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APPLICATION OF MACTOR ANALYSIS FOR HALAL AND SUSTAINABLE TOURISM DEVELOPMENT IN POSONG, INDONESIA

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Abstract

This study aims to analyze the role of stakeholders in the development of Posong Tourism Area as a halal and sustainable tourism destination. This research employs a qualitative approach using the MACTOR (Matrix of Alliances, Conflicts, Tactics, Objectives, and Recommendations) analysis to identify the level of influence and dependence among stakeholders. Data were collected through in-depth interviews with key actors involved in tourism development, including government institutions, tourism managers, tourism awareness groups (Pokdarwis), business actors, and local communities. The results show that the key stakeholders in the development of Posong Tourism as a halal and sustainable destination include the Department of Tourism and Culture, Posong tourism management, Tourism Awareness Group (Pokdarwis), village government, and MSMEs. These actors have high levels of influence and dependence, indicating their strategic role in determining the direction of tourism development. The findings highlight the importance of strengthening collaboration and coordination among stakeholders to support the effective implementation of halal and sustainable tourism. This study implies that stronger stakeholder synergy can enhance sustainable tourism development and contribute to strengthening the local economy.

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INTRODUCTION

Tourism plays a strategic role in enhancing social welfare and driving economic growth, particularly in developing countries. In Southeast Asia, including Indonesia, the tourism sector has become a key contributor to national economies. Prior to the Covid-19 pandemic, tourism contributed 4.97% to Indonesia's Gross Domestic Product (GDP), exceeding the global average of 3.60%, and generated significant foreign exchange earnings that increased from USD 10.8 billion in 2015 to USD 17.6 billion in 2019 (Rahardjo et al., 2023; Yudhoyono et al., 2021). Building on this economic foundation, Indonesia holds a strategic advantage in developing halal tourism due to its position as the world's largest Muslim-majority country.

Globally, halal tourism has emerged as a rapidly growing market segment, reflecting increasing demand for tourism services that align with Sharia-compliant lifestyles. Halal tourism encompasses nature-based tourism, cultural tourism, and man-made attractions that adhere to halal lifestyle standards, allowing tourists to enjoy diverse recreational experiences without compromising religious obligations (Casum & Bawono, 2023; Dewi, 2023). According to the Global Muslim Travel Index, successful halal tourism destinations must meet four key indicators: accessibility, communication, environment, and services. Among these indicators, the environmental dimension is particularly critical, as it emphasizes the need for sustainable practices to minimize tourism's negative impacts on natural resources (Sismanto et al., 2022).

Although tourism generates substantial economic benefits, it also poses significant environmental challenges. Unsustainable tourism development can result in pollution transfer, waste accumulation, soil erosion, habitat degradation, and increased pressure on endangered species, ultimately threatening the very resources upon which tourism depends (Mejjad et al., 2021; Rahardjo et al., 2023). Growing environmental awareness among Muslim travelers has intensified demand for tourism models that integrate Sharia compliance with environmental responsibility. Consequently, the convergence of halal principles and sustainable tourism has emerged as a new paradigm in destination development.

Sustainable tourism fundamentally emphasizes balance among economic growth, environmental protection, and community welfare (Richardson, 2021). Tourism development therefore must not only focus on expanding visitor numbers or facilities, but also on maintaining long-term ecological integrity and social harmony. This approach aligns closely with the Islamic framework of Maqasid al-Shariah, particularly the protection of the environment, preservation of life, and intergenerational equity, which together form the ethical foundation for responsible and sustainable tourism development (Dugonjić & Uršulin-Trstenjak, 2022).

At the local level, Posong Tourism Object is one of the main natural attractions in Temanggung Regency, located in Tlahab Village, Kledung District, at an altitude of approximately 1,400 meters above sea level. Posong offers environmentally oriented nature tourism experiences, including sunrise viewpoints and camping activities that attract a growing number of visitors (Kiswantoro et al., 2022; Yunizar et al., 2022). Despite its potential, Posong tourism has not been systematically developed within a

halal and sustainable tourism framework. Existing tour packages lack halal certification, creating constraints for Muslim tourists, while sustainability principles have yet to be fully integrated into destination management (Sodiq & Anggraini, 2024).

