



## **Toward Sustainable Tourism: Insights for Mactor Analysis in Ngebel Lake, Indonesia**

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### **Article Information      Abstract**

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Sustainable tourism development requires the synergy of actors' and actors' attitudes in responding to goals and opportunities for conflict to arise due to resistance between actors and goals. This study aims to identify stakeholder actors, identify the strengths and attitudes of actors towards sustainable tourism development goals and describe the pattern of linkage between actors with development goals in Ngebel Lake. This research uses a sequential mixed method that combines quantitative and qualitative approaches sequentially in all stages of the research process. Data collection methods using in-depth interviews with actors. Data analysis using MACTOR software to identify stakeholder actors' strengths, relationships, and alliance patterns. The results showed that Local Communities, Small and Medium enterprises, and the Services Office of Environment are the dominant actors in tourism development in the Ngebel Lake area. Meanwhile, The Department of Youth Sports and Tourism, the Village Government, the Tourism Awareness Group, and Visitors are relay actors. The finding of this study is that most stakeholders converge in support of achieving the strategic objectives, although some resist the purposes. It can be recommended to develop a pattern of collaboration between all stakeholders needed for the sustainable development of tourism potential in Ngebel Lake.

## INTRODUCTION

The concept of sustainability in the tourism sector has become an interesting discussion among researchers and academics in this decade (Muresan *et al.*, 2016). The Sustainable Development Goals (SDGs) are an essential part of the UN 2023 agenda, which encourages sustainable development through approaches such as controlling natural resources, providing employment opportunities for local communities, developing cultural potential and local products using sustainability to have an economic impact on developing countries and backward country (UNWTO, 2018). As a result, SDGs have become a major focal point for tourism research on contributions to sustainable development (KC, Dhungana, and Dangi, 2021). SDG guidelines can be put into practice thinking of sustainability in tourism; this is the background of the emergence of this issue of sustainable tourism.

The primary key to success and implementation in sustainable tourism development is stakeholder support (Byrd, 2007). Often, decisions made in this way are perceived by the local community as not reflecting the interests and opinions of the community. The second issue is that the decision-making system is perceived as having competing interests; therefore, the decisions made again do not reflect the public interest. Many researchers have disagreed with sustainable tourism, which includes economic, environmental, cultural, and social aspects (Pan *et al.*, 2018). In tourism activities, the potential of natural resources can be used intensively even though sometimes it impacts the environmental, economic, and social conditions.

On the other hand, tourism is not only limited to three major concepts, namely economic, social, and environmental, but also pays attention to economic, social, cultural, and educational aspects (Rosardi *et al.*, 2022). The concept of sustainable development in the tourism sector addresses economic, environmental, and social elements through policies and strategies (Sunardi *et al.*, 2021).

Another research, Surugiu & Surugiu (2015), believes that stakeholder engagement effectively involves the roles of local communities, indigenous peoples, visitors, and the government. Different findings in Palazzo *et al.* (2022) argue that sustainable economic growth can be achieved through tourism by protecting the environment, preserving natural resources, creating jobs, and maintaining local cultural diversity. The findings above have not yet understood sustainable tourism, so this study aims to analyse the strategies and stakeholders that play a role in sustainable tourism development.

Indonesia's tourism potential is at a level to be proud of, with an increasing trend that tends to be positive (Ollivaud, Haxton, and Branch, 2018). Data on foreign tourist visits to Indonesia show that in 2022, it reached 5.47 million visits (Kementerian Pariwisata dan Ekonomi Kreatif, 2022). The contribution of tourism to the National Gross Domestic Product is 8%, and foreign exchange receipts of IDR 240 trillion (BPS, 2021). Tourism can act as a catalyst for development. Besides that, tourism can also increase tax revenues, equalise income, increase employment opportunities and improve the balance of payments. Tourism potential in Indonesia broadly includes almost all types of tourism that can be promoted to tourists as artificial products with a variety of diversity and uniqueness from every region in Indonesia, one of which is in Ngebel Lake Ponorogo Tourism (See Figure 1). Ngebel Lake is one of the leading tourist destinations in Ngebel Village, Jenangan District, Ponorogo Regency, East Java. It is one of the targets for tourism development by the Ponorogo Regency government through increasing the number of tourist visits and improving the local economy (Fredian Nugroho *et al.*, 2022). Within the scope of the Ponorogo district, Telaga Ngebel is a tourist destination with the highest number of visits of 281,760 visitors when compared to other tours, such as the Tombs of Kyai Ageng M. Besari & Tegalsari with 69,657 visitors; Sendang Bulus with 66,175 visitors; Brilliant Water Park with 52,022 visitors, and Batoro Katong Tomb with 18,783 visitors.

