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Deliberative Policy Approaches to Conflict Resolution in Coastal Shrimp Farming Governance: Evidence from Madura

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Abstract: Shrimp farm management in coastal areas often causes conflicts of interest involving local governments, shrimp farm entrepreneurs, local communities, and environmental groups. Social stability is also disrupted because shrimp farm management causes environmental pollution, damage to marine ecosystems, which results in the loss of livelihoods for coastal communities, and environmental disturbances caused by continuously running aerators. This study aims to formulate deliberative policy strategies to resolve conflicts of interest and social instability in shrimp farm management. The method used is qualitative descriptive with a case study approach. This study involved 9 institutions with 15 informants with data collection through observation, interviews, and documentation. Data were analyzed through interview transcription, theme categorization, and pattern identification. The data were presented in the form of analysis metrics, descriptions, and data visualization using NVivo Pro 12. The results of the study show that shrimp farm management involves many actors and has a significant impact on the environment, society, and economy. Local government deliberative policies are a solution-oriented and progressive strategy to prevent conflict and harmonize the interests of actors. The research findings were explored further by interpreting the issues and reinforcing the importance of shrimp farm management practices and consultations involving local government to harmonize interests. However, public involvement in planning needs to be optimized so that solutions are more effective and conflicts are resolved quickly.

Keywords:
Conflict of interest
Deliberative policy
Governance
Local government
Social instability

1. Introduction

Conflicts of interest and social instability in coastal aquaculture management have become popular and growing issues in several countries, illustrating the complexity of the difficulties faced by public officials in offering strategic solutions (Didar-Ul Islam & Bhuiyan, 2016; Hossain et al., 2013; Saha & Kamal, 2023; Syarifuddin et al., 2025; Talukder et al., 2025). Shrimp pond management has complex impacts

on socio-economics and the environment, land and environmental security, the loss of traditional agriculture (Paul & Røskaft, 2013), food insecurity, marginalization, rural unemployment, social unrest and conflict, mangrove degradation, destruction of biodiversity, sanitation, saltwater intrusion, pollution, and disease outbreaks, which are the most strategically affected (Hossain et al., 2013; Martinez-Alier, 2001). Farmers, shrimp farmers, and fishermen are the three actors involved in short-term and long-term interests (Bergh et al., 2023).

Meanwhile, the number of shrimp farms has increased, mainly in coastal areas. This increase has been seen in the size of farmland and production levels. In Bangladesh, the increase in production has been significant, contributing 2.5% of global production (Saha & Kamal, 2023; Siemens & Islam, 2025). Mexico can generate USD 1 billion per year (Escobedo-Bonilla et al., 2025). In Vietnam, shrimp farms have replaced the rice-based agricultural system (Binh et al., 2005), and have become a strategic industry in Malaysia (Natrah et al., 2025). The economic sector can have a significant impact, but in terms of the environment, the damage is very real in several countries. In the United States and Vietnam, the impact is on global warming and freshwater eutrophication (Al Eissa et al., 2022).

The expansion of shrimp farms has also occurred in Indonesia and the Madura region of East Java, which are major contributors to national shrimp farm production. The Madura region, which consists of the districts of Bangkalan, Sampang, Pamekasan, and Sumenep, is quite strategic for the development of shrimp farms (Nugroho et al., 2024). As of 2024, there are 248.53 hectares of shrimp ponds, according to the Investment and Integrated Services Agency (DPMPTSP). This data excludes shrimp ponds that do not have permits. In Bangkalan Regency, there are 62 unlicensed shrimp ponds and 12 licensed ones. Sampang has 132 ponds, of which only 15 have permits. Pamekasan has 27 ponds, of which 14 have permits. Meanwhile, Sumenep has 400 shrimp ponds without operational permits as of 2024. The proliferation of ponds has had complex social, economic, and environmental impacts (Umam, 2022).

The existence and increase in shrimp farm production in Madura not only impacts the environment, water quality, and soil structure changes, but also has social impacts and intensifies conflicts of interest. Its existence has a real impact on the farming community due to the loss of livelihoods for fishermen and agricultural areas as a result of environmental pollution. The livelihoods of the Madura coastal community still depend on the sea as fishermen, and then on agriculture for productive areas around the coast.

Another impact is conflicts of interest in the form of opposition from environmental communities that are concerned about the sustainability of nature and the economic future of coastal communities. Communities concerned with environmental sustainability are in conflict with the government as the policy maker and leading sector in shrimp farm management, as well as shrimp farm entrepreneurs who have economic interests.

