

Analysis of value chains, roles and actor networks in organic tiger shrimp management in Sidoarjo District, East Java, Indonesia, based on the concept of blue economy

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Abstract. The management and governance of tiger shrimp farming in Sidoarjo, East Java, is characterised by classic problems related to farming techniques, environmental management and non-technical issues such as policy and social issues. This study aimed to capture the evolving value chain and the actors involved in it, in an effort to contribute to an improved governance of the organic tiger shrimp value chain in Sidoarjo District. This research proposes the use of a multi-stakeholder cooperation approach to organic tiger shrimp value chain management to overcome these challenges. The research methods used were in-depth interviews and focus group discussions with stakeholders, as well as secondary data collection from various sources. Data were analysed descriptively to derive the tiger shrimp's value chain management flow using the software Mactor to identify patterns of dependency, influence, convergence, divergence, ambivalence and competitiveness among the actors involved. The results show that multi-stakeholder cooperation in organic tiger shrimp's value chain management has a significant impact in addressing the challenges of organic tiger shrimp production. Actors, including shrimp farmers, seed providers, the private sector known as PTA, as well as government at local and national levels, play a key role in this process. Problems related to environmental management are the entry point for the implementation of partnership patterns based on the roles and functions of each actor in the chain.

Key Words: governance, value chain, actor role, multistakeholder partnership.

Introduction. Shrimp, especially tiger shrimp in Sidoarjo, East Java is one of the most important raw materials in the aquaculture industry in Indonesia and has an international market share, and is supported by the availability of land and a favourable environment in Sidoarjo District. Tiger shrimp farming activities in Sidoarjo District face several obstacles, such as water input from the estuary that is hampered by sedimentation at several points or locations. Such water input problems can cause a decrease in the quantity and quality of shrimp production and will lead to a decrease in product competitiveness on the global market. Therefore, the sustainability of raw materials and suitability to market needs are important aspects in an effort to improve product competitiveness in the global market, requiring an optimization both in terms of methods and management. To reform the business, it is important to analyse the value chain as an effort to increase tiger shrimp production. Value chains describe the various activities required to produce a product or service from conception, through various stages of production, involving a combination of physical transformation and inputs from various producer services, delivery to the final consumer, and final disposal after use (Kaplinsky et al 2001; Schmitz 2005). Value chains can also be seen as a way to analyse the sources of value creation and competitive advantage in a business or industry. Understanding value chains is important for providing

insights that cannot be found in studies that have a specific focus or framework on economic actors, policy, or fisheries management (Rosales et al 2017). Value chain analysis demonstrates that problems faced by industry sectors are the result of multiple drivers of change, such as poor governance and market access, as well as the competitiveness of small-scale fisheries (Rosales et al 2017).

Efforts to increase and maintain sustainable tiger shrimp production in Sidoarjo District cannot be separated from the integration of stakeholders involved in the tiger shrimp management value chain. In the implementation of sustainable development, stakeholders are an important component that determines the achievement of performance indicators (Fauzi 2019). Based on the description above, it is assumed that in tiger shrimp management activities in Sidoarjo District, the involvement of multi-actors or multi-stakeholders is important in determining the direction of tiger shrimp value chain development with the main objective of meeting consumer demand. A multi-actor system may lead to conflicts of interest related to the strategic objectives of the system. Actor analysis is useful for determining points of agreement or disagreement among actors about the system's goals.

The concept of combining shrimp farming management in ponds involving upstream-downstream actors in one area is closely related to the concept of value chains in an effort to increase integrated production, which also includes the linkage of suppliers and consumers (Harnadi et al 2019; Hossain & Hossain 2019; Umamaheswari et al 2020). This management concept also requires cross-sectoral synergies involving the role of various parties, including central and local governments, the private sector, shrimp farmer associations, associations of aquaculture facilities and infrastructure providers, investors, partners, and farmer groups. The concept of partnerships based on a participatory approach from the community and various parties is one of the things that can be sought to manage development activities, such as infrastructure, mentoring, business incubation, and resource management. The concept of partnership in resource management is an effective platform for the process of formulating/thinking together, built by the parties in sustainable development programmes, as a forum for interaction of various types of knowledge and coordination of tasks that allow cooperation from various actors, building trust, resolving conflicts and building networks (Steelman et al 2015). This will be in line with the concept of blue economy which aims to develop the economic sector based on efforts to manage marine and coastal natural resources in a sustainable manner, controlling the impact of environmental damage and involving the community as the main actors in its development.

This study aimed to analyse the flow of the organic tiger shrimp value chain in Sidoarjo Regency (existing conditions) and to analyse and evaluate the roles and networks of actors to meet the needs of farmers and businesses in managing the organic tiger shrimp value chain in a sustainable and inclusive manner.

