



Stakeholder mapping for integrated mangrove ecotourism governance

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ABSTRACT

Background: Gunung Anyar mangrove ecotourism represents one of the practical implementations of sustainable tourism that integrates natural resource utilization, conservation efforts and ecological sustainability. The site covers approximately 25 hectares, where mangrove vegetation serves as the main attraction, complemented by various facilities and amenities. The ecotourism management operates collaboratively by involving diverse stakeholder groups to ensure the preservation of natural resources and ecosystem functions. However, these stakeholders are not yet effectively managed, and there is a lack of clear rules governing their interactions and roles. This study aims to map and analyze the stakeholders involved.

Methods: The research was conducted in Gunung Anyar District, Surabaya, with respondents selected using purposive sampling. Data were obtained through questionnaires, interviews and direct observation. The research methods included stakeholder identification, classification and investigation of their relationships. The analysis tool used was the stakeholder grid. **Findings:** The results show that the stakeholders identified as key players (Quadrant I) are the Ministry of Environment and Forestry, the Ministry of Tourism and Creative Economy, the Department of Food Security and Agriculture, Mangrove Botanical Garden Technical Implementation, and the tourism awareness group. **Conclusion:** Twenty stakeholders were classified into four groups, namely the public sector, private sector, non-governmental organizations, and local community groups involved in the development of Gunung Anyar mangrove ecotourism, Surabaya. Their positions were classified as subject, key players, context setter, and crowd based on their level of influence and importance. **Novelty/Originality of this Article:** This study offers the first quantitative stakeholder mapping of the Gunung Anyar mangrove ecotourism area, revealing five critical key players and structural governance gaps that previous studies have not identified. The findings can support stakeholder participation in determining policy schemes and contribute to wiser management and utilization of mangrove forest ecotourism in the future.

KEYWORDS: conservation; ecotourism; key players; stakeholder mapping; sustainable tourism.

1. Introduction

Economic growth often occurs at the expense of the quality of natural resources and the environment because of the impact caused by economic activity. These impacts create external costs that must be borne by the public as well as future generations. Internalization of external costs needs to be enforced as a strategy to prevent damage to natural resources and the environment (Maulana, 2022). Local economies are often based on the intensive

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use of natural resources, and in many cases, there is a deep link to neo-extractive policies and practices, which puts the wellbeing of local inhabitants at risk. This includes intensive pressure on ecosystems, uncontrolled urban expansion, and high rates of informal activities as well as irresponsible industrial activities (Grimm & Sampaio, 2017). A new socio-economic order, supported by policies that address systemic injustices, must be inclusive of all groups of populations and species and their rights to flourish (Higgins-Desbiolles, 2006). Sustainability is a big challenge for tourism, as it often involves travel and high levels of consumption. Therefore, tourism is an interesting focal point in the research agenda, especially sustainability (Filho et al., 2018), because of the opportunities created to analyze the possibility of balancing the three pillars of economic, social and environmental sustainability (Purvis, 2018). Tourism has an impact on three levels; 1) as an economic activity, 2) as a generator of employment, wealth and prosperity, and 3) as a consumer-driven activity, which is usually associated with high levels of consumption that tend to be exploitative, which in the end can deplete natural resource reserves. This gives rise to a tourism paradigm with sustainability which combines several of these pillars which can later be classified based on the level of sustainability and management involving various stakeholders (Ayres, 2001).

The Intergovernmental Panel on Climate Change (IPCC, 2021) assessment report highlights the unquestionable human influence on global warming. It synthesizes knowledge about the physical foundations of climate change, indicating that recent changes are unprecedented over centuries and even thousands of years, and that all regions are already affected by extreme events. Climate change poses a variety of threats to ecosystems, biodiversity, and human lives. Mangrove forests are one of the key nature-based solutions that address climate change and its impacts while providing socio-economic and ecological services (Agaton & Collera, 2022). The recent tourism and climate change stocktake has identified the task of delineating a “whole-of-sector roadmap to a just transition” as a prominent agenda for 2028 (Tourism Panel on Climate Change, 2023). Tourism is a thriving industry in the present world that plays an important role in local, regional and global economic growth and development. Empirical evidence in the tourism literature shows how decisions made by certain groups (usually powerful stakeholders) have provided limited opportunities for marginalised groups to voice their concerns (Higgins-Desbiolles, 2020). The nature and culture that provide attractions to tourists are the major products of tourism. Nature plays an important role in tourism development, and within nature; environmental factors are the main component for tourism development. Nature-based tourism is often called ecotourism, which relates to traveling to relatively undisturbed or uncontaminated natural areas with specific objectives such as studying, admiring and enjoying the scenery with its flora, fauna and any existing cultural manifestation (both past and present) found in these areas. Ecotourism differs from other forms of tourism particularly due to the opportunity for observation and learning it provides to tourists and its contribution to cultural conservation and long-term sustainability of communities and natural resources. According to Tiarantika & Efani (2024), ecotourism is one form of tourism aimed at appreciating and conserving biodiversity and natural ecosystems while providing economic and social benefits to local communities. It is form of sustainable tourism that benefits the community, environment, and local economy. Ecotourism is related to nature and the environment, and promoting it requires protecting nature and the environment.

