



Strengthening the Role of Local Actors in Sustainable Coastal Management Systems

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ABSTRACT

This study aims to analyze the strengthening of local actors' roles in sustainable coastal management systems in the Gisik Cemandi coastal area, Sidoarjo Regency, East Java, Indonesia. The study addresses the gap between formal coastal governance programs and the lived experiences of coastal communities. A qualitative case study design was used to explore how local actors interpret their roles, participate in decision-making, manage environmental change, and interact with formal institutions. Data were collected from 20 to 30 informants through semi-structured interviews, field observations, and document analysis. The participants included fishers, mangrove group members, tourism awareness group members, women involved in coastal economic activities, youth representatives, village officials, environmental volunteers, and relevant institutional actors. The findings reveal four main themes: local ecological knowledge as a basis for decision-making, community participation as social legitimacy, informal leadership as an institutional bridge, and structural constraints that limit local agency. The study shows that local actors are not only beneficiaries of coastal programs, but also knowledge holders, mediators, and key agents in sustaining coastal governance. These findings contribute to collaborative governance, co-management, and social-ecological system studies by emphasizing the importance of trust, inclusion, and local legitimacy. The study recommends stronger policy mechanisms that involve local actors from planning to evaluation and suggests future comparative research across different coastal communities.



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1. Introduction

Coastal areas are strategic socio-ecological spaces that support fisheries, marine tourism, mangrove ecosystems, biodiversity conservation, and local livelihoods. These areas also face increasing pressure from climate change, coastal abrasion, pollution, resource extraction, tourism expansion, and competing spatial claims. In many coastal regions, sustainability problems do not only emerge from ecological degradation, but also from weak governance arrangements that fail to connect formal policy with local social realities. Berkes (2020) argues that community-based resource management needs to be understood as part of a complex social-ecological system because local institutions, ecological knowledge, and collective action interact continuously. This perspective is relevant for coastal management because ecological protection cannot work

effectively when local actors remain marginal in planning, monitoring, and decision-making processes.

In Indonesia, coastal management has a high level of complexity because coastal communities depend directly on marine resources for economic survival, cultural identity, and social continuity. Local actors such as fishers, village leaders, women's groups, youth organizations, mangrove groups, tourism awareness groups, and customary actors often hold detailed knowledge about ecological change, fishing seasons, local conflicts, and resource-use patterns. Razak et al. (2024) show that coral reef restoration in Indonesia requires not only legal clarity, but also stronger institutional support and community involvement. This condition indicates that coastal sustainability cannot rely only on top-down regulation. It also requires local legitimacy, social trust, and practical knowledge from people who live with coastal ecosystems every day.

Field realities in coastal communities often show a gap between formal coastal management programs and the everyday experiences of local communities. Government programs may introduce conservation, tourism, or rehabilitation initiatives, but community members may interpret those programs differently based on livelihood needs, past conflicts, access to resources, and trust in institutions. McLean et al. (2022) found that fishers' local ecological knowledge can reveal how communities perceive fishery conditions and management performance. This type of knowledge is important because formal data often fail to capture daily ecological signals, informal rules, and local coping strategies. Therefore, local actors should not be treated only as beneficiaries of coastal development. They need to be positioned as knowledge holders, decision partners, and social agents who shape the success of sustainable coastal management.

The role of local actors also becomes important because coastal governance involves many stakeholders with different interests. Marine conservation, coastal tourism, fisheries management, mangrove rehabilitation, and blue economy programs often create overlapping claims among local communities, government agencies, private actors, and conservation institutions. Di Franco et al. (2020) state that marine protected area governance becomes stronger when stakeholders engage in collaboration and co-production of knowledge. Trust also plays a central role in this process because knowledge exchange between communities, scientists, and policy actors depends on credible relationships. Cvitanovic et al. (2021) explain that trust is essential for connecting environmental science and policy practice. In this context, strengthening local actors means strengthening the social foundation of coastal governance.

Previous studies have discussed community participation, co-management, marine protected areas, and blue economy governance. Collier (2020) highlights that community-based co-management requires enabling conditions such as institutional capacity, legitimacy, and clear role distribution. Wuwung et al. (2022) show that blue economy governance needs clearer implementation pathways so that economic development does not weaken ocean health and social justice. Rahman et al. (2022) also found that community participation can support sustainable development in marine protected areas when local welfare and environmental goals are connected. However, many studies still focus on institutional design, policy outcomes, or management effectiveness. Less attention has been given to how local actors interpret their roles, negotiate with external institutions, and construct practical strategies in their own social and cultural context.