Material and Method

Location and time of research. This study was conducted from March 2022 to December 2023 in traditional tiger shrimp ponds in Sidoarjo Regency (Figure 1).

Value chain analysis. Kaplinsky et al 2001 stated that there is no "right" technique for conducting value chain analysis, as the methodology used is highly dependent on the research subject being addressed. Each chain has its own characteristics, whose uniqueness and relevance can be captured and analysed effectively by understanding all parts of the activity. Researchers suggested that the methodology should address the problem in a chain with the following structure: (1) entry points for value chain analysis; (2) value chain mapping (actors, product flows, volumes, geographic flows, knowledge and information); (3) product segments; (4) how producers access end markets; (5) governance (coordination, regulation, control); (6) relationships, linkages and trust; (7) improvements in the value chain; costs and margins (Kaplinsky et al 2001; M4P 2008; Rosales et al 2017; Vermeulen et al 2008).



Figure 1. Research location (source PTA).

Actor and network analysis. The data in this study was also analysed using the Mactor (Matrix of Alliances and Conflicts: Tactics, Objectives and Recommendations) software. Mactor is a software developed by Michel Godet in 1991 to analyse in depth the power relations between actors, the competitiveness of actors, and actors' attitudes towards goals (Godet 1991). The way Mactor works is based on the influence between actors, which can be categorised as direct, indirect, and potential influence. Direct influence occurs if actor A influences actor B, while indirect influence occurs if actor A influences actor B and B influences actor C, thus, through by transitivity, actor C is indirectly influenced by A. Potential influence occurs if actor A is supposed to influence B. Mactor works based on a structural analysis approach. The stage of constructing actor and strategy tables in Mactor analysis starts with entering data into a position matrix, known as the 1MAO and 2MAO or Actor-Goal Matrix, which uses the Saliency variable that indicates how important the realisation of an outcome is to the achievement of the actor's overall goal. Furthermore, the data will be calculated to produce the MID (Matrix of Direct Influence) and MAO (Matrix of Actor X Objective) through a computer algorithm process (Fauzi 2019).

Results and Discussion

Value chain analysis of tiger shrimp management in Sidoarjo Regency. Governance of the tiger shrimp value chain in Sidoarjo District uses rules, such as formal and informal agreements between actors, which impact the behaviour of actors of the value chain (Rosales et al 2017). These agreements are supported by government (central and local) and the local private sector. The role of actors in the value chain is defined by the linkages between the parties involved (Table 1).

Table 1

Patterns of relationships between actors in the supply chain

<i>Actor 1</i>	<i>Actor 2</i>	<i>Relationship pattern</i>	<i>Function</i>
Farmers	Processing unit	Formal (contract)	Private organization, PT. ATINA, known as PTA is a tiger shrimp collector in Sidoarjo. This contract binds the farmers to produce shrimp in a good way in accordance with organic tiger shrimp farming standards (eco-shrimp). Based on the contract agreement, farmers only sell their shrimp to PTA regardless of quantity and size. The process of categorisation to value-added shrimp products is the responsibility of PTA after receiving tiger shrimp as raw material for production. Without a formal agreement or agreement signed by the actors.
Farmers	Breeders	Informal (trust)	This type of relationship is described as an agreement based on trust, reliability, and is usually a long-term relationship. in terms of supplying processed shrimp and fresh shrimp of uniform size.
Processing unit	Exporter (trader)	Formal (contract)	

The formal contract to regulate the tiger shrimp chain in Sidoarjo was strengthened by the East Java government through East Java Governor Regulation No. 37 Year 2022, in the Guidelines for Environmental Sustainable Management of Traditional Tiger Shrimp and Vannamei Shrimp (Provinsi Jawa Timur 2022). This regulation emphasises how shrimp farming meets all standards in producing shrimp in a traditional and environmentally friendly manner. The central government, through the Decree of the Minister of Marine Affairs and Fisheries of the Republic of Indonesia No. Kep.02/Men/2007 (Ministry of Marine Affairs and Fisheries 2007) on Good Aquaculture Practices has regulated how shrimp should be farmed in a good way while maintaining environmental sustainability. As a result of this ministerial decree, farmers must certify their ponds and farming activities in accordance with the standards set out in the decree. Based on the data obtained, most of the farmers who act as raw material suppliers to PTA processing unit have received good aquaculture certification from the government. This illustrates that the quality and sustainability of products and the environment of business activities have become a concern for business actors in the value chain. This fact also answers the opinion stating that (Azizah et al 2020).

