Stakeholder Management in Developing a Sustainable Tourism Village Based on Renewable Energy Using RACI Matrix

Syamsul Ma’arif1*, Flora Grace Putrianti2, Nurul Myristica Indraswari3, Dương Quê Nhu4, Esti Dwi Pujianingsih1, Ana Kardiya Marsinta2, Pipit Ardianti3

1Industrial Engineering Department, Faculty of Engineering, Universitas Sarjanawiyata Tamansiswa, Indonesia
2Psychology Department, Faculty of Psychology, Universitas Sarjanawiyata Tamansiswa, Indonesia
3Management Department, Faculty of Economy, Universitas Sarjanawiyata Tamansiswa, Indonesia
4Faculty of Tourism and Hospitality Management, School of Economics, Can Tho University, Vietnam

ABSTRACT

The tourism village offers cultural, natural, and authentic culinary experiences, but the growth of tourism villages must be managed sustainably to address adverse environmental impacts. Stakeholder management becomes a critical factor in planning a sustainable energy-based tourism village development project. This research aims to identify key stakeholders in the development project of the "Kampung Emas" tourism village based on renewable energy, understand their roles and responsibilities, and formulate stakeholder management strategies. The research was conducted by interviewing key stakeholders in the project and analyzing the results using the RACI Matrix table. The analysis identified four main stakeholders: the Village Head, the Tourism Awareness Group Chair, the Restaurant Manager, and the Academician. The Village Head plays a strategic role as the information disseminator at the village level; the Tourism Awareness Group Chair is fully responsible for the critical phases of the project, the Restaurant Manager has responsibilities in technical and strategic tasks, and the Academician contributes significantly to the analysis of each task. The proposed stakeholder management strategy positions the Village Head as an information disseminator, the Tourism Awareness Group Chair as the primary spokesperson, the Restaurant Manager in strategic decision-making, and the Academician as a consultative partner. This approach is expected to support successfully implementing the renewable energy-based tourism village development project.

Keywords: RACI matrix, renewable energy, stakeholder management, sustainable tourism village

*Corresponding Author
Name: Syamsul Ma’arif
E-mail: syamsul.maarif@ustjogja.ac.id

This is an open-access article under the CC BY 4.0 International License © JISEM (2023)

© 2023 Some rights reserved
INTRODUCTION

In recent years, tourist villages have emerged as an intriguing tourism model in various countries [1]. These villages offer tourists authentic cultural, natural, and culinary experiences, contributing to the economic growth of local regions. However, tourism growth presents challenges regarding resource management and environmental impact [2], [3]. One crucial aspect to consider is energy sustainability, wherein renewable energy development plays a key role in mitigating the negative environmental impacts of tourism development, such as environmental degradation and carbon emissions [4], [5]. Tourism villages are often closely associated with regional cuisine or traditional local food [6]. Culinary activities in tourist villages generate significant organic waste [7]. However, this organic waste holds the potential to be transformed into a source of renewable energy through waste-to-energy technologies [8], [9].

Despite the importance of utilizing renewable energy for the sustainability of tourism, implementing such practices in tourist village development projects still needs to be improved. This is due to the frequent oversight of integrating aspects such as economics, energy, and agriculture in these projects [10]. To address this, an initial step in tourist village development should involve effective stakeholder management [11]. Identifying the roles of each stakeholder becomes a critical factor in achieving the success of renewable energy-based tourist village development projects [12]. Numerous analyses of stakeholder roles in tourist village development have been conducted. The methods commonly employed for identifying stakeholder roles in tourist village development include qualitative descriptive approaches utilizing observations, interviews, and documentation [13], [14], [15]. While these methods are widely used, the qualitative descriptive approach is sometimes considered more complex, particularly in organizing the roles and responsibilities of each stakeholder in a project [16].

Therefore, this research uses the RACI matrix method to analyze stakeholder management in a renewable energy-based tourist village development project. The RACI Matrix is a project management tool that aids in identifying the roles and responsibilities of each stakeholder in a specific project or task [17]. The RACI matrix classifies stakeholders into four categories: Responsible, Accountable, Consulted, and Informed. This tool is designed to organize roles and responsibilities in a project or task, providing a clear overview of who is accountable, who is involved in consultation, and who needs to be informed [18].

The main objective of this research is to analyze stakeholder management in a culinary-based tourist village development project that converts organic waste into renewable energy. The research encompasses three primary formulations. First, it identifies critical stakeholders involved in the renewable energy-based tourist village development project. Second, identify the roles and responsibilities of each stakeholder towards the project's success, and third, formulate effective stakeholder management strategies to support project implementation, aiming to enhance support and achieve mutually beneficial consensus. Focusing on these objectives, this research is expected to significantly contribute to developing renewable energy-based tourist villages, particularly in the context of stakeholder management.

