

## Key Variables for Successful Community – Based Ecotourism Management in East Java, Indonesia

**Anthon Efani**

Department of Socio-Economic Fisheries and Marine Science, Faculty of Fisheries and Marine Science, Brawijaya University

**Reny Tiarantika**

Department of Environmental Science, Post-Graduate School of Environmental Science, Brawijaya University

**Asfi Manzilati**

Department of Economic, Faculty of Economic and Business, Brawijaya University

**Abu Bakar Sambah**

Department of Fisheries and Marine Resources Utilization, Faculty of Economic and Business, Brawijaya University

他

<https://doi.org/10.5109/7326927>

---

出版情報 : Evergreen. 11 (4), pp.2831-2847, 2024-12. 九州大学グリーンテクノロジー研究教育センター

バージョン :

権利関係 : Creative Commons Attribution 4.0 International

# Key Variables for Successful Community - Based Ecotourism Management in East Java, Indonesia

Anthon Efani<sup>1,\*</sup>, Reny Tiarantika<sup>2</sup>, Asfi Manzilati<sup>3</sup>, Abu Bakar Sambah<sup>4</sup>,  
Muhammad Faisal Riza<sup>5</sup>, Soemarno<sup>6</sup>, Koderi<sup>2</sup>

<sup>1</sup>Department of Socio-Economic Fisheries and Marine Science, Faculty of Fisheries and Marine Science, Brawijaya University, Indonesia

<sup>2</sup>Department of Environmental Science, PostGraduate School of Environmental Science, Brawijaya University, Indonesia

<sup>3</sup>Department of Economic, Faculty of Economic and Business, Brawijaya University, Indonesia

<sup>4</sup>Department of Fisheries and Marine Resources Utilization, Faculty of Economic and Business, Brawijaya University, Indonesia

<sup>5</sup>Department of Business Administration, Faculty of Administration Science, Brawijaya University, Indonesia

<sup>6</sup>Department of Soil Science, Faculty of Agriculture, Brawijaya University, Indonesia

\*Author to whom correspondence should be addressed:

E-mail: anthonefani@ub.ac.id

(Received January 30, 2024; Revised June 21, 2024; Accepted October 15, 2024).

**Abstract:** As a country rich in natural resources, Indonesia has vast opportunities to develop ecotourism. One of the regions in Indonesia that is trying to optimize ecotourism potential is East Java one of Clungup Mangrove Conservation (CMC) Tiga Warna, but institutional problems and biased policy focus have hampered its development. The aim of this research is to identify and formulate key variables for sustainable management of ecotourism and to find a description of the interdependence relationship between variables in CMC Tiga Warna Ecotourism. Data analysis was carried out using the MICMAC (Cross Impact Matrix Multiplication Applied to Classification) method. The research results show that input variables such as pro-environmental activities, improving access to enter ecotourism areas, and community involvement, have an important role in forming an effective and sustainable management system. Key variables involve factors such as the integrity of the environmental fabric, opportunities and opportunities for employment, and the existence of mentoring, which supports sustainability and positive impacts on the environment and local communities. All main stakeholders can be involved in decision making through a good governance system supported by balanced policies on each dimension of sustainability.

Keywords: ecotourism; management; sustainability; strategy; MICMAC

## 1. Introduction

The management of ecotourism in Indonesia is governed by several policies related to national development, such as the Tourism Law Number 10 of 2009, the Biodiversity Conservation Law Number 5 of 1990, the Forestry Law Number 41 of 1999, the Coastal and Small Islands Management Law Number 27 of 2007, and the Regional Government Law Number 23 of 2014<sup>1,2)</sup>. However, the failure in ecotourism development occurs due to overlapping management, policy disharmony, and sectoral egos within each ministry responsible for ecotourism development<sup>3,4)</sup>. Four government ministries, including the Ministry of Environment and Forestry, the Ministry of Tourism and Creative Economy, the Ministry

of Home Affairs, and the Ministry of Maritime Affairs and Fisheries, have authority in ecotourism management and policy-making. Nevertheless, Indonesia's tourism and ecotourism regulation dynamics have yet to prioritize objective scientific space and directed vision application<sup>5)</sup>. Issues related to ecotourism management need immediate attention because many countries consider tourism as an alternative development source expected to become a new economic force amid declining natural resources<sup>6,7)</sup>. One of the fastest-growing subsets of tourism is ecotourism<sup>8)</sup>, focusing on environmental sustainability. Ecotourism is deemed to have positive effects on the natural environment while considering long-term economic feasibility and social justice<sup>9)</sup>. Additionally, ecotourism is believed to promote cultural sensitivity between visitors

and local residents and act as a catalyst for sustainable development<sup>10</sup>). However, according to<sup>11,12</sup>), ecotourism planning still needs attention, especially regarding the declining quality of natural forests due to rapid ecotourism development in the region.

Since 2008, Indonesia has promoted tourism through the Visit Indonesia program, introducing the country's environmental and cultural diversity internationally. Indonesian tourism has been among the fastest-growing, ranking 9<sup>th</sup> globally, 3<sup>rd</sup> in Asia, and 1<sup>st</sup> in Southeast Asia, achieving recognition as "The Top 20 Fastest Growing Travel Destinations"<sup>13</sup>). Tourism continues to be a rapidly growing sector, noted for its high effectiveness in job creation and revenue generation<sup>14,15</sup>). Despite various ecotourism management issues, ecotourism remains a significant forex contributor to Indonesia<sup>13</sup>).

As a resource-rich country, Indonesia has vast opportunities for ecotourism development. One of the regions optimizing ecotourism potential is East Java. The Clungup Mangrove Conservation (CMC) Tiga Warna ecotourism area in East Java is managed by the local community and comprises mangrove, coral reef, and seagrass conservation areas<sup>16</sup>). The successful management of ecotourism at CMC Tiga Warna aligns with the current tourism destination management trend, emphasizing limited natural resource utilization while prioritizing environmental protection to increase environmental awareness among local residents and tourists, ensuring sustainability<sup>17-19</sup>).

The findings of this research, mapping strategic variables in the CMC Tiga Warna Ecotourism Area and describing their intensities of influence and interdependence, will aid policymakers in understanding the relationships between key variables and directing focus towards the most crucial variables for successful management. Based on these research findings, it is hoped that high-quality long-term strategies will be developed, mitigating potential future issues and fostering successful future-oriented thinking to realize a sustainable CMC Tiga Warna ecotourism area. There are three conservation areas within it, namely mangrove conservation consisting of Clungup Beach and Gatra Beach, coral reef conservation at Tiga Warna Beach, Sapana Beach, Mini Beach, and Watu Pecah Beach, as well as seagrass conservation at Gatra Beach. The area of mangrove conservation is 74.59 Ha, coral reef 10 Ha, seagrass < 1 Ha, and protected forest 33 Ha. The total area reaches 117.59 Ha.

The management of ecotourism in CMC Tiga Warna is in line with the current trend of tourist destination management, which utilizes natural resources in a limited manner while still prioritizing environmental protection to encourage increased environmental awareness among local residents and tourists, aiming to maintain the sustainability and quality of ecotourism. Ecotourism like CMC Tiga Warna serves as an environmentally friendly tourism model, generating economic benefits by emphasizing conservation for increased environmental

awareness and maintaining environmental sustainability for quality preservation in the future. One factor that will help the success of managing the ecotourism potential of CMC Tiga Warna is the existence of a map of key variables that should be considered by policymakers. To fulfill this, this research is conducted with the aim of examining the mapping of strategic variables in the CMC Tiga Warna Ecotourism Area by describing the intensity of influence and interdependence between variables, both direct and indirect, and stratifying them from most important to least important<sup>20</sup>).

The research findings will assist policymakers in understanding the relationships between key variables and directing focus on the most determining variables to ensure successful management. Based on these research findings, it is expected to develop high-quality long-term strategies, avoid potential issues that may arise in the future, and encourage forward-thinking to realize a sustainable CMC Tiga Warna ecotourism area.

## 2. Research Background

One of the areas in Indonesia striving to optimize ecotourism potential is in the Malang Regency region of East Java. The optimization of ecotourism aims to support synergistic and sustainable economic growth through ecotourism activities such as CMC Tiga Warna. The CMC Tiga Warna area is managed by the Bhakti Alam Sendang Biru Foundation, which focuses on coastal conservation issues formed and managed by a group of people who are aware of the importance of sustainable coastal ecosystems for community life. Ecotourism management in CMC Tiga Warna aligns with the current trend of tourist destination management, utilizing limited natural resources while prioritizing environmental protection to ensure the existence of sustainable ecotourism. An environmentally friendly tourism model generates economic benefits by promoting conservation to increase environmental awareness and environmental sustainability as a conservative ecotourism model for coastal ecosystems<sup>21</sup>).