Furthermore, the development of tourism infrastructure in Posong has involved the conversion of approximately 2.5 hectares of agricultural land—out of the total 394.15 hectares of agricultural land in Tlahab Village—into commercial tourism areas. This physical transformation has led to various environmental pressures such as water and air pollution, soil erosion, waste accumulation, habitat loss, and increased stress on local ecosystems. This situation is further exacerbated by high tourist inflows, with visitor numbers surging from 79,147 in 2017 to 127,000 in 2024 (Media Center Temanggung, 2025). Such rapid growth, particularly during weekends and holidays, intensifies traffic congestion and environmental degradation, strongly underscoring the need for coordinated management among stakeholders to regulate visitor flows, mitigate negative impacts, and enhance destination resilience (Romalee et al., 2025; Yudha et al., 2022).

Despite the increasing number of studies on halal tourism and sustainable tourism, most existing research examines these concepts separately, focusing either on service attributes for Muslim tourists or on environmental sustainability dimensions. Empirical studies that explicitly analyze stakeholder power relations, conflicts of interest, and strategic alignment in the development of halal and sustainable tourism destinations remain limited, particularly in rural and nature-based tourism contexts in Indonesia. As a result, there is a lack of comprehensive analytical frameworks capable of capturing actor dynamics and policy coherence in destinations such as Posong.

The development of Posong as a halal and sustainable tourism destination requires strong stakeholder synergy based on the Pentahelix model, involving academics, businesses, communities, government, and media (Hasanah et al., 2024; Umiyati & Tamrin, 2021). Policymakers play a decisive role in determining the success or failure of this process, given their authority in regulating land use, environmental protection, and tourism standards. In this context, the MACTOR (Matrix of Alliances and Conflicts: Tactics, Objectives, and Recommendations) method is particularly relevant, as it enables systematic analysis of actor influence, convergence, and divergence regarding strategic objectives.

This study applies MACTOR analysis to examine stakeholder interactions in the development of halal and sustainable tourism at the Posong Tourism Object, Temanggung. While traditional frameworks such as the Analytic Hierarchy Process (AHP) or Interpretive Structural Modeling (ISM) excel at prioritizing criteria or structuring relational hierarchies, they often fall short in capturing behavioral dynamics, power struggles, and strategic alliances. Similarly, methods like Social Network Analysis (SNA) effectively map structural connections but lack the capability to quantitatively assess actors' convergence or divergence on specific policy objectives. Unlike these conventional analytical tools, MACTOR uniquely facilitates the identification of power asymmetries, potential conflicts, and shared objectives among actors through structured stages. These stages include actor identification, objective formulation, power relation assessment on a scale of 0–4, and evaluation of actor positions toward strategic goals. By employing this approach, the study aims to formulate collaborative

strategies that align economic development with Sharia-compliant sustainability principles in Posong tourism development (Pratiwi et al., 2024; Romalee et al., 2025).

Given the complexity of stakeholder interests and sustainability challenges in Posong tourism development, this study focuses on examining how MACTOR analysis can be applied to support the development of halal and sustainable tourism at the Posong Tourism Object, Temanggung. To address this, the study explicitly formulates two specific research questions: (1) How are the influence and dependencies among stakeholders structured in the development of Posong tourism? and (2) To what extent do these actors converge regarding the strategic objectives of halal and sustainable destination management? By answering these questions, the study seeks to identify policy directions that may guide stakeholders in managing Posong Tourism Object as a halal and sustainable tourism destination.

METHODS

Approach and Research Design

This study employs a prospective analysis approach using an actor-based strategic analysis method known as MACTOR to examine power relations, convergence, and divergence of objectives among stakeholders (Bendahan et al., 2004; Fauzi, 2019; Jaziri & Boussaffa, 2010). The research setting is located at the Posong Tourism Object in Temanggung Regency, Indonesia, which is currently facing challenges in integrating Sharia-compliant and environmental sustainability frameworks. The target population comprises all stakeholders involved in the destination's development. The sampling technique was purposive, guided by the Pentahelix (ABCGM) framework, which emphasizes collaboration among Academics, Business, Community, Government, and Media. The selected sample consists of ten key institutional actors chosen based on three criteria: (1) formal authority in tourism-related decision-making, (2) functional roles in Posong tourism management, and (3) the degree of influence over halal and sustainable tourism outcomes. The detailed list of the selected actors, their institutional affiliations (informants), and the specific symbols used in the MACTOR software analysis are presented in Table 1