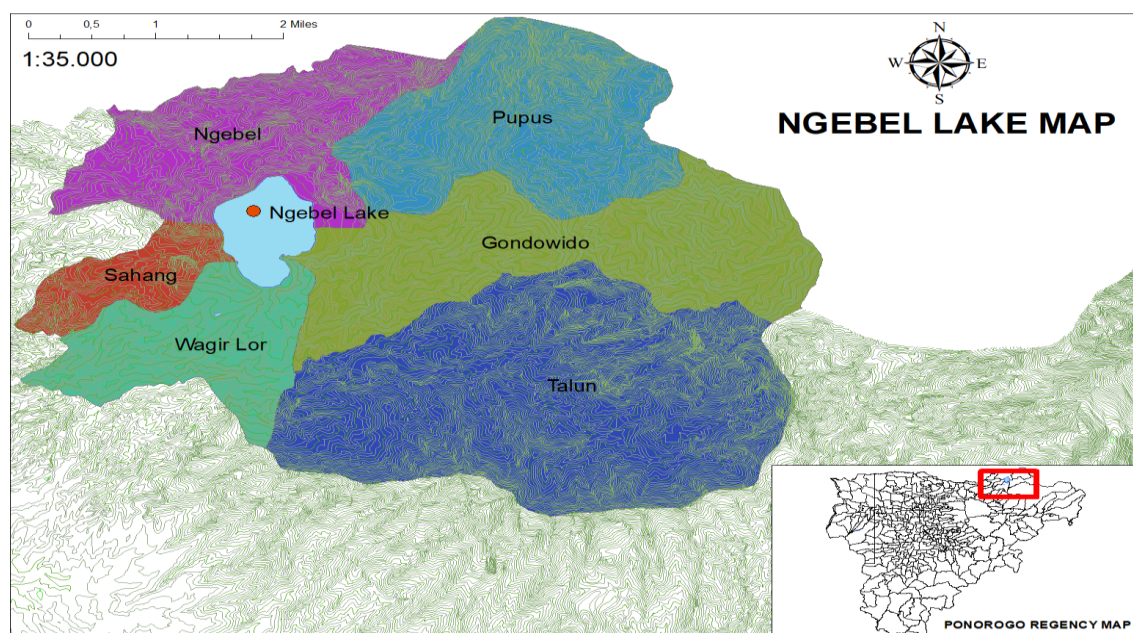
However, the percentage of tourist visits to Ngebel Lake is still below the average growth in tourism in East Java, which is 16.2 per cent (BPS Ponorogo, 2023).

Therefore, Ngebel Lake tourism needs to be developed through the principle of sustainability by considering economic, social, and environmental aspects. The development of Ngebel Lake tourism must match demand and supply to avoid creating gaps. If the tourist area has a high gap, it can lead to a waste of resources. In addition, the wide enough Ngebel Lake ecosystem gives this area potential so that it can be developed into a tourist attraction to attract tourists (Faradisa *et al.*, 2021).

The tourism sector is currently affected by many global changes, infrastructure, and tourism administration (Riadh, 2022). Participatory efforts in collaborating with all public and private

stakeholders when managing tourism through new governance and collaboration networks (Zheng & Tsai, 2019). With good planning and effective management, tourism can generate positive benefits in terms of the economic, environmental, and social (Kementarian Pariwisata dan Ekonomi Kreatif, 2012).

The outstanding contribution of the tourism sector is inseparable from the role of actors (Gravitani *et al.*, 2022). The actors' knowledge of the prevailing system and structure influences the ability of the actors to interact innovatively and creatively in creating ownership and management of economic resources (Tronvoll, 2017). Characteristics of actors who are free to set their own goals and carry out strategic actions to achieve the goals achieved (Heger & Rohrbeck, 2012).



**Figure 1.** Ngebel Lake Location Map

Source: ArcGIS, 2023 (Processed)

The complexity of the problems in the tourism sector, primarily how the actors work together to interact and act with each other, is a basic necessity in decision-making in the industry (Pechlaner, Volgger, and Herntrei, 2012). Further research argues that the idea of stakeholder engagement in the tourism sector has grown because of a belief that this engagement

can generate positive impacts in sustainable tourism and support participation, encourage empowerment, and enable more inclusive types of stakeholder engagement (McComb *et al.*, 2017). Therefore, this study is designed to identify stakeholder actors in Ngebel Lake, describe the strengths and attitudes of actors towards sustainable tourism development goals

in Ngebel Lake, and describe the pattern of linkage between actors with development goals. The results of this study can be used as a reference for future policy recommendations in determining the appropriate institutional model and by the pattern of coordination and involvement of stakeholders in the development of tourism potential in Ngebel Lake.