Furthermore, ecotourism is a special type of tourism and an interesting field to analyze this condition. Its conservation approach, involvement in local communities, and small scale all contribute to providing economic activity that is guided by environmental concerns but also generates significant positive social impacts. However, this approach does not match the current scale of tourism, so its scope may remain very limited (Fennel, 2020). Furthermore, The International Ecotourism Society (TIES) views tourism, and ecotourism in particular, as including various types of stakeholders, namely from tourism operators to many local community agents, and tourists themselves, who are clients, but can also act as self-conscious ecotourists (TIES, 2019). The interaction between all these stakeholders

makes a major contribution to the results of the industry as well as its integrated and sustainable management, in terms of its sustainability objectives. The concept of ecotourism is a sustainable tourism concept that reflects environmental insight and is guided by the principles of balance and environmental sustainability.

Ecotourism is a type of tourism development that supports conservation. Conservation does not hinder development, in fact it will trigger the establishment of sustainable development (Harahab et al., 2021). The economic development of the tourism industry, especially ecotourism management, must adhere to and comply with ecotourism principles. Apart from implementing these principles, it is also important that support from the government, private sector, universities/researchers, and social media is required to build superior ecotourism management. Therefore, stakeholder analysis outlines the concerns of each stakeholder, regardless of whether they influence mangrove ecotourism management. In addition, it shows how much power stakeholders have in making decisions and their contribution to preventing more significant damage to resources in the future. Stakeholder analysis is also useful in maximizing the potential of local resources (Rachmawati & Anjana, 2021).

Numerous contemporary issues, ranging from biodiversity loss, climate change, healthcare and educational access, to social inequities and responsible artificial intelligence (AI), are increasingly complex and demand stakeholder engagement (Youn & Baek, 2024). The increasing use of stakeholder analysis in natural resource management reflects a growing recognition that stakeholders can and should influence environmental decision-making. Stakeholder analysis can be used to avoid inflaming conflicts, ensure that the marginalization of certain groups is not reinforced, and fairly represent diverse interests (Ellis et al., 2016). According to Mushove & Vogel (2005), stakeholder analysis can be used to understand environmental systems by defining the aspects of the system under study, identifying who has a stake in those aspects of the system and prioritizing stakeholders for involvement in decisions about those aspects of the system. Stakeholder analysis is also derived from participatory methods of project design that seek to integrate the interests of disadvantaged and less powerful groups. Furthermore, stakeholder analysis is a central theme in conflict management and dispute resolution (Swiderska, 2002). Stakeholder analysis is also used to understand the diverse range of potentially conflicting stakeholder interests (Koschmann, 2017). Therefore, this research aims to map and analyze the stakeholders involved, so that their influence on policy can be accurately targeted and maximized. Thus, it is hoped that this research can make a significant contribution to the development of sustainable management strategies, which are an important instrument for determining the direction and policy strategy for utilizing ecotourism mangroves in Gunung Anyar, Surabaya by mapping the stakeholders involved. In addition, it is hoped that it can be an alternative that provides a methodological and practical basis for other ecotourism products.

2. Methods

This study was conducted from February to March 2023 in the mangrove ecotourism area of Gunung Anyar, Gunung Anyar Tambak Village, Rungkut District, Surabaya City, East Java Province. This study used a sampling technique, namely purposive sampling, and the data collection technique involved conducting in-depth interviews with 30 key informants as respondents. Apart from interviews, data collection techniques were also carried out through focus group discussions (FGD), observation, and document and literature reviews. Respondents were selected based on the characteristics and relevance of the description of the concerns (interests) and impact (influence) of every stakeholder in the Gunung Anyar mangrove ecotourism (Idrus, 2009).