Table 1. Actors of Posong Tourism Development

Aktors	Informan	Number of Individuals	Symbol
Akademics	1. INISNU Temanggung	1	Akademisi
	2. Halal Center INISNU Temanggung	1	HCI
Business	3. MSMEs around Posong	2	UMKM
	4. Homestay owners near Posong	1	Homestay
	5. Posong Tourism Manager	1	Mgr Posong

Community	6.	Tourism Awareness Group (Pokdarwis) of Tlahab Village	1	Pokdarwis
Government	7.	Departement of tourism and culture Temanggung Regency	1	Dikbudpar
	8.	Ministry of Religious Affairs of Temanggung Regency	1	Kemenag Tmg
	9.	Tlahab Village Government	1	Pemdes
Media	10.	Temanggung TV	1	Tmg TV

Source : Primary data, 2025

Instrument/measures

The primary instrument used in this study is the MACTOR analytical framework (Bendahan et al., 2004; Fauzi, 2019; Jaziri & Boussaffa, 2010). According to (Godet, 1991), as elaborated by (Fauzi, 2019), the MACTOR analysis is based on three main inputs represented in matrix form. First, stakeholder positions toward development objectives are captured through the Matrix of Actors–Objectives (MAO). Second, the relative importance of each objective for individual actors is assessed, resulting in the 2MAO matrix, which reflects both positive and negative actor attitudes toward specific objectives. Third, stakeholder power relations are measured using the Matrix of Direct Influence (MID), which describes the degree of influence exerted by one actor over another.

The MACTOR procedure in this study follows several analytical stages. Initially, problem identification was conducted to define the scope of halal and sustainable tourism development issues in Posong. At this stage, key actors and strategic objectives were identified through Focus Group Discussions (FGDs) and structured interviews supported by questionnaires. This process ensured that the selected actors and objectives were contextually relevant and empirically grounded.

Next, the MID matrix was constructed to assess direct influence among actors. The level of influence was measured using a scale ranging from 0 to 4, where 0 indicates no influence, 1 reflects influence on operational procedures, 2 affects work implementation, 3 influences the actor's mission, and 4 affects the actor's existence. Based on the MID matrix, the MACTOR software automatically calculates both direct and indirect influence relationships, producing the Matrix of Direct and Indirect Influence (MIDI).

Subsequently, the 2MAO matrix was developed to evaluate the degree to which each development objective affects individual actors. The scoring also used a scale from 0 to 4, with the possibility of positive or negative values to reflect supportive or conflicting relationships. Positive scores indicate that an objective supports or is vital to the actor, whereas negative

scores indicate that an objective threatens the actor's procedures, mission, or existence. Once the MID and 2MAO matrices were completed, MACTOR performed mathematical computations to generate maps of actor influence, convergence, and divergence, which formed the basis for policy analysis.

Data Collection and Analysis

The data collection protocol was carried out through a combination of qualitative and quantitative procedures. Initially, problem identification and the scoping of halal and sustainable tourism development issues in Posong were conducted. Following this, primary data were collected through Focus Group Discussions (FGDs) and structured interviews supported by questionnaires administered to the representatives of the ten selected key actors. Prior to data collection, institutional permission was formally obtained from the relevant local authorities. Furthermore, informed consent was secured from all individual participants, with explicit guarantees regarding data confidentiality and anonymity, ensuring that their responses would be used solely for academic purposes. This protocol ensured that the identification of strategic objectives and the scoring of relationships were empirically grounded, ethically sound, and contextually relevant.

For data processing and analysis, the collected scores were compiled into the initial matrices. The quantitative analytics were performed using the MACTOR software through several systematic computational steps. First, the actors' power relations were inputted into the Matrix of Direct Influences (MID). The software then automatically calculated both direct and indirect influence relationships to produce the Matrix of Direct and Indirect Influences (MIDI), which determines each actor's net competitiveness and dependency. Second, the actors' stances on specific goals were recorded in the Matrix of Actors and Objectives (1MAO). This was subsequently weighted by the actors' MIDI scores to generate the Valued Matrix of Actors and Objectives (2MAO/3MAO). Third, based on these weighted positions, the software calculated the Convergence Matrix (CAA) to identify potential alliances based on shared interests, and the Divergence Matrix (DAA) to highlight potential conflicts. Finally, the software's mathematical computations generated maps of actor influence, dependence, convergence, and divergence, which served as the empirical foundation for formulating policy recommendations and collaborative strategies for the destination.

