

Tourism Destination Mapping Based on Tourism Characteristics and Carrying Capacity of Province in Indonesia

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Abstract

The development of tourist destinations in Indonesia can encourage an increase in tourist visits and the length of stay of tourists while in tourist destinations. Tourism destination development needs to be in line with the characteristics of the tourism destinations they have. This study conducted a cluster analysis to map 34 provinces in Indonesia based on 13 aspects of tourism characteristics and carrying capacity. Mapping results formed four groups of tourist destinations with similar characteristics. Cluster-1 has the best average tourist carrying capacity, so it is classified as an advanced destination group consisting of West Java, Central Java, DI Yogyakarta, East Java, and Bali. Cluster-2 consists of DKI Jakarta and Riau Island, with two bad aspects, so they are classified as the revitalization of tourist destinations. Cluster-3 consists of North Sumatra, West Sumatra, Banten, West Nusa Tenggara, East Nusa Tenggara, West Kalimantan, East Kalimantan, South Kalimantan, South Sulawesi, North Sulawesi, and West Papua, which have poor performance in 6 aspects so that it is categorized as a developing tourism destination. Cluster-4 comprises 16 other provinces with poor performance in 9 elements, so it is classified as a pioneering tourist destination. Mapping results are compared with the policies of 10 priority tourism destinations (DPP) in Indonesia, and it is found that 3 DPPs (Bangka Belitung, Morotai-North Maluku, and Wakatobi-Southeast Sulawesi) are included in cluster-4 with the category of pioneer tourist destinations. Development of these 3 DPPs requires increased funding.

Keywords: Carrying Capacity; Clusters; Mapping; Tourism; Tourist Destinations.

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1. Introduction

1.1 Background of Problems

The development of the tourism sector makes a significant contribution to the economy. Based on tourist trend data for the last five years (2015-2019), foreign tourist visits to Indonesia grew 11,47 percent and reached 16.1 million people in 2019 with a foreign exchange value of USD 18.45 billion (BPS, 2020). In the same year, domestic tourists made 282 million trips and grew by 12.4% with spending of IDR 291 trillion. The tourism sector can also employ 14.96 million people, contributing 4.97% to the Indonesian economy. The significant contribution of the tourism sector to the economy has prompted the government to make the tourism sector one of the efforts to accelerate national economic growth.

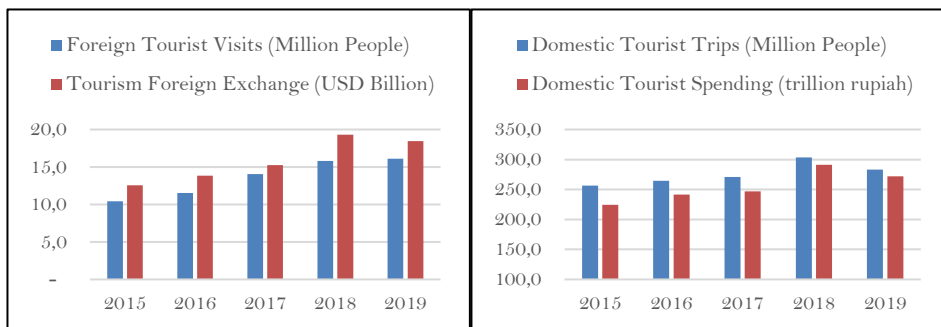


Figure 1. Arrivals of foreign tourists and domestic tourists in Indonesia 2015-2019

Source: BPS, 2020

In the National Medium Term Development Plan (RPJMN) 2020-2024, the government sets a policy direction for new tourism development from initially being oriented towards the number of tourist visits to quality tourism, with the main objectives of providing (i) added value to the tourism sector, (ii) increasing foreign exchange, (iii) destination readiness, and (iv) industrial capacity, tourism, and community human resources in Indonesia. The government has set a target for tourism development by 2024, namely 22.3 million foreign tourist visits and 30 billion USD of foreign exchange, with tourism contributing 5.0 percent to the national economy and employing 15 million people. The government carried out several strategies, both strengthening the demand side and improving the supply side in achieving the set targets. Supporting the demand side is expected to effectively attract tourist arrivals, which is carried out through marketing aspects, such as promotions, providing travel packages, and holding festivals. Meanwhile, improvements on the supply side increased the length of stay and expenditure of tourists, supported by advances in the tourism industry, tourism institutions, and human resources, as well as the development of tourism destinations.

The condition of an inadequate tourism destination will provide a less memorable experience for tourists, which can lead to the limited length of stay and spending by tourists, and a reluctance to make return visits. The readiness of tourist destinations is a requirement that must be met. Government Regulation (PP) Number 50 of 2011 concerning the National Tourism Development Master Plan (RIPPARNAS) mandates that the realization of the national tourism development vision can be fulfilled by developing tourism destinations that

are safe, comfortable, attractive, easily accessible, environmentally sound, and capable of experiencing improvement.