This study aims to analyze the strengthening of local actors' roles in sustainable coastal management systems. The study focuses on the experiences, meanings, participation mechanisms, knowledge practices, and institutional relationships that shape local actors' involvement in coastal governance. Hsu and Peng (2023) emphasize that coastal residents' vulnerability and livelihood sustainability need to be understood through the social conditions that influence their adaptive capacity. This study contributes theoretically to collaborative governance, co-management, and social-ecological system studies by placing local actors at the center of analysis. Practically, the study provides insights for local governments, coastal communities, conservation organizations,

and development agencies in designing participatory, fair, and context-sensitive coastal management models.

2. Materials and Methods

This study uses a qualitative approach with a case study design. The case study design was selected because the research aims to understand the role of local actors in sustainable coastal management within a specific social, ecological, and institutional context. The study is not designed to measure participation statistically, but to interpret how local actors experience, negotiate, and strengthen their position in coastal governance. Rangel et al. (2025) show that community-based marine protected area design requires engagement and legitimacy-building processes that can only be understood through close attention to local interaction. The case study design allows the researcher to examine local meanings, institutional relationships, conflict dynamics, and practical strategies in detail. This design also supports limited replication because the research procedures, participant criteria, data collection stages, and analysis process are described systematically.

The research will be conducted in the Gisik Cemandi coastal area, Sedati District, Sidoarjo Regency, East Java, Indonesia. This location was selected because it represents a coastal area where local communities interact directly with fisheries, mangrove management, coastal tourism, and environmental rehabilitation activities. The research will be carried out from June to September 2026. This period includes preliminary observation, participant recruitment, field data collection, data validation, and thematic analysis. The participants will include fishers, mangrove group members, tourism awareness group members, village officials, women involved in coastal economic activities, youth representatives, local environmental volunteers, and representatives of relevant government or conservation institutions. Jiang et al. (2024) emphasize that community participation in marine protected areas has become an important global research concern because participation influences conservation legitimacy and management sustainability.

Participants will be selected using purposive sampling. The main criteria include direct involvement in coastal management activities, knowledge of local environmental change, experience in community decision-making, and willingness to participate in interviews. Snowball sampling will also be used to identify additional informants who have specific knowledge about conflict history, informal rules, mangrove rehabilitation, fishery practices, or local institutional networks. Kuran et al. (2025) show that co-management in small-scale fisheries requires attention to collective action, local leadership, and institutional learning. Based on this logic, the study will involve approximately 20 to 30 informants or until data saturation is reached. The number may be adjusted during fieldwork if new themes continue to emerge from interviews and observations.

Data will be collected through semi-structured interviews, field observation, and document analysis. Semi-structured interviews will explore local actors' roles, participation experiences, perceptions of coastal change, relationships with government institutions, conflict management, and strategies for sustaining coastal resources. Field observation will focus on community meetings, mangrove activities, coastal livelihood practices, tourism management, and everyday interactions among local actors. Document analysis will include village regulations, meeting notes, local program reports, coastal maps, community group records, photographs, and policy documents. Frohlich et al. (2023) argue that blue economy policy involves complex institutional networks, so document analysis is useful for identifying how formal rules connect with local governance practice. These three data sources will allow the researcher to compare spoken narratives, observed practices, and written evidence.

Data validity will be strengthened through source triangulation, method triangulation, member checking, and audit trail. Source triangulation will compare information from fishers, village officials, community groups, women's groups, youth representatives, and institutional actors. Method triangulation will compare interview data, observation notes, and documents. Member

checking will be conducted by returning key interpretations to selected informants to ensure that the findings represent their experiences accurately. Ahmed (2024) explains that trustworthiness in qualitative research depends on credibility, transferability, dependability, and confirmability. An audit trail will also be maintained through interview transcripts, field notes, coding records, analytic memos, and documentation of methodological decisions. This process will make the research more transparent and traceable.

Data analysis will use thematic analysis supported by the interactive logic of data condensation, data display, and conclusion drawing. The first stage involves repeated reading of interview transcripts, observation notes, and documents to gain familiarity with the data. The second stage involves open coding to identify statements related to local leadership, participation, ecological knowledge, institutional barriers, trust, conflict, adaptation, and collaboration. The third stage groups codes into broader themes, such as local legitimacy, collaborative mechanisms, knowledge integration, structural constraints, and strategies for strengthening coastal governance. Kiger and Varpio (2020) explain that thematic analysis is useful for identifying and interpreting patterned meanings across qualitative data. The final stage involves reviewing themes, refining interpretations, and linking findings to the research objective. Ahmed et al. (2025) stress that thematic analysis must follow clear stages so that the interpretation remains systematic, transparent, and grounded in data.

