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Article

Evaluating rural tourism competitiveness: Application of PROMETHEE-GAIA method

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DEVELOPMENT ECONOMICS | RESEARCH ARTICLE

Evaluating rural tourism competitiveness: Application of PROMETHEE-GAIA method

Esther Sri Astuti Soeryaningrum Agustin^{1*}, Rina Martini² and Budi Setiyono²

Abstract: This study aims to analyze the factors that determine rural tourism competitiveness in Indonesia, measure the tourism competitiveness in each rural tourism, and discover the gap between rural tourism in four provinces. This study adopts the Travel and Tourism Competitiveness Report (TTCR) Model from the World Economic Forum, and we develop the combination between the PROMETHEE method and GAIA plane. This study finds that Giri Emas is rural tourism with the highest score of competitiveness index compared to others. Generally, the tourism sector potential in Indonesia is great and must be developed with additional sense of policy to have a better performance. Stakeholders need to give attention to the Health and Hygiene sub-pillar to be ready during pandemic and post-pandemic. This study encourages policymakers to develop an appropriate strategy that can make the performance of the tourism sector better. Managerial implications are that rural tourism needs to approach various aspects other than the tourist attraction factors. Policymakers should give priority to health facilities and capacities as part of the pandemic response. This study measures the tourism competitiveness of villages with semi-structured interviews and questionnaires. Therefore, it will portray a more detail tourism in Indonesia.

Subjects: Statistics for Social Sciences; Hospitality; Tourism; Economics

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PUBLIC INTEREST STATEMENT

Our research is motivated by the lack of case studies of tourism competitiveness at the rural level especially in developing countries. We, therefore, analyze the competitiveness in 17 tourist villages in Sumatra (Aceh), Java (Central Java), Bali, and Sulawesi (North Sulawesi) in 2020 by adopting the Travel and Tourism Competitiveness Report (TTCR) Model from the World Economic Forum and we develop the combination between the PROMETHEE method and GAIA plane. The main challenge was that we had fieldwork during the COVID-19 pandemic.

As we did the research in the pandemic situation, we have an interesting finding that stakeholders should give attention to the Health and Hygiene sub-pillar to be ready during pandemic and post-pandemic. This study encourages policymakers to develop an appropriate strategy that can make the performance of the tourism sector better. We hope that this research can become a pioneer for the competitiveness of tourist villages and enrich the tourism literature.

Keywords: Competitiveness; index; tourism; rural; village; PROMETHEE; gaia plane

1. Introduction

In a decade, tourism has transformed to be one of the major industries in the world. The recent increase in the tourism development and the growth in disposable income have affected individuals to spend more on travel and tourism itineraries (Kumar & Dhir, 2020). Tourism has a significant role in the expansion of economy, particularly for developing countries, since it becomes an avenue for growth, sources of foreign earnings, and an essential component of export diversification (Andrades & Dimanche, 2017; Goffi et al., 2019). The success of tourist destinations depends on tourism competitiveness (Di Betta & Amenta, 2012; Borseková et al., 2017; Cracolici & Nijkamp, 2009; Kulyk & Brelik, 2019; Sadq et al., 2019). It becomes a prerequisite for the sustainable tourism development of a region or country in a competitive market (Andrades-Caldito et al., 2013). A tourist destination is no longer seen as a distinct and unique natural, cultural, artistic, or environmental resource but as an attractive product with complex and integrated services that provide holiday experiences for tourists (Kulyk & Brelik, 2019). The purpose of travel is to create a competitive advantage in order to attract more tourists that has created strong competition in the travel and tourism industry. Therefore, it is important for tourism stakeholders, especially government and business, to identify the factors that determine the competitiveness of tourism in order to match the available resources and management strategies and create value for tourists (Michael et al., 2019).

Tourism is one of the potential sectors in Indonesia. The international tourism receipts in Indonesia amounted to around 12.2 million to 16 million US dollars between 2009 and 2018 (Statista, 2020). Indonesia has a great potential shown by the number of tourists, which increased from 2018 to 2019 from 14.40 to 14.92 tourism sector contribution to economy from 2006 to 2018 approximately USD 6.03–8.81 trillion, which direct contribution from USD 1.91 to 2.75 trillion in the same period. According to the Travel & Tourism Index, the position of Indonesia has increased to 40 with a score of 4.3 in 2019 (World Economic Forum, 2019).

In March 2020, a large-scale Coronavirus Disease 2019 (COVID-19) from China that immediately spread across the world was declared as a primary public health of international concern and a global pandemic by the World Health Organization (WHO). Strict regulations to halt the virus transmission through closure of access to borders of countries had made people reluctant or unable to travel (Sun et al., 2020). A significant decrease in human and community mobility also affects the tourism industry (Uğur & Akbiyik, 2020; Yang et al., 2020). The COVID-19 outbreak and high risks of future pandemics have created new tourism development challenges that require insights for the strengthening of competitiveness of tourism destinations (Streimikiene et al., 2021).

