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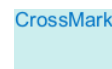
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Decision Support Systems to Choose the Type of Tourist Object that are Opened after Covid 19 Pandemic Using TOPSIS

Method

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Abstract. In the early 2020, the Covid 19 has started spreading to countries worldwide. It has become a pandemic that has many impact on human lives. The Indonesian government has sought to prevent the spread of the virus by doing Restricted Implementation on Community Activity (RICA) which makes people's consumption and purchasing power decrease. That is because they **9**ry out their work, school and business activities from home. There is not one industry unaffected, and tourism is no exception. The tourism sector is severely affected by the Covid-19 pandemic due to the decline in and the ban on tourist visits, both local and international. Especially, it happens in areas with the highest tourist visits that are as a driving force for the people's economy. The government currently has had a discourse on opening tourist areas in the new normal era by paying attention to health protocols. However, the opening of tourist areas needs a more in-depth study so that it is carried out appropriately that it still prioritizes health, public safety, tourism actors and tourist visitors. This research discusses the opening of tourism in the new normal era by discussing the tourism sector that can be opened based on the types of tourism criteria that exist in several **2**gions of Indonesia such as Bali, Lombok, West Nusa Tenggara, Komodo Island, East Nusa Tenggara, Yogyakarta and Bandung. This research uses the TOPSIS method, which is a multicriteria decision-making method. It is based on the concept that the best alternative does not only have the shortest distance from the positive **9**deal solution but also the longest distance from the negative ideal solution. TOPSIS is ideal for deciding the criteria for the type of tourism o **15**ed in the new normal era. The results show that the **15**PSIS method can be used as a determinant of tourism opening decisions during the Covid-19 pandemic. The study sources are primary and secondary data. Primary data is taken from the responses, and secondary data comes from journal ref **3**nces related to research with the TOPSIS method. The results of the research shows that visitors prefer natural tourism areas, marine tourism, water conservation, adventure tourism, national parks, natural tourism parks, and grand forest parks

INTRODUCTION

In the new normal era, many sectors are trying to recover and rising from **17** the impact of the spread of the Covid-19, especially in **the tourism sector**. Social restrictions **and the** restricted implementation of community activity have resulted in the collapse of the community's economy. It also happens to people in tourism areas who depend on it as their main livelihood. The government has had a discourse on opening tourist areas by paying attention to health protocols in the new normal era. However, in the process of opening tourist areas, a more in-depth study is needed. The study is going to be useful for the government to implement some **17**ropriate policies that are based on public health and safety procedures. So, it is not going to create new clusters **of the spread of the Covid-19** and **the tourism sector** industry cannot be **in** decline which causes economic necessity[1]. In the past year, many studies have discussed the Covid 19 pandemic outbreak, along with its impact on various sectors including the tourism sector as in research [2][3][4][5]. In the new normal era, it is hoped that it will become a turning point for the revival of all se **9**rs, especially sectors that are connected to the economy. One of the sectors is the tourism sector. The opening of **the tourism sector in the new normal era** seems to be something urgent and needs to get extra attention from various parties, especially the government. It is because in this sector there is a mutualism symbiotic chain of livelihoods starting from traders, hotels, tour guides, transportation entrepreneurs, and the country's economy that will be affected in a larger aspect. The opening of the tourism sector is expected to reduce the level of the voidness of the community because they cannot enjoy natural beauty over a long period [6]. **4** It is also hoped that tourism

managers can assess in detail the effects of the pandemic to bounce back from this decline in tourism [7]. The TOPSIS method has been used in various studies during this pandemic as a reference in making decisions such as in this research [8][9][10]. This research discusses the tourism sector based on the types of tourism criteria that exist in several regions of Indonesia such as Bali, Lombok, West Nusa Tenggara, Komodo, East Nusa Tenggara, Yogyakarta, and Bandung. As many factors must be considered in the decision-making process, it is going to be as relatively as difficult to decide on a problem [11]. TOPSIS is an effective method that can be used for choosing and deciding the number of criteria to be specific choices for operations, for example, standardization, the measurement of the length of the space between some points and means operators, at each of the compatible stages of TOPSIS[12]. TOPSIS, in its conventional way, is called a method that is used for decision-making when there are multicriteria in global companies. It is suggested for reckoning the length of the space between some criteria to the ideal and the anti-ideal points when organizing assessment processes in which attributes are tentative.[13] Civic becomes the best car based on the chosen range [14]. TOPSIS becomes an easy, understandable, and acceptable technique [15]. TOPSIS technique is easy to comprehend and warrant the pursuit of the best possibilities criterion depicted in a simple mathematical calculation [16]. So, the TOPSIS method is used in making decisions to reopen the tourism sector. The concept of the TOPSIS method is to calculate and measure the performance of the alternatives from the criteria offered. It is used to solve practical decision problems. In research. In research[8] the TOPSIS method has been used to make decisions out assisting to prioritize people who have lost their jobs so that they get help due to the COVID-19 pandemic. The TOPSIS method is a multicriteria decision-making method based on the concept that the best alternative not only has the shortest distance from the positive ideal solution but also has the longest distance from the negative ideal solution[9]. The TOPSIS method is a method of assessment that is interpreted to provide each object to be evaluated specifically for its value [17]. It is a simple and efficient method of several criteria for identifying solutions from a set of several alternatives. As in the journal [18][19] the TOPSIS method is used as a determinant of business locations and it is currently also needed in decision making to see the readiness of various regions in facing the new normal [20]. Especially in the tourism sector, each region is expected to be able to adapt to the current new normal conditions [21][5].