In the processing unit, PTA applies HACCP and BRCGS Global Food Safety Standards (2022) for shrimp production for consumption. Obtaining HACCP and BRCGS certifications creates new prospects in the industry, particularly with export markets, and new clients (Rincon-Ballesteros et al 2021). BRCGS standards have positive impacts, enabling product and process innovation, improving the output and productivity. However, BRCGS certification goes further than these by stimulating the modernisation and investment in innovation. Broader innovation includes product innovation and new technology as well as changes in business processes and enhanced product quality, including safety (Rincon-Ballesteros et al 2021). As part of its efforts to fulfil the standards, PTA provides field supervisors to assist farmers in conducting aquaculture activities in accordance with recognized standards. It was found that farmers who have formal contracts with PTA get

supervised in the farming process as one of the benefits of the contract. PTA also designed one of the Technical Implementation Units of the DJPB KKP as a technical supervisor in shrimp farming activities for farmers.

Value chain analysis can also illustrate the general flow of total cost margin along the chain (Kahar et al 2022; Rosales et al 2017). As shown in Figure 2, 100% nauplii or post larvae are produced at the hatchery unit at a price of USD 0,0020 per head. And along the chain, the product increases in value. Based on the data obtained, in producing approximately 20-30 headless tiger shrimp kg⁻¹, there is an added value of USD 0,20 for each shrimp. This value is produced by 100% traditional farmers and processing units until it reaches the market, both locally and abroad.

In Figure 2, the nauplii/post larval rearing phase has the highest value added, at approximately USD 0,084 per shrimp, or about 97.5% of the rearing period (of ±3 weeks). The price per shrimp increases rapidly to about USD 0,11 when the shrimp enter the processing unit and are ready to be processed into value-added end products for the market. These differences suggest that the players in the tiger shrimp value chain have different margin distributions (Awal et al 2020), but it is important to remember that each phase has its own challenges in value chain management.

Based on these factors, it was found that the largest value or margin is at the downstream stage. This strengthens the assumption that price control is at the downstream stage. This condition illustrates that farmers have a low bargaining position and cannot determine the selling price of the product. However, from the facts in the field, PTA is also responsible for managing the farming environment, in addition to profit margins (Awal et al 2020). Therefore, this chain needs to be established to improve the bargaining position of farmers in the tiger shrimp value chain in Sidoarjo District.

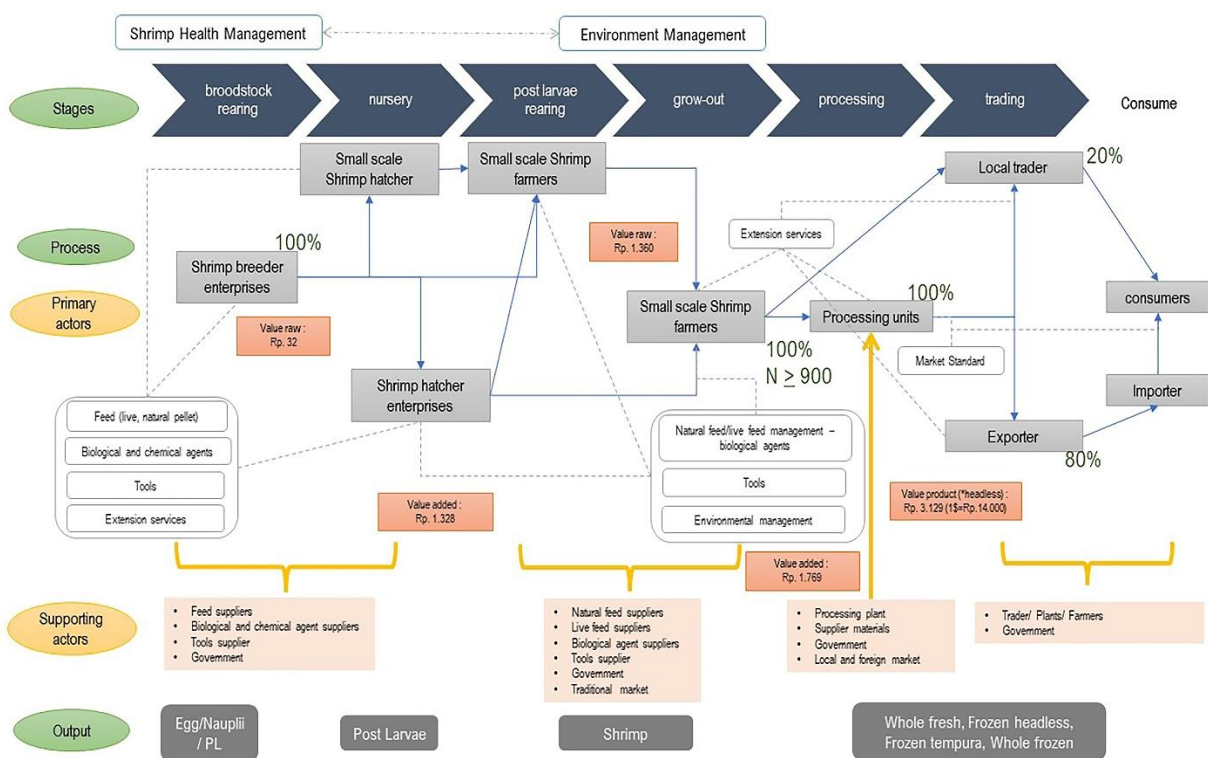


Figure 2. Value chain mapping in tiger shrimp management based on farmer cooperation with PTA.