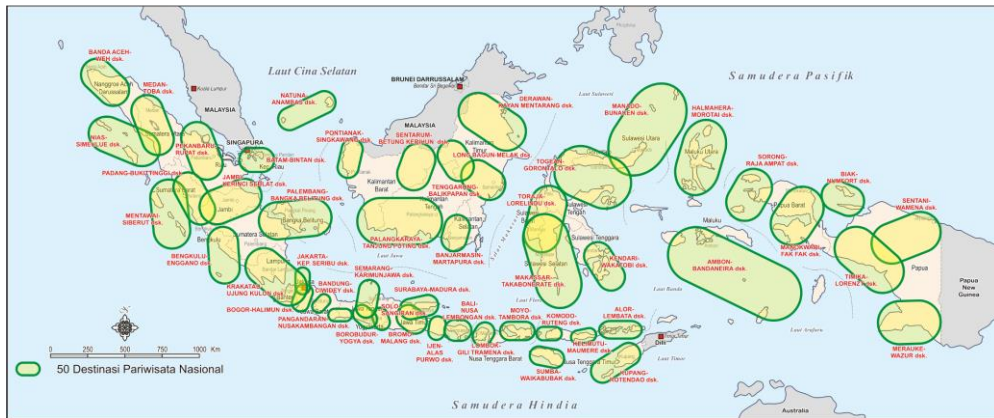


Figure 2. Distribution of 50 National Tourism Destinations in Indonesia

Source: Government Regulation number 50 of 2011

However, the development of national tourism destinations in Indonesia has been unevenly distributed. Tourist visits as one of the indicators to describe the success of tourism show that Bali tourism destinations are still the leading and mainstay of tourism in Indonesia, where foreign tourist visits through the Bali entrance are 6.3 million people or contribute 40% of all foreign tourist visits to Indonesia (BPS, 2019). Domestic tourist visits to Bali DNP also reached 10.5 million, contributing to Bali's GRDP reaching 61% (tertiary sector). The success of developing Bali tourism destinations needs to be replicated by the government in other tourism destinations in Indonesia. Tourism destinations must be built comprehensively, focusing on the quality of tourist attractions, increasing the completeness of amenities, expanding accessibility, and being supported by competent tourism human resources, a sustainable environment, and strengthening institutions at destinations.

The development of tourism destinations, especially in physical infrastructure development, requires increased funding. The limited fiscal condition of the central government (APBN) and local government (APBD) means that tourism destinations in Indonesia cannot be fully developed simultaneously. The development of tourist destinations needs to be prioritized on tourism destinations with adequate carrying capacity readiness so that the budget can be optimal. Tourism destinations that are development priorities must consider relatively ready supporting facilities. The government must formulate appropriate strategies and interventions in optimizing the development of tourism destinations, primarily through the effectiveness of tourism destination development programs that the previous government has implemented. Government intervention in developing tourism destinations can be more optimal if tourism-related policies can be planned, compiled, and implemented by tourism characteristics and carrying capacity that varies in each regional group.

1.2 Research Problems and Objectives

Tourism destination mapping is rarely done at the national level based on their tourism carrying capacity. There are studies and analyses related to tourism destinations at the regional level by identifying the main tourist areas that need to be developed in a tourism

destination. The government, through the Integrated Tourism Masterplan (ITMP) at the Lombok tourism destination level, has determined four main tourist areas, namely (i) Senggigi-Gili Tramen, (ii) Lombok South Coast, (iii) Sembalun-Rinjani, (iv) Mataram. Determining leading tourist areas to be developed is based on tourist attraction, accessibility infrastructure, tourist amenities, economic investment, institutional human resources, social culture, marketing, and spatial regulations.

In other literature, a mapping analysis of tourist sentiment has been carried out in Phuket, Thailand, based on a TripAdvisor review. The results show that positive tourist sentiment is found in (i) beautiful, clean, and not crowded beach views, (ii) sustainable island development and limited visits, and (iii) market development that emphasizes food quality and reasonable prices. The World Economic Forum (WEF) publication regarding the 2019 Tourism & Travel Competitiveness Index (TTCI) shows the competitiveness between countries based on adequate environmental conditions, tourism policies, infrastructure conditions, and the availability of natural and cultural tourism objects. However, the results of the TTCI have yet to show the necessity of tourism development and competitiveness at a lower level, namely competitiveness and carrying capacity at the level of Indonesian tourism destinations.

Other research related to tourism destinations, but not explicitly associated with mapping, was conducted by Anggraini (2016), who analyzed complementary relationships and competition between tourism destinations using case studies on ten priority tourism destinations in Indonesia. However, the research results have yet to describe the classification of tourist destinations with better carrying capacity. Other research related to tourism still uses the impact approach on the economy in Indonesia. The study by Mahadevan (2017) found that the tourism sector can increase its contribution to a country's economy. Like Riyanto (2020), the results show that tourism, as the leading sector in the economy, has a significant influence on reducing the poverty rate and the depth and severity of poverty and can increase the income of the lower middle class.