The phenomenon occurring in the current research location is the interaction between the growth of the tourism industry and the demands for economic improvement, putting pressure on mangrove ecosystems, coral reefs, and seagrass beds, resulting in ecosystem degradation and pollution in CMC Tiga Warna. This condition creates conflicts of interest among residents, local governments, entrepreneurs, and environmentalists in the CMC Tiga Warna area. Therefore, it can be concluded that the CMC Tiga Warna ecotourism area has complexity and interconnected problems. Thus, a study of complex solutions models of mapping strategy variables for successful management is needed<sup>22</sup>).

As a conservative, sustainable, and high-quality coastal ecotourism destination, it turns out that the coastal environment in CMC Tiga Warna is always vulnerable to declining environmental quality, including due to

differences in environmental awareness among visitors and local communities. Therefore, ecotourism managers need to implement natural conservation activity execution strategies to ensure the sustainability and quality of ecotourism destinations and increase environmental awareness among visitors and local communities<sup>23</sup>).

Specifically, the issues in CMC Tiga Warna are: not yet mapping out strategic variables that are key to management (mapping is still limited to zoning), having an environmental vulnerability index of 53.32 (moderately vulnerable) causing environmental degradation<sup>17,24</sup>, management actions that are not in line and policies not based on priority scales. This is supported by preliminary study data indicating that activities in CMC Tiga Warna tend to be incidental, and lastly, management issues caused by the lack of stakeholder intensity, one of which is the local community, in advancing and supporting the existence of CMC Tiga Warna ecotourism area.

### 3. Research Design

Community Based Ecotourism (CBE) is a concept of ecotourism development that involves and empowers local communities to have full control over its management and development, thereby contributing to the local community's welfare enhancement and the sustainability of local culture. Discourse on tourism

failures has sparked debates regarding the current paradigm of tourism development, which is deemed to be less beneficial to local communities. Effective tourism development should bring economic, social, and cultural benefits to communities around destinations. Hence, the idea of developing tourism that is more community-oriented emerged, known as Community Based Tourism (CBT). Through the development of CBT, the tourism industry is expected to become an instrument of development that significantly improves the well-being of communities. Globally, CBT is not just about tourism development but is also developed as part of poverty alleviation programs in South Africa, Thailand, Dominica, the Caribbean, Jamaica, and Barbados. The concept of CBT is also adapted in ecotourism, leading to the term Community Based Ecotourism (CBE)<sup>25</sup>).

Community-based ecotourism focuses on the active role of communities in ecotourism endeavors. This is based on the fact that communities possess knowledge about nature and culture, which serve as potential and marketable attractions for tourism, making community involvement essential. In this research, the research design is structured around eight dimensions of sustainable community-based ecotourism management, including environmental, economic, social, infrastructure, institutional, technological, conservation, and regulatory dimensions (Fig. 1).

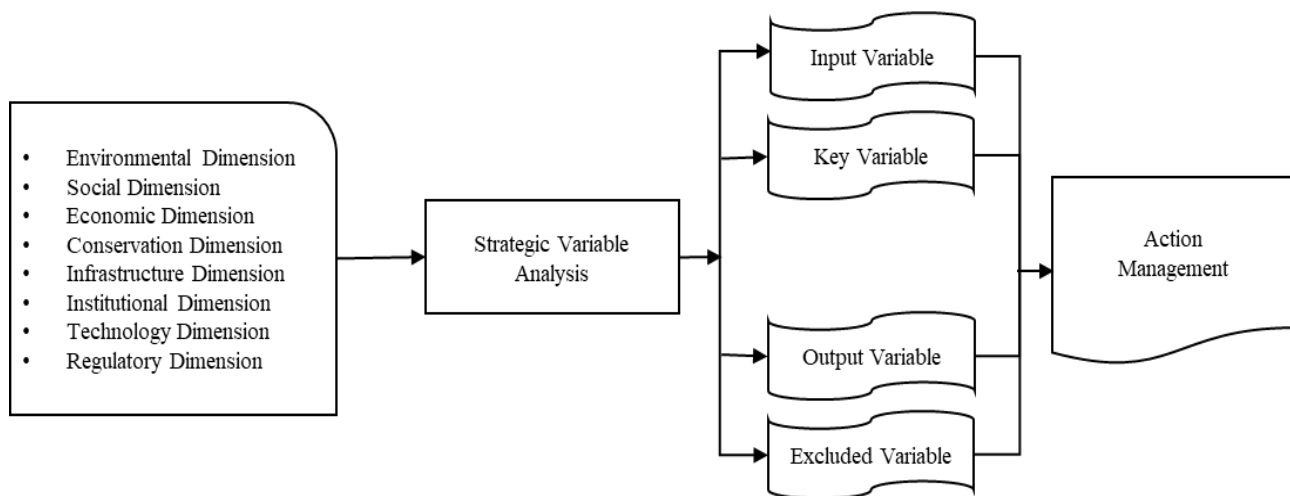


Fig. 1: Research Design

### 4. Methodology

#### 4.1 Research Location

Figure 2, this research focuses on Ecotourism CMC Tiga Warna, with a focus on six observation points, namely: Clungup Beach, Gatra Beach, Watu Pecah Beach, Sapana Beach, Mini Beach, and Tiga Warna Beach. This location was purposively chosen considering the highly

potential coastal resources and productive ecosystems of coral reefs, mangroves, seagrass beds, and biodiversity in this area to be developed into marine ecotourism destinations. Although Clungup Mangrove Conservation (CMC) Tiga Warna is known as the best-managed ecotourism site in East Java and is also ranked among the top three ecotourism sites in Indonesia, sustaining its management requires an analysis capable of identifying management success variables.

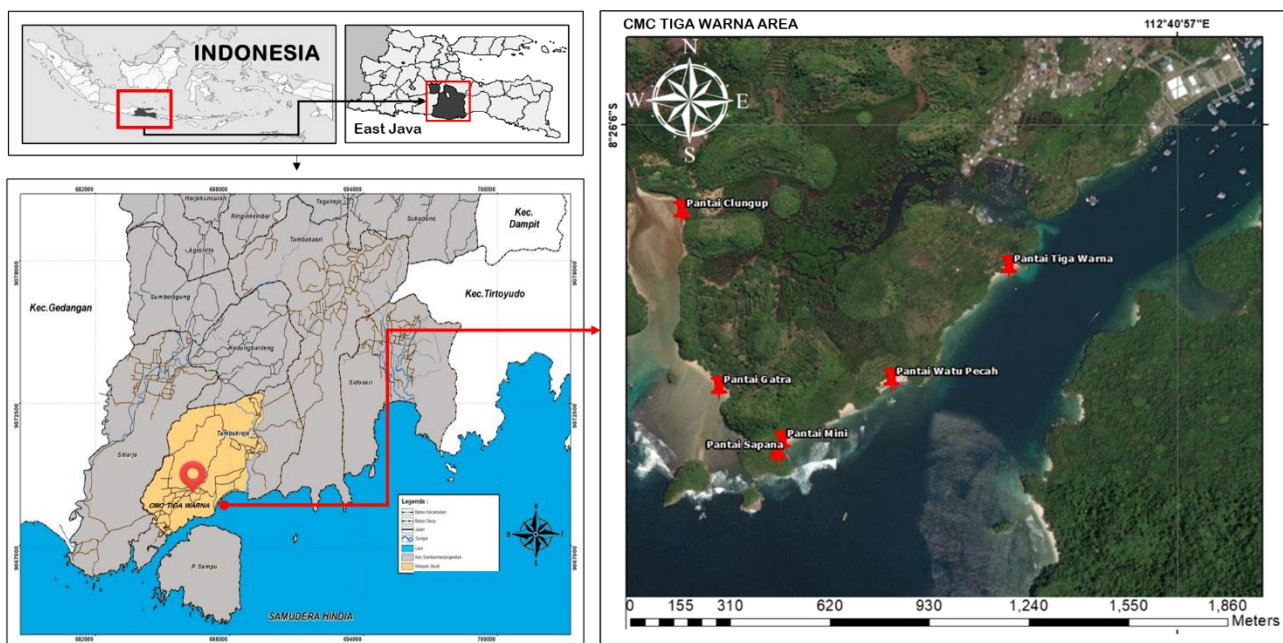


Fig. 2: Research Location

#### 4.2 Population and Sample

The population in this study consists of stakeholders involved in the management of Ecotourism CMC Tiga Warna, with sample selection using purposive sampling criteria for stakeholders who have expertise in ecotourism management. The considerations for determining expert criteria are as follows: Experts who have authority in decision-making policy such as ecotourism area management, experts who have authority in the development of ecotourism area management sector, experts who are affected by ecotourism area management activities, experts who are prerequisites for success in ecotourism area management sector, experts who have competencies in ecotourism area management sector. Data collection was carried out using a questionnaire instrument involving 110 respondents, including the Department of Tourism and Culture, the Department of Marine and Fisheries, the Department of Environment, the Department of Forestry, ecotourism managers, economic actors, village heads, RT and RW heads, the community, tourists, and academics.