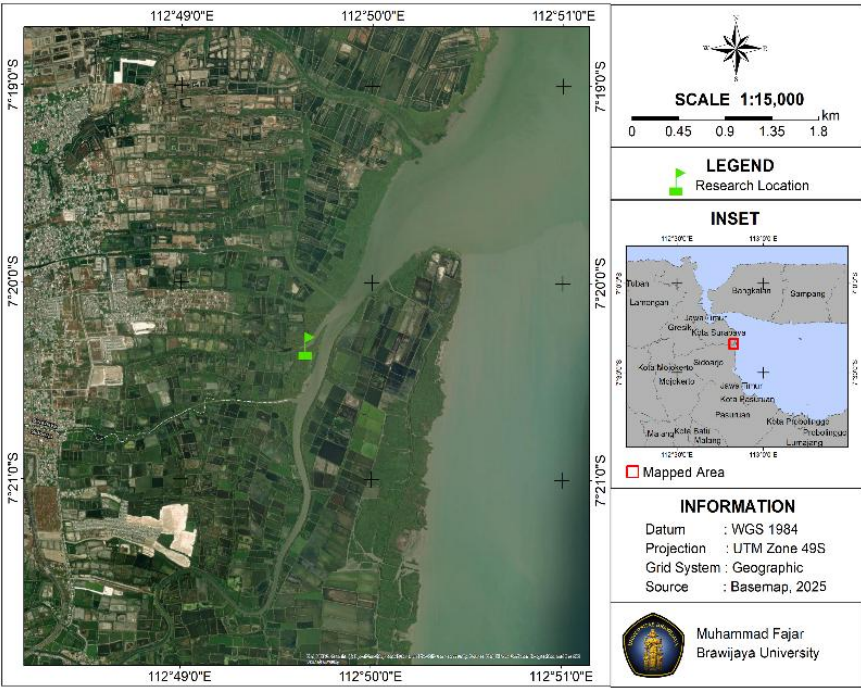


Fig. 1. Research location

According to Bungin (2003) states that the uniqueness of in-depth interviews is the involvement and understanding of the informant's real conditions, where the interviewer and informant are involved in social life for a relatively long time (Sutopo, 2006). Purposive sampling is a sampling method that is carried out by selecting subjects based on certain characteristics that are considered to have a relationship with previously known population characteristics (key informants) (Etikan, 2016). The respondents who will be used as samples in this research can be seen in Table 1 below.

Table 1. Characteristic of respondent

Respondent characteristics	Code
Ministry of Environment and Forestry	MoEF
Ministry of Tourism and Creative Economy	MoTCE
Ministry of Marine Affairs and Fisheries	MMAF
Department of Tourism and Culture	DTC
Department of Environment	DE
Department of Food Security and Agriculture	DFSA
Natural Resources Conservation Center	NRCC
Regional Development Planning Agency	RDPA
Gunung Anyar Subdistrict	GAS
Mangrove Botanical Garden Technical Implementation Unit/ <i>Unit Pelaksana Teknis Kebun Raya Mangrove</i>	UPT
Travel agent	TA
Micro, Small, and Medium Enterprises Group	MSMES
Indonesian Forum for the Environment/ <i>Wahana Lingkungan Hidup</i>	WALHI
Indonesian Biodiversity Foundation/ <i>Yayasan Keanekaragaman Hayati</i>	KEHATI
Go-Forest	GF
Farmers group	FG
Tourism awareness group	TAG
Youth organization	YO
Visitor	Vis
Local community	LC

In order to identify stakeholders, it is first necessary to define the aspect of the system, problem, or issue under study. This is an important initial step, but one that is rarely considered explicitly in stakeholder analysis. This may partly be due to the difficult dialectic between issue definition and stakeholder identification. Without knowing the issues, it is difficult to know which stakeholders should be involved in identifying relevant issues (Dougill et al., 2006). The analysis was carried out using several methods, including stakeholder identification, differentiating between and categorizing (classification and mapping), and investigating relationships between stakeholders (Reed et al., 2009). The research framework for stakeholder analysis can be seen in Figure 1 as follows.

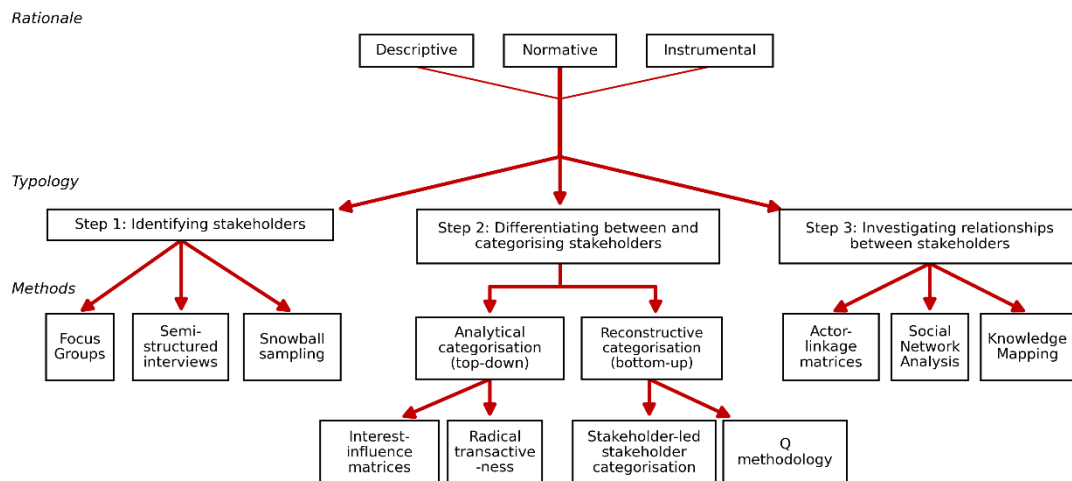


Fig. 2. Stakeholder analysis framework
(Reed et al., 2009)

Stakeholder categorization involves utilizing an influence and interest matrix to group stakeholders into key players, context setters, subjects, and the crowd (Materials et al., 1992). The results of in-depth interviews with key informants expressed in quantitative measures (ordinal scale), where scoring uses questions to measure the level of influence and interest of each stakeholder as the basis for preparing a matrix which is then classified based on criteria for the level of influence and interest (mapping). A score of 5 means very high, a score of 4 means high, a score of 3 means relatively high, a score of 2 means less high, and 1 means low (Rachmawati & Anjana, 2021). Next, the total scores from the five questions are added up, and the scores for the level of influence and interest of each stakeholder are categorized based on the type of indicator and then compared to form coordinates. The role played by each stakeholder is based on coordinate position (Trisnanto et al., 2023).