## RESEARCH METHODS

The method used in this study is a sequential mixed method, which means that this study combines qualitative and quantitative approaches at each stage of the research process from start to finish to obtain a holistic picture of the characteristics of stakeholders in Situ Ngebel against other stakeholders (Mafruhah *et al.*, 2020).

This study uses primary data with data collection techniques through in-depth interviews with purposively selected stakeholders based on how involved and understood the key informants were regarding the development of a sustainable tourism model in Ngebel Lake. Key informants interviewed included the Youth Sports and Tourism Office of Ponorogo Regency, East Java; Ngebel Village Government and Wagir Lor; Ngebel Tourism Awareness Group; Enterprises Owned by Ngebel and Wagir Lor Villages; Ngebel Tourism Manager; Visitors around Ngebel Lake; Communities around Ngebel Lake; Ponorogo District Environmental Office, East Java; and Small and Medium Enterprises around Ngebel Lake. Interview activities are carried out by visiting the location of informants with questionnaires. The interview asked about the informant's knowledge of sustainable tourism development in Ngebel Lake and the problems that arise. The informant's answer was recorded. Each informant's interview takes approximately 30 minutes.

All data from in-depth interviews were then analysed using the "Matrix of Alliances and Conflicts Tactics, Objectives, Recommendations (MACTOR)" software. MACTOR is a software developed by Michael Godet in 1991 that analyses the relationships between actors, their

attitudes, and the competitiveness of actors about goals (Godet, Durance, and Gerber, 2013).

The way actors work is based on a structural approach, where the influence between participants is divided into potential, direct, and indirect effects (Riadh, 2022). Three possible impacts occur in the MACTOR analysis; the first, namely potential influence, occurs when actor A is estimated to have a more significant effect than actor B. Second, direct result occurs when actor A influences actor B. Third, indirect influence occurs when actor A affects actor B. At the same time, actor B influences actor C, so the transitivity assumption is applied where actor C controls indirectly and actor A influences directly (Ariyani *et al.*, 2020).

The steps in the MACTOR analysis are divided into four stages: first, define all the actors used in the research; 2. define all objectives used in the study; 3. Describe the actors' relationship as measured by scoring from a scale of 0, meaning there is no influence, to a scale of 4, which means very influential; 4. Describe the relationship between the attitude (resistance level) of actors towards goals as measured on a scale: (+) implies support, (0) means neutral, and (-) means against. Meanwhile, the role or contribution of goals for actors is measured with a scale from 0, which means not essential, to 4, which means very important (Rees & MacDonell, 2017). The research data was obtained directly from in-depth interviews with participants (stakeholders) and then compiled into a matrix, which was processed using MACTOR software to produce various analysis results. The results of the analysis obtained are then presented in the form of tables and graphs which describe the potential and competitiveness of the participants in developing the Ngebel Lake tourist destination, an overview of interrelated patterns, and potential conflicts—arising between actors and a summary of inter-actor support for the goals to be achieved in the development of the Ngebel Lake tourist destination (Boumaour *et al.*, 2018).

## RESULTS AND DISCUSSION

The research results are based on the accuracy of informant sources (stakeholders) in identifying variables (actors and objectives) that influence sustainable tourism development in Ngebel Lake, Ponorogo Regency, East Java, Indonesia. It is essential to provide the informants with an understanding and a general explanation of sustainable development in the tourism sector before conducting in-depth interviews.

The next step is to list the variables based on the experience and knowledge of the informants. The results of the identification show that there are nine variables of stakeholders and ten objectives that affect sustainable tourism development in Ngebel Lake. The list of stakeholders (see Table 1) and the development goals (see Table 2) of sustainable tourism in Ngebel Lake are provided in the following discussion.