From Masyarakat Peduli Lingkungan (FMPL) consistently protests to the government to evaluate the licensing and control of ponds in productive areas. Wahana Lingkungan Hidup Indonesia (Walhi) East Java often protests against the leniency of licensing and environmental damage caused by shrimp ponds. Then there is the Barisan Ajaga Tanah Ajaga Na'poto (BATAN) community, which consistently advocates for affected communities to take action for justice and advocates for coastal communities to protect the sustainability of their land so that it is not sold or leased to shrimp farm entrepreneurs. Furthermore, the DPRD representative body, as an aspirator, often urges and pressures the government to evaluate shrimp farm permits and crack down on illegal farms as well as legal farms that violate operational procedures.

The problem of shrimp ponds requires a conceptual study that is not only new but also strategic in resolving conflicts of interest. Local government policies that are solution-oriented, responsive, and aspirational are needed. Policies are more than just government actions to carry out development (Hassall,

2020). Policies are closely related to fulfilling public interests and realizing development justice. Equitable policies include responsive policies to public problems that have an impact on social stability. Policies should not only be production-oriented (people-centered) but also human development-oriented (Prasetyo, 2012). Therefore, in conflicts of interest, deliberative and participatory policies are needed to produce equitable agreements that involve all stakeholders.

Deliberative policy refers to inclusive development and equitable policies. Inclusive development is the application of optimal participation principles, involving marginalized groups and accommodating strategic issues (Widianingsih & Paskarina, 2019). Inclusiveness in development encompasses social, ecological, and relational dimensions (Rammelt & Gupta, 2021a). Deliberative policy brings together a broader spectrum of citizens, politicians, and experts to achieve effective and democratic policies (Fischer & Boossabong, 2018). Deliberative policy bridges gaps in interests and provides opportunities to find innovative policies. Deliberative policy includes plans to increase capacity and reflexivity, communication, and public engagement among different actors and representatives of minority groups (Romsdahl, 2020). The expected orientation of deliberative policy is to address the complexity of interests, uncertainty, differences in values, and understanding that characterize contemporary policy areas (Wagenaar, 2022).

Therefore, this article will explain the deliberative policy strategy of local governments in shrimp farm governance in resolving conflicts of interest between shrimp farm communities, environmental groups, local governments, representative councils, and shrimp farm entrepreneurs. The goal is to create fair and solution-oriented policies that take into account economic growth, environmental sustainability, and social stability.

2. Literature Review

Deliberative Policy Making

Deliberative policy-making is a participatory approach that emphasizes stakeholder involvement and collaborative decision-making, especially in complex contexts such as shrimp farm management. Deliberative policy is a public policy concept that produces policies that are more innovative, responsive Prasetyo (2012); Schaffer et al. (2022), participatory (Romsdahl, 2020), and oriented towards the public interest (Dignam, 2020). The public interest must take priority over private interests in order to build social stability (Dignam, 2020), as part of ensuring democracy and providing a sense of security for the public (Abbas et al., 2021). This policy includes inclusive development Annahar et al. (2023), and a deliberative system (Ercan et al., 2020).

The principle of inclusivity emphasizes deliberative policy-making by involving various stakeholders, ensuring that all voices are heard, especially those of local communities affected by shrimp farming practices. This inclusivity fosters trust and cooperation among stakeholders, which is essential for effective management (Tissamana & Amornsiripong, 2020). Decision-making is conducted transparently to build trust among stakeholders, an important principle in resolving conflicts and ensuring that all parties understand the implications of policies (Tissamana & Amornsiripong, 2019).

Deliberative policy is essentially the involvement of all interest groups in accommodating strategic issues (Widianingsih & Paskarina, 2019). Policy is carried out in a bottom-up manner based on democratic principles (Alam et al., 2022). Deliberative policy offers an integrative and progressive approach to the complexity of problems, the relationality and practical nature of the policy process (Bartels et al., 2020), through deliberation between citizens and officials as a strategy for investigating policy orientation (Wagenaar, 2022).

Realization in Shrimp Farm Management

Deliberative policy-making can improve shrimp farm management by integrating local knowledge and practices into the policy framework. Involving the community, environmental groups, and shrimp farm entrepreneurs in the design of shrimp farm management can result in better environmental management and increased productivity (Joffre et al., 2019; Liao, 2007). The involvement of stakeholders in discussions on sustainable shrimp farm management practices integrated with environmental sustainability can result in better policy decisions (Boa et al., 2025).

Active participation by stakeholders, including shrimp farm entrepreneurs, shrimp farmers, communities in shrimp farming areas, NGOs, and government agencies, can significantly influence the sustainability of shrimp farm management. In some cases, stakeholder participation has been shown to increase the adoption of sustainable practices through more intensive interactions Joffre et al. (2019), between stakeholders and policymakers (Galappaththi & Berkes, 2015). The involvement of stakeholders empowers local communities to contribute to decision-making processes that affect the principles of inclusiveness and fairness (Rasaili et al., 2024). This empowerment can lead to better resource management, a more sustainable environment, and more stable economic improvement (Susilowati et al., 2017).