Based on this, research to map tourism destinations represented by 34 provinces in Indonesia is essential to carry out. The grouping of tourist destinations is based on the characteristics and carrying capacity of tourism in each region. Cluster analysis is the methodology used in mapping because it can group objects into a particular group so that within one group, there are similarities/homogeneity to one another. In contrast, between groups, there are differences/heterogeneity. Through the results of this research, tourism destinations can determine and recommend tourism development strategies that suit the needs of each group so that they can provide benefits and a more significant economic impact in Indonesia. The results of the grouping of tourist destinations will also give an overview of the classification of the main tourist destinations in Indonesia so that development programs and budgets can be prioritized and optimized for better tourist destinations with adequate carrying capacity.

The results of this study will also evaluate government policies in carrying out development in tourism destinations. There are 10 Tourist Destinations that are the priority of the government to accelerate growth, including Lake Toba, Lombok, Borobudur, Labuan Bajo, Manado-Likupang, Bromo-Tengger-Semeru, Wakatobi, Bangka Belitung, Morotai, and Raja Ampat. The results of the tourist destination groups formed from the research will be compared with the conditions of tourism carrying capacity in the ten government DPPs so that appropriate policy recommendations can be issued.

2. Data and Method

2.1 Data

There are 13 aspects of tourism carrying capacity used in this study, measured through secondary data obtained from various publicly available government data portals. The aspects used in this study are determined based on identifying previous research and related literature and then selected according to their relevance. The relevant factors determine the availability of secondary data in 34 provinces and the 2019 observation year. Then 13 selected aspects of tourism development are defined, where these aspects are index values from the constituent secondary data indicators, which are then normalized with units 1-10.

Table 1. Research Aspect and Constituent Indicators

Domain	Code	Aspect	Constituent Indicators
Attractions	X1	Nature Tourism Attractions	Nature tourism attractions are the availability of tourist attractions, especially natural tourism (geopark, marine tourism, national parks, world heritage, tourist areas), to attract tourists.
	X2	Artificial and Culture Tourism Attractions	Artificial and culture tourism attractions are the availability of cultural and artificial tourist attractions that can attract tourists, primarily cultural and artificial (festivals, amusement, recreation parks, cultural tourism, local wisdom).
Accessibility	X3	Air Accessibility	Air Accessibility is the availability of air accessibility to provide easy connectivity for cross-regional tourists to come for domestic and foreign tours. It consists of airport quality, domestic aircraft passenger density, and foreign aircraft passenger density.
	X4	Land and Sea Accessibility	The availability of land and sea accessibility can provide easy connectivity for tourists while traveling in an area and increase the length of stay of tourists in destinations. It consists of road quality, convenience on public transportation, and port quality.
Amenities	X5	Tourist Amenities	Availability of amenities and tourist facilities as tourist support facilities in traveling includes accommodation, eating and drinking, and other supports. It consists of the availability of star and non-starred hotel rooms, restaurants, and cafes.
	X6	Digital Infrastructure	The availability of digital infrastructure is a supporting force for community activities in tourism, especially related to the availability of ICT. It comprises the quality of ICT usage, access, and infrastructure.
	X7	Basic Infrastructure	Availability of basic infrastructure as a carrying capacity for community activities in tourism, especially related to infrastructure. It consists of household access to (i) sanitation services, (ii) drinking water services, (iii) defecation facilities, and (iv) affordable, decent housing.
Socio-Cultural	X8	Human Resources and Manpower	Adequate availability and quality of human resources, especially supply chain support workers for tourism activities in the tourism supply chain. It consists of the availability of tourism schools, the average length of schooling, and the gross high school enrollment rate.

	X9	Security and Safety	Security and safety are the fulfillment of comfort for tourists visiting an area through guarantees of security and safety from potential threats of danger. It consists of crime rate, democracy level, and disaster-prone index.
	X10	Hygiene and Health	Hygiene and health are the fulfillment of comfort for tourists visiting an area through guarantees of cleanliness and health from potential diseases. It consists of the ratio of medical personnel, hospital beds, life expectancy, and access to handwashing facilities with soap.
	X11	Environmental Sustainability	The implementation of quality and sustainable tourism policies through eco-friendly tourism is shown by the availability of water quality, air quality, and deforestation rates in Indonesia.
Economics & Investment	X12	Economic and Fiscal	Economic and fiscal is the availability of adequate fiscal space accompanied by price competitiveness friendly to tourists. It consists of regional fiscal capacity, spending per capita, and the contribution of tourism to the economy.
	X13	Investment	Investment is a good level of ease of doing business in the tourism sector. It consists of the ease of doing business index, the level of construction costs, and the investment growth in hotel restaurants.