METHOD

The TOPSIS method is used in this research with the following stages:

- 1 Determine alternatives, criteria and research weight. Determination of important criteria as the basis for the stage of the matrix assessment
- 2 Perform normalized decision matrix analysis. At this stage, an assessment of the performance rating of each alternative A_i is carried out on each offered C_i criterion and carries out normalization.
- 3 Calculate the normalized matrix value (R), namely by making a normalized matrix for R values based on the criteria.
- 4 Calculate the weighted normalized matrix (Y) by making a weighted normalized decision matrix (Y). This stage is done by making a multiplication between the weighted value of each attribute by using an equation.
- 5 Calculate the positive ideal solution matrix (A^+) and the negative ideal solution matrix (A^-) by calculating the criteria attribute to get the negative and positive values. The result is the ideal solution to be achieved.
- 6 Calculate the distance of the ideal negative solution (D^-) and positive ideal solution (D^+). This stage is done by calculating the distance between the negative and positive ideal solutions for each of the criteria offered. The results are values of D^+ and D^- for the criteria C_1 , C_2 , C_3 and C_4 .
- 7 find out the preference value for each alternative offered. This stage is the last step in the TOPSIS method. The preference value is obtained from the D^+ and D^- values from the distance between the negative and positive ideal solutions, then these values are entered into the equation and get the result in the form of the proximity of an alternative to the ideal solution of the problem in the research.

Sources of research data come from primary and secondary data. The primary data come from respondents who like tourism activities and have visited tourist areas, especially tourism in Bali, Lombok, West Nusa Tenggara, Yogyakarta, Komodo Island, East Nusa Tenggara and Bandung. Meanwhile, the secondary data come from the second source, namely journals related to the TOPSIS method in the selection process and decision-making that was successfully

used to solve problems regarding multicriteria. Based on the results of observations and data collection, there are 4 criteria that are going to be used as alternative references, namely natural tourism areas, marine tourism, water conservation, petroleum tourism, national parks, natural tourism sites, and grand forest parks are as C1 criterion. Then botanical gardens, zoos, safari parks, tourist villages that are managed by the community are as C2 criterion. Then historical tours, temples, museums, historical buildings, palaces and reserves are as C3 criterion. And lastly, outdoor amusement parks, cinemas, indoor tourism are as C4 criterion

RESULT AND DISCUSSION

The initial stage is to determine alternatives and their criteria and weights. These criteria are used as a basic reference for determining which cities or islands for tourism to be opened. The criteria used are based on:

- 1 Natural tourism areas, marine tourism, water conservation, adventure tourism, national parks, nature tourism areas, and grand forest parks (C1)
- 2 Botanical gardens, zoos, safari parks, tourist villages managed by the community (C2)
- 3 Historical tours, temples, museums, historical buildings, palaces and reserves (C3)
- 4 Outdoor amusement parks, cinemas, indoor tourism (C4)

Meanwhile, the alternative cities or regions where tourism are being opened are:

- 1 Bali (A1)
- 2 Lombok West Nusa Tenggara (A2)
- 3 Yogyakarta (A3)
- 4 Komodo Island East Nusa Tenggara (A4)
- 5 Bandung (A5)

The research was carried out to select which areas of the aforementioned areas to reopen tourism so that community social activities and economic growth can improve. The weighted criteria were 5 for very good, 4 for good, 3 for enough, 2 for bad, and 1 for very bad. The following table is the result of the criteria weight assessment:

TABLE I. Result of Weighted Criteria.