Shrimp farm governance has been implemented through several approaches, including sustainable co-management Alam et al. (2022); Hukom et al. (2022), management institutions Suprihadi et al. (2022), collaborative government Setiawan (2022), sustainable livelihood framework (Wibisono et al., 2023), sustainable policies and policy implementation (Yulinar et al., 2023). However, no deliberative policy approach has been implemented in relation to shrimp pond management, which is fraught with many interests and social conflicts.

Research Gap

Previous studies on shrimp aquaculture governance have primarily focused on aspects such as sustainable co-management models, institutional arrangements, collaborative governance, livelihood frameworks, and policy implementation in managing aquaculture sustainability. While these studies provide important insights into environmental management and economic productivity, they tend to emphasize technical management, institutional coordination, or sustainability frameworks rather than examining deliberative policy approaches as a mechanism for resolving conflicts among multiple stakeholders. In particular, conflicts of interest between shrimp farm entrepreneurs, local communities, environmental groups, and government actors remain underexplored from a deliberative governance perspective.

Moreover, existing literature rarely analyzes how participatory dialogue and inclusive policy processes can harmonize competing socio-economic and environmental interests in shrimp farming governance, especially in the Indonesian coastal context. Therefore, this study addresses this gap by exploring how deliberative policy strategies implemented by local governments can function as a conflict-resolution mechanism in shrimp farm governance in Madura, emphasizing stakeholder participation, inclusive dialogue, and policy responsiveness to social and environmental tensions.

3. Research Methods

Research Design

This research method adopts qualitative research with a case study approach (Creswell, 2018). Qualitative research allows for an in-depth understanding of how to resolve conflicts of interest and

social instability in shrimp farm management using a deliberative policy approach (Rammelt & Gupta, 2021b). Case studies will enable a comprehensive exploration of the specific context related to shrimp farm management policies.

Research Subjects and Informants

Data collection was conducted through semi-structured interviews as the format chosen for its flexibility in exploring topics in depth while maintaining consistency. The interview questions were carefully compiled and developed after an in-depth review of relevant literature (Igudia, 2020) to ensure their purpose and suitability for the governance design (Jiang et al., 2024) of shrimp ponds in the Madura coastal region. Data was obtained from 15 informants.

Table 1. Demography of Participant

Participant ID	Interest Group	Background Specifications	Location
P1	Local Government	Bappeda	Sumenep
P2	Local Government	Bappeda	Pamekasan
P3	Local Government	DLH	Sumenep
P4	Local Government	DLH	Pamekasan
P5	Local Government	Dinas Kelautan dan Perikanan	Sumenep
P6	Local Government	DPMPTSP	Sumenep
P7	Legislative Power	DPRD Komisi III	Pamekasan
P8	Legislative Power	DPRD Komisi I	Sumenep
P9	Fish Farm Owner	Pemilik tambak Berizin	Sumenep
P10	NGO	Walhi	Jatim
P11	NGO	BATAN	Sumenep
P12	NGO	FMPL	Sumenep
P13	NGO	FMPL	Pamekasan
P14	Community	Affected areas	Sumenep
P15	Farmer	Affected communities	Sumenep

The questions asked were tailored to the interest groups and backgrounds of each informant. Some questions related to the form of pond management and licensing, the supervisory role of the legislative body, compliance with licensing and pond management procedures, the participation of interest groups in pond management planning, the impact of ponds on the environment, and sustainable management strategies.

Data Analysis Techniques

The data were analyzed through interview transcription, theme categorization, and document analysis (Miles & Huberman, 1994). The results of the questions that had been adjusted to the topic were analyzed and patterns were identified in accordance with the research topic requirements on shrimp pond management (Williamson et al., 2018). The analysis results were presented in the form of analysis metrics, data categorization, and data visualization using NVivo Pro 12. Then, a discourse analysis approach was carried out, namely analyzing the basic meaning and social implications of language in qualitative data. This is often used to explore how language shapes social reality (Preston & Payne, 2025).

4. Results and Discussion

Stakeholder Interest and Involvement in Shrimp Farm Management

Many stakeholders are involved and have interests in shrimp farm management, so that if good management is not implemented, it will lead to conflicts and cause significant losses, especially for farmers and the surrounding community (Hukom et al., 2022; Umbas et al., 2022). In general, the interests of various actors are related to environmental sustainability, economic growth, economic justice and equity, social stability, and the health of the pond community (Iber & Kasan, 2021; Macusi et al., 2022; Seong et al., 2021; Xuan et al., 2021). The actors involved include aquaculture entrepreneurs, agricultural actors, fisheries actors, affected local communities, local governments, and environmentalists.