**Table 1.** List of stakeholders in sustainable tourism development in Ngebel Lake

| No | Long Name                              | Short Name | Description  |
|----|--|------------|--|
| 1  | Department of Youth Sports and Tourism | DYST       | Youth Sports and Tourism Office of Ponorogo Regency, East Java |
| 2  | Village Government                     | VG         | Ngebel Village Government and Wagir Lor                        |
| 3  | Tourism Awareness Group                | TAG        | Ngebel Tourism Awareness Group                                 |
| 4  | Village Owned Enterprises              | VOE        | Enterprises Owned by Ngebel and Wagir Lor Villages             |
| 5  | Tourism Manager                        | TM         | Ngebel Tourism Manager   |
| 6  | Visitors                               | V          | Visitors around Ngebel Lake                                    |
| 7  | Local Community                        | LC         | Communities around Ngebel Lake                                 |
| 8  | Services Office of Environment         | SOE        | Ponorogo District Environmental Office, East Java              |
| 9  | Small Medium Enterprises               | SMES       | Small and Medium Enterprises around Ngebel Lake                |

Source: MACTOR, 2023 (Processed)

**Table 2.** List of destinations in sustainable tourism development in Ngebel Lake

| No | Sustainable Tourism Aspects | Long Name                            | Short Name |
|----|-----------------------------|--------------------------------------|------------|
| 1  | Economic aspect             | Increase in Regional Original Income | OLGR       |
| 2  | Economic aspect             | Increased employment expansion       | EE         |
| 3  | Economic aspect             | Increase in the number of tourists   | IT         |
| 4  | Economic aspect             | Poverty Reduction                    | PR         |
| 5  | Social aspect               | Maintaining Local Wisdom             | MLW        |
| 6  | Social aspect               | Conflict of Interest                 | CI         |
| 7  | Social aspect               | Private Involvement                  | PI         |
| 8  | Social aspect               | Increased infrastructure development | ID         |
| 9  | Environment aspect          | Change of Land Use for Tourism       | CLUT       |
| 10 | Environment aspect          | Impact on Environmental Damage       | IED        |

Source: MACTOR, 2023 (Processed)

The results of stakeholder analysis using the MACTOR software show an interdependent relationship between stakeholders regarding sustainable tourism development at Ngebel Lake, as shown in Table 3. The most influential

stakeholders are the Local Community and the Department of Youth Sports and Tourism, while the stakeholders with a tendency to be highly dependent are village-owned enterprises. This matrix shows that Local Community

stakeholders and the Department of Youth Sports and Tourism strongly influence and determine the success of sustainable tourism object development in Ngebel Lake. Meanwhile,

Village Owned Enterprises stakeholders are the weakest in controlling the scenario of sustainable tourism development in Ngebel Lake.

**Table 3.** Matrix of Influence and Interdependence Between Stakeholders

| MDI  | DYST | VG  | TAG | VOE | TM  | V   | LC  | SOE | SMES | Di   |
|------|------|-----|-----|-----|-----|-----|-----|-----|------|------|
| DYST | 23   | 23  | 19  | 23  | 19  | 19  | 17  | 18  | 17   | 155  |
| VG   | 21   | 20  | 19  | 19  | 19  | 18  | 15  | 16  | 17   | 144  |
| TAG  | 18   | 19  | 17  | 20  | 18  | 17  | 17  | 16  | 15   | 140  |
| VOE  | 19   | 19  | 16  | 19  | 18  | 16  | 14  | 17  | 15   | 134  |
| TM   | 15   | 14  | 15  | 14  | 13  | 14  | 12  | 13  | 14   | 111  |
| V    | 19   | 18  | 16  | 20  | 16  | 15  | 15  | 16  | 15   | 135  |
| LC   | 22   | 22  | 21  | 21  | 17  | 19  | 17  | 17  | 17   | 156  |
| SOE  | 18   | 19  | 17  | 19  | 19  | 20  | 17  | 14  | 17   | 146  |
| SMES | 21   | 21  | 17  | 20  | 18  | 18  | 16  | 17  | 16   | 148  |
| Di   | 153  | 155 | 140 | 156 | 144 | 141 | 123 | 130 | 127  | 1269 |

Source: MACTOR, 2023 (Processed)

Figure 2 shows that the Local Community, Small Medium Enterprises, and Services Office of Environment are in Quadrant 1 (at the top left). In the quadrant I position, all stakeholders have high influence and low dependence on sustainable tourism development in Ngebel Lake. In contrast, in Quadrant 3 (shown at the bottom right), Tourism Managers and village-owned enterprises have a high level of dependency and very little influence on

sustainable tourism development in Ngebel Lake. In Quadrant 2, the Department of Youth Sports and Tourism, Village Government, Tourism Awareness Group, and Visitors are relay stakeholders, where they depend on the stakeholders encouraged in Quadrant 1. However, they significantly influence Quadrant 3 by the impact of Quadrant 1 stakeholder actions on Quadrant 2 stakeholders.