Based on these factors, it was found that the relationship between actors involved in the value chain is relatively based on contractual agreements to maintain or build transactions between them. According to Watabaji et al (2016), contracts are an important role that can be used to connect smallholders with large processors. Therefore, this chain needs to

be built in order to produce products that meet market needs and can also improve the welfare of the actors involved.

According to literature, interdependence between actors in the chain will result in strong value chain integration (Danese et al 2004; Watabaji et al 2016). However, as is known in the reality of partnership or co-operation schemes, integrated coordination becomes very difficult when the chain of business activities often crosses institutional or company boundaries (Danese et al 2004). In response to this, making actors rely on coordination plans that cross institutional or company boundaries is not impossible, especially if it is necessary (Balindo & Otadoy 2024). Thus, based on the value chain analysis, it is possible to map out some of the identified problems that demand attention from the various parties involved in the value chain.

Technical issues that arise along the supply chain, including disease and environmental management, are actually classic problems that can be solved both individually and collectively. These issues require collaboration and integration among stakeholders. Farmers, in this case those in the hatchery and grow-out sub-sectors, should cooperate in dealing with diseases by involving the government or independent laboratories. In addition, in terms of value chain management, farmers and the private sector will be key actors in the implementation of the rules set by the government, both at local and national levels (Rosales et al 2017). So, along with these issues, the availability of raw materials with all the complexity of the actors involved will be an important thing to consider in value chain management.

In addition, sedimentation issues also need to be addressed. It is widely recognised that Sidoarjo district has problems with mudflow along its waterways, and associated sedimentation issues in the estuary and in primary and secondary channels ((Ekawati & Sulistyowati 2021; Pratama et al 2019; Pratama & Supriatna 2018). These problems require the local government to develop cooperation with various parties to find solutions, which will require a lot of effort and attention.

Despite all the problems identified, shrimp products remain popular and are marketed and distributed to domestic and overseas markets as a result of the tiger shrimp value chain management (Pane et al 2021; Sambodo et al 2023). The market share and selling price of domestic shrimp products will be influenced by their quality and added value. The quality and value added will affect the export value and national income from shrimp farming activities. In response, tiger shrimp management needs to be carried out sustainably to preserve the environment and meet international quality assurance standards. The application of sustainable farming methods is expected to be one way to improve the quality of shrimp produced in Indonesia and provide new market opportunities.

From a value chain perspective, a business is viewed as a series of processes that transform inputs into outputs that are valuable to consumers (Kaplinsky et al 2001; M4P 2008; Rosales et al 2017; Watabaji et al 2016; WBCSD 2011). Basically, consumers will receive product value from three main sources, namely: actions that produce different products, actions that have implications for reducing product prices and actions that can directly satisfy consumer needs. Through value chain analysis, it will be possible to identify the value contribution at each stage of the business or company until the product or service is received by consumers.

Analysing the role of actors and networks in the management of wind shrimp value chain in Sidoarjo Regency.

The management of the tiger shrimp value chain in Sidoarjo District involves the government, the private sector, and the community at various levels. Based on their roles and referring to previous research (Kurniawan 2017), these actors can be grouped into: primary stakeholders consisting of tiger shrimp farmers, tiger shrimp nurseries, and PTA. These stakeholders tend to play a major role in the tiger shrimp value chain management process in Sidoarjo District. Meanwhile, the Meteorology, Climatology and Geophysics Agency (BMKG), the East Java Provincial Public Works and Water Resources Office (DPUSDAProv), the Sidoarjo District Regional Planning and Development Agency (BappedaKab), the Sidoarjo District Regional Financial and Asset Management Agency (BPKADKab), the Sidoarjo District Office of Housing, Settlement Areas, Human Settlements and Spatial Planning (DPerkimTRKab), the Sidoarjo District

Office of Public Works and Water Resources (DPUSDAKab), the Financing institutions and the tiger shrimp input providers/private sector as supporting to work programmes conducted by key stakeholders. The Coordinating Ministry for Maritime Affairs and Investment (Marvest), the Directorate General of Aquaculture of the Ministry of Maritime Affairs and Fisheries (DJPB-KKP), the East Java Provincial Maritime Affairs and Fisheries Office (DKPPProv), and the Sidoarjo District Fisheries Office (DisPerKab) are key stakeholders that have the role and legal authority in decision-making and regulatory arrangements related to tiger shrimp value chain management in Sidoarjo District.