In conducting this study, we adhered to a strict code of ethics to ensure the integrity and ethical responsibility of our research process. The ethical considerations included: 1) Informed Consent: All participants were fully informed about the purpose of the study, the methods involved, and the potential use of the collected data. Written consent was obtained from all participants before their involvement in the study. 2) Privacy and Confidentiality: We ensured that the identities and personal information of all respondents were protected. Data was anonymized, and access to the raw data was restricted to the research team only. 3) Participant Safety and Well-being: The study was designed to minimize any potential risks to participants.

We took all necessary precautions to ensure that participants would not experience any physical or psychological harm as a result of their participation. 4) Transparency: The research process was conducted with transparency. Participants were provided with contact information for the research team and were encouraged to ask questions and seek clarification on any aspect of the study, and 5) Professional Responsibility: The research team adhered to high standards of professional conduct, ensuring that the study was conducted with integrity and respect for all participants. This included following best practices in data collection, analysis, and reporting.

#### 4.3 Data Analysis

The MICMAC method (Cross Impact Matrix Multiplication Applied to Classification) is a software developed by the Institut d'Innovation Informatique pour l'Entreprise (3IE)<sup>26</sup>, to update the structural analysis method from its previous qualitative form to quantitative<sup>27</sup>. In its operation, Micmac applies matrix properties<sup>28</sup>. The purpose of Micmac is to identify and analyze the main variables of a system. The advantage of Micmac compared to other structural methods is that it allows for grouping and hierarchical determination of strategic variables of a system and understanding their mutual influence. This feature is very beneficial in the policy-making process as it directs the policy focus, considering that policy focus often leads to irrelevant variables, resulting in failure.

The explanations provided by Micmac analysis will create greater confidence and trust in the issues raised and present diverse assumptions<sup>29</sup>. The operationalization of the Micmac method consists of several stages, namely: (1) defining the problem, identifying internal and external

variables; (2) assessing the relationships between variables according to the level of influence and dependence, assessed with a ranking scale between: 0 = none, 1 = weak, 2 = moderate, 3 = strong, P = potential. The assessment results will qualify the intensity of influence between variables into groups of direct influence, indirect influence, and potential influence. Direct influence occurs if variable A affects variable B; indirect influence occurs if variable A influences B and B influences variable C, and thus C is indirectly influenced by A. Potential influence occurs if variable A should affect B, while no direct influence occurs if a variable does not affect another variable; (3) analyzing the intensity of influence and dependence of variables determined by the position of variables on the influence and dependence quadrant map. The operational framework of the research is outlined in the following diagram (Fig. 4):

Figure 3, assists in analyzing the influence and dependency of system variables and categorizes them into four typologies, which include determinant variables, relay variables, depending variables, excluded variables, and regulatory variables:

- a) Determinant variables, which are variables that have a significant influence and are less dependent on other variables. These variables are considered as inputs and greatly determine the system's mobility (variable input). Determinant variables are highly important and require maximum policy-maker attention as they strongly influence other variables.
- b) Relay variables, also known as key variables. Relay variables are highly influential while also

being highly dependent on other variables. These variables are the least stable because any influence that occurs on them can flow throughout the entire system. Relay variables are also referred to as instability factors because they have a "boomerang effect" on the system, meaning actions taken on these variables will affect the direction of the system's mobility.

- c) Depending variables, also known as output variables. Output variables describe the impact generated by other variables, especially determinant variables and relay variables. These variables are located in the southeast quadrant of the map. The location of output variables indicates variables that have little influence with high dependence, making them highly sensitive to influencing factors. These variables serve as descriptive indicators of system evolution.
- d) Excluded variables are variables that have minimal influence and are slightly dependent on other variables. These variables have a low potential to produce changes (inertia trend) in the system. Excluded variables are also referred to as autonomous variables.

This research utilizes a list of strategic variables from eight dimensions consisting of environmental, economic, social, infrastructure, institutional, technological, conservation, and regulatory dimensions. The selection of variables from each dimension was gathered through a literature review of previous studies and the applicable laws in Indonesia (Table 1).

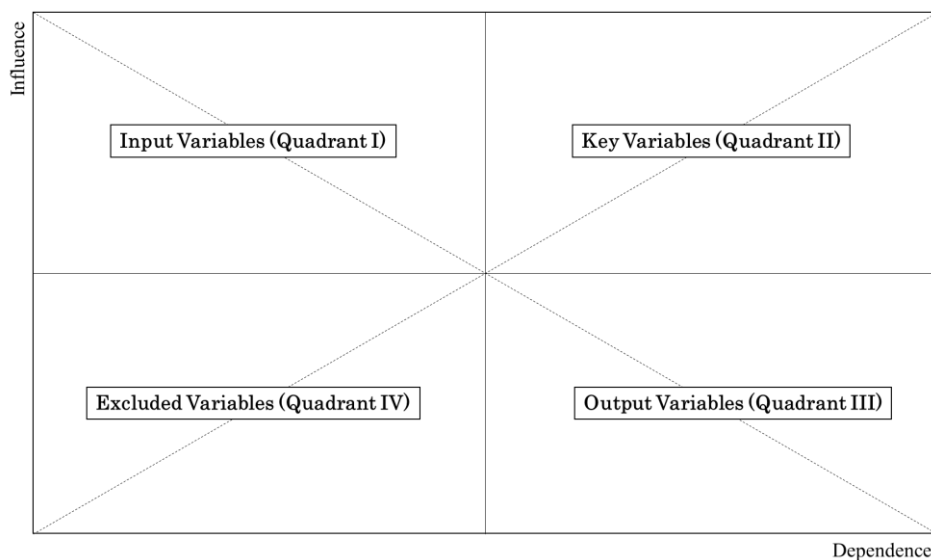


Fig. 3: Quadrant Mapping

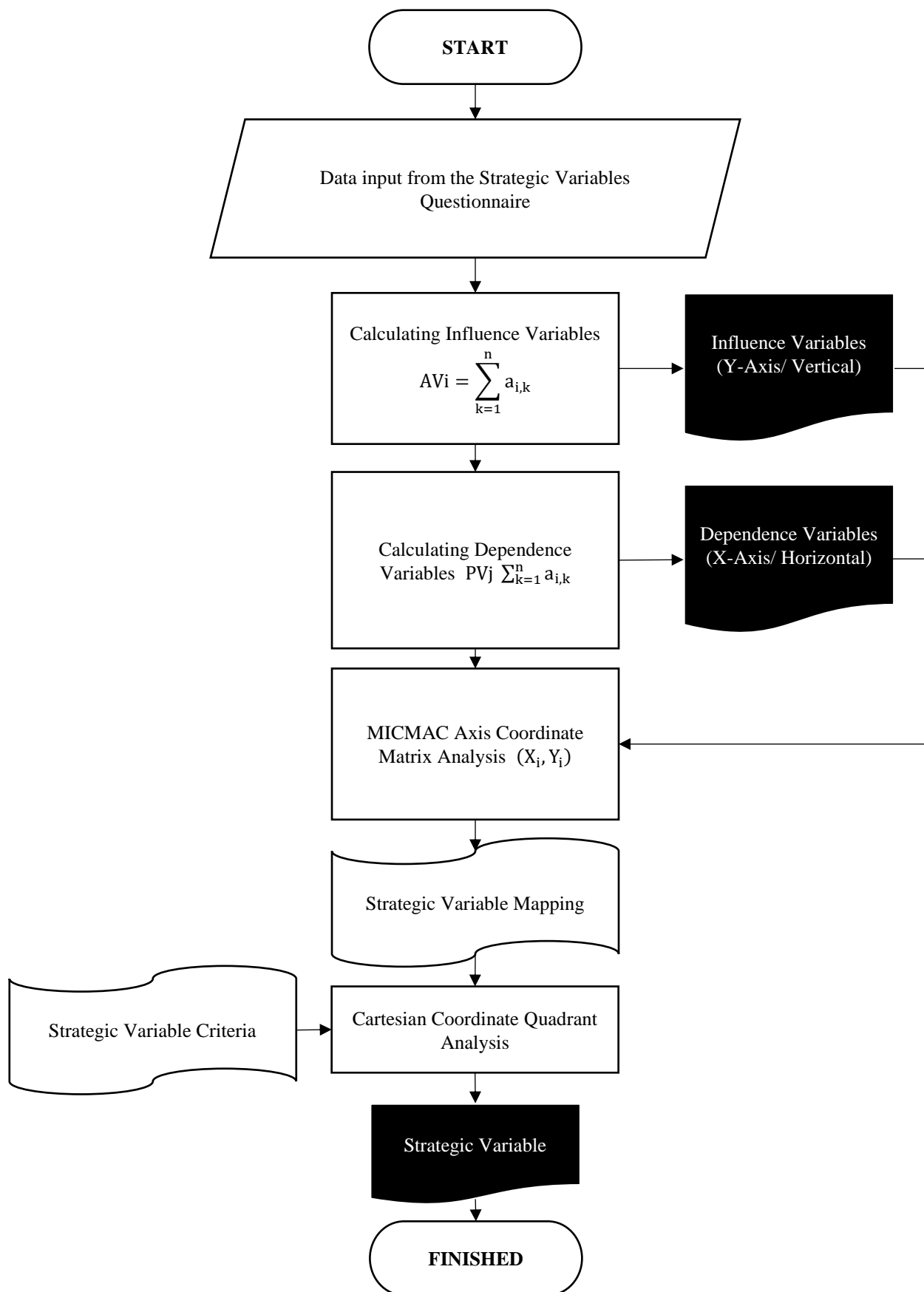


Fig. 4: Research Operational Framework

Table 1. List of Strategic Variables for the Development of the CMC Tiga Warna Ecotourism Area