The next step is stakeholder mapping by adding up the scores of interests and influences of each stakeholder by forming coordinates with the position of the stakeholder. Quadrant 1 is occupied by stakeholders with a score of interest and influence > 12.5. Quadrant 2 is occupied by stakeholders with an interest score of > 12.5 and an influence of < 12.5. Quadrant 3 is occupied by stakeholders with an interest score of < 12.5 and an influence of > 12.5. Quadrant 4 is occupied by stakeholders with an interest score of < 12.5 and an influence of < 12.5. The results of stakeholder mapping, determined by their level of influence and interest, are classified into four categories, namely key players, subjects, context setters, and crowd. According to Reed et al. (2009), stakeholder classification results based on influence and interests suggest four categories, which consist of; 1) key players are stakeholders who have high interest and high influence; 2) subjects are stakeholders defined as those who have high interest but low influence; 3) context setters are stakeholders who have high influence but low interest; and 4) crowds are stakeholders who have low interest and influence.

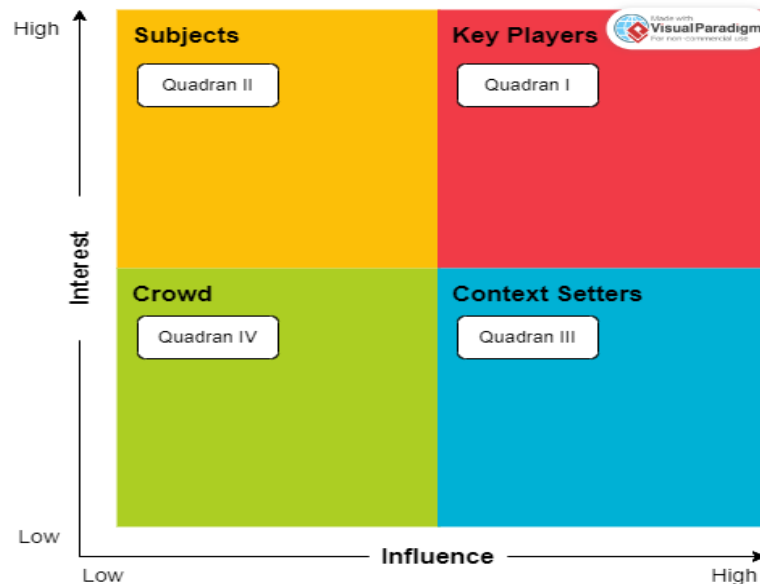


Fig. 3. Stakeholder grid

The roles played by each stakeholder based on the coordinate position can be described as shown in Figure 3. The stakeholder mapping outcomes, determined by their influence and interests. The cooperation carried out is in terms of coordination and division of work between each stakeholder. However, some collaborations have not been carried out optimally, such as coordination between stakeholders where there is no unified thought and understanding in ecotourism development, and there are no rules governing the interaction and roles of each stakeholder.

3. Results and Discussion

The city of Surabaya is an urban area where part of the land borders directly on the coast, so you can find many mangrove plants, especially on the East Coast of Surabaya/*Pantai Timur Surabaya* (Pamurbaya). Based on data from the Department of Food Security and Agriculture Surabaya (2011), the development of the mangrove ecosystem in the Pamurbaya area has fluctuated, even tending to decline. In 1978-1985 the area of mangrove land was 3,300 Ha. In 1985 it decreased to 2,500 hectares because many of them were converted into residential areas. In 1990-1998, the condition of mangrove land improved to an area of 3,100 Ha. However, in 2000-2010 the condition declined again until the area became 491.62 Ha. One of them is the Gunung Anyar mangrove ecotourism. Therefore, the Surabaya City Government has made the Gunung Anyar mangrove ecotourism area a protected area which has been regulated in Regional Regulation Number 3 of 2007 concerning Regional Spatial Planning and is sustainable in Regional Regulation Number 12 of 2014 concerning Regional Spatial Planning for 2014-2034. Apart from that, the Surabaya City Government and various stakeholders from outside the government are also carrying out mangrove planting activities as an effort to rehabilitate or restore the mangrove ecosystem.

The factors and roles of stakeholders will greatly determine the success of developing the Gunung Anyar mangrove ecotourism area, namely, the existence of strategic mapping and stakeholders analysis that must be considered by policymakers to ensure the environmental ecosystem. The effectiveness of various policies must of course also be supported by a structure that allows coordination between stakeholders (Maulana et al., 2022). Therefore, according to Salman (2022), stakeholder theory plays an important role in stakeholder management. It contributes significantly to the development of ecotourism and has become an excellent tool for identifying stakeholders involved in destination planning and management. The importance of stakeholder theory in tourism arises from

the fact that effective project implementation and planning depend on the participation of many stakeholders. Stakeholders, commonly known as stakeholders by (Reed et al., 2009) are defined as parties who can influence or be affected (receive the impact) by a decision taken. Stakeholders were grouped and identified using two criteria, namely the aspect of stakeholder strength and the aspect of stakeholder relative importance to a problem. Stakeholder analysis is an approach and procedure for achieving an understanding of a system by identifying key actors or key stakeholders in the system and assessing the interests of each in the system.