3. Results and Discussions

The analysis identified four main themes that explain how local actors strengthen sustainable coastal management in the Gisik Cemandi coastal area, Sidoarjo Regency. These themes include local ecological knowledge as a basis for decision-making, community participation as social legitimacy, informal leadership as a bridge between institutions, and structural constraints that limit local agency. The findings show that local actors do not view coastal management only as an environmental program. They understand it as a shared effort to protect livelihoods, maintain social order, and secure the future of coastal resources. This finding supports the view that community-based resource management works within a complex social-ecological system, where ecological change, social relations, and institutional capacity influence one another (Berkes, 2020).

The first theme concerns the role of local ecological knowledge in understanding coastal change. Fishers and mangrove group members explained that they use daily observations to read changes in tides, sedimentation, mangrove growth, fish movement, and seasonal uncertainty. One fisher stated, “We know the coast is changing not from reports, but from the water level, the mud, and the fish that no longer come at the same time.” This statement shows that local knowledge is experiential and practical. It comes from repeated interaction with the coastal environment. Observations also showed that local actors often discussed environmental changes informally before reporting them to village officials or group leaders. This pattern confirms that local ecological knowledge can help identify environmental problems earlier than formal monitoring systems. McLean et al. (2022) also found that fishers’ knowledge can reveal how communities interpret fisheries conditions and management performance.

The second theme shows that participation becomes meaningful when local actors feel that their voices influence decisions. Several informants stated that they were willing to join mangrove planting, coastal cleaning, and tourism management activities when they understood the purpose of the program and saw direct benefits for the community. However, participation decreased when programs came only as instructions from external institutions. A member of a tourism awareness group said, “People will come if they are invited to discuss, not only asked to work after the decision has been made.” This finding indicates that participation is not only about physical involvement. It also requires recognition, dialogue, and shared decision-making. This pattern aligns with Collier (2020), who explains that community-based co-management requires legitimacy, institutional support, and clear role distribution.

The third theme relates to informal leadership. Village leaders, senior fishers, women's group coordinators, youth representatives, and mangrove activists played important roles in translating formal programs into language that the community could understand. These actors helped reduce distrust, mediated conflicts, and encouraged residents to join collective activities. During field observation, informal leaders often acted as connectors between government officers and community members. They explained technical policies, negotiated activity schedules, and reminded residents about agreed rules. One woman involved in coastal economic activities stated, "Sometimes people listen more to those who live here than to officers from outside." This statement shows that local legitimacy depends on social closeness and trust. Cvitanovic et al. (2021) emphasize that trust is essential for knowledge exchange between communities, researchers, and policy actors.

The fourth theme reveals several constraints that limit the role of local actors. Informants mentioned limited funding, weak coordination between institutions, unclear program continuity, unequal access to information, and low involvement of women and youth in formal meetings. Some actors felt that coastal programs focused more on short-term activities than long-term institutional strengthening. A youth participant explained, "We are often invited to help in activities, but rarely involved in planning." This finding suggests that local participation still contains hierarchy. Certain groups become visible as labor contributors, but remain less visible as decision-makers. Frohlich et al. (2023) argue that blue economy and coastal policy involve complex institutional networks, so weak coordination can reduce the effectiveness of local implementation.

The findings also show that sustainable coastal management in Gisik Cemandi depends on the ability to integrate ecological protection with livelihood security. Mangrove conservation, coastal tourism, and small-scale fisheries were not viewed as separate sectors by local actors. They were seen as connected sources of income, identity, and environmental protection. When mangrove areas improved, some residents connected this change with better tourism potential and stronger coastal protection. However, some fishers also expressed concern that conservation rules could limit access to traditional fishing areas if not discussed transparently. This tension shows that sustainability must balance ecological goals and social justice. Wuwung et al. (2022) remind that blue economy governance should not focus only on economic growth, but also on ocean health and fairness for coastal communities.

Discussion

The findings indicate that strengthening local actors is not only a technical strategy, but also a social and institutional process. Local actors contribute through ecological observation, collective labor, informal negotiation, community mobilization, and conflict mediation. These roles are often invisible in formal policy documents, but they strongly influence whether coastal management programs are accepted or rejected by the community. This result supports Di Franco et al. (2020), who argue that marine governance becomes stronger when knowledge is produced collaboratively between stakeholders. In the case of Gisik Cemandi, collaboration works best when external programs recognize local experience as valid knowledge, not merely as supporting information.

The study also confirms that participation must be understood beyond attendance in meetings or involvement in activities. In many cases, community members joined coastal programs because they trusted local leaders, understood the benefit of the activity, and believed that the program matched local needs. This finding is consistent with Rahman et al. (2022), who found that community participation supports sustainable development in marine protected areas when environmental goals connect with local welfare. However, this study adds a qualitative insight that participation can become superficial when local actors are involved only after key decisions have been made. Therefore, the quality of participation matters more than the number of participants.