RESULT AND DISCUSSION

Characteristics of Participants

The development of halal and sustainable tourism in Posong requires an active role and synergy from various parties. In this study, 10 key actors were identified representing the Pentahelix concept (Academics, Business, Community, Government, and Media). The selection of actors is based on their authority, function, and influence in the field:

1. Academics (INISNU Temanggung): Serves as a strategic partner for the local government in studying and developing halal tourism potential based on scientific foundations.

2. Halal Center INISNU Temanggung: Functions as a halal certification service center for MSMEs and the vanguard in halal studies in the Temanggung region.
3. MSME Actors: As a business pillar providing products and services, MSMEs directly intersect with fulfilling the basic needs of tourists.
4. Inn (Homestay) Owners: Crucial accommodation providers ensuring that lodging facilities and services meet comfort standards and Sharia principles.
5. Posong Tourism Object Manager: The key actor fully responsible for the daily management and operation of the destination.
6. Tourism Awareness Group (Pokdarwis) of Tlahab Village: A local community group playing a strategic role in environmental conservation, cultural promotion, and mobilizing citizen participation.
7. Department of Tourism and Culture (Dikbudpar): Government representation with the authority to formulate policies, regulations, and allocate resources for sustainable tourism growth.
8. Office of the Ministry of Religious Affairs (Kemenag): The religious authority tasked with ensuring all aspects of tourism services comply with halal standards and Islamic values.
9. Tlahab Village Government (Pemdes): Has the authority to integrate tourism programs into the Village Government Work Plan (RKPDes), issue Village Regulations (Perdes), and supervise regional order.
10. Temanggung TV: Representation of local mass media acting as an effective communication tool to promote destinations while educating the public on halal and sustainable concepts.

Strategic Development Objectives

In the MACTOR analysis, the interaction between actors is measured based on their preferences for the region's development objectives. There are 8 (eight) strategic objectives established in this study:

1. Halal Certification for MSME Products: Building Muslim tourists' trust in the hygiene and halal status of local products.
2. Sharia Accommodation: Providing comfortable resting places in accordance with Islamic law.
3. Privacy and Comfort: Creating a safe tourism environment that respects visitor privacy.
4. Environmental Conservation: Preserving natural beauty to provide long-term ecological benefits.
5. Pollution Prevention: Reducing the negative impacts of tourism, such as waste pollution, through environmentally friendly management.
6. Community Empowerment: Encouraging inclusive tourism development so that local communities become main actors.
7. Community Economic Improvement: Ensuring income diversification (e.g., food stalls, homestays, and souvenirs) to improve residents' welfare.

8. Increasing the Number of Tourists: Inviting more tourists in a measured manner without destroying the carrying capacity principle.

Main Results: Actor Influence and Dependency

Based on the results of interviews and MACTOR data processing, the influence and dependence between actors can be mapped. The influence of actors is shown by the numbers in column Ii, while the Di indicator shows the level of dependence between actors.

Tabel 2. Actor Influence and Dependency

MDII	Akademisi	UMKM	Homestay	Mgr Posong	Pokdarwis	HCI	Dikbudpar	KemenagTmg	Pemdes	TmgTV	Ii
Akademisi	10	17	13	15	13	7	17	16	15	17	130
UMKM	5	17	17	18	17	3	19	9	19	18	125
Homestay	6	17	16	17	16	3	17	9	17	16	118
Mgr Posong	6	20	20	22	18	2	22	9	24	20	141
Pokdarwis	6	20	20	21	18	2	20	9	23	20	141
HCI	10	18	12	15	13	7	17	16	15	17	133
Dikbudpar	7	23	21	23	20	5	25	13	24	24	160
KemenagTmg	5	12	11	11	10	4	11	11	11	12	87
Pemdes	6	19	19	20	18	2	21	9	22	20	134
TmgTV	6	18	16	17	16	4	18	10	17	18	122
Di	57	164	149	157	141	32	162	100	165	164	1291

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Source: MACTOR Analysis Result, 2025