However, there is difficulty in defining and specifying the concept of tourism competitiveness because of the broad dimensions (Salinas Fernández et al., 2020). Currently, there are many proposals for defining and measuring their level of competitiveness to evaluate tourism competitiveness because these measures can contribute to planning and allocating priority resources for the tourism sector (Barbosa et al., 2010; Mazanec et al., 2007). Tourism competitiveness can be evaluated from a quantitative perspective by analyzing data from secondary sources or by gathering qualitative information from surveys of tourists, tourism agents, or experts in the sector (Kozak & Rimmington, 1999).

Therefore, this study aims to reshape the competitiveness of rural tourism impacted by the pandemic, particularly villages in Aceh, Bali, Central Java, and North Sulawesi as the main tourist destinations in Indonesia using the Tourism Competitiveness Index (TCI). We also analyze the importance of specific indicators and influential factors that determine the competitiveness of rural tourism in Indonesia. It will be the novelty of research as there is still limited literature discussing tourism competitiveness in the rural level. Besides, the measurement technique is more

comprehensive by using the multi-criteria Preference Ranking Organization Method for Enrichment of Evaluations (PROMETHEE) and Geometrical Analysis for Interactive Assistance (GAIA).

2. Tourism competitiveness in Indonesia

According to Melián-González and García-Falcón (2003), unique resources and capabilities can be a source of sustainable competitive advantage. In addition, when the relevant assets are “rare” (non-homogeneous), it can lead to a competitive advantage. The ability of the destination’s public administration to coordinate the different economic and social agents plays a critical role in tourism (Horng & Tsai, 2012).

In Indonesia, the tourism sector is snowballing. According to Hermawati (2020), the tourism sector is in the top five alongside the oil and gas and coal and palm oil sectors in the Indonesian economy and has a significant contribution of around 90% to people’s welfare through the gross domestic product (GDP). For developing countries, the tourism industry offers an ideal avenue to take advantage of globalization, where it strongly supports poverty reduction and is one of the main contributors to the economic development (Scheyvens, 2007).

To evaluate and rank tourism performance, systematic performance evaluation with mathematical tools is important for decision-making (Ranjan et al., 2016). As competitiveness cannot be measured directly, the literature has used several methods (Croes & Kubickova, 2013). The out-ranking method such as PROMETHEE becomes one of the popular measurements that facilitates pairwise comparisons of alternatives to assign ratings or partial ratings, and it is most often used because of its ease of understanding by decision-makers (Sapkota et al., 2018). Behzadian et al. (2010) describe whether the PROMETHEE-GAIA is used for similar studies elsewhere; what are the advantages of this method for such studies. PROMETHEE has some advantages compared to other multiple-criteria decision-analysis (MCDA) methods such as user friendliness, simplicity of the model strategy, variation of the solution, and implementation. Besides, the GAIA plane provides powerful graphical visualization tools for multi-criteria analysis (Behzadian et al., 2010; J. P. Brans & De Smet, 2016).

3. The conceptual framework of tourism competitiveness

Competitiveness is a concept which has a relationship between environment, territory, and population. According to Krieger Mytelka (1999), competitiveness is the ability to deliver goods and service in a global market. According to the literature, there are two perspectives of competitiveness, namely micro- and macroperspectives. Microperspectives focus more on industry and company, where competitiveness is associated with company’s performance such as creativity, environment, technology advances, knowledge capacity, and human development (Hanafiah & Zulkifly, 2019; Lengnick-Hall & Lengnick-Hall, 2002; Porter, 1990). Meanwhile, macroeconomic perspectives explain that the productivity of a nation depends on political, cultural, social, and economic factors (Hanafiah & Zulkifly, 2019; Kitson et al., 2004).

Next, the competitiveness tourism concept is maximizing the tourism expenditure to attract more tourists (d’Hauteserre, 2000; Hanafiah & Zulkifly, 2019). Moreover, tourism competitiveness according to Dupeyras and Maccallum (2013) is the ability of destination to attract both residential and non-residential tourists to provide an excellent tourism service, innovative and interactive, so that it is able to gain market share in the world by utilizing available resources to encourage tourism so that it is utilized in an efficient and sustainable way. d’Hauteserre (2000) and Hassan (2000) also stated the same ideas that tourism competitiveness is the ability of a destination to maintain and improve the market position.

There are some studies that analyze tourism competitiveness in the tourism sector, and there are three things that can be concluded from the previous studies. First, there are various studies discussing tourism competitiveness (Hanafiah & Zulkifly, 2019; Perna et al., 2018; Stankova & Vasenska, 2017) and commonly the study’s characteristic is the country level (Koc & Altinay,

2007; Rodríguez-Díaz & Pulido-Fernández, 2019). Studies that focus on tourism destination commonly analyze destination performance based on the tourist perception survey on specific destination using attributes such as attraction and shopping facility. Besides, tourism destination performance is assessed by some indicators such as price, quality, sustainability, and positioning on both national and international levels.