3.1 Stakeholders identification

The results of stakeholder interviews in the development of Gunung Anyar mangrove ecotourism, Surabaya were carried out through several stages, the first of which was identification. Identification was carried out by conducting direct observations and in-depth interviews as well as studying relevant literature. The consideration for being selected as a stakeholder is based on experience and knowledge as well as direct involvement in accordance with the main duties and functions relevant to the research location. Based on the identification results, there are 20 stakeholders who come from various elements and groups. Where the involvement of roles and interests between stakeholders will influence cooperative relationships in ecotourism management, both in the form of a policy, shared vision and mission, main tasks and functions as well as other institutional rules relating to capacity, authority and functions carried out (Tandio et al., 2023). Stakeholders are identified among humans and human organisations. Focus groups are often used, wherein small groups brainstorm stakeholders, their interests, their influence, and other features, and classify them (Reed et al., 2009). Priorities for the engagement of identified stakeholders are determined typically based on their relative interest and influence, though other variables may also be considered. Stakeholders with substantial influence and interest are deemed key stakeholders.

Table 2. Identification of the stakeholders

Classification	Stakeholder identification	Code
Public sector	Ministry of Environment and Forestry	MoEF
	Ministry of Tourism and Creative Economy	MoTCE
	Ministry of Marine Affairs and Fisheries	MMAF
	Department of Tourism and Culture	DTC
	Department of Environment	DE
	Department of Food Security and Agriculture	DFSA
	Natural Resources Conservation Center	NRCC
	Regional Development Planning Agency	RDPA
Private sector	Gunung Anyar Subdistrict	GAS
	Mangrove Botanical Garden Technical Implementation Unit/ <i>Unit Pelaksana Teknis Kebun Raya Mangrove</i>	UPT
	Travel agent	TA
Non-governmental organization	Micro, Small, and Medium Enterprises Group	MSMEs
	Indonesian Forum for the Environment/ <i>Wahana Lingkungan Hidup</i>	WALHI
	Indonesian Biodiversity Foundation/ <i>Yayasan Keanekaragaman Hayati</i>	KEHATI
Local community	Go-Forest	GF
	Farmers group	FG
	Tourism awareness group	TAG
	Youth organization	YO
	Visitor	Vis
	Local community	LC

In its implementation, the differences in influence and interests have an impact on the different roles of each stakeholder in the mangrove ecotourism management activities of Gunung Anyar, Surabaya. Which is divided into four categories, namely key players, context setters, crowd, and subjects which can influence the management, development and policies regarding tourism in an area related to biodiversity (Nugroho & Yuniarti, 2021). According to Reed et al. (2009), it can be concluded that the term stakeholder always involves the interests, influence and power of affected individuals or groups. The stakeholders involved directly play a role and participate in developing the mangrove ecotourism of Gunung Anyar, Surabaya. On the other hand, stakeholders who are involved indirectly are stakeholders who do not participate in the mangrove ecotourism of Gunung Anyar, Surabaya but have the potential to be involved in tourism activities. In the implementation in Gunung Anyar mangrove ecotourism, Surabaya, there are four classifications of main stakeholder elements, namely the public sector, private sector, non-governmental organizations, and local communities. Each stakeholder plays a role in developing the ecotourism area. In accordance with the (Manowong & Ogunlana, 2010) recognize that when stakeholder management is not implemented, perceptions of it become negative, opportunities to achieve goals are reduced, and opportunities to interact with other stakeholders are significantly affected. This helps identify their interests and thoughts according to the project. Below is an identification of the stakeholders based on key informant interviews and analysis of each stakeholder's responsibility (see Table 2).

3.2 Stakeholders mapping

In the next process, designers employ tools to investigate the relationships among stakeholders, or between stakeholders and the surrounding environment. For example, a stakeholder map is used in service design to represent stakeholders and their interactions/relationships. In systems design, ecosystem mapping through actor maps, ecology maps, or network analysis visualises the entities in a system, allowing for immediate comprehension and assisting in the development of strategic conclusions (Kalbach, 2020). It provides a means of understanding the dynamics of complex environments and the relationships and interactions among entities. Network analysis powered by various metrics and visualisation tools is useful for understanding stakeholder relationships underlying complex sociotechnical problems and developing design strategies. These tools facilitate the visualisation of complex systems to identify the positions of human stakeholders within the system; however, they do not consider non-humans as stakeholders (Youn & Baek, 2024).

