its own course” reflect a belief that humans have limited control over environmental threats.

This fatalism explains why, at early stages, abrasion is not perceived as a threat, but rather as a routine phenomenon that does not trigger warning signals. Conversely, a hierarchical orientation is strongly evident within government bureaucracies, particularly within the Marine and Fisheries Office (DKP) and the Regional Disaster Management Agency (BPBD), where risk is understood through command structures, Standard Operating Procedures (SOPs), and official reports. Hierarchical groups tend to believe that risk should be managed through procedures, regulations, and formal authority. This orientation explains why bureaucratic institutions interpret abrasion as an “annual program” or a “routine mitigation agenda,” rather than as an urgent ecological crisis. Their perceptions remain stable because they depend on organizational workflows rather than personal experience. On the other hand, an individualist orientation can be observed among private-sector actors, such as Corporate Social Responsibility (CSR) companies involved in mangrove planting initiatives.

These actors view risk as an opportunity to take action based on strategic, reputational, or pragmatic benefits. Within this group, risk is not perceived as something to be feared, but as something that can be managed efficiently through rapid and flexible actions. Meanwhile, an egalitarian orientation is strongly reflected in community-based groups such as *Pokmas Kreasi Alam Bahari*. Solidarity, collective action, and shared awareness form the foundation of their responses. Community members who are directly exposed to abrasion as illustrated by the experiences of Pokmas tend to demonstrate high levels of risk perception and community-based responses. Initiatives such as constructing wave barriers from bags filled with marine waste represent a concrete example of egalitarian orientation: collective action undertaken to confront a shared threat.

Thus, these four cultural orientations help explain the diversity of perceptions identified in this study. Fatalism among coastal communities initially suppresses vigilance; hierarchical bureaucratic structures frame abrasion in administrative language; individualism within the private sector drives opportunistic action; and community egalitarianism promotes more adaptive collective responses. This framework clarifies that differences in how actors interpret *slow-onset disaster* risks are not merely differences in information, but are rooted in cultural distinctions that shape how actors live, work, and relate to coastal environments. For coastal communities, the sea is not merely a source of danger, but an integral part of identity, living space, and economic rhythm. Such value systems encourage the emergence of *risk normalization*, defined as the tendency to perceive environmental change as part of a natural and expected cycle (Nuriman et al., 2022). This helps explain why some communities initially do not perceive abrasion as a threat, until its impacts manifest in the form of land loss or housing damage.

Variations in perception between bureaucratic institutions and field-level actors are therefore a consequence of differences in position, experience, and exposure to information. These differences become more pronounced when risks evolve gradually, as threats of this nature do not typically trigger spontaneous institutional responses (Alam et al., 2025). Previous literature on slow-onset hazards such as studies on land subsidence in Semarang, seawater intrusion along the East Java coast, and peatland degradation in Kalimantan reveals similar patterns. Bureaucratic institutions tend to respond to risk administratively, while communities respond pragmatically due to direct exposure to impacts. These findings reinforce the observation that institutional perceptions are often constrained by organizational structures (Sjöberg, L., 2020), resulting in slower recognition of threats compared to field actors who witness ecological change on a daily basis. When compared with *sudden-onset* risks such as flash floods or earthquakes, this perceptual gap becomes even more evident.

In disasters that occur abruptly, nearly all actors bureaucrats, communities, experts, and technical implementers tend to share relatively similar threat perceptions. Previous studies on local government responses to the Yogyakarta earthquake or Jakarta floods, for example, demonstrate that time pressure and the magnitude of impact prompt high-intensity bureaucratic responses (Ruslie et al., 2022). These responses include rapid mobilization, cross-sector coordination, and increased public communication. However, such patterns do not apply to *slow-onset disasters*, which unfold quietly and therefore do not generate institutional compulsion to act. From a theoretical perspective, this condition aligns with the concept of *temporal bias* in risk management, which refers to the tendency of individuals and institutions to prioritize threats with rapid onset over those that develop slowly. *Slow-onset disasters* such as abrasion, seawater intrusion, or sea-level rise often fail to trigger “psychological alarms” within organizations, causing risk perception to diminish within bureaucratic structures.

In addition, *risk normalization theory* explains how gradually unfolding threats are often accepted as part of a “new normal,” leading institutions to delay significant responses until impacts become severe (Morgan, 2025). Environmental experts interviewed in this study further reinforce this view by noting that scientific uncertainty and limited routine socialization contribute to fluctuating perceptions. This perspective is consistent with academic literature on *risk communication gaps*, which describes situations in which institutions believe they have adequately understood risks through documents and policies, yet fail to develop the same level of sensitivity as field actors who experience impacts empirically (Hariani et al., 2024).