Based on the results of Mactor analysis, DJPB-KKP is the most influential actor on the success of the organic tiger shrimp value chain ($I = 190$) and tiger shrimp farmers are the most dependent actor on the achievement of organic tiger shrimp value chain management objectives ($D = 191$). This illustrates that the DJPB-KKP will play a major role in influencing tiger shrimp value chain management (Figure 3). On the other hand, tiger shrimp farmers depend on other actors to produce quality organic tiger shrimp as raw materials. Based on these data, a map of influence and dependency between actors was obtained (Figure 3). Influence between actors illustrates the ability of actors to influence other actors, design, planning and implementation of tiger shrimp value chain development in Sidoarjo District. Based on their power, actors were positioned on the influence and dependency map in four quadrants and categorised as dominant actors in quadrant I (high influence), dominated actors in quadrant III (high dependency), isolated or autonomous actors in quadrant IV (low influence and dependency), and relational actors in quadrant II (high influence and dependency) (Ariyani & Umar 2020; Fauzi 2019). The maps of influence and dependency can be controlled by those who own material resources, hold a certain social position, or know how the system works (Tronvoll 2017).

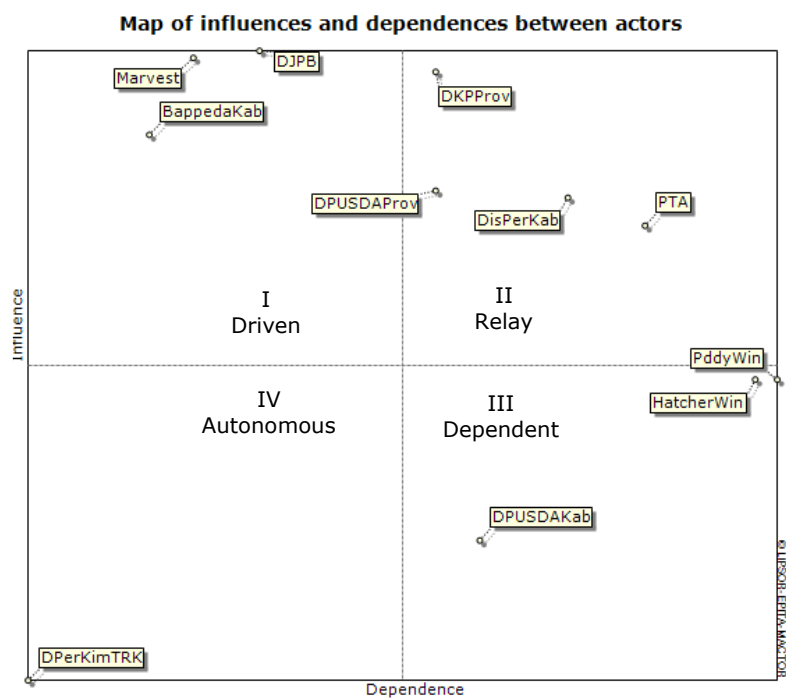


Figure 3. Map of influence and dependency between actors.

On the actor map, it was found that the driving actors, i.e. the dominant or highly influential actors, were DJPB-KKP, Marvest, and the District Planning Agency. These actors were located in quadrant I. Some actors were identified in quadrant II, meaning that they are interdependent on each other but also have a relay influence in the organic tiger shrimp value chain management programme (Fauzi 2019). Government actors such as the East Java DKPPProv, East Java DPUSDAProv, and Sidoarjo DisPerKab are in this quadrant, reflecting a high level of importance in tiger shrimp value chain management. This is supported by the presence of PT Atina in the same quadrant. Actors in quadrant II or relay actors are actors who will play a role when implementing various decisions in the field.

These relay actors spearhead the successful operationalisation of organic tiger shrimp value chain development according to their respective capacities and roles.

Sidoarjo DPerKimTRKab is in a passive position (having little dependency and influence, but being autonomous), although it is the deciding institution in determining the spatial layout of the region. Sidoarjo DPUSDAKab along with tiger shrimp farmers and farmers are in quadrant III, which reflects that these actors are dominated actors that will be influenced and dependent on other actors (Fauzi 2019). The Sidoarjo DPUSDAKab will move according to the priority programmes to be developed. In developing the organic tiger shrimp value chain in Sidoarjo District, the Sidoarjo DPUSDAKab handles sedimentation of estuaries and primary channels, but under the coordination and authority of the East Java DPUSDAProv. Meanwhile, tiger shrimp farmers and nurseries will move in accordance with the direction of driven actors and relay actors in carrying out their roles in the value chain.