Referring to Table 2, the actor with the highest influence is Dikbudpar (160), followed by the Posong Manager and Pokdarwis, each with a value of 141. The high influence possessed by the actors of the Department of tourism and culture is evidence that the Department of tourism and culture has duties and functions in making policies for the development of Posong tourist attractions as halal and sustainable destinations. The role of the Department of tourism and culture is very important in making tourism development policies, including in terms of management, development, and guidance of tourism business actors. Through the duties and authority possessed by the Department of Culture and Tourism will facilitate in realizing Posong as a halal and sustainable tourist destination. This finding aligns with prior MACTOR analyses in Indonesian sustainable tourism contexts, where tourism offices and awareness groups like Pokdarwis consistently demonstrate dominant influence due to their policy-making and direct management roles (Gravitiani et al., 2022a; Handayani et al., 2022; Rahardjo et al., 2023).

Posong tourism object managers and tourism awareness groups are other high-influence actors directly interfacing with tourism operations. Their elevated positions enable goal acceleration, but require coordination with local groups, as evidenced in Ngebel Lake where Pokdarwis acted as relay actors bridging dominant influencers like SMEs and environment offices to dependent managers (Rahardjo et al., 2023). This necessitates inter-actor collaboration for synergy, consistent with empirical patterns emphasizing joint interaction in rural tourism (Ariyani et al., 2020).

On the other hand, the actors with the highest dependence on the existence of this tourism are the Village Government (165), MSMEs (164), and Temanggung TV (164). The Tlahab Village Government, as a government actor, will fully participate in ensuring the success of applicable programs and policies but cannot directly act as an initiator. This is akin to its relay role in multiple cases that are highly dependent on upstream policies (Gravitiani et al., 2022b; Rahardjo et al., 2023). Meanwhile, along with the development of Posong into a halal and sustainable tourism destination, MSME actors urgently require assistance for the halal certification of their products as well as education on organic and inorganic waste management. Furthermore, MSMEs rely heavily on the site economically to conduct their business activities, a dependency that aligns with post-COVID analyses where MSMEs were proven to urgently need empowerment from tourism agencies (Handayani et al., 2022). The last actor with high dependence is Temanggung TV. As a media and publication actor, they tend to become active only when there are newsworthy events. Despite having high dependence and acting reactively, their promotional role is crucial and vital in publicizing Posong to the wider community. This position perfectly matches the characteristics of the media, which generally exhibits low direct influence in the stakeholder map of the hospitality industry (Iskandar et al., 2023).

The influence and dependence between actors can also be seen from the map of influence and dependence between actors which is divided into four quadrants. Quadrant I is filled by actors with high levels of influence but low dependence, Quadrant II is filled by actors with high influence and dependence, Actors who have low levels of influence and high levels of dependence are in Quadrant III while actors who have the same influence and dependence are equally low in Quadrant IV.

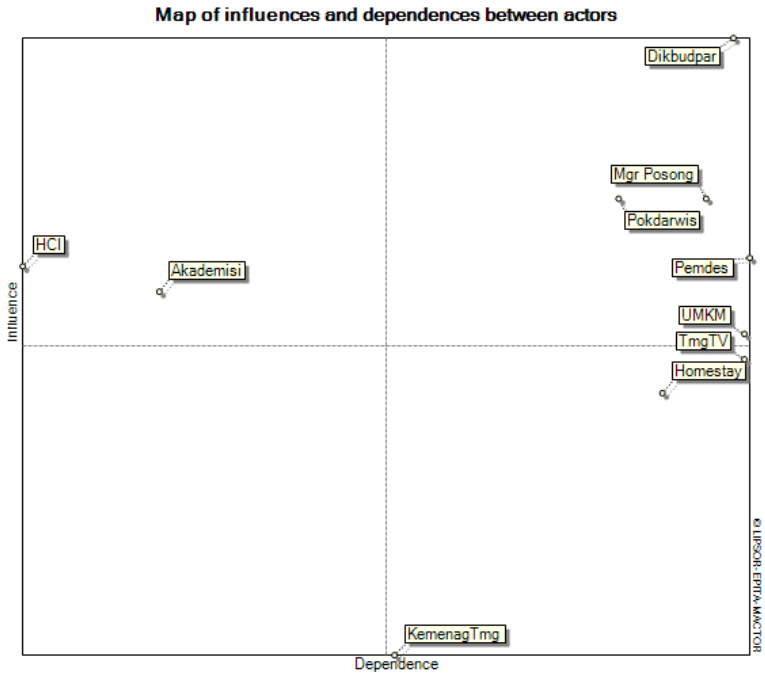


Figure 1. Actor Influence and Dependency Map
Source: MACTOR Analysis Result (2025)