2.2 Calculating Index

The index value for each aspect of the research is calculated based on the constituent indicators. The steps taken in calculating the index value on the tourism carrying capacity aspect are as follows.

1. **Determination of Indicators.** Resolution of several indicators used as constituents for research aspects according to their relevance and significance.
2. **Determination of Maximum and Minimum Value.** The value of the tourism aspect index is calculated by first determining each indicator's value based on the set maximum and minimum limit values. Determination of maximum/minimum limit values uses official rule values for several hands. However, for indicators that do not have a standard, the average value of empirical data (data distribution for each province) is used plus twice the standard deviation value.
3. **Data Normalization.** Data normalization is necessary to provide a comparable measure. Each forming indicator is standardized through the maximum and minimum values before later being used in calculating the index.

$$\text{Indicator Score} = \frac{\text{Indikator Score} - \text{Minimum Limit}}{\text{Maximum Limit} - \text{Minimum Limit}} \quad (1)$$

4. **Calculation of Aspects.** The various composite variables for each indicator are calculated on average to obtain values for each aspect using the following equation.

$$\text{Aspect Index} = \frac{\text{Score } X_1 + \text{Score } X_2 + \dots + \text{Score } X_n}{n} \times 10 \quad (2)$$

2.3 KMeans Clustering

Cluster analysis aims to group observations that have specific characteristics in common. This analysis classifies objects into a group so that in one group, there are

similarities or homogeneity to one another. In contrast between groups, it is hoped that there will be differences/heterogeneity (Hair, 2009). KMeans Clustering is a non-hierarchical clustering technique often used to group many observations. The number of clusters is determined in advance as part of the clustering stage. The distance matrix (similarity) must not be determined in advance. (Johnson & Wichern, 2007)

1. Determine the magnitude of k (the number of clusters)
2. Dividing each object into k clusters
3. Calculate the centroid value with the formula

$$v_{kj} = \frac{\sum_{i=1}^n x_{ij}}{n_k} \tag{3}$$

4. Grouping based on the nearest centroid using the i_{th} object euclidian distance and the j_{th} variable with the formula

$$d_{ij} = \sqrt{\sum_{k=1}^p \{x_{ik} - x_{jk}\}^2} \tag{4}$$

5. Recalculate the cluster center point (centroid) for new and outgoing members (objects) in step 3
6. Do iterations 3 and 4 until there are no changes in-group members.

2.4 Multivariate Analysis of Variance (MANOVA)

Multivariate Analyze of Variance or MANOVA compares mean values between populations. One-Way Multivariate Analyze of Variance or one-way MANOVA compares the averages of two or more populations with more than one dependent variable. This understanding explains that MANOVA is used to examine the effect of a treatment on responses so that differences between groups can be identified (Johnson & Wichern, 2007). The MANOVA test requires the assumption that the residuals are normally multivariate distributed and that the variance and covariance matrices are homogeneous. Meanwhile, the model of MANOVA is as follows.

$$3 \quad X_{ij} = \mu + \tau_i + e_{ij} \tag{5}$$

3. Results and Discussion

Tourist destinations in Indonesia are grouped into several groups using the K-means Clustering method. The number of clusters is 4 to 7, and a pseudo-f statistical test is performed on each cluster formed to determine the best cluster.

Table 2 shows that grouping 4 clusters is the optimal cluster because the highest pseudo-f statistic value is 11.53. Then, testing the differences in characteristics between groups was carried out using the One-Way MANOVA method. Before carrying out the MANOVA analysis, the assumptions are that the variance-covariance is homogeneous and the residuals are normally distributed multivariate.

Table 2. Grouping Results and Pseudo-F Statistics

Number of Clusters	Pseudo F-Statistic	Number of Members in Group						
		1	2	3	4	5	6	7
4	11,53	5	2	11	16			
5	10,01	1	2	8	18	5		
6	10,31	1	4	7	2	10	10	
7	11,44	3	2	4	1	9	2	13

The result of homogeneity testing of the variance-covariance matrix using the Box's M value is 10.012, with a significance of 0.019, where the p-value is more significant than α ($\alpha = 5\%$) so that the variance-covariance matrix is not homogeneous. Based on this, in fulfilling the assumption of homogeneity, the most robust test statistic used in the One-Way MANOVA test is Pillai's Trace test statistic (Seber, 1984).

Test Results		
Box's M		10.012
F	Approx.	3.314
	df1	3
	df2	95226.789
	Sig.	.019
Tests null hypothesis of equal population covariance matrices.		

Figure 3. Homogeneity Test of Covariance Variance Matrix.