Dimension	Variable		Code	Source
Environment	Pro-environment activities	Activities that support environmental sustainability such as environmental protection and management planning, utilization of natural resources in accordance with environmental capacity, pollution control, and/or environmental damage control (environmental inventory, conservation area designation, and environmental education)	LI1	<ul style="list-style-type: none"> <li>• Law no. 32 of 2009, article 4</li> <li>• Law no. 27 of 2007, article 3</li> <li>• Minister of Home Affairs Regulation No. 33 of 2009, article 3</li> </ul> <small>30,31)</small>
	Environmental governance integrity	Environmental order integrity includes environmental sustainability, consistency in environmental quality, and tourism suitability (tourism activities should align with environmental conditions or not cause environmental damage)	LI2	
	Maintaining environmental conditions	Preservation of natural beauty, cleanliness of tourist attractions, and establishment of carrying capacity	LI3	
Social	Community involvement	Community participation, respect for the social-cultural and religious values of surrounding communities, and community empowerment	SO1	<ul style="list-style-type: none"> <li>• Law No. 5 of 1990, articles 3, 6, 20</li> <li>• Law No. 27 of 2007, article 6</li> <li>• Law No. 23 of 2004, articles 12, 25, 31, 258</li> <li>• Minister of Home Affairs Regulation No. 33 of 2009, articles 1, 3</li> </ul> <small>30,31)</small>
	Employment opportunities	Opening opportunities for local businesses, job opportunities in the tourism sector, and community welfare	SO2	
	Reducing social conflicts	Reducing social conflicts, increasing community knowledge, and fostering harmony among stakeholders	SO3	
Economic	Evaluation of economic aspects	Driving regional economic development, accelerating economic growth, and generating local revenue (PAD)	EK1	<ul style="list-style-type: none"> <li>• Minister of Home Affairs Regulation No. 33 of 2009, article 3</li> <li>• Law No. 27 of 2007, articles 29, 36</li> <li>• Law No. 10 of 2010, article 28</li> </ul> <small>30,31)</small>
	Business scaling-up	Enhancing sustainable ecotourism efforts, promoting tourism industry growth, and benefiting the tourism industry	EK2	
	Management budget	Availability of conservation budgets, facility budgets, and CSR (Corporate Social Responsibility) budgets by managers	EK3	
Infrastructure	Availability of facilities and infrastructure	Availability of public facilities, healthcare facilities, and places of worship	IN1	<ul style="list-style-type: none"> <li>• Law No. 10 of 2010, article 33, paragraph 2c</li> </ul> <small>31–34)</small>
	Improving access to ecotourism	Availability of public transportation to tourist locations, road access to ecotourism sites, and travel routes	IN2	
	Tourist attractions	Number of attractions, tourism appeal, and land availability	IN3	
Institutional	Role of institutional groups	Role of NGOs, institutional activity, and growth of community organizations/groups	KE1	<ul style="list-style-type: none"> <li>• Law No. 10 of 2010, article 5, paragraph 76</li> </ul> <small>30,31)</small>
	Authorities and responsibilities	Determining the authority and responsibilities of various institutions involved in ecotourism management.	KE2	



Dimension	Variable		Code	Source
		This includes task division and authority among government, conservation agencies, and the private sector.		
	Coordination patterns and governance system improvements	Establishing coordination among managers, coordination between managers and relevant departments, and good governance systems	KE3	
Conservation	Nature conservation	Environmental preservation includes preserving natural capabilities, balanced use of nature, and maintaining ecological processes	KO1	<ul style="list-style-type: none"> <li>• Law No. 5 of 1990 Article 2, 7, 10, 12, 13, 28</li> <li>• Minister of Home Affairs Regulation No. 33 of 2009 Chapter II Article 3b</li> </ul> 31,34,35)
	Conservation support activities	Continuous rehabilitation efforts, maintaining the integrity of areas according to natural landscapes, and avoiding extinction risks	KO2	
	Monitoring the quality of conservation areas	Considering the potential and carrying capacity of the area, ecosystem protection, and biodiversity conservation areas	KO3	
Technology	Technological mastery	Level of marketing technology mastery, ability to apply environmentally friendly technology, and database technology development capability	TE1	<ul style="list-style-type: none"> <li>• Law No. 10 of 2010, Articles 36-49</li> </ul> 30,32)
	Digital information access	Ecotourism information accessibility, online ecotourism marketing, and digital advertising	TE2	
	Management database	Availability of institutional databases, tourism databases, and ecosystem databases	TE3	
Regulation	Law enforcement and regulations	Availability of legal instruments, regional regulations for ecotourism management, and policy transparency	RE1	32,33,36)
	Provision of assistance	Legal oversight availability, number of local security personnel, and legal counseling for natural resource management	RE2	
	Policy synergy	Harmonization of policies, compliance with tourism management documents, and implementation of management in accordance with management documents.	RE3	

## 5. Result and Discussion

The management of CMC Tiga Warna ecotourism, like ecotourism management in general, requires a strategic approach to ensure sustainability and balance between natural resource utilization and environmental protection.

### 5.1 Mapping Strategic Variables for Community-Based Ecotourism Management Success

Strategic variable mapping is the process of analyzing and identifying key factors that influence the success or failure of an organization or project. In the context of strategic management, strategic variable mapping

involves the identification of variables that have a significant impact on the goals and performance of the organization. Strategic variable mapping enables organizations to focus on the most influential aspects and formulate appropriate strategies<sup>37)</sup>. Furthermore, strategic variable mapping can help organizations anticipate changes in the business or industry environment, allowing them to respond more quickly and effectively<sup>28,32)</sup>. In conclusion, strategic variable mapping is a crucial step in strategic planning that allows organizations to understand and manage the key factors shaping their operational context.

The application of prospective analysis in decision-

making processes considering the position and intensity of variable influences in the form of direct or indirect effects has justified the validity and strength of the approach in determining the most desired variables for the development of the CMC Tiga Warna Ecotourism area based on relay variables as key factors and simultaneously yielding expected benefits in the future.

An essential component in the development of the CMC Tiga Warna Ecotourism area management is

determining the variables that are key factors. In this study, mapping of strategic variables is divided into 4 quadrants: input variables (quadrant I), key variables (quadrant II), output variables (quadrant III), and exclude variables (quadrant IV). The following are the results of mapping the strategic variables of CMC Tiga Warna ecotourism management:



Fig. 5: Mapping of Strategic Variables Based on Management Quadrants

As shown in Figure 5, it can be observed that the research findings indicate there are 8 variables located in quadrant I, 8 variables in quadrant II, 7 variables in quadrant III, and 1 variable in quadrant IV. The classification of variables in more detail can be seen in the following table (Table 2):

Table 2. Classification of Strategic Variables

Quadrant	Variables
<b>Input Variables (Quadrant I)</b>	Pro-environmental activities (LI1)
	Improvement of access to ecotourism areas (IN2)
	Coordination patterns and governance system improvement (KE3)
	Community involvement (SO1)
	Law enforcement and regulations (RE1)
	Management budgeting (EK3)
	Conservation quality monitoring (KO3)
	Digital information access (TE2)

<b>Key Variables (Quadrant II)</b>	Environmental order integrity (LI2)
	Job opportunities and employment prospects (SO2)
	Scaling up business (EK2)
	Availability of facilities and infrastructure (IN1)
	Authority and responsibility (KE2)
	Conservation-supporting activities (KO2)
	Existence of mentoring (RE2)
	Technology mastery (TE1)
<b>Output Variables (Quadrant III)</b>	Maintaining environmental conditions (LI3)
	Economic evaluation (EK1)
	Reducing social conflicts (SO3)
	Policy synergy (RE3)
	Management database (TE3)
	Role of institutional groups (KE1)
	Nature preservation (KO1)
<b>Excluded Variables (Quadrant IV)</b>	Tourist attraction (IN3)

In Table 2, it can be observed that in the management of CMC Tiga Warna ecotourism, there are 8 variables categorized as input variables, namely: pro-environmental activities, improvement of access to ecotourism areas, coordination patterns and governance system improvement, community involvement, law enforcement and regulations, management budgeting, conservation quality monitoring, and digital information access. These variables in quadrant I are crucial in determining a good management system.