C1	C2	C3	C4
3	4	5	6

Table 1 shows that the area of natural tourism, marine tourism, water conservation, adventure tourism, national parks, nature tourism parks, and forest parks (C2) has a weight of 5 or very good. This is because tourism visitors prefer to visit the type of tourism in the C2 criterion rather than visit other criteria. Furthermore, the criterion for botanical gardens, zoos, safari parks, tourist villages managed by the community (C3) has a weight of 4. Then historical tourism, temples, museums, historical buildings, palaces and cultural heritage (C1) has a weight of 3. Outdoor amusement parks, cinema, indoor travel (C4) has a weight of 2. Determination of the weight value is important because it determines the assessment of the ideal matrix positive and ideal matrix negative. For criteria with a high weight number, the better the value, on the contrary, if the weight value decreases, the value is also be lower. To fill in numbers, you can adjust the importance scale of the TOPSIS method in the following table:

TABLE II. Result of Weighted Criteria.

Criteria	C1	C2	C3	C4
A1	4	5	4	3
A2	5	4	3	3
A3	4	4	4	4
A3	4	4	4	4
A5	3	4	3	3

After determining the alternative criteria and weight values, the second stage is to calculate the value based on the stages of TOPSIS method. The third stage is to calculate the normalized matrix value (R) by finding the root of the squared criterion value. The fourth stage is to perform the calculations for the weighted normalized matrix (Y) by calculating the criterion weight of each alternative offered for the criteria C1, C2, C3 and C4. The fifth stage is to calculate the positive ideal solution matrix (A+) and the negative ideal solution matrix (A-). Before determining the positive and negative ideal matrices, the maximum and minimum values for each of the criteria offered must be determined first. The maximum and minimum values can be seen in the weighted normalized matrix table. Then the sixth stage is to do calculations to find out the distance of the negative ideal solution (D-) and the ideal positive solution (D+). The final stage is to perform an assessment for the alternative preferences offered. The preference value is the closeness of an alternative to the most ideal solution in research. Here are the preference values:

TABLE III. Result of Weighted Criteria.

Criteria	Value Of D+	Value Of D-
C1	$(0,1826)/(0,1826+0,1826)$	0,5
C2	$(0,1826)/(0,1826+0,1826)$	0,305
C3	$(0,1826)/(0,1826+0,1826)$	0,171
C4	$(0,1826)/(0,1826+0,1826)$	0,82

Table 3 shows that the largest order of preference value is 0.5 for C1 criteria, then 0.305 for C2 values, 0.171 for C3, and 0.82 for C4 criteria.

Based on the table of final preference values, it is known that visitors prefer to visit natural tourism areas, marine tourism, marine conservation, adventure tourism, national parks, nature tourism parks, and forest park parks. Then the next choice is to visit the botanical gardens, zoos, safari parks, tourist villages managed by the community. The third choice for visitors to choose historical tours, temples, museums, historical buildings, palaces and cultural heritage. And lastly, visitors choose outdoor amusement parks, cinemas, indoor tours.

CONCLUSION

In this research, it can be concluded that the TOPSIS method can be used as a determinant of tourism opening decisions during the Covid19 pandemic. The results showed that visitors would prefer to visit natural tourism areas, marine tourism, water conservation, adventure tourism, national parks, nature tourism parks, and grand forest parks rather than visit other tourism areas. Then the next choice is to visit the botanical gardens, zoos, safari parks, and tourist villages. The third choice for visitors to choose are historical tours, temples, museums, historical buildings, palaces and cultural heritage. And lastly, visitors choose outdoor amusement parks, cinemas, and indoor tours.

This research can help the government to decide which tourist objects are going to open first. It is especially as a consideration for the areas of Bali, West Nusa Tenggara Lombok, East Nusa Tenggara Komodo, Yogyakarta and Bandung as areas with high levels of tourism in Indonesia.