Table 3 shows the results of examining the multivariate normal distribution for each residual group formed. The correlation between d_j^2 and $Q_{(c,p)}$ shows an examination of the multivariate normal distribution. The residuals have a multivariate normal distribution if the value from the Shapiro-Wilk test fails to reject H_0 . The Shapiro Wilk value obtained (W) is more significant than α (0.05). The residual assumption has a multivariate normal distribution, so MANOVA analysis can be carried out.

Table 3. Homogeneity Test of Covariance Variance Matrix

Group Cluster	Testing
	Shapiro Wilk
Group Cluster 1	0,664
Group Cluster 2	0,876
Group Cluster 3	0,944
Group Cluster 4	0,976

Figure 4 shows the results of testing the differences in characteristics between groups using One-Way MANOVA. The test results with One-Way MANOVA, where the calculated F value on the Pillai's Trace test statistic is 4.363, with a significance of 0.000. The p-value is lower than α ($\alpha = 5\%$), so it is concluded that the results of mapping tourist destinations have an average difference between groups (heterogeneity) and have the same characteristics in the group members formed (homogeneity).

Multivariate Tests ^a						
Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.998	603.262 ^b	13.000	18.000	.000
	Wilks' Lambda	.002	603.262 ^b	13.000	18.000	.000
	Hotelling's Trace	435.689	603.262 ^b	13.000	18.000	.000
	Roy's Largest Root	435.689	603.262 ^b	13.000	18.000	.000
cluster	Pillai's Trace	2.218	4.363	39.000	60.000	.000
	Wilks' Lambda	.010	5.086	39.000	54.050	.000
	Hotelling's Trace	14.174	6.057	39.000	50.000	.000
	Roy's Largest Root	10.276	15.809 ^c	13.000	20.000	.000

a. Design: Intercept + cluster
 b. Exact statistic
 c. The statistic is an upper bound on F that yields a lower bound on the significance level.

Figure 4. Results of One-Way MANOVA Analysis

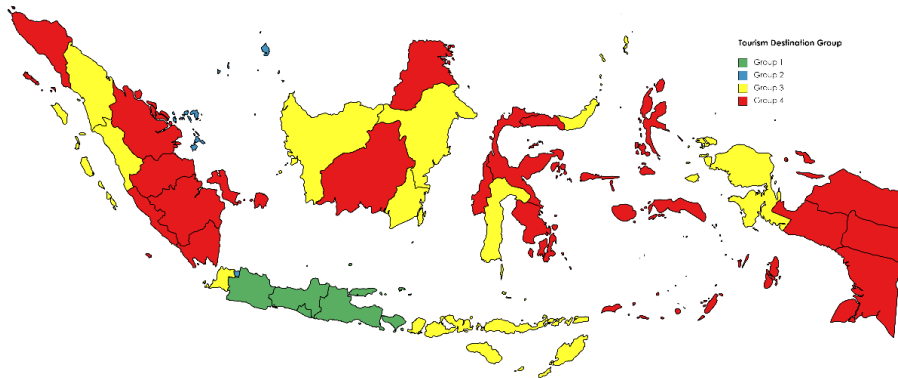


Figure 5. Mapping Results of Tourism Destinations in Indonesia

The mapping results using KMeans Clustering show that the 4 clusters of tourism destinations are optimum clusters with differences in characteristics between groups and similar characteristics within group members. Comparing the average values between the formed groups shows which groups have better aspects of tourism carrying capacity than other groups.

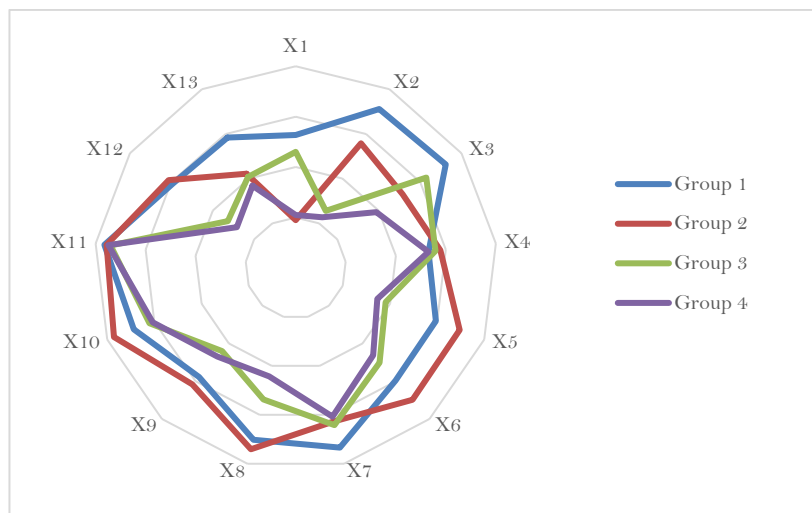


Figure 6. Radar Diagram of Average Differences Between Groups

Group 1 and group 2 had higher index scores in several aspects than group 3 and group 4. In particular, group 1 slightly outperformed group 2 in the Tourism Attractions and Accessibility domain. Meanwhile, group 3 outperformed group 4 in the Tourism Attractions domain. In addition, each tourist destination group's ranking is determined based on the group's average value in each aspect of tourism carrying capacity.