The research results indicate that in the management of CMC Tiga Warna ecotourism, these eight input variables play a crucial role in shaping an effective and sustainable management system. Firstly, pro-environmental activities stand out as a key variable reflecting commitment to conservation efforts and environmental sustainability, forming the basis for environmentally friendly tourism practices<sup>38</sup>). Next, improvement of access to ecotourism areas becomes a significant focus, given its vital role in managing visitor flows and minimizing negative impacts on ecosystems<sup>39,40</sup>). Coordination patterns and governance system improvement are key in regulating various activities within the area, ensuring harmony between utilization and preservation<sup>41</sup>). Community involvement has proven significant in designing policies and management practices, creating local economic opportunities, and strengthening connections between tourists and local communities<sup>42,43</sup>). Law enforcement and regulations serve as the foundation for protecting the environment and communities from potential damage or conflicts<sup>44</sup>). Adequate management budgeting is a crucial element in supporting various initiatives, including infrastructure maintenance and conservation programs<sup>45</sup>). Conservation quality monitoring is a variable that realizes the concept of sustainability, allowing periodic evaluations of ecotourism impacts on ecosystems<sup>46</sup>). Finally, digital information access forms the basis for transparency and effective interaction among managers, visitors, and local communities, enriching the experience and understanding of all relevant parties<sup>47</sup>). Overall, these variables interact and support each other, forming a solid foundation for sustainable and positively impactful management of CMC Tiga Warna ecotourism.

The key management variables for CMC Tiga Warna Ecotourism include environmental order integrity, job opportunities and employment prospects, scaling up business, availability of facilities and infrastructure, authority and responsibility, conservation-supporting activities, existence of mentoring, and technology mastery.

The key variables in managing CMC Tiga Warna Ecotourism involve factors that support sustainability, growth, and positive impacts on the environment and local communities. Firstly, environmental order integrity is a key variable as it reflects a commitment to maintaining ecosystem sustainability and minimizing negative impacts<sup>48</sup>). Job opportunities and employment prospects are key variables because ecotourism has the potential to

be a livelihood source for local communities, providing sustainable economic benefits<sup>49,50</sup>). Scaling up business reflects aspirations to increase the scale of ecotourism operations, creating broader economic growth opportunities<sup>51,52</sup>). Availability of facilities and infrastructure is an important variable to ensure visitors can enjoy tourism experiences safely and comfortably<sup>53,54</sup>). Authority and responsibility encompass the division of roles and responsibilities among stakeholders involved in management, determining effective coordination and transparency<sup>55</sup>). Conservation-supporting activities are key variables because they support conservation efforts and ecosystem restoration<sup>56</sup>). The existence of mentoring is an essential element in building local community capacity, providing support to ensure their sustained involvement<sup>3,57</sup>). Technology mastery reflects the need to leverage innovation and technological solutions in ecotourism management and marketing<sup>58</sup>). Overall, these variables complement each other, forming a strong foundation for sustainable, inclusive, and positively impactful management of CMC Tiga Warna Ecotourism.

The output variables for managing CMC Tiga Warna Ecotourism include maintaining environmental conditions, economic evaluation, reducing social conflicts, policy synergy, management database, role of institutional groups, and nature preservation. Output variables in managing CMC Tiga Warna Ecotourism reflect desired outcomes from ecotourism management efforts. Firstly, maintaining environmental conditions is a key output variable that indicates success in protecting and maintaining the sustainability of natural ecosystems in the ecotourism area<sup>59</sup>). Economic evaluation is an important output variable as it reflects the positive impact of ecotourism on local economic growth, job creation, and increased income for local communities<sup>49,60</sup>). Reducing social conflicts includes successful management efforts to minimize tension or disputes that may arise between managers, visitors, and local communities<sup>61,62</sup>). Policy synergy is an output variable that reflects the alignment and coherence of policies among all stakeholders involved in ecotourism management<sup>63</sup>). Management database includes the results of systematic data and information collection to support effective decision-making and evidence-based management<sup>64</sup>). The role of institutional groups reflects the involvement and positive contributions of institutional groups in ecotourism management<sup>65</sup>). Lastly, nature preservation encompasses success in maintaining the authenticity and sustainability of nature around the ecotourism area<sup>66</sup>). Overall, these output variables serve as indicators of success and positive impacts of managing CMC Tiga Warna Ecotourism on surrounding sustainability dimensions.

The excluded variable for managing CMC Tiga Warna Ecotourism is tourist attraction. This variable indicates that this element does not have a significant influence on the success of the management system. The fact that this variable is in quadrant IV, indicating low influence and



mentoring existence, and policy synergy show relatively strong dependency on other variables. This indicates that the success of these variables is closely related to other factors within the ecotourism management system. On the other hand, variables such as scaling up business, improvement of access, conservation-supporting activities, authority and responsibility, environmental order integration, coordination patterns, and governance system improvement have a strong indirect influence on other variables<sup>17,73,74</sup>. This means that changes or improvements in these variables can induce changes in other factors within the system, albeit indirectly.

Another interesting finding is that environmental order integration has a very strong influence on job opportunities and employment prospects. This indicates that conservation and environmental preservation efforts can have a significant positive impact on job creation and economic opportunities around the ecotourism area<sup>40,75,76</sup>. Overall, understanding the indirect dependency of

variables is crucial in designing comprehensive ecotourism management policies and strategies, ensuring that each variable can contribute optimally to the sustainability and success of the management system. Changes in variable rankings based on influence and dependency<sup>77</sup>. These changes depict the ranking position of variables in the initial condition (MDI matrix/Matrix Direct of Influence) and after Boolean iteration with MDII (Matrix Direct and Indirect of Influence).

### 5.3 Displacement Map Variables

Displacement map is the change in the position of variable quadrants, indicating the shift of variables from the initial position to the final position after considering indirect influences<sup>78</sup>. The following is the displacement map between variables from direct to indirect effects (Fig. 8):

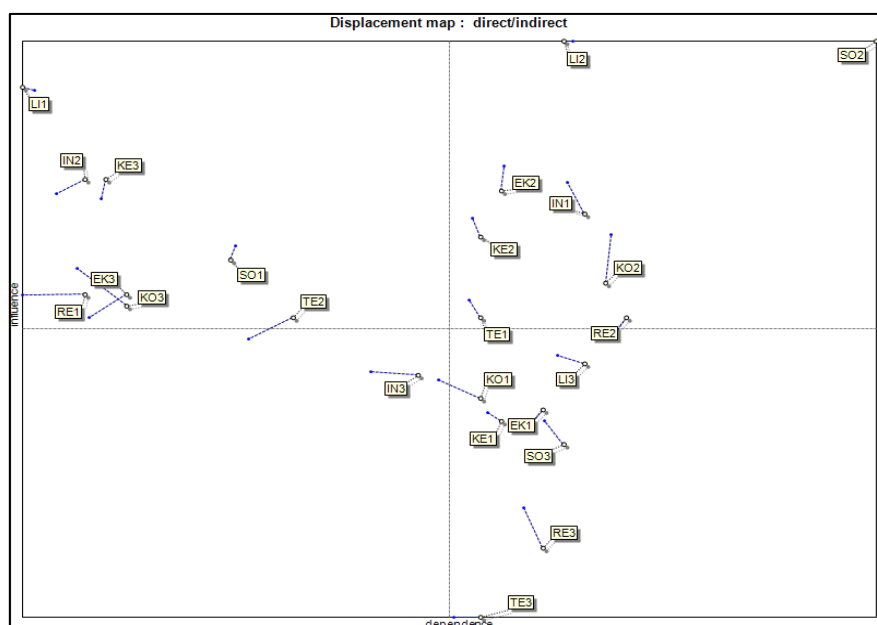


Fig. 8: Management Variable Displacement Map

The research results regarding the displacement map of management variables in CMC Tiga Warna Ecotourism show quadrant changes in two specific variables, namely digital information access (TE2) and conservation area quality monitoring (KO3). The digital information access variable (TE2) initially falls within the input variable quadrant but undergoes a quadrant shift to the exclude variable. This indicates that digital information access has a relatively small or insignificant impact on other variables in the context of ecotourism management. Therefore, this variable is considered to have a relatively minor role in shaping the success of the management system and is placed in the exclude variable<sup>12</sup>. Digital information access (TE2) in the context of CMC Tiga Warna Ecotourism management is considered to have a relatively small or insignificant impact on other variables

in the management system. This can be understood from several aspects. First, the direct influence of digital information access on key variables in ecotourism management is limited. In this context, digital information may not substantially contribute to policy development or strategic decision-making that affects ecotourism sustainability<sup>57</sup>. Additionally, the level of dependence of digital information access on other variables is low. In the displacement map, variables with low dependence or minimal influence tend to be placed in the exclude variable. This may indicate that in the system analysis, the management of CMC Tiga Warna Ecotourism may not heavily rely on digital information access aspects to achieve sustainability or operational success<sup>62</sup>.

Meanwhile, the conservation area quality monitoring variable (KO3) initially falls within the output variable

quadrant but undergoes a quadrant shift to the exclude variable. This change can be interpreted that, although monitoring the quality of conservation areas is important for achieving preservation and sustainability goals, in this analysis context, this variable is considered to have an insignificant impact or low dependence on other variables<sup>79)</sup>. Therefore, conservation area quality monitoring is placed in the exclude variable. The displacement of the conservation area quality monitoring variable (KO3) in the displacement map may reflect a thorough evaluation of its role in the context of managing CMC Tiga Warna Ecotourism. Initially placed in the output variable, conservation area quality monitoring is considered to have desired impacts and positive contributions to ecotourism management outcomes. However, this shift is likely caused by several considerations.