Convergence and divergence between actors in principle describe the similarities and differences in actors' attitudes towards goals (Ariyani & Umar 2020). Actors who have similar attitudes will converge, while those who differ will diverge. Convergence analysis is intended to determine the possibility of potential actor alliances, so as to determine which actors can work together to achieve goals and avoid conflicts that may occur.

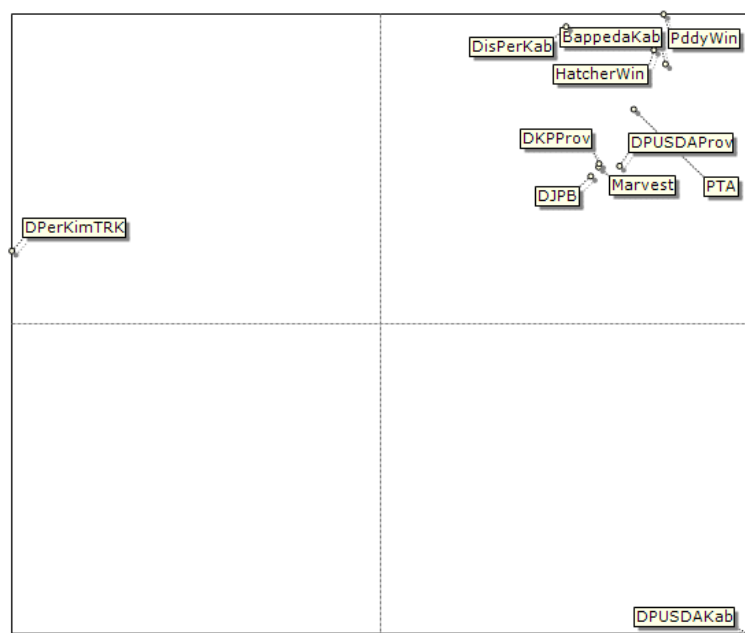


Figure 4. Map of convergence between actors.

The potential alliance/cooperation of actors in organic tiger shrimp value chain management in Sidoarjo District is between DJPB-KKP and East Java DKPPProv, which has the highest level of importance, with an intensity coefficient of 24.5. This illustrates that these two actors have an important role in coordinating the parties involved in managing the organic tiger shrimp value chain in Sidoarjo District. The degree of convergence of 96.3% indicates that more actors pursue common interests as intensity rises (Fauzi 2019). The convergence analysis visualises that the actors that have the potential to align are not only the DJPB-KKP and East Java DKPPProv, but also tiger shrimp farmers with the DJPB-KKP and East Java DKPPProv, which based on the results of the analysis show a strong potential alliance in supporting the achievement of program objectives. Government actors that have the potential to collaborate in the development of tiger shrimp value chain management in Sidoarjo District are the Marvest, East Java DPUSDAProv, Sidoarjo BappedaKab, Sidoarjo DPUSDAKab, and Sidoarjo DisPerKab. These actors are supported by tiger shrimp breeders and PTA, which are in the same quadrant of the convergence map. The Sidoarjo DPerKimTRKab and the Sidoarjo DPUSDAKab also still have the potential for alliances with the other nine actors mentioned above (Figure 4).

The actor with the weakest alliance potential (Fauzi 2019) is the Sidoarjo DPerKimTRKab with Sidoarjo DPUSDAKab with a coefficient of 7.8. These results also illustrate the divergence of Sidoarjo DPerKimTRKab and Sidoarjo DPUSDAKab actors towards other actors in maintaining the value chain. This is caused by differences in the priority scale of development programmes from each office. Both institutions support actors in the provision of infrastructure. Their position as autonomous and dependent actors in the actor influence and dependency map suggests that they may be able to associate with actors in the driven and relay positions to support the tiger shrimp value chain development programme in Sidoarjo District.