Shrimp farm entrepreneurs are the main actors in the booming shrimp farming industry in coastal areas. There are foreign entrepreneurs who own 0.5-3 hectares of land and local entrepreneurs who generally only own 0.1-0.5 hectares. Local entrepreneurs can be from the local village or from other villages within the same district. Entrepreneurs are involved in preparing capital to purchase land owned by local residents to be used as shrimp farms. For outside entrepreneurs, there are no shrimp farms that are leased. All shrimp farms are privately owned, with the land purchased from the community. The process of acquiring shrimp farm land also involves village officials to ensure that the community is willing to sell their land to other parties (entrepreneurs) for shrimp farming purposes (P9:P12).

Farmers are actors affected by shrimp farm management. Therefore, farmers have an interest in ensuring that shrimp farms are managed as well as possible so as not to eliminate their livelihoods. Farmers' interests lie in the productivity of seaweed farmers and land farmers who grow corn and grains (P12: P13: P15).

Coastal areas polluted by shrimp farm waste cannot produce high-quality seaweed. In fact, areas that are severely polluted cannot be used to grow seaweed because the results are not only poor quality but also detrimental due to low productivity. Meanwhile, land farmers lose their livelihoods due to the conversion of land that was previously suitable for agriculture. Therefore, farmers have an interest in ensuring that shrimp farms are not permitted on productive agricultural land. Fields located 1-2 km from the coastline have an impact on seawater pollution and are detrimental to seaweed farmers (P10: P11).

The majority of the coastal community works as fishermen. Fishermen with large capital will fish in the middle of the sea, but those with only small boats will fish near the coast. When the pond industry became increasingly popular around 2020, the coastal area was no longer a productive zone for fishermen. The coastline is polluted by shrimp farm waste, resulting in fish degradation (P10:P11:P12).

Fishermen have an interest in ensuring that the sea is not polluted and remains a source of income. Another interest is in the regulation of shrimp farm management so that waste does not pollute the sea, which has an impact on low fish productivity (P15).

Local communities are not involved in shrimp farm management, but they have an interest in farm management because they feel the direct and indirect impacts. Environmental stability and land security are concerns for communities living near shrimp farms. The impacts felt by local communities include noise and odor pollution. Shrimp ponds generate noise that disturbs the social stability of the community. There are two devices that are used continuously, namely water wheels and diesel engines, which emit noise that can be heard up to 150-200 m around the pond area. The noise gets louder at midnight, disturbing the community who are trying to rest.

Shrimp farms also produce odors that are quite pungent for residents in the farm area. The pungent odor arises during harvest time due to improper waste disposal. Waste disposal within 3-5 days causes odors that are very disturbing to the community (P14: P13).

Local governments have an interest in economic, social, and environmental stability. The government plays a leading role in management indirectly through policy. Shrimp farms are generally managed by private companies with high capital. Often, managers are classified as investors rather than local people. Therefore, local governments also have an interest in increasing regional income, environmental sustainability, production sustainability, and the implementation of rules and regulations (Suprihadi et al., 2022). However, what is important for the government to pay attention to is social and environmental stability. Therefore, the synergy of economic, social, and environmental interests is a concern for local governments.

The role of environmental advocates can be defined as community-based organizations that have an interest in the environment and the economic sustainability of the surrounding community. In some areas, pond management practices are facilitated by multi-stakeholder initiatives led by NGOs, which translate global norms, knowledge, and policy objectives into local knowledge and practices (Kusumawati & Bush, 2015). Environmentalists have an interest in maintaining environmental security so that it remains productive, unpolluted, and unexploited by economic interests.

Table 2. Stakeholder Interest in Shrimp Farm Management

Actors	Interests	Involvement of other actors
Shrimp farm owner	Business and economic sustainability	- Village government
Agricultural practitioners	Productivity and harvest conditions	- Regional government
Fisheries operators	Fish catch productivity Ocean cleanliness	- Environmentalist
Community	Environmental stability Social	- Environmentalist (Walhi, Batan, FMLS)
Village/regional government	Economic interests	- Village head, village officials, pond entrepreneurs
Environmentalist	Environmental safety and sustainability	- Community

The Impact of Shrimp Farm Management on Socio-Economics and the Environment

Over the past decade, the shrimp farming industry has grown rapidly and undergone significant transformation in coastal areas (Kais & Islam, 2021). This development has impacted three aspects, namely the environment, economy, and society (Ray et al., 2021). Local climate disasters and environmental pollution are the most disruptive impacts on the environment. Marginalization, mangrove degradation, and rural unemployment are also part of the economic impacts of shrimp farming management (Taher et al., 2023).

Shrimp farm management has caused significant environmental pollution, damaging and disrupting productive land. This pollution takes the form of solid and liquid waste that is discharged into the waterways of the shrimp farming area and dumped on the coastline. Liquid waste from production is directly discharged into receiving water bodies, namely rivers, containing BOD5, TSS, and NH (Desmantri R & Sulfa, 2024). This condition is also influenced by the suboptimal performance of Wastewater Treatment Plants (WWTPs) as a solution to prevent waste from having an extreme impact on environmental damage.