Compared with previous research on co-management, this study reinforces the importance of role clarity and institutional support. Collier (2020) explains that community-based co-management needs enabling conditions, including legitimacy and institutional capacity. The present findings show that these conditions are still uneven at the village level. Local actors have strong social commitment, but their role is often limited by funding dependence, fragmented programs, and weak access to formal planning spaces. This gap shows that strengthening local actors requires more than inviting them to activities. It requires institutional mechanisms that allow them to participate in planning, implementation, monitoring, and evaluation.

The findings also extend previous studies on local ecological knowledge. McLean et al. (2022) show that fishers' ecological knowledge can provide important insight into fisheries and management conditions. This study adds that local ecological knowledge also functions as a social tool. It helps communities build shared awareness, justify collective action, and negotiate with external actors. For example, local observations about sedimentation, mangrove growth, and fish movement became a basis for discussing rehabilitation needs. This means that local knowledge does not only describe nature. It also shapes social decisions about how the coast should be managed.

The role of informal leadership is another important contribution of this study. Formal governance often focuses on official institutions, regulations, and administrative structures. However, the findings show that informal actors can determine whether coastal programs gain community trust. Senior fishers, women's group leaders, youth representatives, and mangrove activists often act as translators between policy language and community experience. This finding aligns with Cvitanovic et al. (2021), who emphasize that trust supports knowledge exchange across science, policy, and practice. In coastal communities, trust is often built through everyday interaction, not only through formal authority.

The findings also reveal a critical issue related to inclusion. Women and youth participate in many practical activities, but they do not always receive equal space in formal decision-making. This pattern suggests that local actor strengthening must address internal community inequality. If participation only involves dominant actors, then coastal governance may reproduce existing power relations. Hsu and Peng (2023) argue that coastal livelihood vulnerability must be understood through social conditions that shape adaptive capacity. Based on this view, inclusive coastal management should create specific spaces for women, youth, and livelihood groups whose experiences may differ from formal leaders.

The practical implication of this study is that local governments and coastal institutions need to design participatory mechanisms that start from problem identification, not only from program implementation. Village forums, mangrove groups, tourism groups, fishers' associations, and women's economic groups should be involved in mapping coastal problems, setting priorities, and evaluating results. Program documents also need to record local knowledge, community agreements, and informal rules that influence coastal resource use. This step can reduce the gap between formal policy and local practice. It can also strengthen accountability because community members can monitor whether agreed actions are implemented.

The theoretical implication is that sustainable coastal management should be analyzed as a relational process. The findings show that sustainability emerges from the interaction between ecological knowledge, social trust, institutional access, and livelihood needs. This supports the social-ecological system perspective because environmental outcomes depend on social relations and governance arrangements. Berkes (2020) emphasizes that community-based resource management needs to move from simple participation models toward complex systems thinking. This study contributes to that argument by showing that local actors are not a single homogeneous group. They have different roles, levels of influence, interests, and constraints.

Future research should examine how gender, age, livelihood type, and institutional position influence participation in coastal governance. Further studies can also compare several coastal

villages to understand why some communities develop stronger local governance than others. Longitudinal research would be useful to track how local actor roles change after policy interventions, coastal rehabilitation programs, or tourism development. Quantitative follow-up studies may also measure the relationship between participation quality, institutional trust, and perceived sustainability outcomes. These future directions can strengthen the evidence base for designing coastal management systems that are participatory, adaptive, and socially just.

4. Conclusions

This study concludes that strengthening local actors is a central condition for building sustainable coastal management systems in the Gisik Cemandi coastal area, Sidoarjo Regency. The findings show that local actors contribute through ecological knowledge, collective participation, informal leadership, conflict mediation, and everyday monitoring of coastal change. Their role is not limited to program implementation. They also shape local legitimacy, build trust, connect formal institutions with community practices, and translate sustainability goals into actions that fit local social and environmental realities. These findings contribute to coastal governance literature by showing that sustainable management depends not only on institutional design, but also on the lived experiences, social relations, and practical knowledge of coastal communities.

Theoretically, this study strengthens the relevance of collaborative governance, co-management, and social-ecological system perspectives by placing local actors as active agents in coastal sustainability. Practically, the findings suggest that local governments, conservation institutions, and development agencies need to involve community actors from the planning stage, not only during implementation. Policy support should create inclusive spaces for fishers, women, youth, mangrove groups, tourism groups, and village institutions in decision-making, monitoring, and evaluation. Future research should compare several coastal villages or use a longitudinal design to examine how local actor roles change over time after conservation, tourism, or blue economy interventions.

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