Based on Figure 1, it can be seen that the actors with high influence and low dependence (Quadrant I) are the Halal Center INISNU Temanggung and Academics. These results indicate that these two actors are capable of influencing other actors in the development of Posong as a halal and sustainable tourism destination. As influential independents, the Halal Center INISNU Temanggung and Academics can collaborate to provide concepts and prepare development roadmaps. Both actors can also provide education regarding the importance of sustainable tourism through various activities such as training, seminars, and community service. This novel positioning for halal-focused entities extends the academic roles that were previously seen merely as relay influencers in prior studies (Ariyani et al., 2020; Destiana, Yuningsih, et al., 2020), establishing their educational programs as a validated strategy capable of driving stakeholder convergence (Rahardjo et al., 2023).

Actors possessing high influence and high dependence (Quadrant II / relay actors) are the Culture and Tourism Office, Posong Tourism Object Manager, Tourism Awareness Group (Pokdarwis), Village Government, and MSMEs. Actors included in Quadrant II directly intersect with Posong tourism across various aspects, ranging from policy and destination management to tourist services. Despite having significant influence, these actors also exhibit a high mutual dependence on one another. This opens up opportunities for robust collaboration and synergy to advance Posong tourism. The Culture and Tourism Office can facilitate coordination among actors to ensure the alignment of vision and mission. Involving operational actors (Posong Manager, Pokdarwis, Village Government, and MSMEs) in decision-making will foster a sense of ownership and shared responsibility. This collaborative condition is highly identical to the tourism recovery process in Central Java, where relay groups such as village associations successfully drove synergies under the coordination of relevant agencies to accelerate the realization of tourism visions (Handayani et al., 2022).

Actors located in Quadrant III are Temanggung TV, Inn Owners, and the Ministry of Religion of Temanggung Regency. These three actors have low influence but high dependence. This is because they have limited resources and information access, and they rely heavily on government policies and support from other tourism actors to play an active role. Compared to actors in other quadrants, these three require more serious support to contribute optimally. This aligns with the conditions of dependent media, communities, and businesses in various Indonesian cases, which urgently demand targeted assistance and support from dominant actors (Gravitiani et al., 2022b; Handayani et al., 2022; Iskandar et al., 2023).

Finally, there are no actors with low influence and low dependence (Quadrant IV). This indicates comprehensive involvement without isolated elements, where all actors share a converging view in the development of Posong tourism. This convergence strongly supports the achievement of shared goals. However, the main challenge faced is how to optimize the role of each actor so that these goals are genuinely realized, considering that most stakeholders often still exhibit operational resistance despite being conceptually aligned, as observed in various applications of the MACTOR method in analogous cases (Gravitiani et al., 2022b; Rahardjo et al., 2023).

Actor Convergence on Objectives

The application of MACTOR analysis can also map the convergence (similarity of views) among stakeholders. The closer the distance between actors in the graph, the stronger their synergy toward the development objectives.