Shrimp pond waste contains high levels of pollutants that pose a threat to the surrounding ecosystem (Nguyen et al., 2020). It also impacts human health because pollutants can contaminate the water

in the pond area (Shetty et al., 2023). The land becomes degraded because the waste is absorbed into productive land and water sources consumed by the community. Ultimately, the shrimp farm area becomes unsafe for the health of the community.

In this aspect, there is a conversion of land from productive agriculture to shrimp ponds. Shrimp ponds are located in two areas, namely coastal areas near the beach and remote areas with access to seawater for shrimp farming. In the eastern part of Sumenep Regency, Dungkek District and Gapura District, there are many shrimp ponds located approximately 1-2 km from the coast, but with a certain depth of water, they can still produce shrimp (P3: P11: P8).

In this inland area, there are productive agricultural lands such as corn and legumes, as well as productive plants such as siwalan trees, which are the main source of income for the village community. The damage to agricultural land is due to the conversion of productive land into shrimp ponds. The damage is then exacerbated by ponds that are no longer functioning and are difficult to restore to traditional agricultural land.

Mangroves have ecological and economic functions for the environment (Haryanto et al., 2023). Mangrove ecosystems affected by shrimp farm waste can degrade when land is cleared and reduce the biodiversity of aquatic biota, including fishery resources for surrounding communities. Shrimp farm waste also causes mangrove pollution, discoloring seawater to a slightly yellowish and reddish hue. The impact on mangrove fertility is not significant, but many mangroves no longer grow densely in coastal areas where seawater is polluted by shrimp farm waste (P3: P4: P10: P13).

Every shrimp farm has an aerator or water wheel. Aerators are devices used to dissolve free oxygen into the pond water. Aerators are intended to make the pond an ecosystem that is comfortable for shrimp growth (Skouteris et al., 2020). Aerators run continuously until the shrimp are harvested. Therefore, aerators are never turned off from the time the shrimp are planted until they are ready for harvest. The problem is that aerators produce noise pollution that greatly disturbs the surrounding community. On average, each shrimp farm has 4-6 aerators installed, so the noise pollution can reach up to 200 m. Noise pollution also comes from diesel engines as an alternative power source when the electricity goes out. Each pond has a backup diesel engine, so when the diesel engine is running in addition to the noise pollution from the aerators, the noise can reach up to 300 meters. This pollution is very disturbing because it occurs day and night. When the community needs to rest and sleep soundly, they are disturbed by the noise pollution from the shrimp ponds (P12:P13:P14:).

Another form of pollution is the strong odor of waste. The waste that is discharged into the river, from the point of disposal to the waste residue in the water, emits an odor that is very disturbing to the pond area. Many ponds are located in densely populated areas. The odor of waste not only spreads around the ponds and disposal sites but also enters the homes of local residents. This occurs about 3-4 days after the waste is discharged (P12:P11:P15).

The main livelihoods of rural communities in shrimp farming areas are fishing and farming. Farming consists of seaweed cultivation and field farming of corn and grains. Shrimp farming has impacted fishermen due to the fish crisis in coastal areas. Fishing methods include angling and net fishing (using nets in coastal areas), which are commonly practiced by local communities as their main source of income. However, coastal pollution has led to fish degradation and the loss of livelihoods for the community (P11).

Other sources of livelihood include field farming and seaweed farming. Seaweed farmers are affected in the same way as fishermen. Seaweed harvests have become unproductive and their quality has declined. This decline in quality has lowered prices and reduced enthusiasm for farming. Meanwhile, in

land farming, there has been a change in land use, which is usually used by the community for grains and palm sap for sugar production, so that the results cannot be harvested. This situation has resulted in the loss of livelihoods for rural and coastal communities (Anh, 2024).

Shrimp farming has led to economic inequality among the surrounding communities. Shrimp farming is only accessible to the middle class because the production capital is quite high. Residents who have the potential to engage in shrimp farming but lack capital are unable to produce shrimp. Shrimp farming can only be done by the middle class. Then, the surrounding community who do not have capital have no alternative but to sell their land at low prices to entrepreneurs. This transfer of ownership has continued from 2018 to 2020, resulting in the surrounding community being unable to benefit from the proliferation of shrimp farms.

On another note, shrimp farms absorb labor. One farm measuring 500-2000m2 can absorb 4 (four) workers, and large-scale farms owned by PT can absorb up to 15 workers. However, not all jobs are accessible to the surrounding community. Worker competence and skills are often the main factors. However, the local community perceives that workers are generally from outside the pond area. As a result, shrimp ponds do not have a significant impact on the economy and employment of the local community, leading to the marginalization of residents as a problem arising from the proliferation of these ponds. The impacts of shrimp pond management are clearly illustrated in Table 2 and the diagram below.