REFERENCES

12. N. A. Bakar and S. Rosbi, "Effect of Coronavirus disease (COVID-19) to tourism industry," *Int. J. Adv. Eng. Res. Sci.*, vol. 7, no. 4, pp. 189–193, 2020, doi: 10.22161/ijaers.74.23
2. Muhyiddin, "Covid-19, New Normal dan Perencanaan Pembangunan di Indonesia Muhyiddin1," *Indones. J. Dev. Plan.*, vol. 4, no. 2, pp. 240–252, 2020, doi: 10.1016/j.cpha.2021.01.002.
3. H. Ferdiansyah, D. Suganda, E. Novianti, and U. L. Khadijah, "PENGELOLAAN MITIGASI KRISIS PARIWISATA AKIBAT PANDEMI COVID-19 DALAM MENGHADAPI FASE NEW NORMAL (Studi Kasus Di Desa Wisata Nglangeran Yogyakarta)," *Open J. Syst.*, vol. 15, no. 3, pp. 4133–4135, 2020.
4. A. Kiswanto, H. Rohman, and D. R. Susanto, "Penyaluran Alat Pencegahan dan Sosialisasi Protokol Kesehatan untuk Pelayanan Kunjungan Wisatawan dalam Menghadapi New Normal Pasca Pandemi Covid-19," *Abdimas Pariwisata*, vol. 1, no. 2, pp. 38–51, 2020.
5. I. B. G. Paramita and I. G. P. A. Putra, "New normal bagi pariwisata bali di masa pandemi covid 19," *J. Ilm. Pariwisata Agama dan Budaya*, 2020, doi: 10.36275/mws.
6. I. P. A. A. Giri, I. M. Girinata, and I. K. Wiratmaja, "KOMUNIKASI EKSTRA NORMAL DALAM MEMBANGUN PARIWISATA BUDAYA ERA NEW NORMAL," *J. Ilm. Pariwisata Agama dan Budaya*, vol. 18, no. 2, pp. 66–73, 2020, doi: 10.36275/mws.
7. M. Škare, D. R. Soriano, and M. Porada-Rochoň, "Impact of COVID-19 on the travel and tourism industry," *Technol. Forecast. Soc. Change*, vol. 163, no. November 2020, 2021, doi: 10.1016/j.techfore.2020.120469
8. E. T. Alawiah and D. A. Putri, "Implementasi Metode TOPSIS pada Penerima Bantuan Sosial Akibat Covid19 di Desa Kotabatu Ciomas Bogor," vol. 5, pp. 72–82, 2021.
9. Sefrika, "Pemilihan Kriteria Penerima Vaksin Dengan Metode TOPSIS," *J. Sains Komput. Inform.*, vol. 5, pp. 93–98, 2021.
10. R. W. Arida, "Implementasi Metode TOPSIS Dalam Pemilihan Jasa Pangkas Rambut Dimasa Pandemi Covid 19," *At-Tamwil*, vol. 3, no. 1, pp. 68–85, 2021, [Online]. Available: <http://https://ejournal.iai-tribakti.ac.id/index.php/perbankan>
11. R. Gustriansyah, "Sistem Pendukung Keputusan Pemilihan Dosen Berprestasi," *Semin. Nas. Teknol. Inf. dan Komun.*, vol. 2016, no. Sentika, pp. 18–19, 2016, [Online].
12. H. S. Shih, H. J. Shyr, and E. S. Lee, "An extension of TOPSIS for group decision making," *Math. Comput. Model.*, vol. 45, no. 7–8, pp. 813–813, 2007, doi: 10.1016/j.mcm.2006.03.023.
13. A. Vega, J. Aguarón, J. García-Alcaraz, and J. M. Moreno-Jiménez, "Notes on dependent attributes in TOPSIS," *Procedia Comput. Sci.*, vol. 31, no. Itqm, pp. 308–317, 2014, doi: 10.1016/j.procs.2014.05.273.
14. S. Abdal, "Application of TOPSIS Method in Decision Making Via Soft Set," *Biomed. J. Sci. Tech. Res.*, vol. 24, no. 3, 2020, doi: 10.26717/bjstr.2020.24.004045
15. X. Li, K. Wang, L. Liuz, J. Xin, H. Yang, and C. Gao, "Application of the entropy weight and TOPSIS method in safety evaluation of coal mines," *Procedia Eng.*, vol. 26, pp. 2085–2091, 2011, doi: 10.1016/j.proeng.2011.11.2410.
16. P. Wangchen Bhutia, "Appication of ahp and topsis method for supplier selection problem," *IOSR J. Eng.*, vol. 02, no. 10, pp. 43–50, 2012, doi: 10.9790/3021-021034350
17. A. A. Chamid, "Penerapan Metode Topsis Untuk Menentukan Prioritas Kondisi Rumah," *Simetris J. Tek. Mesin, Elektro dan Ilmu Komput.*, vol. 7, no. 2, p. 537, 2016, doi: 10.24176/simet.v7i2.765.
18. T. Kristina, "Sistem Pendukung Keputusan Dengan Menggunakan Metode TOPSIS Untuk Pemilihan Lokasi Pendirian Grosir Pulsa," *Paradigma*, vol. 20, no. 1, pp. 8–12, 2018.
19. M. Adiwisanghagni, "Penggunaan Metode Topsis dalam Rancangan Sistem Penunjang Keputusan untuk Menentukan Lokasi Usaha Baru (Studi Kasus: Arena Disc Yogyakarta)," *Semin. Nas. Teknol. Inf. dan Multimed.*, 2015, pp. 187–192, 2015.
20. E. Y. Utomo, T. Udjani, and B. Irawanto, "Fuzzy AHP TOPSIS Method Based TrFN for New Normal Problem Fuzzy AHP TOPSIS Method based TrFN for New Normal Problem," 2020.
21. A. Wicaksono, "New Normal Pariwisata Yogyakarta," *KepariwisataJurnal Ilm.*, vol. 14, no. 3, pp. 139–150, 2020

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