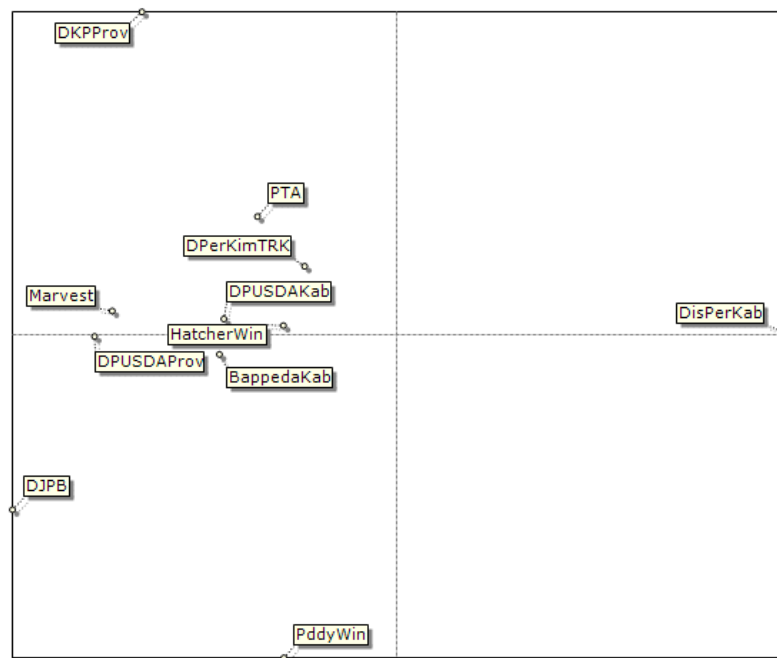


Figure 5. Map of divergence between actors.

Convergence and divergence analyses show that Sidoarjo DisPerKab actors are in a conflicting position with DJPB-KKP as well as other actors in the chain (Figure 5). This divergence illustrates the "absence" of the Sidoarjo District Fisheries Office in developing tiger shrimp value chain management among farmers. A potential conflict was identified between the Sidoarjo District Fisheries Service and the DJPB-KKP with an intensity coefficient of 6.4. Differences in the discourse on the handling of estuary and primary channel sedimentation cases in Sidoarjo District were triggered by differences in conceptions between the two actors, regarding the extent of primary channels. Increasing organic tiger shrimp production is still a priority for both agencies directly involved in Indonesia's fisheries development, so there is still potential for alliance between the two actors, as indicated by the intensity coefficient of 22.0.

Convergence and divergence analyses produced ambivalence between actors (Figure 6), which illustrates that actors can form alliances with other parties despite being on different sides of convergence and divergence analyses (Fauzi 2019). The ambivalence analysis results show that the Sidoarjo DisPerKab has a high ambivalence value of 0.4. This illustrates that these actors can cooperate or form alliances with other actors that have low ambivalence scores, such as the Sidoarjo BappedaKab. This exposed that these two actors could be a good trigger for the Sidoarjo District Government's involvement in the organic tiger shrimp value chain management programme in Sidoarjo District.

Convergence, divergence and ambivalence among actors involved in the organic tiger shrimp value chain management programme in Sidoarjo District leads to competitiveness among actors (Ariyani & Umar 2020). Analysing the competitiveness among actors shows that there are actors who are very influential but also very dependent, but at the same time, their competitiveness is weak or retroactive condition. However,

actors who are influential enough and do not have dependency or retroactivity will have high competitiveness.

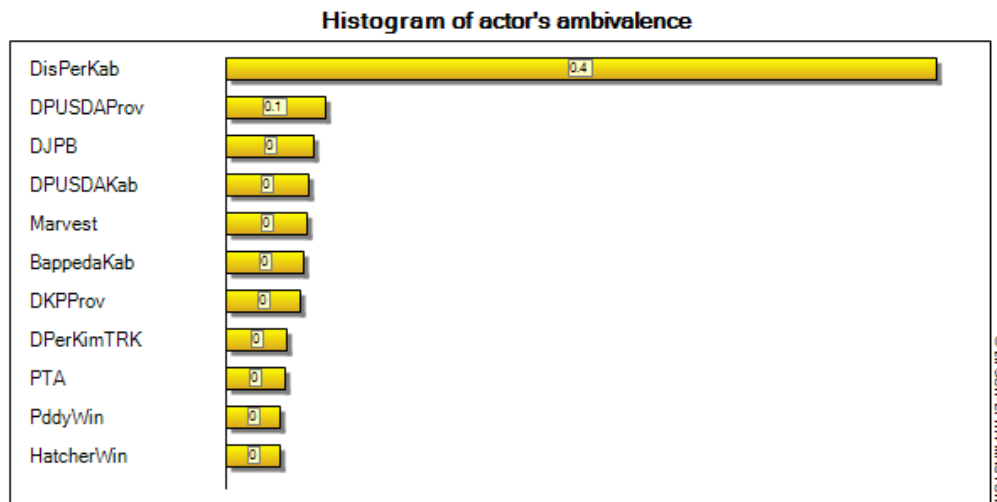


Figure 6. Histogram of actor's ambivalence.