Second, researchers measure tourism competitiveness on various models such as the Michael Porter's Diamond of Competitiveness (Curta, 2016; Estevão et al., 2018), the Crouch-Ritchie Model (Mazanec & Ring, 2011; Stankova & Vasenska, 2017), the Dwyer-Kim Model (Perna et al., 2018; Weldearegay, 2017), and the World Economic Forum (Perna et al., 2018; Rodríguez-Díaz & Pulido-Fernández, 2019). Porter explains the advantage of the competitive model of the country. According to Porter, the concept of competitiveness is productivity, where productivity will improve the quality of products and increase the production efficiency. There are six elements that are used to measure tourism competitiveness such as factorial determinants, demand, upstream and downstream industries, the strategy, structure and competition between firms, the government, and the chance. Moreover, the Crouch-Ritchie model consists of seven components that influence the policy perspective in determining the competitiveness of tourism destination. All of the seven components come from external and internal drives, intended to provide guidance so that the Destination Management Organization is responsible in achieving the ultimate goal of destination competitiveness which is to provide a high standard of living for the society (Ritchie & Crouch, 2010). Dwyer and Kim (2003) strengthen the Crouch and Ritchie model where demand condition is a crucial factor to determining destination competitiveness. Dwyer and Kim also stated that destination competitiveness is not an ultimate goal but an intermediate goal to achieve national economic prosperity (Dwyer & Kim, 2003). The fourth model is the Travel and Tourism Competitiveness Report (TTCR) Model from the World Economic Forum. It compares 130 countries in the world by measuring destination competitiveness through factors and policies that generate tourism industry and travel become more attractive (Mazanec & Ring, 2011; Perna et al., 2018).

Our study is intended to analyze tourism competitiveness on the village level. Therefore, it is able to create a more detail picture of tourism in Indonesia. The utilization of the Model World Economic Forum (2019) in this study will be easier to map factors that become enablers and blockers for tourism competitiveness development. By measuring tourism competitiveness on the village level, it will help to identify the strength and weakness of the tourism sector in a nation. Thus, policymakers will gain relevant information to decide which program that must be prioritized to improve tourism sector performance.

4. Research methodology

This study combines the Travel & Tourism Competitiveness Index 2019 from the World Economic Forum (WEF), the PROMETHEE method, and the GAIA plane. Figure 2 explains that indicators are categorized into four main pillars, namely Enabling Environment, T&T Policy and Enabling Conditions, Infrastructure, and Natural and Cultural Resources. Then, the four main pillars are put in detail into sub-pillar, which totalled to 14 pillars. However, we exclude one sub-pillar of the air transport infrastructure because data collected on the level of village where airport commonly is located in the cities, so there are 13 pillars used in this study. Besides, each pillar has an equal weight because we consider it to have the same importance. As shown in Table 1, every main pillar has the same weight (0.25). Besides, the weighting for each pillar is also equal.

We conducted fieldwork in Sumatra (Aceh), Java (Central Java), Bali, and Sulawesi (North Sulawesi) in 2020 when COVID-19 crippled the tourism sector. The choice of survey's areas in four provinces is located on different four Islands in Indonesia to represent the different tourism village destination characteristics in Indonesia. The survey was conducted in 17 tourism villages located in these four provinces. Respondents who were interviewed were 480 respondents in total, which consisted of 135 Aceh people, 140 Balinese, 74 Javanese, and 131 North Sulawesi people. The survey was conducted using the questionnaire which refers to index indicators of Travel &

Table 1. Weights used in the rural competitiveness index in Indonesia

Pillars		Preference	Dimension Weight, %	Weight of the Pillar within a Dimension, %	Implicit Weight of the Pillar, %
Dimension 1: Enabling Environment			25		
A1	Business Environment	Max		20	5
A2	Safety and Security	Max		20	5
A3	Health and Hygiene	Max		20	5
A4	Human Resource and Labor Market	Max		20	5
A5	ICT Readiness	Max		20	5
Dimension 2: T&T Policy and Enabling Conditions			25		
B1	Prioritization T&T	Max		25	6.25
B2	International Openness	Max		25	6.25
B3	Price Competitiveness	Max		25	6.25
B4	Environment Sustainability	Max		25	6.25
Dimension 3: Infrastructure			25		
C1	Ground and Port Transport	Max		50	12.5
C2	Tourist Service Infrastructure	Max		50	12.5
Dimension 4: Natural and Cultural Resources			25		
D1	Natural Resources	Max		50	12.5
D2	Cultural Resources and Business Travel	Max		50	12.5