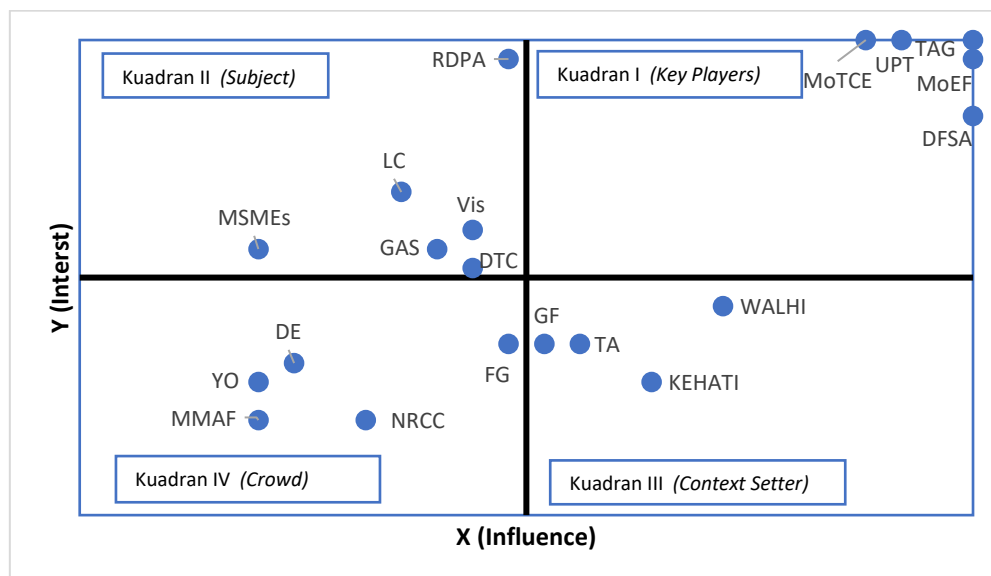


Fig. 4. Result output stakeholder grid

Recognizing the stakeholders' positions is needed because it points out their power which is the correlation between interest and influence. Each position will be different among stakeholders depending on their answers and their perceived power. It will also explain that the stakeholder's location is very dynamic, and each stakeholder can influence others. Relations among stakeholders and their connectivity were also observed during the interview, helping us understand the relationship among stakeholders better. Due to these reasons, mapping the stakeholder positions will help us describe who is more powerful than others (Nugroho et al., 2021). Next, stakeholder classification is carried out by comparing the scoring results with the level of interest and influence of each stakeholder in the form of an interest and influence matrix using a stakeholder grid. The categories in the matrix can describe the position and role played by each stakeholder in the development of mangrove ecotourism in Gunung Anyar, Surabaya (Figure 4).

Stakeholders who are included in category II (subjects) in this group have a high level of interest but have low influence in providing policy direction and management. This stakeholder type is supportive but holds minimal capacity to alter the situation. Nevertheless, they have the potential to influence others through partnerships with different stakeholders and might also be influenced by other stakeholders (Rachmawati et al., 2021). The stakeholders included in this group are; Micro, Small, and Medium Enterprises Group, Local Community, Visitor, Gunung Anyar Subdistrict, Department of Tourism and Culture, Regional Development Planning Agency. Even though this group has great potential, its role is often ignored. With support from the key player group through empowerment activities and active participation, they can play an important role in the development of mangrove ecotourism in Gunung Anyar, Surabaya.

According to Reed et al. (2009), key players are the most engaged stakeholders in administration, given their considerable influence and vested interest in the project's progression. Key Players as stakeholders are highly pivotal due to their significant values and substantial impact on the success of the management process. For the key players group, their position plays a very important role because these stakeholders have a high level of interest and influence in management and policy. Often stakeholders in this group are considered to be the driving force in making activities and development successful for other stakeholders. The stakeholders included in this group are; Ministry of Tourism and Creative Economy, Ministry of Environment and Forestry, Mangrove Botanical Garden Technical Implementation Unit, tourism awareness group, Department of Food Security and Agriculture.

In this group, the context setter stakeholder has high influence but a low level of importance. The stakeholders included in this group are; Indonesian Forum for the Environment/*Wahana Lingkungan Hidup* (WALHI), Indonesian Biodiversity Foundation/*Yayasan Keanekaragaman Hayati* (KEHATI), travel agent, Go-forest. Associations of ecotourism actors, through their widely dispersed members, can have a strong influence on the successful management of an ecotourist area. The existence of this association can be a medium that is effective enough to socialize the existence of an ecotourist area. Associations among ecotourism actors can also be influenced by recommendations on what types of ecotourism are popular and in demand by the public now and in the future. The associations of ecotourism actors can also influence public choices regarding the types of ecotourism available. The implementer group organizes, coordinates, and manages resources to implement development programs (Alfiandri & Mayarni, 2023).

Stakeholders in this group have a low level of interest and influence in management. The stakeholders included in this group are; Farmers Group, Natural Resources Conservation Center, Department of Environment, youth organization, Ministry of Marine Affairs and Fisheries. This stakeholder group can also be considered as observers because even though they have contributed to management, they are not directly involved. According to Rietbergen (1998), stakeholders who exhibit minimal or no influence and interest should also be engaged in a program or project without necessitating an

exceptionally tailored strategy for their involvement. Hence, stakeholders categorized in quadrant 4 (crowd) possess the potential for collaboration in governing the utilization of their mangrove ecotourism in Gunung Anyar, Surabaya.