Table 4. Assessment of Indicators for Each Group

Group	Excellent	Good	Deficient	Poor
	7,51-10,00	5,01-7,50	2,51-5,00	0,00-2,50
Group 1	1 Aspect	12 Aspect	-	-
Group 2	2 Aspect	9 Aspect	1 Aspect	1 Aspect
Group 3	-	6 Aspect	7 Aspect	-
Group 4	-	4 Aspect	7 Aspect	2 Aspect

Group 1 tourism destinations have achieved good tourism carrying capacity in all aspects. Group 2 also has good tourism carrying capacity, except for two aspects which are still classified as unfavorable. Group 3 has six good aspects, whereas seven other aspects of tourism carrying capacity still need to be developed. Meanwhile, tourist destinations in group 4 have nine aspects classified as not good, even two of which are classified as poor. Based on the above analysis, classification is carried out for each tourist destination group formed in Table 5.

Table 5. Assessment of Indicators for Each Group

Group	Classification of Tourism Destination
Group 1	Advanced Tourism Destination
Group 2	Revitalization Tourism Destination
Group 3	Developing Tourism Destination
Group 4	Pioneer Tourism Destination

Group 1 is classified as an advanced tourist destination because all aspects of tourism carrying capacity have an average good rating. This group comprises five provinces: Jawa Barat, DI Yogyakarta, Jawa Tengah, Jawa Timur, and Bali. The variety of available travel options can attract tourist visits with various tourist typologies. Ease of accessibility can be used as a tourism hub and encourage the movement of tourists around tourist destinations, and broaden tourist travel patterns. The availability of good amenities can increase the length of stay and spending of tourists and provide a memorable experience for tourists while on the Destination. Good socio-cultural carrying capacity shows the readiness of the region to receive tourists, shown by good hospitality and tourism workforces, guaranteed safety and security, clean and healthy destinations, and paid attention to the environment's carrying capacity. Economic and investment conditions that grow positively can encourage the development of tourism destinations in line with market demand. The development of this tourism destination in the future will be directed in a sustainable and will apply international standards.

Table 6. Descriptive Statistics of Group 1 Tourism Carrying Capacity Aspects

Domain		Aspect	Min	Avg	Max
Attractions	X1	Nature Tourism Attractions	2,52	5,28	7,33
	X2	Artificial and Culture Tourism Attractions	6,46	7,12	7,71
Accessibility	X3	Air Accessibility	5,16	7,23	8,39
	X4	Land and Sea Accessibility	3,99	5,31	6,41
Amenities	X5	Tourist Amenities	4,31	5,95	8,30
	X6	Digital Infrastructure	5,43	5,97	6,77
	X7	Basic Infrastructure	6,27	7,34	8,33
Socio-Cultural	X8	Human Resources and Manpower	6,02	7,02	7,80
	X9	Security and Safety	4,65	5,79	6,40
	X10	Hygiene and Health	5,43	6,87	8,46
	X11	Environmental Sustainability	7,11	7,65	8,50
Economics & Investment	X12	Economic and Fiscal	4,71	5,92	6,82
	X13	Investment	5,33	5,84	6,93

The second group comprises two provinces, including Kepulauan Riau and DKI Jakarta. This tourism destination is classified as a revitalization tourism destination because almost all aspects have good tourism carrying capacity and have the highest average compared to other tourism destination groups. However, two aspects of tourism carrying capacity are still classified as unfavorable. The condition of tourism carrying capacity in the amenity domain and socio-cultural domains in this tourism destination group shows good results, the highest compared to other groups. Sources of tourist visits in this group rely on aspects of cultural and artificial tourist attractions due to the limited (unfavorable) choice of natural tourist attractions. The wide choice of amusement parks, shopping, and recreation, as well as the hosting of events and festivals, shows that this tourism is aimed at tourists with business and MICE needs. In addition, the carrying capacity of both air and land-sea accessibility has achieved good results. It can be used as an entry point for foreign tourist visits by considering the geographic region with neighboring countries. In addition, there has been a slowdown in investment growth, especially in the hotel and restaurant sector, so tourism needs to be revitalized by focusing on productive tourist areas.