**Figure 2.** Matrix of influences and dependencies between actors

Source: MACTOR, 2023 (Processed)

The stakeholders with the highest mobilisation scores are the Tourism Awareness Group, Services Office of Environment, and Small Medium Enterprises (Table 4). This indicates that regarding sustainable tourism development, these three stakeholders actively develop sustainable tourism in Ngebel Lake. The results of the mobilisation analysis (shown in the bottom row) indicate the objectives expected, to become the leading strategic issue to elicit a response from stakeholders. In this discussion, the goal that is considered essential by stakeholders is to increase local revenue. The next goal that is a priority is related to the

development of infrastructure for tourist attractions (Ngebel Lake).

The existence of a level of tourism in an area does not rule out the possibility of an increase in community welfare and an increase in government PAD through the sale of food and beverage, souvenirs, crafts, lodging, and other supporting facilities (Hartono, 2023; Kusuma & Suryaningrum, 2021). In addition, the existence of tourism is also able to have a positive impact on infrastructure improvements. Adequate road conditions and accommodation are thought to influence tourists' desire to visit a tourist location (Jovanivic & Ilic, 2016).

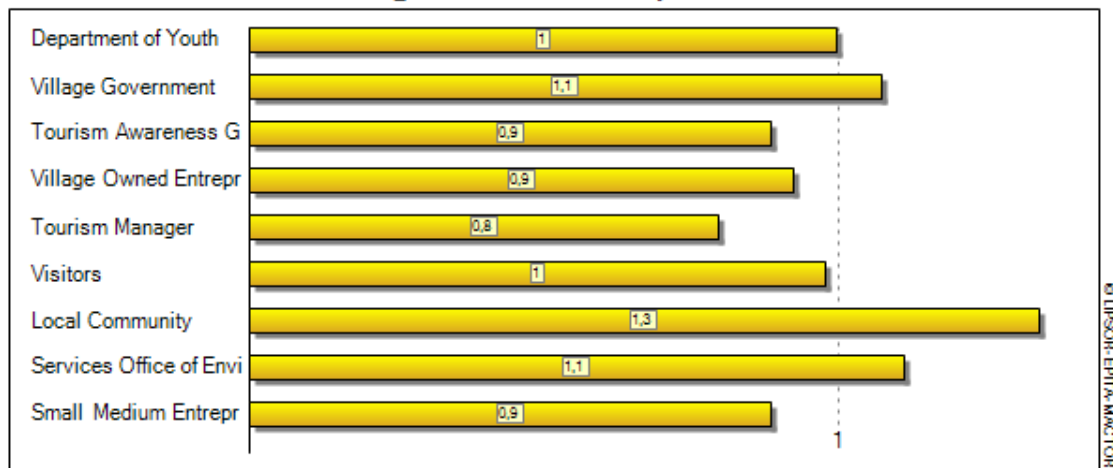
**Table 4.** Degree of mobilisation between stakeholders with objective goals

| 3MAO                    | OLGR | EE   | IT   | PR   | MLW  | ID   | CLUT  | IED  | CI   | PI   | Mobilisation |
|-------------------------|------|------|------|------|------|------|-------|------|------|------|--------------|
| DYST                    | 3.2  | 1.1  | 3.2  | 3.2  | 2.1  | 3.2  | -1.1  | 2.1  | 3.2  | -1.1 | 23.5         |
| VG                      | 2.9  | 1.9  | 1.9  | 1.0  | 1.9  | 2.9  | -1.9  | -2.9 | 2.9  | 1.9  | 22.0         |
| TAG                     | 2.0  | 3.0  | 1.0  | 2.0  | 3.0  | 2.0  | 3.9   | 3.0  | -3.9 | 3.9  | 27.6         |
| VOE                     | 2.6  | 3.4  | 2.6  | 1.7  | 1.7  | 0.9  | -2.6  | 2.6  | 3.4  | 2.6  | 23.9         |
| TM                      | 2.7  | 2.1  | 1.4  | 1.4  | 2.1  | 1.4  | -2.1  | -1.4 | 1.4  | 1.4  | 17.1         |
| V                       | 2.8  | 1.9  | 2.8  | 2.8  | 0.9  | 2.8  | 1.9   | 2.8  | -2.8 | -2.8 | 24.5         |
| LC                      | 2.5  | 1.2  | 1.2  | 2.5  | 3.7  | 2.5  | 3.7   | -2.5 | 1.2  | 2.5  | 23.7         |
| SOE                     | 3.4  | 2.2  | 3.4  | 2.2  | 2.2  | 3.4  | -3.4  | 3.4  | -2.2 | 3.4  | 29.1         |
| SMES                    | 4.6  | 3.4  | 1.1  | 3.4  | 1.1  | 4.6  | -2.3  | 4.6  | 3.4  | 4.6  | 33.1         |
| Number of agreements    | 26.6 | 20.2 | 18.6 | 20.2 | 18.8 | 23.5 | 9.6   | 18.4 | 15.5 | 20.2 |              |
| Number of disagreements | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | -13.2 | -6.7 | -9.0 | -3.9 |              |
| Degree of mobilisation  | 26.6 | 20.2 | 18.6 | 20.2 | 0.0  | 23.5 | 22.8  | 25.1 | 24.5 | 24.1 |              |