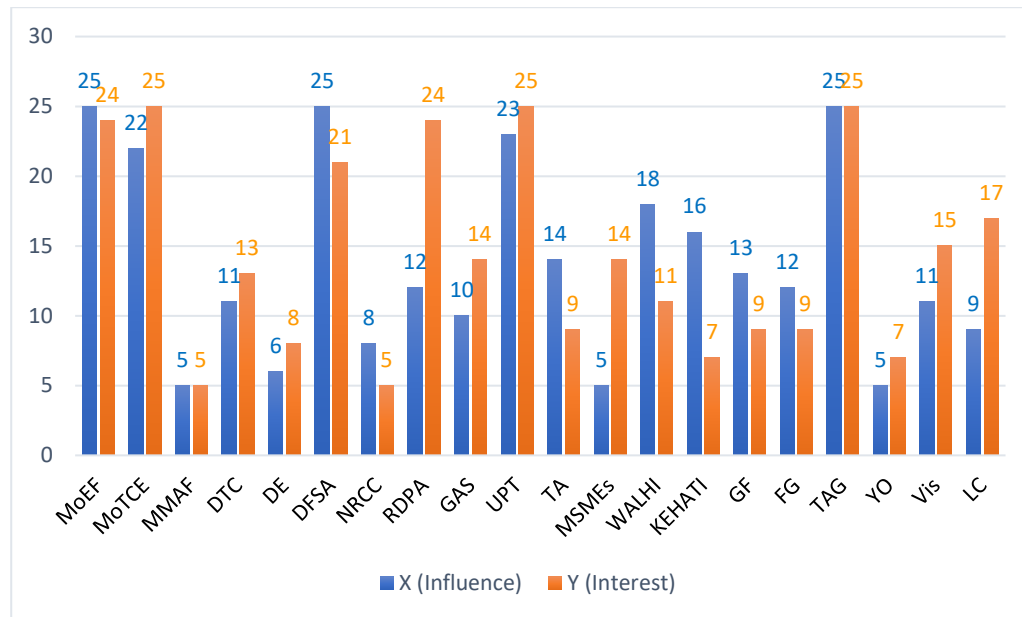


Fig. 5. Level of interest and influence of stakeholders

3.3 Relation between stakeholders

The relational dynamics uncovered in this study reveal a multilayered and asymmetrical network in which authority, resources, and decision-making processes are unequally distributed among stakeholder groups. The central governance coalition—comprising MoEF, MoTCE, DFSA, UPT, and the tourism awareness group—functions as a dominant institutional cluster that shapes the strategic trajectory of ecotourism management. Their capacity to mobilize regulatory instruments, allocate resources, and determine operational priorities creates a top-down governance structure that, while effective in issuing directives, inadvertently fosters dependency among local communities, MSMEs, and other subject-category stakeholders. These dependency relationships reduce the bargaining power of bottom-up actors, leading to limited influence over policy setting despite their substantive contribution to day-to-day ecotourism activities. External advocacy organizations—WALHI, KEHATI, and Go-Forest—form a parallel sphere of influence. Though they do not engage directly in daily operations, their activities in environmental monitoring, awareness campaigns, and public communication give them significant leverage to legitimize or challenge government-led initiatives. Their episodic interventions often act as corrective forces that highlight ecological risks or governance gaps, thereby influencing public sentiment and policymaking processes. Travel agents, meanwhile, contribute market-driven pressures by shaping tourist flows and preferences, indirectly steering ecotourism practices through market demand rather than formal governance mechanisms.

Table 3. Dynamic of stakeholder relationship

Stakeholder group	Nature of relationship	Potential synergies	Potential conflicts/tensions
Key players (MoEF, MoTCE, DFSA, UPT, TAG)	Strong, hierarchical relationships	Policy alignment, coordinated area management, community support programs	Overlapping mandates, inconsistent interpretation of regulations

Subjects (LC, MSMEs, Visitors, GAS, DTC, RDPA)	High dependence on policymakers	Operational implementation, tourism services, empirical field data	Perceived unfair benefit distribution; limited voice in policy-making
Context setters (WALHI, KEHATI, Go-Forest, TA) Crowd (FG, NRCC, DE, YO, MMAF)	Episodic, issue-driven relationships Weak, passive relationships	Environmental advocacy, branding, ecotourism promotion Support for rehabilitation and social activities	Advocacy pressure against government objectives; market-driven conflicts Misalignment due to limited involvement; potential resistance in local dynamics
Cross-group	Unstable, informal interactions	Co-management, joint programs, periodic FGD	Absence of formal interaction rules; weak bottom-up information flow

Peripheral actors such as the farmers group, NRCC, DE, YO, and MMAF embody a latent yet underutilized layer within the network. Their involvement is sporadic and poorly institutionalized, despite possessing local ecological knowledge, territorial familiarity, and social capital that could strengthen long-term conservation outcomes. Their current marginalization reflects structural weaknesses in stakeholder integration, where the absence of formal engagement frameworks prevents meaningful participation. Altogether, these findings illustrate that sustainable ecotourism development cannot rely solely on identifying stakeholder categories; it requires reconfiguring the relational architecture into a genuinely collaborative governance model. This involves reducing dependency structures, closing coordination gaps, instituting formal role delineation, and enhancing multidirectional communication. Without such systemic restructuring, the stakeholder network risks perpetuating policy fragmentation, inefficient resource deployment, and weakened community empowerment—hindering the ecological resilience of mangrove ecosystems and lowering the socio-economic benefits of ecotourism in the long term.