In the third group, there are 11 tourism destinations, namely the provinces of Sumatera Utara, Sumatera Barat, Banten, Nusa Tenggara Barat, Nusa Tenggara Timur, Kalimantan Barat, Kalimantan Timur, Kalimantan Selatan, Sulawesi Selatan, Sulawesi Utara, and Papua Barat. This group is included in the classification of developing tourism destinations because several aspects of tourism carrying capacity are classified as good and can be a modality in developing tourism destinations in the future. Suitable accessibility modalities need to be utilized as tourism hubs in tourist activities and strengthening travel patterns in tourism destinations to increase the length of stay of tourists both within the tourism destination and with surrounding tourism destinations. The carrying capacity of tourist attractions still needs improvement, so the government needs to encourage the thematic development of tourist attractions based on their main tourism potential. The

development can be optimized, considering some available tourist attractions are still relatively natural. Meanwhile, the carrying capacity of amenities still needs to be improved because local tourists dominate tourism. The economic and investment aspects are also classified as unsuitable due to the need for more government attention to prioritizing their region's tourism sector.

Table 7. Descriptive Statistics of Group 2 Tourism Carrying Capacity Aspects

Domain		Aspect	Min	Avg	Max
Attractions	X1	Nature Tourism Attractions	1,40	1,90	2,40
	X2	Artificial and Culture Tourism Attractions	5,53	5,58	5,64
Accessibility	X3	Air Accessibility	4,14	5,16	6,17
	X4	Land and Sea Accessibility	5,60	5,78	5,97
Amenities	X5	Tourist Amenities	6,68	6,96	7,23
	X6	Digital Infrastructure	6,47	6,99	7,51
	X7	Basic Infrastructure	6,19	6,27	6,35
Socio-Cultural	X8	Human Resources and Manpower	6,10	7,41	8,72
	X9	Security and Safety	5,43	6,18	6,92
	X10	Hygiene and Health	6,78	7,72	8,65
	X11	Environmental Sustainability	7,00	7,56	8,13
Economics & Investment	X12	Economic and Fiscal	4,11	6,12	8,13
	X13	Investment	3,61	4,21	4,82

Table 8. Descriptive Statistics of Group 3 Tourism Carrying Capacity Aspects

Domain		Aspect	Min	Avg	Max
Attractions	X1	Nature Tourism Attractions	1,64	4,60	7,50
	X2	Artificial and Culture Tourism Attractions	1,49	2,56	4,28
Accessibility	X3	Air Accessibility	4,66	6,30	8,11
	X4	Land and Sea Accessibility	4,59	5,59	7,35
Amenities	X5	Tourist Amenities	1,33	3,82	5,41
	X6	Digital Infrastructure	3,78	5,02	6,20
	X7	Basic Infrastructure	5,27	6,42	7,04
Socio-Cultural	X8	Human Resources and Manpower	3,85	5,37	7,02
	X9	Security and Safety	2,56	4,41	5,62
	X10	Hygiene and Health	4,42	6,20	8,09
	X11	Environmental Sustainability	5,73	7,40	8,17
Economics & Investment	X12	Economic and Fiscal	2,10	3,27	4,16
	X13	Investment	1,67	4,08	6,22

The fourth group has 16 tourist destinations, namely Aceh, Sumatra Selatan, Bangka Belitung, Jambi, Riau, Bengkulu, Kalimantan Tengah, Kalimantan Utara, Sulawesi Tenggara, Sulawesi Tengah, Gorontalo, Maluku, Maluku Utara, and Papua. This group of tourism destinations is classified as pioneer tourism destinations because most aspects of tourism carrying capacity still need to be improved and have the lowest average compared to other tourism destination groups. The development of tourist attractions in this group needs differentiation through selecting the main tourist attractions and prioritizing local wisdom values as development modalities. The unfavorable carrying capacity of air accessibility is one of the reasons for the limited entry of foreign and domestic tourists to visit this group of destinations. However, the potential for good land-sea accessibility can allow this group to become a travel pattern with the agglomeration of surrounding tourism destinations with better carrying capacity. Aspects of human resources and labor are classified as not good because the economic sector is still dominated by other sectors (non-tourism). Tourism development in this group requires a high fiscal risk from the government.

Table 9. Descriptive Statistics of Group 4 Tourism Carrying Capacity Aspects

Domain		Aspect	Min	Avg	Max
Attractions	X1	Nature Tourism Attractions	0,34	2,10	4,32
	X2	Artificial and Culture Tourism Attractions	1,27	2,28	4,16
Accessibility	X3	Air Accessibility	1,45	3,89	6,19
	X4	Land and Sea Accessibility	4,41	5,31	6,83
Amenities	X5	Tourist Amenities	1,66	3,46	5,18
	X6	Digital Infrastructure	2,96	4,63	5,85
	X7	Basic Infrastructure	3,90	6,08	6,83
Socio-Cultural	X8	Human Resources and Manpower	3,32	4,43	5,26
	X9	Security and Safety	3,60	4,70	5,79
	X10	Hygiene and Health	4,66	6,07	7,21
	X11	Environmental Sustainability	4,79	7,49	8,60
Economics & Investment	X12	Economic and Fiscal	1,92	2,84	3,88
	X13	Investment	1,11	3,68	5,22

In the 2020-2024 National Medium-Term Development Plan (RPJMN), the government established 10 Priority Tourism Destinations (DPP) to attract visits, increase tourists' expenditure and length of stay, and be supported by sustainable development, including world-class destination management. Some of the indicators used by the government are similar to the tourism carrying capacity indicators carried out in this research. However, several indicators in determining priority tourist destinations still need to be considered in the tourism carrying capacity mapping indicators, namely indicators of trends in tourist arrivals that are good and growing. Both of these indicators are indicators from the demand side, which are not the carrying capacity of a tourism destination in terms of supply-side availability.