Firstly, there is the finding that conservation area quality monitoring has low dependence on other variables in the management system. In other words, the results of this monitoring may not significantly influence overall performance or ecotourism sustainability<sup>20)</sup>. Therefore, placement in the exclude variable may reflect a decision to highlight other factors considered more strategic or important. Additionally, there are considerations of efficiency or effectiveness in management. If monitoring the quality of conservation areas is deemed to have a less significant impact on decision-making or performance improvement<sup>50)</sup>, then the variable is considered less relevant and placed in the exclude variable.

Changes in environmental dynamics or policy changes can also play a role in this shift. If there are changes in management policies or changes in environmental factors affecting quality monitoring, this can influence the placement of variables in the displacement map<sup>28,32)</sup>. Understanding these shifts in the displacement map provides important insights to managers and decision-makers. This can guide in determining management priorities, identifying variables requiring greater focus, and adjusting strategies to enhance sustainability in the CMC Tiga Warna Ecotourism area.

#### 5.4 Implications

The implications of this research indicate that in managing CMC Tiga Warna Ecotourism, there needs to be greater emphasis on variables that directly impact the sustainability and success of the management system. Variables such as law enforcement and regulations, conservation quality monitoring, and job opportunities and employment prospects are top priorities in efforts to enhance management sustainability. Therefore, greater efforts are needed in enforcing strict law enforcement, intensive conservation quality monitoring, and job opportunity enhancements as key drivers in maintaining the sustainability of the management system. On the other hand, the complexity of inter-variable relationships also emphasizes the importance of understanding indirect

variable dependencies. Variables such as technology mastery, policy synergy, mentoring, management database, and information access show a very strong dependency on other variables. This indicates the need for a holistic approach in designing policies and management strategies, ensuring that each variable can contribute optimally to the sustainability and success of the management system. Additionally, strong environmental order integration highlights the significant potential of environmental preservation efforts in creating job opportunities and economic prospects around the ecotourism area. Therefore, in designing policies and management strategies, it is important to consider the interaction between these variables and how they can be collectively driven to achieve sustainability and success goals for managing CMC Tiga Warna Ecotourism.

The importance of studying this field lies in providing deep insights into the strategic variables that influence the success of community-based ecotourism management. By identifying and analyzing key variables such as pro-environmental activities, community involvement, and environmental order integrity, this research supports ecological preservation and the socio-economic well-being of local communities. It also offers innovative management approaches that consider the complex interactions between various sustainability dimensions, providing practical guidance and evidence-based policy recommendations. The results can assist policymakers and ecotourism practitioners in taking effective priority actions, making ecotourism management more holistic, sustainable, and beneficial for both the environment and the community.

## 6. Conclusions

This study provides critical insights into the management of CMC Tiga Warna ecotourism by identifying and analyzing key variables that impact its success and sustainability. The findings emphasize the importance of pro-environmental activities, community involvement, and improved access to ecotourism areas as foundational elements for effective management. Key variables such as environmental order integrity and job opportunities directly support sustainability and positive community impacts, while output variables like economic evaluation and maintaining environmental conditions serve as success indicators. Conversely, variables like tourist attractions were found to be less significant, suggesting a need to prioritize more influential factors. The study also reveals that law enforcement, conservation quality monitoring, and job opportunities have substantial direct effects on other variables, highlighting the importance of these areas for policy and management focus. Understanding the complex interdependencies among variables is crucial for developing effective ecotourism management strategies, ultimately contributing to environmental preservation, community welfare, and economic development.

This study has several limitations, including the restriction of data and sample size to CMC Tiga Warna, which may not be generalizable to other ecotourism areas. The use of questionnaires as the primary instrument may also affect the results due to potential respondent bias. For future research, it is recommended to expand the study area to various ecotourism locations, use mixed-method approaches, conduct longitudinal studies, and involve interdisciplinary collaboration. Additionally, more comprehensive analysis and the implementation and empirical evaluation of policies can enhance the relevance and impact of the research in sustainable ecotourism management.

### References

- 1) W. Wang, L. Feng, T. Zheng, and Y. Liu, "The sustainability of ecotourism stakeholders in ecologically fragile areas: implications for cleaner production," *J. Clean. Prod.*, **279** 123606 (2021). doi:10.1016/j.jclepro.2020.123606.
- 2) H.H. Adinugraha, I.F.A. Nasution, F. Faisal, M. Daulay, I. Harahap, T. Wildan, M. Takhim, A. Riyadi, and A. Purwanto, "Halal tourism in indonesia: an indonesian council of ulama national sharia board fatwa perspective," *J. Asian Financ. Econ. Bus.*, **8** (3) 665–673 (2021). doi:10.13106/jafeb.2021.vol8.no3.0665.
- 3) A. Wondirad, D. Tolkach, and B. King, "Stakeholder collaboration as a major factor for sustainable ecotourism development in developing countries," *Tour. Manag.*, **78** (November 2018) 104024 (2020). doi:10.1016/j.tourman.2019.104024.
- 4) J. Brooks, K.A. Waylen, and M.B. Mulder, "Assessing community-based conservation projects: a systematic review and multilevel analysis of attitudinal, behavioral, ecological, and economic outcomes," *Environ. Evid.*, **2** (1) 1–34 (2013). doi:10.1186/2047-2382-2-2.
- 5) A. Eryan, A. Marbun, A.A. Nugroho, G. Jane, M.M. Handayani, N. Qomariyah, Nuruliawati, R. Fajrini, and S.H. Safira, "Arah Baru Kebijakan Penegakan Hukum Konservasi Sumber Daya Alam hayati dan Ekosistemnya," 1st ed., Indonesian Center for Environmental Law (ICEL), Jakarta, 2019.
- 6) L.P. Sudini, and M. Wiryani, "Juridical analysis of local government authority on the establishment local regulations eco-tourism development," *Diponegoro Law Rev.*, **7** (1) 53–69 (2022). doi:10.14710/dilrev.7.1.2022.53-69.
- 7) C. Yuliaty, N. Kurniasari, R. Triyanti, and A. Zulham, "Stakeholders role in economy creative development of maritime culture in alor regency," *IOP Conf. Ser. Earth Environ. Sci.*, **744** (1) 0–8 (2021). doi:10.1088/1755-1315/744/1/012107.
- 8) Y.E. Choi, C.O. Oh, and J. Chon, "Applying the resilience principles for sustainable ecotourism development: a case study of the nakdong estuary, south korea," *Tour. Manag.*, **83** (October 2020) 104237 (2021). doi:10.1016/j.tourman.2020.104237.
- 9) M.L. Tseng, C. Lin, C.W. Remen Lin, K.J. Wu, and T. Sriphon, "Ecotourism development in thailand: community participation leads to the value of attractions using linguistic preferences," *J. Clean. Prod.*, **231** (1) 1319–1329 (2019). doi:10.1016/j.jclepro.2019.05.305.
- 10) E. Mondino, and T. Beery, "Ecotourism as a learning tool for sustainable development. the case of monviso transboundary biosphere reserve, italy," *J. Ecotourism*, **18** (2) 107–121 (2019). doi:10.1080/14724049.2018.1462371.
- 11) S. Khanra, A. Dhir, P. Kaur, and M. Mäntymäki, "Bibliometric analysis and literature review of ecotourism: toward sustainable development," *Tour. Manag. Perspect.*, **37** (1) 1–15 (2021). doi:10.1016/j.tmp.2020.100777.
- 12) S. Choudhary, A. Sharma, K. Srivastava, H. Purohit, and M. Vats, "Read range optimization of low frequency rfid system in hostile environmental conditions by using rsm approach," *Evergreen*, **7** (3) 396–403 (2020). doi:10.5109/4068619.
- 13) Kementerian Pariwisata Dan Ekonomi Kreatif Republik Indonesia, "Pariwisata Indonesia," 1st ed., Badan Pariwisata Dan Ekonomi Kreatif Republik Indonesia, Jakarta, 2022.
- 14) H. Job, S. Becken, and B. Lane, "Protected areas in a neoliberal world and the role of tourism in supporting conservation and sustainable development: an assessment of strategic planning, zoning, impact monitoring, and tourism management at natural world heritage sites," *J. Sustain. Tour.*, **25** (12) 1697–1718 (2017). doi:10.1080/09669582.2017.1377432.
- 15) M. Hultman, A. Kazemina, and V. Ghasemi, "Intention to visit and willingness to pay premium for ecotourism: the impact of attitude, materialism, and motivation," *J. Bus. Res.*, **68** (9) 1854–1861 (2015). doi:10.1016/j.jbusres.2015.01.013.
- 16) R. Tiarantika, Soemarno, A. Efani, and Koderi, "Developing a decision support system for sustainable management of community-based ecotourism: a case study of cmc tiga warna," *Int. J. Sustain. Dev. Plan.*, **19** (6) 2205–2219 (2024). doi:10.18280/ijdsdp.190620.
- 17) H. Riniwati, N. Harahab, and Z. Abidin, "A vulnerability analysis of coral reefs in coastal ecotourism areas for conservation management," *Diversity*, **11** (7) 1–15 (2019). doi:10.3390/d11070107.
- 18) Sukuryadi, N. Harahab, M. Primyastanto, and B. Semedi, "Collaborative - based mangrove ecosystem management model for the development of marine ecotourism in lembar bali," *Environ. Dev. Sustain.*, **23** (5) 6838–6868 (2021). doi:10.1007/s10668-020-00895-8.