Source: MACTOR, 2023 (Processed)

The results of calculating the competitiveness of the actors are explained in the analysis of the direct and indirect influence of the actors on other actors (Figure 3), which shows that the community is an actor who has an important role, both directly and indirectly in tourism development, with a competitive score of 1.3; Village Government, with a competitiveness score of 1.1; Services Office of Environment, with a competitiveness score of 1.1; Department of Youth Sports and Tourism with a

competitiveness score of 1. In contrast, actors with weak competitiveness are Tourism Managers, with a score of 0.8. Tourism Awareness, with a score of 0.9, Village Owned Enterprises, with a score of 0.9. This can be caused by the position of Tourism Manager, Tourism Awareness, Village Owned Enterprises, which tends to be in Quadrant 3 (shown at the bottom right), which is the position of an actor affected by the policy (Rees and MacDonell, 2017).

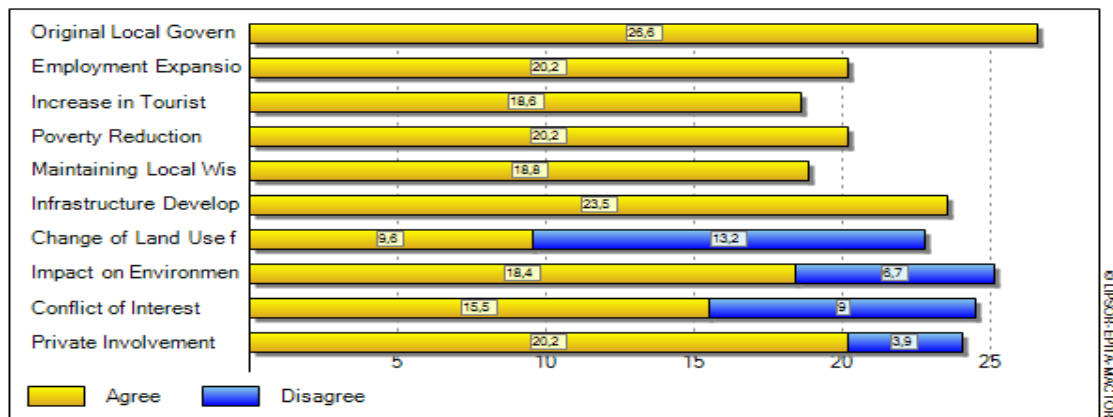


**Figure 3.** Histogram of MMDII's competitiveness  
Source: MACTOR, 2023 (Processed)

The results of the subsequent analysis are related to the development objective map, which results in an analysis that there is a determination of stakeholder support or resistance in a development (Wijayanto et al., 2022). To find out the map of actors' support for development goals, a group of goals to be achieved is mapped to the level of importance where the more important a goal is, the stronger the support of the actors for that goal. Figure 4 presents a map of the destination of the tourism development project in Ngebel Lake. Based on the goal map, it is known that there are stakeholders who are resistant to the goals set. It is proven that in Figure 4, there are pros and cons of plans seen in yellow (pro) and blue (cons) on the goal graph bar. The goal that has the highest intensity is the goal of increasing local original income. This is to the results of in-depth interviews with stakeholders who stated that the Ngebel Lake tourist area could increase local revenue by increasing tourist attractions and developing the MSME sector and other supporting sectors (such as lodging, accommodation, and others).

The next goal that has strong support from the actors is infrastructure development. This is right because infrastructure conditions such as highways, electricity, directions to tourist attractions, and tourist facilities are minimal, so it needs improvement.