This research carries significant implications for the broader development of renewable energy-based tourist villages. By identifying the potential and challenges in utilizing organic waste as a renewable energy source in culinary-based tourist villages, this research can provide practical guidance for decision-makers in developing renewable energy sources in similar tourist villages. It is hoped that this will encourage the adoption of more sustainable and environmentally friendly renewable energy solutions, unlocking the potential for more responsible and future-oriented tourism development.
RESEARCH METHODS

This research was conducted in the Tourist Village "Kampung Emas" in Putat Urban-Village, Patuk District, Gunungkidul Regency, Special Region of Yogyakarta, Indonesia (Fig. 1). The village was chosen as the research location due to its prominent attractions, particularly the traditional restaurant offering a variety of regional dishes, especially those from the Yogyakarta region, renowned as a leading cultural and educational city in Indonesia. The increasing number of visitors to the traditional restaurant "Omah Kampoeng Emas" posed challenges in managing the organic waste generated. Therefore, the selection of this restaurant aligns with the initial research plan, which aims to develop a culinary-based tourist village into a sustainable energy-based tourist village. The main potential explored is managing organic waste as an energy source through waste-to-energy technology. In the planning of this development project, the roles of stakeholders related to the Tourist Village "Kampung Emas" are crucial factors in achieving the success of this transformation.

![Fig. 1. Atmosphere of the traditional restaurant "Omah Kampoeng Emas"](image)

The research was conducted from July to September 2023, focusing on stakeholder management in developing the Tourist Village "Kampung Emas." The primary focus of this research is the transformation plan of the Traditional Restaurant "Omah Kampoeng Emas" into a tourist village based on renewable energy, utilizing the processing of culinary organic waste as a renewable energy source. The research subjects encompass various stakeholders involved in this process, including those with roles, support, contributions, and related interests. Identifying the roles of each stakeholder is at the centre of the analysis to achieve the success of the sustainable tourist village development project.

This research was conducted based on the Project Stakeholder Management Process stages, referring to the Project Management Institute (PMI) [19]. The stakeholder management process is an organized stage to identify, assess, and manage the expectations of individuals or groups with personal interests in the project outcomes. The main steps in the project stakeholder management process for developing a sustainable energy-based tourist village using the RACI Matrix approach can be seen in Fig. 2.
Fig. 2. Stages of the Project Stakeholder Management Process [19]

Fig. 2 illustrates the stages of the overall project stakeholder management process. However, in this study, the primary focus extends only to identifying stakeholders related to the development project of the energy-based tourist village in "Kampung Emas." Therefore, the results of this research are limited to the initiating stage, which represents the initial phase in project management. The details of the initiating stakeholder management process adopted from the PMBOK Guide [19] can be observed in Fig. 3.

1. Identify Stakeholders

In the development project of the energy-based tourist village "Kampung Emas," the Identify Stakeholders stage is conducted to recognize all parties involved, both internal and external. The primary input includes the structure and organizational processes of the "Kampung Emas" Tourist Village. The tools and techniques involve stakeholder analysis and selecting stakeholders based on expert opinions. The result is a selected list of stakeholders—individuals who significantly impact the project.
2. Interview Stakeholders

In the development project of the energy-based tourist village in "Kampung Emas," the Interview Stakeholders stage aims to gain a deeper understanding of the selected stakeholders. The primary input is the previously identified stakeholders. The tools and techniques used in this stage include questionnaires and interviews to gather more in-depth information. The outcome of this process is a deeper understanding of the project's activities and the roles, tasks, and responsibilities of each interviewed stakeholder. The preparation of interview materials and questionnaires includes:

- Stage 1 (Identification of Renewable Energy Sources): identification of types and volumes of organic waste; analysis of the energy potential from organic waste
- Stage 2 (Planning Organic Waste Processing): design of the organic waste processing system into renewable energy; selection of waste-to-energy technology
- Stage 3 (Implementation of Renewable Energy System): construction of organic waste processing installations in the restaurant; integration of waste processing installations into the renewable energy system; training in waste-to-energy technology operation
- Stage 4 (Monitoring and Evaluation): development of an energy source monitoring system; evaluation of waste-to-energy technology performance
- Stage 5 (Communication and Promotion): communicating the plan to all restaurant employees; promoting the restaurant's transformation to all customers

3. Classify Stakeholders

The Classify Stakeholders process in the development project of the energy-based tourist village in "Kampung Emas" involves analyzing and classifying the roles, tasks, and responsibilities of each previously interviewed stakeholder. The primary input is the questionnaire and interview results, providing in-depth information about project-related activities. The RACI Matrix is used as a tool and technique to assign the status of R (Responsible), A (Accountable), C (Consulted), and I (Informed) to each stakeholder. This provides clear guidance on who is responsible, who needs to be consulted, and who needs to be informed in each project activity. This process results in a structured and appropriate stakeholder management strategy, assisting the project team in executing the project with optimal stakeholder involvement.