Table 10. Examination of the Status of Government Priority Tourism Destinations

No	Tourism Destination	Region	Mapping Result
1	Bromo-Tengger-Semeru	Jawa Timur	Advance Tourism Destination
2	Borobudur	Jawa Tengah	Advance Tourism Destination
3	Danau Toba	Sumatera Utara	Developing Tourism Destination
4	Lombok-Mandalika	Nusa Tenggara Barat	Developing Tourism Destination
5	Labuan Bajo	Nusa Tenggara Timur	Developing Tourism Destination
6	Manado-Likupang	Sulawesi Utara	Developing Tourism Destination
7	Raja Ampat	Papua Barat	Developing Tourism Destination
8	Wakatobi	Sulawesi Tenggara	Pioneer Tourism Destination
9	Bangka Belitung	Bangka Belitung	Pioneer Tourism Destination
10	Morotai	Maluku Utara	Pioneer Tourism Destination

Based on the mapping results, Borobudur and Bromo-Tengger-Semeru tourist destinations are Advanced Tourism Destinations. Five other tourist destinations, namely Danau Toba, Lombok-Mandalika, Labuan Bajo, Manado-Likupang, and Raja Ampat are Developing Tourism Destinations. Meanwhile, there are still three tourism destinations whose tourism carrying capacity mapping results are Pioneering Tourism Destination, namely Wakatobi, Morotai, and Bangka Belitung. The selection of these three tourism destinations as government priorities has the consequences of fiscal financing and high budget priority from the government. Therefore, alternative funding is needed through a blended financing scheme by relying on support from the regional budget, the private sector, investors, and foreign loan funds, to accelerate the development of tourist destinations.

4. Conclusion and Recommendation

The development of future tourism destinations needs to be planned with the principle of equitable development. In principle, tourism development follows trends and market forces, which result in quality differences between tourist destinations. Economic conditions between regions also have significant differences, so development in the tourism sector needs to be a tool to reduce inter-regional disparities and boost the regional economy. The equitable development between tourism destinations maintains the capacity of tourists and the level of tourist satisfaction. Tourism destinations that are heavily visited can reduce the

quality of the tourist experience, impact resource sustainability, and be a source of other problems such as congestion, air pollution, and environmental degradation.

Tourist destinations with good carrying capacity must be designated as national tourism growth centers and distributed to other destinations to distribute benefits and reduce the burden on tourist visits. The group of advanced and revitalized tourist destinations must be developed to improve service quality and strengthen infrastructure to attract foreign and domestic tourist markets with higher purchasing power. Then, a group of developing tourism destinations also needs government support through development in several poor aspects.

The development of pioneer tourist destinations needs to focus on tourist attractions which are the main advantages, to boost the economy and the quality of human resources in stages. Pioneer tourism destinations adjacent to advanced, revitalized, and developing (main tourism destinations) need to become a pattern of tourist travel in an agglomeration of tourism destinations. The relationship between these tourism destinations can maximize the carrying capacity they have so that visitors can take advantage of good accessibility and connectivity infrastructure, tourist services, and the availability of adequate amenities at the main tourist destinations, and can distribute benefits by increasing tourist activity through the tourism options provided at a pioneer tourism destination. The strengthening of this pattern in tourism destinations is in line with the limited government budget availability.

The development of tourism destinations also needs to prioritize differentiation, through the thematic determination of each tourism destination, as a form of diversification of tourism products between destinations. These themes adjust to the characteristics of the carrying capacity and the storyline that is being developed. The development of tourism destinations also needs to strengthen the link to various natural-cultural and economic potentials owned by each tourism destination, including the agricultural sector, whose contribution still dominates in several regions. Creating connections is essential to increase the multiplier effect on tourist spending. Ultimately, existing tourism destinations must be managed professionally through an institutional strength with a tourism function in line with the vision and mission of the proposed development plan.

This research still needs perfection in further study. The research conducted still focuses on the provincial level as a representation of Tourism Destinations, which has depth at a lower level. The aspects used in this study are still focused on the supply side of a tourism destination rather than adding attention to the demand side of a tourism destination. Clustering tourist destinations can also use other grouping methods according to research objectives. In particular, the government needs to compile a tourism competitiveness or carrying capacity index at the national level regularly to provide a factual (evidence-based) picture of tourism development in every tourism destination in Indonesia.

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