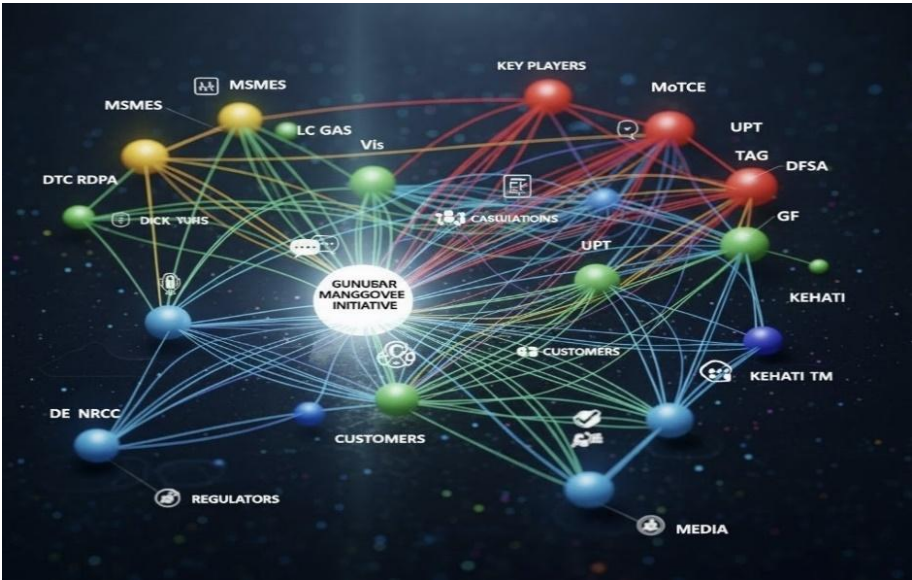


Fig. 6. Stakeholder network map

The stakeholder's position obtained from the analysis can be used as inputs for planning processes to determine the participation strategy. In general, participation strategies can be implemented through sharing information or one-way communication, discussion, involvement, collaboration or empowerment (Adger & Luttrell, 2000). Co-management refers to the distribution of authority and decision-making between multiple stakeholders such as local communities, government organizations, and non-governmental

organizations (NGOs). Ideally, the involvement of a wide range of stakeholders in the co-management of an ecosystem would eventually increase shared motivation, trust, effectiveness, coordinated collective action, and collaboration. Collaboration between stakeholders is considered as an essential component of co-managing institutions and networks in environmental governance while a lack of collaboration hinders the effectiveness of co-management (Dandy et al., 2014).

4. Conclusions

There are 20 stakeholders who are classified into 4 groups, namely the public sector, private sector, non-governmental organizations, and local community groups involved in the development of Gunung Anyar mangrove ecotourism, Surabaya, whose positions are classified as subject, key players, context setter, and crowd based on their level of influence and importance. Stakeholders who are included in the key players classification and have many relationships between stakeholders have a big role in developing mangrove ecotourism in Gunung Anyar, Surabaya. Collaborative ecotourism management, synchronizing activity programs between stakeholders and synergizing with each other, needs to be carried out to increase the effectiveness of ecotourism development for the mangrove ecotourism of Gunung Anyar, Surabaya.

Stakeholder effectiveness as well as stakeholder engagement, which are important components in stakeholder management, depend on stakeholder commitment. Interests, perspectives, and values are reflected in decision-making. Therefore, special emphasis should be given to stakeholder management in tourism planning. Stakeholders have different goals when it comes to resource development and conservation. While it is uncertain whether these expectations are driven by values or satisfaction, it is important to plan and implement effective strategies. Collaboration lies at the core of much contemporary natural resource and conservation management. It is widely cited as a process suited to addressing and resolving conflict amongst stakeholders and coping with change and complexity. Strategies to manage key stakeholders who contribute to the progress of ecotourism. Ignoring stakeholder concerns can have long-term negative impacts on local tourism, communities, and the natural environment. Supporting mangrove management can be done if the main responsibility of stakeholders is accompanied by a clear strategic work plan. In addition, coordination among stakeholders needs to be improved to establish inter-stakeholder relations, which in turn will lead to an agreement and understanding of the concept of sustainable mangrove management. Therefore, it is important to understand stakeholder perspectives on ecotourism management and development.

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Author Contribution

MF.M., CA.I., & AR. contributed to the literature search, interpretation, writing, and proofreading of the manuscript. All authors have read and agreed to the published version of the manuscript.

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During the preparation of this work, the authors used Grammarly to assist in improving the grammar, clarity, and academic tone of the manuscript. After using this tool, the authors reviewed and edited the content as needed and took full responsibility for the content of the publication

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