The expansion of employment is supported quite strongly by actors. This is related to the limited job opportunities in the Ngebel sub-district area, where most of the population works as farmers. Tourist destinations increase job opportunities and pressure productive young people to leave their home areas (Aryawan, Sara, and Purnami, 2019). This is in line with the results of the actor's strength analysis, which states that local communities have great potential to be involved in the success of tourism development. Given limited resources, goals can be achieved on a priority scale from the highest level of support to the lowest (Ariyani, Fauzi, and Umar, 2020). However, on the other hand, some actors do not support goals that include change of land use for tourism, impact on environmental damage, conflict of interest, and private involvement.

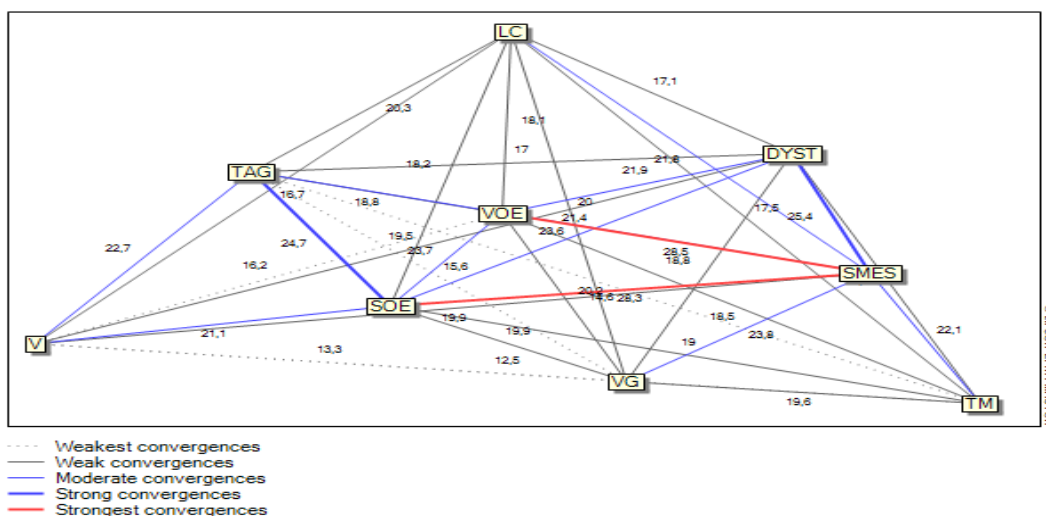


**Figure 4.** Histogram of The Goals  
Source: MACTOR, 2023 (Processed)

The following discussion relates to analyzing actors' attitudes toward goals, as shown on the actor convergence map, where actors are grouped based on similar philosophies. If they share one attitude, they meet; if they have different perspectives they separate. Convergence map analysis is used to analyse the interrelationships between actors in avoiding conflict (because of the pros and cons of goals). Figure 5 shows the possible interrelationships between actors in developing sustainable tourism in Ngebel Lake. The process results in Figure 5 shows that the actors with powerful convergence are Village Owned Enterprises, Small and Medium Enterprises, and the Services Office of Environment. The Tourism Awareness Group

and the Services Office of Environment demonstrate strong convergence.