Table 3. Impact of Shrimp Farm Management

No	Impacts	Design	Duration (years)
1	Land and Environmental Security	Pollutant	1 to 4
2	Agricultural Land Destruction	Conversion of productive land	5 to 11
3	Marine Pollution	✓ Smelly water ✓ Itchy beach water ✓ Changes in seawater color ✓ Fish erosion	3 to 10
4	Mangrove Degradation	✓ Vegetation land cover ✓ Fisheries crisis	2 to 6
5	Noise and Aroma Pollution	✓ Noise ✓ Smell	1 to 2
6	Rural Unemployment	✓ Loss of agricultural livelihoods ✓ Fishing crisis	2 to 5
7	Marginalization	Unequal job opportunities	2 to 5
8	Ecotourism Degradation	✓ Dirty destinations ✓ Smelly destinations ✓ Polluted shorelines ✓ Tourist degradation	2 to 7

Pattern of Conflict of Interest and Social Instability

The emergence of conflicts of interest and social instability is triggered by unprofessional and procedural management of shrimp farms. Professionalism refers to farm management that takes into account environmental aspects, social order, waste management to prevent pollution, and maintaining a balance between social and economic conditions so that social unrest does not occur. Procedures relate to compliance with licensing by shrimp farm entrepreneurs through the Investment and Integrated Services Agency (DPMPTSP), IPAL management through the Fisheries Agency, and zoning location

determination through the Environment Agency (DLH). Shrimp farm management that does not pay attention to professionalism and procedures ultimately leads to conflicts between stakeholders and unstable social conditions (P1: P2: P5: P7).

The pattern of conflict of interest that occurs is in the form of social solidarity actions, demonstrations, and hearings with the government to discipline shrimp farms that are harmful to the public and to reorganize Local Regulation No. 12 of 2013 concerning the 2013-2033 Spatial Plan for Sumenep Regency, which provides leniency in the management of shrimp farms. Conflict always has an impact on food insecurity, public welfare, and a person's ability to live better (Shemyakina, 2022). This conflict is a concern for the United Nations in its SDG 16 agenda on building peace, justice, and strong institutions (source: sdgs.com). Another pattern is public opposition through social media and extreme media carried out by public figures who are concerned about the environment and community life (P7: P8), while traditional communities criticize and ridicule disorderly governance and ponds that harm the community through social media (P12: P13).

Conflict also arose during the transfer of community land ownership to shrimp farm entrepreneurs. Formally and notarially, the legal transfer process was carried out from residents to shrimp farm entrepreneurs. However, the transfer was caused by the community's lack of knowledge and the intervention of the village government to persuade the community to sell their land. As a result, the residents regretted their decision after learning that their land had been converted into shrimp farms that polluted the surrounding area. This regret eventually accumulated into a social movement to raise public awareness to oppose and reject the sale of land, as well as to discredit the village government as a broker of ownership transfers.

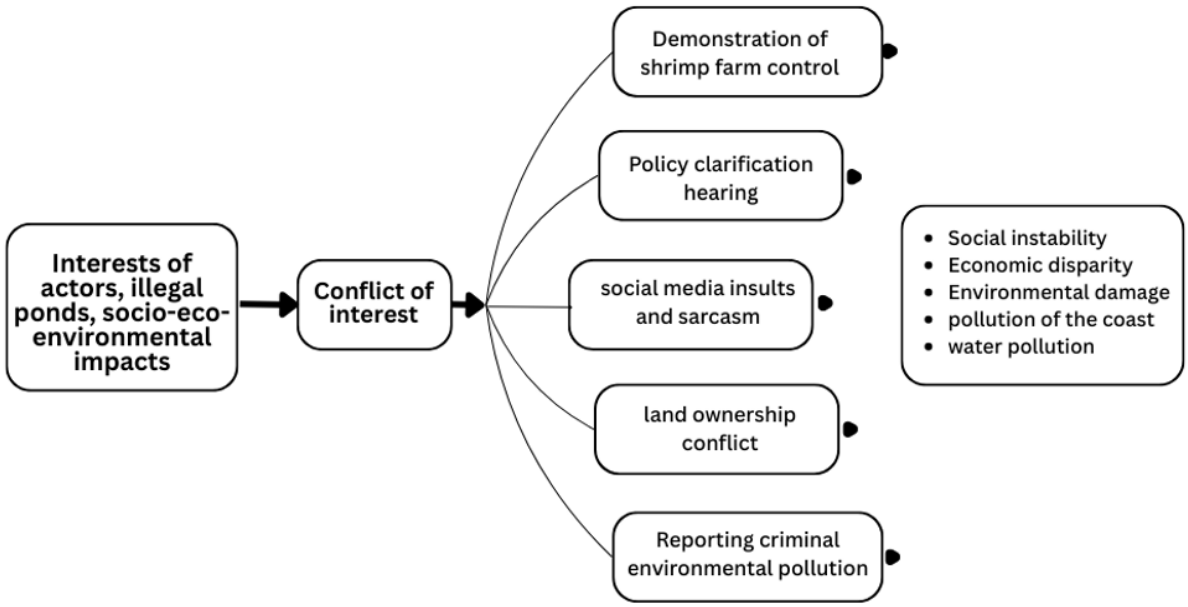

Figure 2. Patterns of Conflict of Interest and Social Instability in Shrimp Farm Management