A brief definition within the RACI Matrix is essential to understanding the roles and responsibilities of each status in project management:

- Responsible: Accountable for an activity or task directly in the project.
- Accountable: Responsible for ensuring the overall execution of the project.
- Consulted: Provides input or consultation regarding expertise or specific knowledge before initiating the project.
- Informed: Needs to be informed about project developments, although not directly involved in executing each activity, but requires knowledge of the latest developments.

RESULTS AND DISCUSSION

This research commenced with the stakeholder identification phase as the initial step. The development project of the "Kampung Emas" Tourist Village focuses on the transformation of the Traditional Restaurant "Omah Kampoeng Emas." Through stakeholder analysis, several stakeholders playing crucial roles in the project planning were successfully identified. Based on expert assessments, it was decided to involve four key stakeholders. Internal project stakeholders include the Tourism Awareness Group Chair, the Village Head, and the Restaurant Manager. In contrast, external project stakeholders involve an academic or lecturer with expertise in developing renewable energy, particularly from organic waste. The selection of each stakeholder is justified as follows:

- Village Head: An official overseeing the tourism awareness group and all its activities.
Tourism Awareness Group Chair: The person leading the management group of tourist attractions within a village (there can be more than one tourist attraction in a village).
Restaurant Manager: The individual responsible for the tourist attraction of the traditional restaurant, which will be transformed to utilize its organic waste as a renewable energy source.
Academician: An individual with knowledge, expertise, and experience in technology for processing organic waste into energy.

In the next stage, these four stakeholders were interviewed, and they were expected to complete questionnaires to obtain more in-depth information. The data from the questionnaire results and interviews were then compiled into the RACI Matrix table (Table 1), providing clear guidance on the tasks and responsibilities of each stakeholder in this development project [20], [21].

**Table 1. RACI Matrix in the development project of the "Kampung Emas" Tourist Village**

<table>
<thead>
<tr>
<th>Task</th>
<th>Village Head</th>
<th>Tourism Awareness Group Chair</th>
<th>Restaurant Manager</th>
<th>Academician</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifying types and volumes of organic waste</td>
<td>I</td>
<td>A</td>
<td>R</td>
<td>C</td>
</tr>
<tr>
<td>Analyzing the energy potential of organic waste</td>
<td>I</td>
<td>A</td>
<td>R</td>
<td>C</td>
</tr>
<tr>
<td>Designing a system for processing organic waste into renewable energy</td>
<td>I</td>
<td>A</td>
<td>R</td>
<td>C</td>
</tr>
<tr>
<td>Selecting waste-to-energy technology</td>
<td>I</td>
<td>A</td>
<td>R</td>
<td>C</td>
</tr>
<tr>
<td>Constructing an organic waste processing installation in the restaurant</td>
<td>I</td>
<td>C</td>
<td>R</td>
<td>C</td>
</tr>
<tr>
<td>Integrating the waste processing installation into the renewable energy system</td>
<td>I</td>
<td>C</td>
<td>R</td>
<td>C</td>
</tr>
<tr>
<td>Providing training for the operation of waste-to-energy technology</td>
<td>I</td>
<td>I</td>
<td>R</td>
<td>C</td>
</tr>
<tr>
<td>Developing an energy source monitoring system</td>
<td>I</td>
<td>I</td>
<td>A</td>
<td>C</td>
</tr>
<tr>
<td>Evaluating the performance of waste-to-energy technology</td>
<td>I</td>
<td>I</td>
<td>R</td>
<td>C</td>
</tr>
<tr>
<td>Communicating the plan to all restaurant employees</td>
<td>I</td>
<td>I</td>
<td>A</td>
<td>C</td>
</tr>
<tr>
<td>Promoting the transformation results of the restaurant to all customers</td>
<td>I</td>
<td>I</td>
<td>A</td>
<td>C</td>
</tr>
</tbody>
</table>

In the development project of the "Kampung Emas" tourist village, mainly focusing on transforming the traditional restaurant "Omah Kampoeng Emas" towards renewable energy, the roles and responsibilities of each stakeholder have significant impacts. The Village Head plays a broader role, focusing on village governance responsibilities [22]. Although not involved in specific technical tasks, the Village Head is informed about critical aspects of the project, including the analysis of the energy potential from organic waste, selection of waste-to-energy technology, construction of waste processing facilities, technology operation training, and promotion of the restaurant's transformation results. Even without direct involvement in task execution, the Village Head's role is crucial to ensuring support and acceptance at the village level, reflecting their strategic role as a community leader.