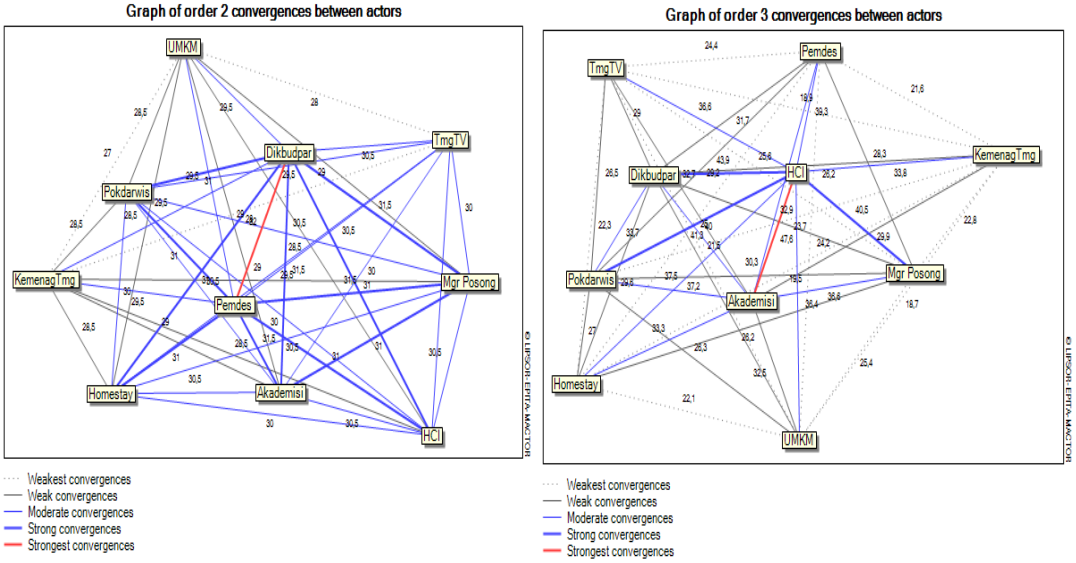


Figure 1. Actor Convergence on Objectives
Source: MACTOR Analysis Result (2025)

Based on Figure 2, we can identify the intensity of participation and the alignment of each actor's goals. This commonality of purpose opens up opportunities for convergence between actors. Convergence between actors can be categorized into very weak, weak, medium, strong, and very strong convergence. Actors who have very strong convergence seen from mapping with two actors (2CAA) towards goals are the Village Government and the Culture and Tourism Office. While actors who have very strong convergence seen from mapping with three actors (3CAA) towards goals are Academics and Halal Center INISNU Temanggung. These results indicate a strong synergy between the two pairs of actors in achieving goals. The Department of tourism and culture can synergize with the Tlahab Village Government in developing Posong tourism into halal and sustainable tourism. In addition, the Halal Center INISNU Temanggung together with academics can make studies, roadmaps, and concepts in the development of halal and sustainable tourism.

Key Result

This study proves the existence of complex power and interest dynamics in the development of Posong. The accumulation of main operational actors (Manager, Pokdarwis, MSMEs, Village Government, and Dikbudpar) in Quadrant II indicates that the success of strategic objectives, such as Economic Improvement (Objective 7) and Environmental Conservation (Objective 4), heavily depends on their daily collaboration. This high interdependence occurs because these actors are the primary "risk-bearers" of the

destination; for instance, MSMEs and managers directly face the consequences of waste accumulation and land conversion, while the Village Government and Dikbudpar are legally responsible for mitigating these impacts. Their clustering in Quadrant II suggests that no single operational actor possesses enough individual power to manage the site's sustainability without the logistical and regulatory support of the others.

Furthermore, the strong convergence between the Village Government and Dikbudpar indicates a solid foundation for integrating top-down policies with bottom-up regulations at the village level. This finding strengthens the Pentahelix model's application in rural contexts by demonstrating that local-regional synergy is not merely a bureaucratic formality, but a survival strategy to align local land-use aspirations with broader tourism standards. On the other hand, the Halal Center and Academics in Quadrant I act as an ideological driving force. Unlike operational actors, they do not rely on field dynamics or visitor numbers, but they possess massive influence in realizing Halal Certification (Objective 1) through their specialized knowledge and technical authority.

In comparison to previous studies, these results offer a distinct perspective. While prior research often positions academic and religious entities as marginal or secondary "relay" actors (Ariyani et al., 2020; Destiana, Kismartini, et al., 2020), this study elevates them to Quadrant I (Influential Independents). This shift underscores a critical evolution in halal tourism management: as Sharia-compliance becomes a mandatory standard rather than a voluntary niche, the actors who control certification and educational advocacy gain a dominant strategic advantage over those who merely manage the physical infrastructure.

Interpretation

Integrating these findings into the halal tourism literature, this study affirms that administrative authority from entities like Dikbudpar and Kemenag must be balanced with educational advocacy from academics and religious facilitation by the Halal Center to foster a resilient destination ecosystem. This is consistent with the Pentahelix model's premise, which emphasizes multi-stakeholder synergy beyond government-led efforts (Destiana, Kismartini, et al., 2020; Rachmiatie et al., 2023; Santoso & Cahyani, 2022). For instance, prior research on rural halal tourism ecosystems similarly highlights suboptimal coordination without such balance, underscoring the government's conductor role in harmonizing actors (Rachmiatie et al., 2023).