Table 2. Net flow of tourism destination, source: PROMETHEE II

Rank	Village	Short Name	Province	Net Flow	Positive Flow (φ^+)	Negative Flow (φ^-)
1	Giri Emas	GEM	Bali	0.5313	0.7617	0,2305
2	Kembanglimus	KEM	Central Java	0.5234	0.757	0,2336
3	Sangsit	SAN	Bali	0.4969	0.7484	0,2516
4	Karangrejo	KAR	Central Java	0.3563	0.6609	0,3047
5	Candirejo	CAN	Central Java	0.3375	0.6641	0,3266
6	Kaliurip	KAL	Central Java	0.325	0.6625	0,3375
7	Nusa	NUS	Aceh	0.2359	0.6164	0,3805
8	Kerobakan	KER	Bali	0.0547	0.5273	0,4727
9	Lapang	LAP	Aceh	-0.0313	0.4688	0,5
10	Mantehage	MAN	North Sulawesi	-0.0844	0.4578	0,5422
11	Alungbanua	ALU	North Sulawesi	-0.2047	0.3961	0,6008
12	Suak Indrapuri	IND	Aceh	-0.2656	0.3594	0,625
13	Suak Ribee	RTB	Aceh	-0.2797	0.3602	0,6398
14	Pandanrejo	PAN	Central Java	-0.3875	0.3063	0,6937
15	Ujong Kalak	UJO	Aceh	-0.4141	0.2852	0,6992
16	Meulaboh	MEU	Aceh	-0.5828	0.1906	0,7734
17	Drien Rampak	DRI	Aceh	-0.6109	0.1898	0,8008

Tourism Competitiveness Index 2019. Besides, we conducted semi-structured interviews to obtain more insights and validate information obtained from the questionnaire.

To analyze rural tourism competitiveness, we employ the PROMETHEE method. The PROMETHEE methods were developed by Brans (J.-P. Brans & Mareschal, 1994; J.-P. Brans & Vincke, 1985; J.-P. Brans et al., 1986). In the PROMETHEE method, actions are first compared pairwise on each criterion according to decision-maker preferences, resulting in local scores that are aggregated to global scores, obtaining partial ranking of the alternatives, PROMETHEE I, or complete ranking of the alternatives, PROMETHEE II (Lopes et al., 2018). The PROMETHEE method starts with the following decision matrix:

$$\begin{bmatrix} f_1(a_1) & f_2(a_1) & \dots & f_j(a_1) & \dots & f_n(a_1) \\ f_1(a_2) & f_2(a_2) & \dots & f_j(a_2) & \dots & f_n(a_2) \\ \dots & \dots & \dots & \dots & \dots & \dots \\ f_1(a_i) & f_2(a_i) & \dots & f_j(a_i) & \dots & f_n(a_i) \\ \dots & \dots & \dots & \dots & \dots & \dots \\ f_1(a_m) & f_2(a_m) & \dots & f_j(a_m) & \dots & f_n(a_m) \end{bmatrix} \quad (1)$$

where $f_j(a_i)$ indicates the performance of i th alternative on j th criterion, m shows the number of alternatives, and n is the number of criteria. The preference structure of the PROMETHEE method is determined by pairwise comparison and the deviation between the evaluations of two alternatives on a particular criterion (Ranjan et al., 2016). The larger the deviation, the greater the preference. The function of decision-maker for beneficial criteria (the higher, the better) is as follows:

$$P_j(a, b) = F_j[d_j(a, b)] \quad (2)$$

where,

$$d_j(a, b) = [f_j(a) - f_j(b)]0 \leq P_j(a, b) \leq 1 \quad (3)$$

The function illustrates the preference (P_j) of a over b for observed deviation of evaluation of criteria $f_{j(i)}$. If the deviation is negative, the preference is 0. To evaluate the preference of a over b all criteria, the preference index $\pi(a, b)$ is based on the calculation of a weighted sum of the preference $P_j(a, b)$. The weights ($w_j > 0$) are positive real numbers that represent the importance of each criteria in the decision (Lopes et al., 2018). The functions are as follows:

$$\pi(a, b) = \sum_{j=1}^m P_j(a, b)w_j \quad (4)$$

and

$$\pi(b, a) = \sum_{j=1}^m P_j(b, a)w_j \quad (5)$$

where $\pi(a, b)$ shows that a is better than b and $\pi(b, a)$ illustrates that b is preferred over a . It can be defined as

$$\pi(a, b) \approx 1 \text{ means a strong preference } a \text{ over } b \quad (6)$$

or

$$\pi(a, b) \approx 0 \text{ indicates a weak preference } a \text{ over } b \quad (7)$$

The two outranking flows are as follows:

$$\text{Positive outranking flow, } \varphi^+(a) = \frac{1}{m-1} \sum_{x \in \text{isin} A} \pi(a, x) \quad (8)$$

or

$$\text{Negative outranking flow, } \varphi^-(a) = \frac{1}{m-1} \sum_{x \in \text{isin} A} \pi(x, a) \quad (9)$$