Deliberative Policy and Conflict of Interest Resolution

Deliberative policy is an effective policy approach to resolving conflicts of interest because it provides space for open and inclusive dialogue. Through deliberation, various stakeholders can reach fair and balanced decisions. Despite facing several challenges, a well-managed deliberative process can

produce more sustainable solutions and reduce the potential for long-term conflict. Deliberative policy offers an integrative and progressive approach to the complexity of problems, the relationality and practical nature of the policy process (Bartels et al., 2020), through deliberation between citizens and officials as a policy orientation investigation strategy (Wagenaar, 2022).

Deliberative policy strategies are implemented by involving actors with an interest in shrimp farm management issues, namely shrimp farm entrepreneurs, communities, environmentalists, and the DLH, led by the local government together with the DPRD in formulating policies. Policies are implemented in a bottom-up manner based on the principles of democracy and participation.

Farming has become the focus of public attention due to two aspects, namely unproductive management and its impact on the environment, economy and society. Meanwhile, the government, as the leading sector, has the authority to make arrangements to be more effective and responsive to environmental and social problems.

From the government's perspective, the proliferation of shrimp farms in Sumenep Regency has raised issues regarding licensing. Farms that do not obtain licences have an impact on production and implementation that violates procedures and does not take environmental aspects into account. In the licensing procedure, farms must take into account the zoning of landslide-prone areas, a minimum zoning of 100 metres from the coastline, and the availability of wastewater treatment plants (Perda. No. 12 of 2012). The government can intervene indirectly so that shrimp farms can have an equitable impact on the socio-ecological conditions of the surrounding community.

Another problem is the inconsistency in cracking down on illegal fish farms. According to regulations, unlicensed fish farms can be prosecuted by the government through the Public Order Agency (Satpol PP) and are subject to environmental crimes (P3: P4: P4). However, in practice, as of 2023, there are still 400 to 550 illegal fish farms. The existence of these illegal ponds is due to the government's difficulty in empowering and assisting pond operators to become compliant and responsive (P11: P13).

Public participation and social contribution are two important elements in conflict resolution, especially those related to conflicts of interest in public policy, resource management, or other social issues (Foroughi et al., 2023; Perlaviciute, 2022). Both play a strategic role in creating sustainable and inclusive solutions by actively involving the community in the decision-making process. Public participation refers to the direct involvement of the community in decision-making processes that affect their lives (Chompucot & A, 2011). This can include various levels of involvement, ranging from expressing opinions to participating in policy formulation. Social contribution relates to the active role of the community or groups in helping to create solutions to conflicts through collective efforts that are voluntary, non-profit, and oriented towards the common good. This contribution can take the form of involvement in communities, social movements, or cross-sectoral cooperation.

Public participation in resolving the issue of ponds took the form of providing public information to the government about several shrimp ponds that were polluting the environment. The public then collaborated with the Regional Representative Council, the Environment Agency, the Regional Development Planning Agency, the Regional Development Planning Agency, and the Public Order Agency so that their participation could be responded to quickly. The public also made critical contributions in the form of hearings with the local government as a means of accelerating action (P7: P8).

The resolution also took the form of social contributions from community groups, community leaders and environmental observers from Walhi Jatim, BATAN and FMPL. The contributions took the form of advocacy for social justice, building public awareness, and participatory solutions. The image below illustrates public participation and social contributions in the resolution of shrimp farm management conflicts.