Specifically, to realize Sharia Accommodation (Objective 2) and Pollution Prevention (Objective 5), Inn Owners and MSMEs exhibit high dependence and cannot operate independently. They require technical halal certification assistance from the Halal Center alongside regulatory support from Dikbudpar and Kemenag. This mirrors post-COVID empowerment needs for SMEs documented in Central Java (Handayani et al., 2022) and broader challenges where MSMEs rely on government facilitation for certification (Nugraha et al., 2024; Prawiro & Fathudin, 2023).

This positioning strongly aligns with the Pentahelix premise that coordinated collaboration across government, business, academia, community, and media minimizes sectoral egos and enhances convergence, as evidenced in West Sumatra's halal tourism innovations calling for expanded networking (Santoso & Cahyani, 2022; Yuniningsih et al.,

2023). Practically, these insights extend MACTOR recommendations from analogous Indonesian cases, highly recommending and urging Dikbudpar and the Village Government to promptly establish a formal collaborative forum involving all Quadrant II actors. Mirroring relay synergies in Ngebel Lake (Rahardjo et al., 2023), this forum should co-develop a Standard Operating Procedure (SOP) for Posong tourism that is both Sharia-standardized and environmentally friendly.

Nevertheless, it is important to acknowledge certain limitations of this research. First, the analysis relies on the qualitative judgments and potential subjectivity of the ten institutional experts interviewed, which may influence the scoring of power relations. Second, this study focuses exclusively on the supply-side stakeholders, leaving the demand-side (tourists' expectations and perceptions) for future investigation. These boundaries suggest that while the strategic recommendations are robust for Posong, their generalizability may be limited to rural destinations with similar socio-economic and institutional profiles.

CONCLUSION

This study aimed to analyze the dynamics of stakeholder roles in the development of Posong as a halal and sustainable tourism destination using the MACTOR method. Addressing the research problem regarding the lack of integrated destination management and the growing environmental pressures, the results demonstrate that integrating Sharia-compliant principles and environmental sustainability cannot be achieved in silos. The central thread connecting the issues of environmental degradation, waste accumulation, and uncertified tourism services is the absolute need for a highly interdependent stakeholder network. Specifically, resolving these issues requires the strong convergence of top-down authority and bottom-up operational execution by actors in Quadrant II (Department of Tourism and Culture, Village Government, Tourism Manager, Pokdarwis, and MSMEs), driven by the concepts and educational advocacy provided by Quadrant I actors (Academics and Halal Center).

Regarding its contributions to the field of knowledge, this study fills the existing literature gap by explicitly unifying the often-separated paradigms of halal and sustainable tourism through the lens of stakeholder power relations. By empirically operationalizing the Pentahelix model using MACTOR in a rural, nature-based context, this study provides a novel theoretical insight: it identifies academic institutions and Halal Centers as "influential independents" rather than mere relay facilitators. This offers a quantifiable, replicable analytical framework for mapping stakeholder convergence and minimizing sectoral egos in similar destination resilience studies.

Based on these findings, it is practically recommended that the Department of Tourism and Culture (Dikbudpar) and the Village Government promptly initiate a formalized collaborative forum involving all operational actors. This forum must be tasked with drafting and enforcing Standard Operating Procedures (SOPs) for Posong tourism that strictly regulate both Sharia-standardized services and environmentally friendly practices. Furthermore, to overcome operational bottlenecks, the government must provide targeted regulatory interventions and funding to assist MSMEs and homestay owners in obtaining halal

certification and implementing robust waste management systems. This process should be intellectually and technically facilitated by Academics and the Halal Center.

While this study provides an in-depth stakeholder analysis, a notable limitation encountered is its heavy reliance on the qualitative judgments and subjectivity of the ten institutional expert informants regarding power relations. Furthermore, the sample exclusively focused on the supply side, excluding the demand-side perspective. Therefore, the specific actor dynamics and policy recommendations may only be generalizable to rural, nature-based destinations with similar socio-economic profiles. It is highly recommended for future researchers to expand this scope by incorporating tourists' perspectives to validate demand-side expectations and comprehensively evaluate the actual socio-environmental impacts of halal and sustainable tourism implementations.

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