- 19) A.T. Nugraha, G. Prayitno, A.W. Hasyim, and F. Roziqin, "Social capital, collective action, and the development of agritourism for sustainable agriculture in rural indonesia," *Evergreen*, **8** (1) 1–12 (2021). doi:10.5109/4372255.
- 20) M.A. Berawi, V. Basten, Y. Latief, and I. Crévits, "Development system on integrated regional building permit policy to enhance green building life cycle achievement," *Evergreen*, **7** (2) 240–245 (2020). doi:10.5109/4055226.
- 21) R. Andhika, and Y. Latief, "Conceptual framework of development of quality culture in indonesian construction company," *Evergreen*, **7** (1) 144–149 (2020). doi:10.5109/2740971.
- 22) C. Smallman, and K. Moore, "Process studies of tourist," *Ann. Tour. Res.*, **37** (2) 397–422 (2010). doi:10.1016/j.annals.2009.10.014.
- 23) R. Tiarantika, Soemarno, A. Efani, and Koderi, "Exploring the sustainable status of community-based ecotourism in east java, indonesia: a comprehensive assessment," *Egypt. J. Aquat. Biol. Fish.*, **28** (3) 585–607 (2024). doi:10.21608/ejabf.2024.358887.
- 24) A. Isdianto, F. Adibah, M.F. Haykal, M.J. Irsyad, I.M. Asyari, and S. Supriyadi, "Indeks kerentanan pesisir ditinjau dari geomorfologi, elevasi, dan ancaman gelombang untuk mewujudkan ketahanan ekosistem pesisir," *Jukung (Jurnal Tek. Lingkungan)*, **8** (2) 69–80 (2022). doi:10.20527/jukung.v8i2.14912.
- 25) P. Pornprasit, and S. Rurkkhum, "Performance evaluation of community-based ecotourism: a case study in satun province, thailand," *J. Ecotourism*, **18** (1) 42–59 (2019). doi:10.1080/14724049.2017.1379529.
- 26) M. Godet, "The art of scenarios and strategic planning: tools and pitfalls," *Technol. Forecast. Soc. Change*, **65** (1) (2000). doi:10.1016/s0040-1625(99)00120-1.
- 27) M. del M. Delgado-Serrano, P. Vanwildemeersch, S. London, C.E. Ortiz-Guerrero, R.E. Semerena, and M. Rojas, "Adapting prospective structural analysis to strengthen sustainable management and capacity building in community-based natural resource management contexts," *Ecol. Soc.*, **21** (2) 1–13 (2016). doi:10.5751/ES-08505-210236.
- 28) J.K. Chen, "An extension of importance-performance analysis method: integrated with fuzzy micmac," *Int. J. Serv. Oper. Informatics*, **9** (1) 83–99 (2018). doi:10.1504/IJSOI.2018.088518.
- 29) M.R. Díaz, and T.F. Espino-Rodríguez, "Determining the sustainability factors and performance of a tourism destination from the stakeholders' perspective," *Sustainability*, **8** (9) 1–12 (2016). doi:10.3390/su8090951.
- 30) D.B. Wiyanto, N. Harahab, Rudianto, and A. Sartimbul, "Cultural heritage conservation of 'the united state army transport (usat) liberty' shipwreck site as a sustainable scuba diving ecotourism," *Int. J. Conserv. Sci.*, **11** (4) 931–944 (2020). doi:10.931-944/cbl.5327637.
- 31) N. Ariyani, and A. Fauzi, "Analisis tipologi variabel strategis pada pengembangan kawasan ekowisata kedung ombo," *J. Wil. Dan Lingkungan*, **7** (3) 196–207 (2019). doi:10.14710/jwl.7.3.196-207.
- 32) M. Nematpour, M. Khodadadi, and N. Rezaei, "Systematic analysis of development in iran's tourism market in the form of future study: a new method of strategic planning," *Futures*, **125** (April 2020) 102650 (2021). doi:10.1016/j.futures.2020.102650.
- 33) P.N. Sadikin, S. Mulatsih, B. Pramudya, and H.S. Arifin, "Dynamic model of ecotourism management in mount rinjani national park," *IOP Conf. Ser. Earth Environ. Sci.*, **399** (1) 1–10 (2019). doi:10.1088/1755-1315/399/1/012041.
- 34) M.S. Lola, M.F. Hussin, I.M. Yusoff, M.N.A. Ramlee, S.H. Isa, A.A. Kamil, N.Z. A. Khadar, and M.T. Abdullah, "A system dynamic model for sustainable ecotourism in tasik kenyer, terengganu, malaysia," *Preprints*, **1** (2) 1–13 (2017). doi:10.20944/preprints201702.0005.v1.
- 35) C. Çetinkaya, M. Kabak, M. Erbaş, and E. Özceylan, "Evaluation of ecotourism sites: a gis-based multi-criteria decision analysis," *Kybernetes*, **47** (8) 1664–1686 (2018). doi:10.1108/K-10-2017-0392.
- 36) M. Fattah, C. Adiintyas, and T.N. Utami, "Sustainability Management Evaluations of Bee Jay Bakau Resort in Probolinggo Using Multi Dimensional Scaling Rapeco Tourism Approach," in: *Eco. Env. Cons*, 2021: pp. 135–14. doi:10.135140/eec0971.
- 37) A.S. Hutomo, and A.H. Fuad, "Engagement and well-being in public space. case study: suropati park jakarta," *Evergreen*, **7** (1) 138–143 (2020). doi:10.5109/2740970.
- 38) H. Tang, Z. Liu, and X. Long, "Analyzing the farmers' pro-environmental behavior intention and their rural tourism livelihood in tourist village where its ecological environment is polluted," *PLoS One*, **16** (3) 1–23 (2021). doi:10.1371/journal.pone.0247407.
- 39) M. Arif, H.M. Behzad, M. Tahir, and C. Li, "The impact of ecotourism nn ecosystem functioning along main rivers and tributaries: implications for management and policy changes," *J. Environ. Manage.*, **320** (July) 115849 (2022). doi:10.1016/j.jenvman.2022.115849.
- 40) T. Kiper, "Role of ecotourism in sustainable development," *Imtech*, **1** (1) 1–30 (2013). doi:10.5772/55749.
- 41) G. Jin, X. Deng, X. Chu, Z. Li, and Y. Wang, "Optimization of land-use management for ecosystem service improvement: a review," *Phys. Chem. Earth*, **101** (1) 70–77 (2017). doi:10.1016/j.pce.2017.03.003.