DJPB-KKP, Marvest and Sidoarjo BappedaKab have the highest level of competitiveness (Figure 7). This suggests that these actors play an important role in planning for tiger shrimp value chain development in Sidoarjo District. Their position as driving actors will contribute greatly to the management of the organic tiger shrimp value chain in Sidoarjo District. In accordance with their role in designing and coordinating local development policies and planning, these actors will be able to align with other potentially relevant parties to encourage the development of organic tiger shrimp value chains in Sidoarjo District. On the other hand, Sidoarjo DPerKimTRKab and Sidoarjo DPUSDAKab are the least competitive actors. This illustrates the role of these two actors in the tiger shrimp value chain in Sidoarjo District. Both actors support the infrastructure for tiger shrimp value chain development in Sidoarjo District. Other actors are in a moderate position.

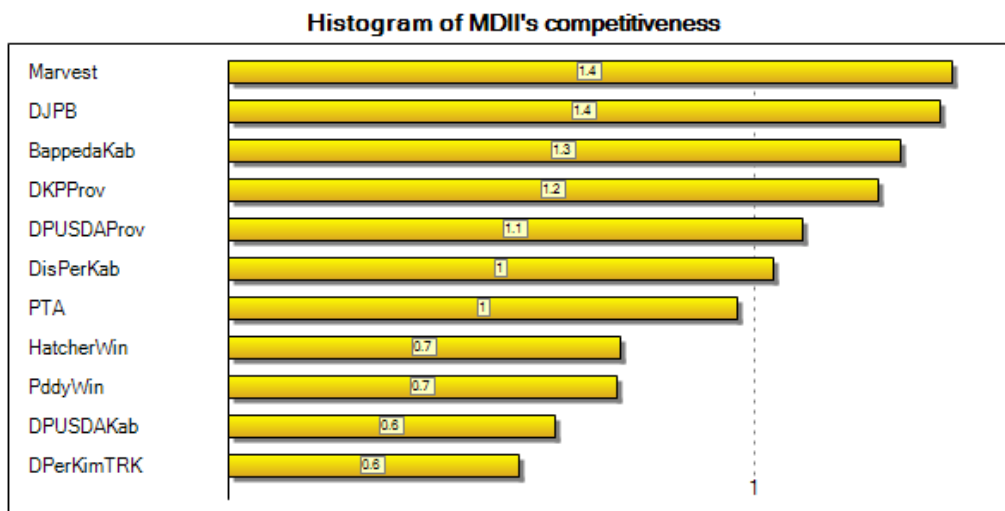


Figure 7. Histogram of competitiveness.

Partnership patterns in tiger shrimp value chain development in Sidoarjo District can be applied based on the roles and functions of each actor in the chain. In managing estuaries and primary channels, the Sidoarjo DisPerKab can collaborate with East Java DPUSDAProv and Sidoarjo DPUSDAKab, in coordination with Marvest and DJPB-KKP as driving actors. Meanwhile, in relation to increasing tiger shrimp aquaculture production, actors consisting of nurseries and farmers can collaborate with DJPB-KKP, East Java DKPProv, Sidoarjo District Government and PTA in terms of aquaculture technology

transfer. On the downstream side, PTA can take full control in managing the processing chain, while still collaborating with local and central government actors and farmers (as a source of raw materials for the factory).

Based on the concept of blue economy (Kurwardani et al 2023; Sambodo et al 2023), the tiger shrimp value chain management in Sidoarjo District has the potential to contribute to the fulfilment of the blue economy framework. This governance concept involves various parties in terms of tiger shrimp value chain management. Environmental management programmes in the tiger shrimp value chain are a key pillar of the multi-stakeholder approach. Resolving environmental issues in terms of estuary and primary channel sedimentation management is a potential entry point for aligning environmental management programmes. The findings of this study indicate that the organic tiger shrimp value chain in Sidoarjo Regency has the potential to be developed with the concept of multi-stakeholder partnerships, by involving all stakeholders. This result is an answer to the problem of suboptimal management that has occurred due to a development that is partial and only carried out by certain actors or parties. This finding leads to the management of commodities that have important economic value using the concept of multi-stakeholder cooperation between the government, private sector and community (Anytha et al 2022).

Conclusions. Based on the research results, the value chain analysis illustrates that the value or price margin is still controlled by the downstream sector. The strong competitiveness of the private sector makes the bargaining position of farmers and breeders under the control of the private sector. The results of the actor analysis show that multi-actor partnerships in tiger shrimp value chain management in Sidoarjo District have the potential to be developed based on the roles and functions of each actor. Multi-actor cooperation in organic tiger shrimp value chain management in Sidoarjo District is a key element in addressing environmental issues, water resource availability, seed quality, and disease control. Cooperation patterns based on the equality of the parties involved, such as the concept of public-private-partnership can be an option in the management of tiger shrimp value chains based on the blue economy and can improve the bargaining position of farmers.

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Conflict of interest. The authors declare no conflicts of interest.

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