The positive outranking flows represent on average how alternative a outranks all other alternatives, while the negative outranking flows show how alternative a is outranked by all other alternatives. The higher the value of $\varphi^+(a)$, the better the alternative. The lower the value of $\varphi^-(a)$, the better the alternative. In the PROMETHEE I method, a partial ranking is calculated from the positive and the negative values of the outranking flows. In the PROMETHEE II method, a complete ranking is obtained by using a net outranking flow that is a combination of positive outranking flow and negative outranking flow, defined as follows:

$$\varphi(a) = \varphi^+(a) - \varphi^-(a) \quad (10)$$

PROMETHEE II gives a comprehensive ranking, from the best to the worst, and comparable alternatives. The higher the value of $\varphi(a)$, the better the alternative.

Furthermore, the Geometrical Analysis for Interactive Aid (GAIA) plane provides visualization and graphical representation of the position of alternatives (tourism destinations) with various criteria supporting the PROMETHEE methodology (J. P. Brans & De Smet, 2016). To create the GAIA plane, suppose that $(A_1, A_2, \dots, A_i, \dots, A_n)$ is the projection of the n points representing the alternatives and $(f_1, f_2, \dots, f_j, \dots, f_k)$ is the projection of the k unit vectors representing the criteria. In the PROMETHEE II method, the relative positions of the projections of the alternatives are determined by w (weights). Sensitivity analysis is used to modify the weights that would move the PROMETHEE decision stick (w) and PROMETHEE decision axis (π). The GAIA plane is depicted in figure 1.

In the GAIA plane, we can draw some conclusions. First, the longer the criteria axis, the more discriminating the criteria. Second, criteria axes that are approximately in the same direction represent similar preferences. Third, criteria axes that are in the opposite direction show the conflicting references. Then, similar alternatives are depicted by the distribution of the points in an adjacent area. Last, a good alternative is when the point stands in the direction of criteria axis. Besides, if (π) is long, it indicates that the PROMETHEE decision axis has a big decision power and decision-maker should choose the alternatives in its direction. In contrast, if (π) is short, the PROMETHEE decision axis does not have strong power decision.

Figure 1. Alternatives and criteria in the GAIA plane, source: (J. P. Brans & De Smet, 2016).

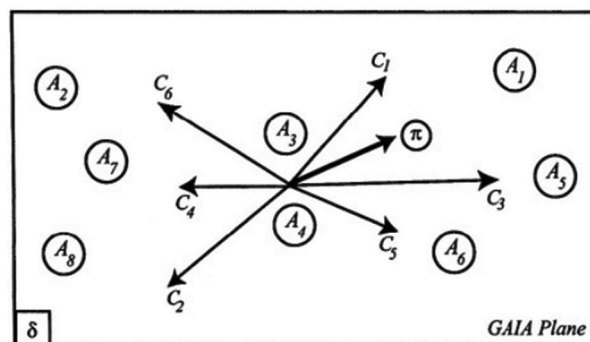
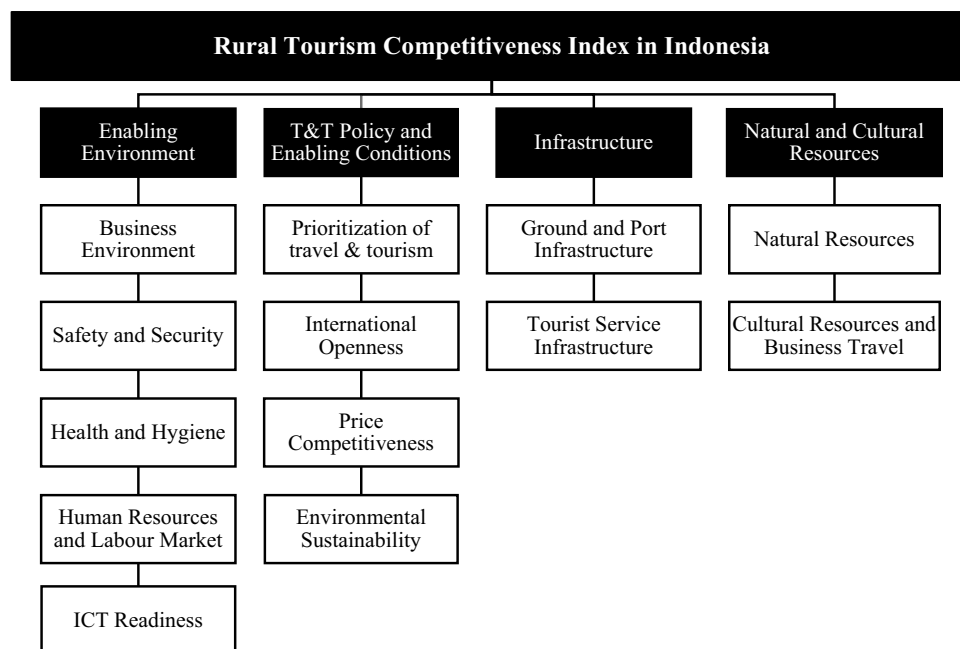


Figure 2. Rural Tourism Competitiveness Index adopted from Travel & Tourism Competitiveness Index 2019.