- 42) S. Khalid, M.S. Ahmad, T. Ramayah, J. Hwang, and I. Kim, "Community empowerment and sustainable tourism development: the mediating role of community support for tourism," *Sustainability*, **11** (1) 1–14 (2019). doi:10.3390/su11226248.
- 43) B. Shahriari, A. Hassanpoor, A. Navehebrahim, and S.J. Inia, "Designing a green human resource management model at university environments: case of universities in tehran," *Evergreen*, **7** (3) 336–350 (2020). doi:10.5109/4068612.
- 44) Z. Baynham-herd, S. Redpath, N. Bunnefeld, T. Molony, and A. Keane, "Conservation conflicts: behavioural threats, frames, and intervention recommendations," *Biol. Conserv.*, **222** (January) 180–188 (2018). doi:10.1016/j.biocon.2018.04.012.
- 45) S. Fadhila, and Y.N. Lukito, "Surveillance and architecture, analyzing the idea of eyes on the street," *Evergreen*, **7** (1) 132–137 (2020). doi:10.5109/2740980.
- 46) S.O. Oladeji, D.O. Awolala, and O.I. Alabi, "Evaluation of sustainable ecotourism practices in oke - idanre," *Environ. Dev. Sustain.*, **24** (2) 2656–2684 (2022). doi:10.1007/s10668-021-01550-6.
- 47) L. Errichiello, and R. Micera, "A process-based perspective of smart tourism destination governance," *Eur. J. Tour. Res.*, **29** (2909) 1–26 (2021). doi:10.54055/ejtr.v29i.2436.
- 48) C. Wijethilake, "Effects of top management commitment and stakeholder pressure sustainability core values and sustainability risk management: moderating effects of top management commitment and stakeholder pressure," *Bus. Strateg. Environ.*, **29** (1) 143–154 (2018). doi:10.1002/bse.2245.
- 49) M. Kim, and Y. Xie, "Sustainable transformative economy: community-based ecotourism," *Sustainability*, **11** (1) 1–15 (2019). doi:10.3390/su11184977.
- 50) H. Nurmaraya, and Y.N. Lukito, "A place to remember: the erasure of pasar johar's collective memory," *Evergreen*, **7** (1) 72–78 (2020). doi:10.5109/2740950.
- 51) A. Lebdioui, and G.B. Shaw, "Nature-inspired innovation policy: biomimicry as a pathway to leverage biodiversity for economic development," *Ecol. Econ.*, **202** (January) 107585 (2022). doi:10.1016/j.ecolecon.2022.107585.
- 52) D. Macqueen, A. Bolin, M. Greijmans, S. Grouwels, and S. Humphries, "Innovations towards prosperity emerging in locally controlled forest business models and prospects for scaling up," *World Dev.*, **125** 104382 (2020). doi:10.1016/j.worlddev.2018.08.004.
- 53) D.Y. Dalimunthe, D. Valeriani, and R.S. Wardhani, "The readiness of supporting infrastructure for tourism destination in achieving sustainable tourism development," *Society*, **8** (1) 217–233 (2020). doi:10.33019/society.v8i1.149.
- 54) A.U. Putri, and E. Ellisa, "Reclaiming residual spaces in urban life: the act of occupancy beneath pedestrian bridges in jakarta," *Evergreen*, **7** (1) 126–131 (2020). doi:10.5109/2740969.
- 55) J. Gan, V. Nair, and A. Hamzah, "The critical role of a lead institution in ecotourism management: a case of dual governance in belum- temengor, malaysia," *J. Policy Res. Tour. Leis. Events*, **1** (1) 1–19 (2018). doi:10.1080/19407963.2018.1516076.
- 56) M.A. Vanderklift, R. Marcos-martinez, J.R.A. Butler, M. Coleman, A. Lawrence, H. Prislán, A.D.L. Steven, and S. Thomas, "Constraints and opportunities for market-based finance for the restoration and protection of blue carbon ecosystems," *Mar. Policy*, **107** (January) 103429 (2019). doi:10.1016/j.marpol.2019.02.001.
- 57) K. Sujatha, N.P.G. Bhavani, V.S. George, T.K. Reddy, N. Kanya, and A. Ganesan, "Innovation in agriculture industry by automated sorting of rice grains," *Evergreen*, **10** (1) 283–288 (2023). doi:10.5109/6781076.
- 58) A.S. Osipchuk, O. V Skydan, N. V Valinkevych, S. V Tyshchenko, and A.O. Lunov, "Innovative ecotourism product development based on the use of geographic information technologies," *J. Geol. Geogr. Geoecology*, **32** (1) 164–177 (2023). doi:10.15421/112316.
- 59) Q. Bakhsh, B. Syed, N. Shah, N. Iqbal, M. Sheeraz, and M. Asadullah, "Impact of tourism development upon environmental sustainability: a suggested framework for sustainable ecotourism," *Environ. Sci. Pollut. Res.*, **30** (1) 5917–5930 (2023). doi:10.1007/s11356-022-22496-w.
- 60) A. Efani, A. Muntaha, R.A. Lestariadi, and E.Y.W. Tirta, "Does Financing Source Affect Productivity and Efficiency in Tuna Fishing Business?," in: Model. Econ. Growth Contemp. Indones., Emerald Publishing Limited, 2022: pp. 237–252. doi:10.1108/978-1-80262-431-120221015.
- 61) B. Ratner, C. Burnley, S. Mugisha, E. Madzudzo, I. Oeur, K. Mam, L. Rüttinger, L. Chilufya, P. Adriázola, B. Ratner, C. Burnley, S. Mugisha, E. Madzudzo, K. Mam, L. Rüttinger, L. Chilufya, and P. Adriázola, "Development in practice investing in multi-stakeholder dialogue to address natural resource competition and conflict," *Dev. Pract. ISSN*, **28** (6) 799–812 (2018). doi:10.1080/09614524.2018.1478950.
- 62) N.A. Pambudi, V.S. Pramudita, M.K. Biddinika, and S. Jalilinasrabad, "So close yet so far - how people in the vicinity of potential sites respond to geothermal energy power generation: an evidence from indonesia," *Evergreen*, **9** (1) 1–9 (2022). doi:10.5109/4774210.
- 63) G.L. Kyriakopoulos, I. Sebos, E. Triantafyllou, D. Stamopoulos, and P. Dimas, "Benefits and synergies in addressing climate change via the implementation of the common agricultural policy in greece," *Appl.*

- Sci.*, **13** (1) 2–33 (2023). doi:10.3390/app13042216.
- 64) K. Swangjang, and P. Kornpiphat, “Does ecotourism in a mangrove area at klong kone , thailand , conform to sustainable tourism ? a case study using swot and dpsir,” *Environ. Dev. Sustain.*, **23** (11) 15960–15985 (2021). doi:10.1007/s10668-021-01313-3.
- 65) H. Moreno-Mendoza, A. Santana-Talavera, and C.J. León, “Stakeholders of cultural heritage as responsible institutional tourism product management agents,” *Sustainability*, **11** (1) 1–14 (2019). doi:10.3390/su11195192.
- 66) S. Admasu, “Ecotourism as a tool to substantially funding conservation endeavors in ethiopia,” *J. Tour. Hosp.*, **9** (3) 432 (2020). doi:10.35248/2167-0269.20.9.432.
- 67) L. Dwyer, D. Edwards, N. Mistilis, C. Roman, and N. Scott, “Destination and enterprise management for a tourism future,” *Tour. Manag.*, **30** (1) 63–74 (2020). doi:10.1016/j.tourman.2008.04.002.
- 68) S. Gössling, D. Scott, and C.M. Hall, “Pandemics, tourism and global change: a rapid assessment of covid-19,” *J. Sustain. Tour.*, **29** (1) 1–20 (2021). doi:10.1080/09669582.2020.1758708.
- 69) M.S. Islam, K.M.A. Kabir, M.S. Islam, and B.B. Saha, “The perception of consumers towards microalgae as an alternative food resource in bangladesh: a contingent valuation approach,” *Evergreen*, **10** (1) 1–17 (2023). doi:10.5109/6781028.
- 70) R. Samal, and M. Dash, “Ecotourism, biodiversity conservation and livelihoods: understanding the convergence and divergence,” *Int. J. Geoheritage Park.*, **11** (1) 1–20 (2023). doi:10.1016/j.ijgeop.2022.11.001.
- 71) I. Nugroho, F.H. Pramukanto, P.D. Negara, W. Purnomowati, and W. Wulandari, “Promoting the rural development through the ecotourism activities in indonesia,” *Am. J. Tour. Manag.*, **5** (1) 9–18 (2016). doi:10.6084/m9.figshare.6265169.
- 72) S. Xu, L. Mingzhu, N. Bu, and S. Pan, “Regulatory frameworks for ecotourism: an application of total relationship flow management theorems,” *Tour. Manag.*, **61** (1) 321–330 (2017). doi:10.1016/j.tourman.2017.02.012.
- 73) A. Boumaour, S. Grimes, L. Brigand, and M. Larid, “Integration process and stakeholders’ interactions analysis around a protection project: case of the national park of gouraya, algeria (south-western mediterranean),” *Ocean Coast. Manag.*, **153** (August 2017) 215–230 (2018). doi:10.1016/j.ocecoaman.2017.12.031.
- 74) S. Feng, R. Zhang, and G. Li, “Environmental decentralization, digital finance and green technology innovation,” *Struct. Chang. Econ. Dyn.*, **61** (1) 70–83 (2022). doi:10.1016/j.strueco.2022.02.008.
- 75) K.C. Anup, K. Rijal, and R.P. Sapkota, “Role of ecotourism in environmental conservation and socioeconomic development in annapurna conservation area, nepal,” *Int. J. Sustain. Dev. World Ecol.*, **22** (3) 251–258 (2015). doi:10.1080/13504509.2015.1005721.
- 76) C.A. Hunt, W.H. Durham, L. Driscoll, and M. Honey, “Can ecotourism deliver real economic, social, and environmental benefits? a study of the osa peninsula, costa rica,” *J. Sustain. Tour.*, **23** (3) 339–357 (2015). doi:10.1080/09669582.2014.965176.
- 77) W.N. Putra, M.I. Adha Widjana, M. Anis, and Y. Prasetyo, “The effect of transformation temperature and holding time of bainite structure formation on s45c steel,” *Evergreen*, **9** (4) 1218–1223 (2022). doi:10.5109/6625732.
- 78) A. Fauzi, “Teknik Analisis Berkelanjutan,” 1st ed., Gramedia Pustaka Utama, Jakarta, 2019.
- 79) G. Prabakaran, D. Vaithyanathan, and H. Kumar, “Fuzzy decision support system for the outbreak of covid-19 and improving the people livelihood,” *Evergreen*, **8** (1) 36–43 (2021). doi:10.5109/4372258.