Evaluation of the Maximum Number Determination Tourists on New Normal Tourism

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Abstract

Before Covid-19 happened, the tourism industry had been faced overtourism problems as the effect of mass tourism growth. Tourism environment quality reduction and the social problem happened to the local people become a problem behind all glitters of tourism growth. Since the Covid-19 outbreak, the overtourism problem changes into nontourism. The spread of Covid-19 in tourism can change the tourism development's paradigm from the visit quantity to the visit quality. Policy about the limitation on the number of visitors applied as the requirement for reopening the tourism sector. This policy is related to the tourism carrying capacity about the maximum amount contained in one tourism area without causing any damages to the environment. This visitor's limitation indirectly solved two problems at once, concerns about the spread of Covid-19 and overtourism repeats. The research was done in Pulau Merah Beach as the destination with the highest visitors in Banyuwangi regency, which has 574 visitors each day and did the tourism opening simulation in a new normal era with visitors' limitation. The tourism manager has determined that 750 people are the maximum number of visitors per day. This research aimed to evaluate the consistency of the number of maximum visitors with Covid-19 policy about visitors limitation using the tourism carrying capacity concept Mix methods were used in this study to deepen data and analysis. Thus, complete and clearer research was gained. Based on the analysis, the physical carrying capacity value of 1.074 people per day, the real carrying capacity value, and effectiveness of 468 people per day. It means the limitation of visitors in new normal tourism in Pulau Merah is safe and by the Covid-19 protocol because it decreased about 30% from the tourism physical carrying capacity. However, if it was evaluated from the real carrying capacity value and effectiveness, those amounts are still exceeding the capacity of the tourism carrying capacity.

Keywords: New Normal, Tourism Carrying Capacity, Visitors Limitation.

INTRODUCTION

The Covid-19 outbreak that was discovered in December 2019 in Wuhan, China, had negative impacts on tourism growth, not only in Indonesia but also all over the world. The spread of the virus, which can be accelerated through mobility and human crowds, has created a public policy that is implemented throughout the country, namely the obligation to maintain physical distancing or physical distancing. As an industry that is based on the mobility of people, tourism activities have to stop temporarily. The large number of economic sectors, which involved in the tourism industry has caused the degradation in the tourism industry widely, not only limited to sectors that related to tourist travel and accommodation. The several other supporting sectors for tourism activities were also affected [1]. The existence of a pandemic has caused tourism paralysis in the economic aspect. However, it can be an advantage for environmental tourism to take a break for a

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Before the pandemic, the tourism industry has already faced problems related to the tourism environment. Behind all the mass tourism trend that is developing massively in various countries, there are environmental and social tourism problems due to overtourism. This term appeared in 2012, which defines the condition where tourism managers and local people feel that there are too many tourists in the tourism destination. So that, they experienced the degradation in environmental quality, the reduction in tourists satisfaction, until the disruption of the local people's social life in that tourism place [2]. One of the cases that occurred was in Thailand, where the government was forced to close one of its islands, which were damaged due to too many visitors [3]. Several destination places in Indonesia which already close to overtourism such as Bali, Labuan Bajo, and Kepulauan Gili [4-8]. If this matter is not resolved quickly, it will be a burden for the tourism sector in Indonesia.

Indirectly, Covid-19 has temporarily resolved *overtourism* problems. However, on the other hand, the tourism problem has changed into

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nontourism [9]. This problem needs to be taken seriously and effectively because tourism is one of the most important sectors that can restore the economic instability that has occurred during the pandemic.

The tourism sector is very complex and is able to have a positive impact on the economic, social, and environmental aspects of the community if it is managed properly and sustainably by integrating the three aspects to achieve a balance. The reopening of tourism after all those problems included *overtourism* and *nontourism*, needs to be done by considering many aspects from the economy, social, environment, and health. The addition of health aspects in accordance with the Covid-19 protocol at the reopening of tourism is very important to conduct the tourism sector in the era of the Covid-19 pandemic. Thus, it does not become a new cluster for the spread of Covid-19.