This misalignment demonstrates that risk perception is shaped not only by technical knowledge, but also by how information flows within organizational systems and how frequently threats are discussed. Beyond recognizing perceptual differences between *slow-onset* and *sudden-onset disasters*, it is important to emphasize that both types of hazards require comparable levels of urgency, even though the mechanisms through which urgency emerges differ significantly. In much of the risk communication literature, one of the greatest challenges lies in ensuring that slowly evolving threats are treated with the same seriousness as sudden events.

*Slow-onset disasters* such as abrasion, seawater intrusion, and land subsidence may lack immediate shock events, but their impacts are cumulative and often more permanent than those of sudden disasters. This reality demands risk communication capable of disrupting the “false calm” produced by slow yet progressive processes (Haslinda, 2025). Within the conceptual framework of *risk salience theory*, threats are considered important to the extent that they achieve *presence value* in the minds of the public and institutions (Alfarabi & Adhrianti, 2023). *Sudden-onset disasters* naturally possess high salience due to their dramatic events, whereas *slow-onset disasters* frequently lose salience, making communication spaces critically important for rendering risks visible.

Here, risk communication functions as a tool for *risk surfacing*, bringing invisible threats to the forefront by emphasizing that delayed responses amplify future impacts. This perspective aligns with Sellnow-Richmond & Sellnow (2020) argument that slow-moving risks require anticipatory communication strategies that cultivate urgency before impacts reach critical thresholds. Environmental experts interviewed in this study also highlighted this issue by noting that communities often experience “on-off consciousness” regarding risk due to inconsistent socialization efforts. These insights reinforce findings from international climate change research, which suggest that long-term threats can only be addressed when risk communication frames them as sufficiently immediate, even in the absence of sudden events.

This approach is reflected in the concept of *temporal framing*, which emphasizes communicating time horizons, observable changes, and foreseeable consequences in the

absence of action. From a risk psychology perspective, both *slow-onset* and *sudden-onset disasters* possess the potential to cause significant harm. However, human perceptual systems are naturally more sensitive to threats that involve shock or surprise.

Consequently, risk communication plays a critical role in embedding a *sense of urgency* within slowly evolving threats by emphasizing long-term causal relationships, unavoidable impacts, and increasing uncertainty. This approach aligns with *anticipatory governance theory*, which advocates policy and communication strategies designed not merely to respond after disasters occur, but to build preparedness before hazards reach dangerous levels (Boyd & Wilson, 2021). Several previous studies, both in Indonesian coastal contexts and internationally, demonstrate that when *slow-onset disasters* are framed appropriately for example, as threats to livelihoods, loss of living space, or economic disruption public perceptions can shift closer to those associated with *sudden-onset disasters*. This indicates that urgency is not derived solely from the characteristics of the disaster itself, but can be constructed through communication strategies that emphasize long-term consequences and the connection between risk and everyday life.

Therefore, although *slow-onset* and *sudden-onset disasters* differ fundamentally in their rhythms and speeds of manifestation, both can be positioned at comparable levels of urgency when managed through strategic, consistent, and layered risk communication. Temporal differences should not result in neglect; rather, they necessitate different approaches to message design and delivery. The central challenge lies not merely in understanding the nature of the threat, but in transforming that understanding into communicative language capable of raising public awareness, fostering a sense of immediacy, and cultivating collective preparedness across all levels of actors (Zajac et al., 2025). At this point, risk perception becomes a determining factor in whether a threat is elevated to policy priority and action, or whether it continues to progress silently until it escalates into an ecological crisis that is difficult to address. Without perceptual alignment, *slow-onset disasters* will continue without alarm, while *sudden-onset disasters* remain the primary focus, ultimately creating preparedness inequalities that disadvantage coastal communities as a whole.

## **Conclusion**

This study concludes that risk communication regarding *slow-onset disasters* in the coastal areas of the North Coast of West Java is interpreted diversely by stakeholders, depending on their positions, experiences, and institutional frameworks. Bureaucratic actors tend to frame coastal abrasion as an administrative and routine environmental management issue, whereas coastal communities and technical implementers interpret it as a tangible threat to living space and livelihoods. Community-based groups view risk as a foundation for building conservation-oriented collective action, while experts emphasize long-term ecological vulnerability and the cumulative nature of impacts. These differing interpretations indicate that *slow-onset disasters* have not yet been fully positioned as urgent disasters, which may weaken preparedness and policy prioritization.

## **Suggestions**

This study suggests the need to develop strategic, consistent, and contextual risk communication that emphasizes the interconnections between ecological risks, everyday life, and long-term consequences. Such an approach is essential to align perceptions among actors and to strengthen collective preparedness in addressing *slow-onset disasters* in coastal areas.

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