5. Results and discussion

This section analyzes the position of the 17 rural tourism destinations in Aceh, Central Java, Bali, and North Sulawesi with the PROMETHEE method. The complete ranking is based on net flows (PROMETHEE II). The difference between the strengths and the weaknesses of rural tourism destination is described in [table 2](#).

The table above indicates that Giri Emas is at the highest position, followed by other positive net flow tourism destinations such as Kembanglimus, Sangsit, Karangrejo, Candirejo, Kaliurip, Nusa, and Kerobokan. The positive net flow reflects that they have strong competitiveness positions. Lapang and Mantehage show negative net flows, but they are close to zero. It means that they are in weak competitiveness positions. Alungbanua, Suak Indrapuri, Suak Ribee, Pandanrejo, Ujong Kalak, Meulaboh, and Drien Rampak have large negative net flows that represent disadvantageous competitiveness positions.

Giri Emas offers various tourism objects such as nautical tourism, water tourism, historical tourism, art tourism, culinary tourism, and educational tourism. Local government support is also good enough, and government actively develops tourism potential in Giri Emas, Buleleng District, Bali Province.

Besides, Kembanglimus Village was the highest tourist village in Central Java Province. It is also reflected from the development of supporting tourism facilities. Kembanglimus Village is located approximately 3 km from Borobudur Temple, having great potential tourism because the Borobudur Temple is one of the Wonders of the World. The Borobudur Temple is one of the greatest Buddha Monument in the world. It was built in the 8th and 9th century during the reign of the Shailendra dynasty. This temple has 11,460 relief panels and 504 Buddha statues; the form of the building is “punden” with terraces consisting of 10 levels. Therefore, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) categorized the Borobudur Temple as one of the entries in the World Heritage List. Therefore, the Kembanglimus tourism village offers various types of tourism such as historical tourism, natural tourism, art tourism, educational tourism, and culinary tourism.

In addition, the Nusa tourist village also has a relatively better score compared to other villages in the Aceh Province. The Nusa tourist village is relatively better for enabling environment, infrastructure, and natural and cultural resources. Therefore, while half of the area of Nusa had ever been destroyed by a great tsunami in 2004, it was able to recover and try to be independent using tourism concept based on community, which is now becoming one of the destinations in Aceh Besar. Furthermore, there are some innovations from the community or creative young local people. Thus, this village has value added compared to other villages especially on tourism.

Meanwhile in North Sulawesi Province, the Mantehage tourism village has good performance compared to other villages. Actually, the tourism potential in Mantehage is great. This island is surrounded by mangrove forest as large as its land space, and due to this large mangrove forest, Mantehage is potentially developed as an eco-tourism destination. The future development must be conducted into two concepts. First, tourists will be able to enjoy the beauty of mangroves on land and in the waters. Unfortunately, supports from the government to develop Mantehage must be improved. Second, the infrastructure condition which is relatively good will ease the access between cities in North Sulawesi.

The partial ranking of the alternatives from PROMETHEE I interprets the competitiveness of rural tourism destinations that is useful for understanding the positioning strategies. As seen in Figure 3, Giri Emas is in the top position followed by Kembanglimus and Sangsit in the second and third place. The PROMETHEE I method also gives us information about the comparability of competitiveness rank of tourism destination. Figure 3 shows that Candirejo is higher than Kaliurip because they can be compared. However, Candirejo and Kaliurip are not comparable with Karangrejo because of the different structure of strengths and weaknesses. Thus, although in PROMETHEE II, the competitiveness position of Karangrejo is higher than Candirejo and Kaliurip, we cannot conclude that Karangrejo is better than Candirejo and Kaliurip. Then, there are Nusa, Kerobakan, Lapang, Mantehage, and Alungbanua in the following position. The competitiveness positions of Suak Indrapuri and Suak Ribee are below Alungbanua. Suak Indrapuri and Suak Ribee cannot be compared even though they are in the same province. The remaining four villages are Pandanrejo, Ujong Kalak, Meulaboh, and Drien Rampak.