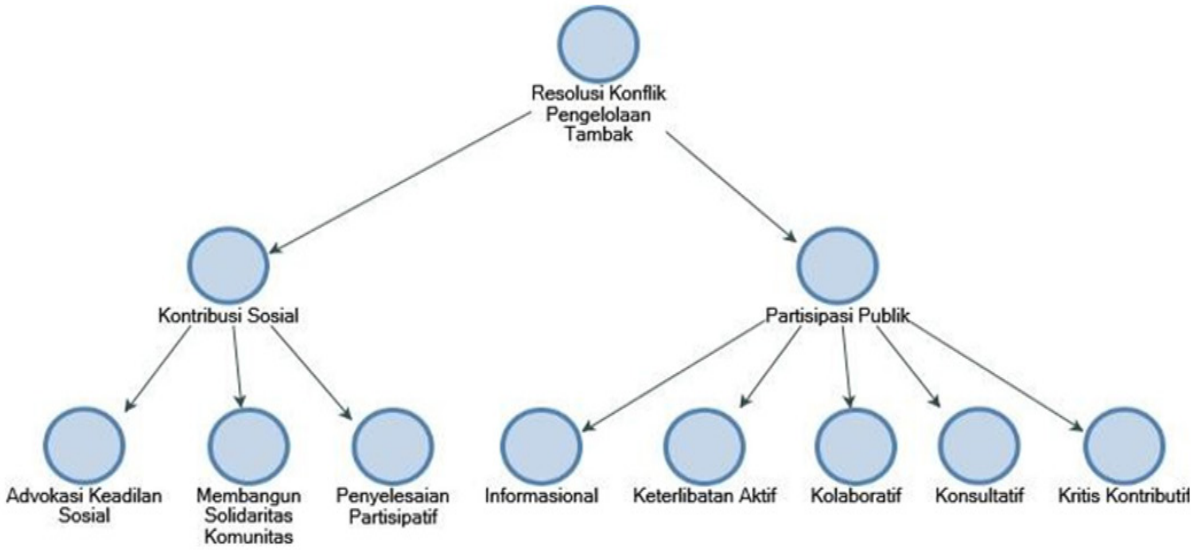

Figure 3. Public Participation and Social Contribution to The Resolution of Shrimp Farm Management

Deliberative meetings and public forums are strategies for unifying views and minimising conflict in a deliberative approach (Asenbaum, 2022; Doyle & Walsh, 2022). Public forums provide a mechanism for accommodating various interests in the decision-making process. Deliberative spaces enable active participation in policy formulation and ensure that decisions are inclusive and fair.

These public forums are not optimally implemented by local governments in accommodating interests. Public forums discussing shrimp farm management strategies do not involve many relevant actors who are concerned about the environment. Two institutions that are focused on participating in informative, constructive criticism, such as BATAN and FMPL, have never been involved in public forums to review shrimp farm management as a strategic basis for decision-making (P11: P12: P13).

Public forums have also been continuously initiated since 2018 due to widespread public opposition. These public forums were held to conduct in-depth studies and revisions to Local Regulation No. 12 of 2013 concerning Spatial Planning. However, until 2023, deliberations involving the Regional Representative Council and the Regional Government have not been able to produce accountable and equitable revisions to the Local Regulation. The 2013 revision of the 2012 Regional Regulation has attracted even more public attention because it contains two important points, namely the creation of more space for exploitation and the removal of shrimp farm locations, so that disaster-prone areas can still be used as shrimp farm locations.

The interests of actors in pond management are never in harmony or alignment. As a result, conflicts of interest and social instability often arise in the form of public dissatisfaction with the local government. However, various strategies are often employed in an effort to harmonize interests and social stability.

The main factor causing conflict is the proliferation of illegal shrimp farms, which automatically have a significant impact on the environment, economy and society. If the shrimp farming industry is regulated in terms of licensing, the potential for environmental pollution can be minimized because the Mining Law stipulates that shrimp farms must have wastewater treatment plants and provide compensation for farm restoration if they are not shut down in the future. Therefore, a deliberative approach is needed for the 700 illegal farms so that they do not apply for license

Licensing procedures must be carried out more professionally, taking into account environmental aspects such as a minimum distance of 100 meter between ponds and the coastline, so that ponds that do not comply with environmental requirements are not permitted to operate. The strategy implemented by the local government is to crack down on illegal shrimp ponds and provide assistance to pond operators so that they are aware of the need to obtain operating license.

5. Conclusion

Shrimp farm management in coastal areas has sparked many conflicts of interest and social instability. Social instability is manifested in lawsuits against illegal shrimp farms, pressure on local governments and regional representative councils to enforce regulations, and calls for in-depth environmental and social studies before issuing shrimp farm permits. The impacts of shrimp farm management encompass economic, social, and environmental aspects. Several actors involved in shrimp farm management and conflicts of interest include local governments, village governments, shrimp farm entrepreneurs, environmental communities, and coastal communities. Environmental communities involved in these conflicts have social and environmental ethical responsibilities. Several community groups include BATAN, an environmental community of the priyayi class, FMPL, an environmental community movement, and Walhi East Java. The tension of the conflict and the situation began to stabilize when the local government attempted to implement a deliberative policy strategy by revising the spatial plan and adopting a participatory approach to the public. The Regional Representative Council (DPRD), as the representative of the public, responded to public demands to be forwarded to local policy makers, and the local government made efforts to enforce regulations based on public aspirations and participation. However, the strategy implemented by the government has not been optimal because the actors involved in the conflict of interest.

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