The Tourism Awareness Group Chair, although not assigned specific technical tasks, holds overall responsibility for the critical phases of the project. This includes identifying types of organic waste, analysing energy potential, designing the processing system, and selecting waste-to-energy technology. The Tourism Awareness Group Chair serves as the primary driver of project success. In constructing waste processing facilities, their input is crucial. The Tourism Awareness Group Chair is
consistently informed about tasks related to providing training, developing monitoring systems, communicating plans to employees, and promoting transformation results to customers. Playing a central role in connecting the project with the community, the Tourism Awareness Group Chair ensures positive acceptance [23], [24]. As a tourism awareness coordinator, their role contributes significantly to integrating environmental and social aspects into sustainable restaurant transformation.

The Restaurant Manager, as a direct participant in the project, plays a key role with substantial responsibilities [25]. Involved in technical tasks such as identifying organic waste, analyzing energy potential, designing processing systems, selecting technology, and building installations, the Restaurant Manager is responsible for integrating installations into the renewable energy system, developing monitoring systems, internal communication, and promoting transformation results to customers. The Restaurant Manager is not asked for input or task progress information during execution due to their direct involvement in strategic tasks ensuring operational success and positive reception from the entire restaurant team and customers.

The Academician’s role is focused on providing technical consultation and knowledge covering all aspects of project planning [26]. Although not directly responsible for task execution, the Academician makes essential contributions, especially in technical analysis and the selection of waste processing technology. Despite not being overall responsible for task success or failure, the Academician plays a vital role in decision-making, forming a solid technological foundation for restaurant transformation. Although not directly provided with task progress information, ongoing consultations ensure the Academician remains an intellectual pillar supporting project success with in-depth technical insights.

Effective collaboration among various stakeholders with diverse roles is the key to the success of the "Kampung Emas" tourist village development project based on renewable energy [27]. While the Village Head focuses on administrative village responsibilities without direct involvement in technical tasks, their role as a critical information disseminator at the village level remains crucial. As the primary driver, the Tourism Awareness Group Chair is responsible for critical project phases and plays a central role in integrating environmental and social aspects. Meanwhile, as a direct actor, the Restaurant Manager plays a crucial role in technical and strategic tasks, ensuring the integration of renewable energy solutions and successful restaurant operations. The Academician, with their intellectual contribution, forms a solid technological foundation. With harmonious collaboration, this project can be a successful example of how coordinated and integrated roles lead to the development of a sustainable and innovative tourist village.

Effective stakeholder management strategies to support the implementation of the "Kampung Emas" tourist village development project based on renewable energy can be formulated through an approach focused on the roles and interests of each stakeholder. The Village Head, as the village leader, can be empowered as a critical information disseminator at the village level, ensuring active support from the local community. The Tourism Awareness Group Chair can be the primary spokesperson to communicate project benefits to the tourism community [28]. Meanwhile, the Restaurant Manager can be more involved in decision-making processes and the implementation of strategic tasks. As a source of technical knowledge, the Academician can become a more active consultative partner. Regular forums for open communication, stakeholder participation in critical decision-making, and identifying potential conflicts of interest are vital to strengthening consensus. Additionally, seeking mutually beneficial solutions and formulating policies or incentives that motivate all parties will reinforce a mutually supportive framework, ensuring project implementation success and creating positive impacts for the entire community.
CONCLUSION

Stakeholder Management Analysis in the sustainable energy-based tourist village development project "Kampung Emas" identifies four key stakeholders: the Village Head, the Tourism Awareness Group Chair, the Restaurant Manager, and the Academician. Through the RACI Matrix, the roles and responsibilities of each stakeholder are revealed. The Village Head, despite not being involved in technical tasks, plays a strategic role as a critical information disseminator at the village level. The Tourism Awareness Group Chair is responsible for critical project phases and is central to integrating environmental and social aspects. As a direct actor, the Restaurant Manager holds substantial responsibilities in technical and strategic tasks. The Academician makes significant contributions to technical analysis and technology selection. Effective stakeholder management strategies involve the Village Head as an information disseminator, the Tourism Awareness Group Chair as the primary spokesperson, the Restaurant Manager in strategic decision-making, and the Academician as an active consultative partner. Regular forums, participation in critical decision-making, and identifying potential conflicts of interest are vital to the success of project implementation and positive impacts on the community.

ACKNOWLEDGMENT

Acknowledgements are extended to the Research and Community Service Institute of Universitas Sarjanawiyata Tamanisiswa (LP2M UST) for funding this research through the Internal Grant Program for the Fiscal Year 2023 with Contract Number: 003/UST/LP2M/K/PDP/VII/2023. Gratitude is also expressed to all the Managers of the "Kampung Emas" Tourist Village, especially the village head, the head of the tourism awareness group, and the manager of the traditional restaurant "Omah Kampoeng Emas."

REFERENCES


https://doi.org/10.56882/jisem.v2i2.25