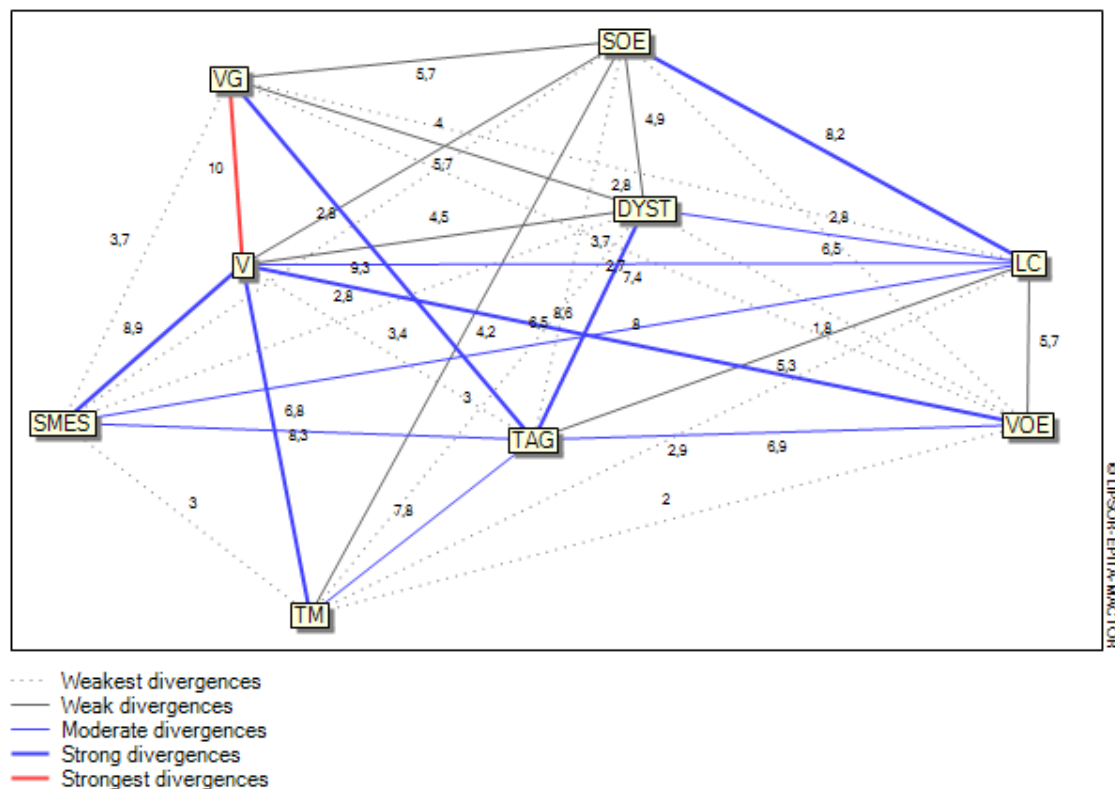
In contrast, convergence occurs between the Services Office of Environment, Visitors, Tourism Awareness Group, Tourism Manager, Small and Medium Enterprises, and Village Owned Enterprises. Figure 5 also shows a weak convergence between Visitors with Village Owned Enterprises and Village Governments. This indicates that visitors have not been actively involved in providing criticism and suggestions for tourism development. Besides, village-owned enterprises have not been able to grasp opportunities as a tourist destination. This is in line with the results of interviews with actors who stated that Village Owned Enterprises has not focused on the commercial field of tourism.



**Figure 5.** Actor Convergence Map  
Source: MACTOR, 2023 (Processed)

The analysis results show differences between actors towards objectives, as shown in Figure 6, which shows that divergence between actors is weak because there is no deep conflict of interest between actors. The most substantial divergence comes from Village Government with Visitors, followed by a strong divergence between Small and Medium Enterprises with Visitors, Tourism Manager with Visitors, Village Owned Enterprises with Visitors, Services Office of Environment with Local Community, Department of Youth Sports and Tourism with Tourism Awareness Group, Village Government with Tourism Awareness Group. This result

further strengthens the assumption that local people have only been spectators in developing tourism in their area because the emergence of tourism businesses in their area can reduce the income and economic well-being of the local population. Low-income residents feel that environmental preservation forces them to reduce their primary economic activity allocation because their economic activities are still dependent on nature (Mafruhah *et al.*, 2020). This result is then supported by policy resistance, which states that some actors do not support converting land use, which was previously the agricultural sector, into the tourism sector.



**Figure 6.** Actor Divergence Map  
Source: MACTOR, processed 2023

## CONCLUSION

This study concludes that sustainable tourism development in Ngebel Lake requires the synergy of various government, private, and community actors. In addition, this study also identified several goals ranging from those strongly supported to those the participants did

not support, so follow-up was needed to answer these findings.

The influence and dependency analysis results between participants place actors in a strategic context where participants are expected to respect each other's competitive advantages. The results of this study indicate a huge opportunity to develop the tourism potential of Ngebel Lake inclusively and involve all

stakeholders. The results showed that Local Communities, Small and Medium enterprises, and the Services Office of Environment are the dominant actors. The Department of Youth Sports and Tourism, Village Government, Tourism Awareness Group, and Visitors are relay actors. Meanwhile, village-owned enterprises and Tourism Managers are dominant actors. Most stakeholders converge in support of achieving the strategic objectives, although some resist the purposes. This result answers the problem of development failure that occurs partially and is only carried out by certain actors. Actor resistance to goals supports this. We hope that this research can be used as a policy recommendation for related parties, especially the Tourism, Youth, and Sports Office of the Ponorogo Regency Government and various parties involved in the development of sustainable tourism with a focus on social, economic, and environmental aspects in the future.

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