The GAIA plane (Figure 4) gives a clear visualization and graphical representation of the position of alternatives (tourism destinations) with various criteria to better understand the strengths and weaknesses the competitive panorama. In general, all criteria axes are approximately of the same length. Interestingly, the (A3) Health and Hygiene is the lowest axis after (D1) Natural Resources in the GAIA plane, which implies the need to improve the sub-pillar. Health and Hygiene subpillar evaluates the competitiveness of the travel and tourism sector requires the perception of access to good drinking water, access to improved sanitation, physicians' density, and the number of hospital (Jovanović et al., 2015). Indeed, the Health and Hygiene sub-pillar is essential for the competitiveness of the travel and tourism sector particularly during COVID-19 and high risks of future outbreaks which make these destinations reliable for tourists. Tourist destinations should implement healthy protocols concerning hygiene in accommodations, restaurants, shops, and measures such as the change of air conditioning filters between each traveler stay, availability of masks, and social distancing (Grech et al., 2020).

Furthermore, we can categorize the destinations into three groups of criteria. The first group consists of (A1) Business Environment, (A3) Health and Hygiene, (B1) Prioritization T&T, (B3) Price Competitiveness, (B4) Environment Sustainability, (C1) Ground and Port Transport, and (D2) Cultural Resources and Business Travel. In this group, tourist villages, such as Giri Emas, Kembanglimus, Karangrejo, and Nusa, enjoy clear and positive competitive positions because they are in the direction of decision axis (π) shown by the red line.

The second group comprises (A4) Human Resource and Labor Market, (A5) ICT Readiness, (B2) International Openness, (C2) Tourist Service Infrastructure, and (D1) Natural Resources. There are

Figure 3. Outranking Graph,
source: PROMETHEE I.

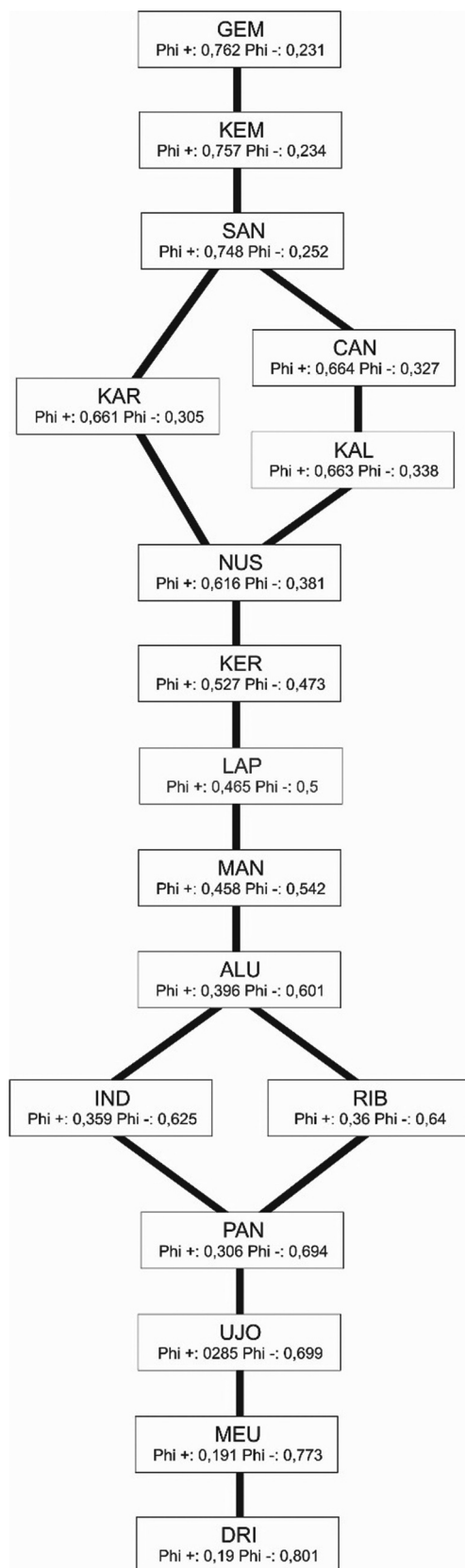
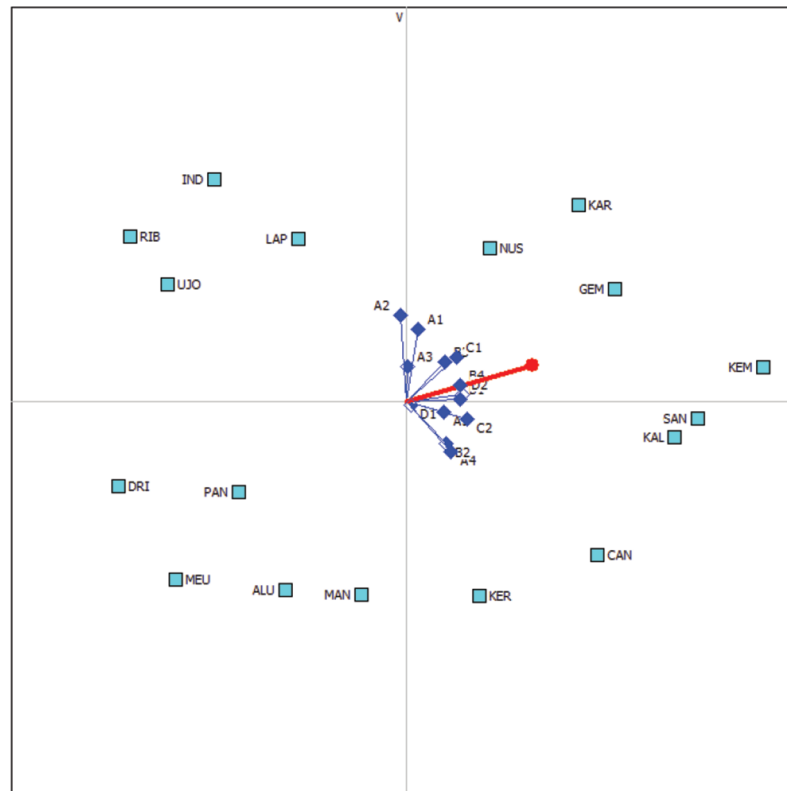


Figure 4. GAIA plane, source: Visual PROMETHEE.



Sangsit, Candirejo, Kaliurip, and dan Kerobokan in this group. Lapang, Suak Indrapuri, Suak Ribee, and Ujong Kalak are in third group that consists of (A3) Health and Hygiene. In contrast, Alungbanua, Pandanrejo, Meulaboh, Drien Rampak, and Mantehage are in disadvantageous competitiveness positions. This should be a major concern of stakeholders.

The approach in understanding rural tourism is no longer based on the attractiveness of each region's potential. Referring to several findings, the level of competition from each tourist area refers to how attractive the area is to tourists. Furthermore, there are factors that cause tourists to visit a tourist area. This is usually also closely related to the supporting factors in the area, both infrastructure and policy.

Existing findings indicate that when the level of health and hygiene of a natural tourism area is considered properly, it will increase the attractiveness of tourists to visit, which is closely related to the current pandemic conditions, where tourists want to take a vacation, in addition to enjoying nature as well as guaranteed health protocols. Thus, tourist areas really need to encourage the emergence of policies that are able to provide a sense of security and comfort for potential tourists.

The ability to explore nature-based or rural tourism areas is actually in line with how cultural areas also become tourist objects. Furthermore, nature tourism, ecotourism, and adventure tourism with the sustainability principles must develop into a priority for rural tourism and stakeholders need to protect the region's competitive advantages such as natural assets (Castanho et al., 2021). At the same time, infrastructure development is needed to support natural potential (Cerreto et al., 2021; Couto et al., 2021). In line with this, the approach of using innovative policies, especially those that regulate optimizing the role of policies and community interaction in tourist sites, is important (Gelbman, 2021). Innovation is also associated with digital optimization (Morrone et al.,

2021). The goal is clear: and interest in tourism development and increasing its attractiveness is focused on physical development and encouraging the assurance of the safety and comfort of tourists through social and humanitarian rules.

6. Conclusion

This research aims to (i) analyze the determinant factors of rural tourism competitiveness in Indonesia, (ii) measure the tourism competitiveness in each of rural tourism, and (iii) discover the gap between rural tourism competitiveness in four provinces. We adopt the Travel & Tourism Competitiveness Index 2019 from the World Economic Forum (WEF). To assess the rural tourism competitiveness, we use the PROMETHEE method, including PROMETHEE I and PROMETHEE II and the GAIA plane. The study finds that Giri Emas has the best competitive tourist destination. In order to discover the gap rural competitiveness, we employ the GAIA plane. It shows that the Health and Hygiene sub pillar is relatively low, while it is important during and after COVID-19 pandemic. Stakeholders in the tourism sector should invest in assets that increase Health and Hygiene sub- pillar, such as the ease of access to good drinking water, ease of access to improved sanitation, physicians density, and the number of hospital beds.

Although water is important to humans and a precious source of health, there can be health problems, if it contains harmful substances of biological, chemical, or radiological origin (Jovanović et al., 2015). Therefore, countries that cannot manage the water quality will have lower competitiveness of the travel and tourism sector because tourists prefer to travel to the hygiene of accommodation and environment such as clean hotels and restaurants (Bauer, 2008). In addition, the health sector should be improved by increasing the number of hospital beds and sufficient number of physicians per number of certain patients will increase tourist destination competitiveness (Jovanović et al., 2015). Therefore, it should be improved to face the uncertainty of pandemics. Besides, nature tourism, ecotourism, and adventure tourism can be developed as potential products to increase the number of tourists. It is essential as tourism in rural areas has advantages such as job creation and strengthening the local economy (Couto et al., 2021). For future research, we recommend combining between questionnaire and interview techniques to obtain more comprehensive results from visitors, tourism agents, and stakeholders.

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