The policy that should be applied as a condition of reopening tourism is the presence of distance and restrictions on visitors to avoid the potential of crowds and jostling while visiting the tourism places. The restriction of these visitors is basically consistent with the concept of carrying capacity tourism in the context of ecotourism. The tourist carrying capacity is defined as the maximum number that can be accommodated by a field without affecting or damaging the existing environment and can give the visitors some kind of satisfying feeling [10]. The concept of tourism support has already existed before the pandemic happened, but it was not properly applied yet. At that time, the focus of the economic continuity was in the tourism sector, not in social and environmental continuity [11-14]. The policy of maintaining distance during Covid-19 has become a new habit all over the world and has become a momentum for the awakening of ecotourism by applying the concept of tourism carrying capacity to prevent the spread of Covid-19 in tourism destinations and becoming a new strategy so that the problem of overtourism does not happen again [15]. Slowly but surely, the Covid-19 virus has changed the paradigm of tourism development, which was initially oriented towards the quantity of visits then changed into the quality of visits.

A tourism destination that has the potential to get a high number of tourists is marine tourism [16]. Pulau Merah Beach is one of the leading marine tourism destinations in the Banyuwangi Regency. Since August 2020, Pulau Merah Beach has conducted simulations to reopen its tourism by obeying the health protocols and visitors' restrictions. In 2019, the number of visitors to Pulau Merah Beach was 192,166 tourists. If calculated the daily average without considering weekdays and weekends, the number of tourists reaches an average of 500 people per day.

Based on the results of preliminary interviews with tourism managers, which is an effort to reopen Pulau Merah beach, the manager gave a limitation of 750 visitors per day. This number actually exceeds the daily average visit to Pulau Merah beach before Covid-19 happened. The manager explained that on Pulau Merah beach, there was no calculation of the carrying capacity of tourism that has been conducted. So the manager does not know for sure the ideal amount that should be accommodated by Pulau Merah beach so that the sustainability of tourism that destination is maintained. The in determination of the number of 750 tourists during the pandemic is also based on an estimation that has not passed the scientific calculations yet. Based on these problems, this study aims to evaluate the suitability of the limits on the number of tourists determined by the tourism manager with the concept of tourism carrying capacity and tourist restriction policy in the new normal era of Covid-19.

MATERIAL AND METHOD Data Collection

This research is a type of mixed-method research, which combines quantitative methods for calculating the carrying capacity of tourism and qualitative to explore more information regarding the visitor restriction policy that has been carried out by Pulau Merah Beach in the reopening of tourism in the New Normal Era of Covid-19. Data that used for calculating the maximum amounts of visitors using the tourism carrying capacity analysis, which is primary and secondary data. Meanwhile, data related to tourism and institutional activities were obtained from *in-depth interviews* with representatives of the Pulau Merah Beach Pokmas and Sumberagung Bumdes. Furthermore, data about rainfall were obtained from the Central Statistics Agency in the Banyuwangi regency (BPS Kabupaten Banyuwangi).

Data Analysis

The formula used in calculating the maximum number of visitors that are safe to accommodate by considering the health protocol and environmental sustainability uses the tourism carrying capacity formula used by Cifuentes [17]. There are three aspects of carrying capacity that was calculated to determine the carrying capacity of tourism, namely physical carrying capacity (PCC), real carrying capacity (RCC), and effective carrying capacity (ECC). The description of each capacity formula is as follows:

Physical Carrying Capacity (PCC)

$$PCC = A \times \frac{v}{a} \times Rf$$

Description:

A : The capacious area for tourism activity

 The capacious area which needed for certain activity (1 visitor.m⁻²)

R*f*: Rotation factor

Rotation factor (Rf) is the amount of daily visitors that can be allowed in a tourism place [17].

$$Rf = \frac{how long the tourism places open}{the average of how long the visitors visit}$$

Real Carrying Capacity (RCC)

$$RCC = PCC - Cf_1 - Cf_2 - Cf_3 - \dots Cf_n$$

That equation can be converted into a percentage:

$$RCC = PCC \times \frac{100 - Cf_1}{100} \times \frac{100 - Cf_2}{100} \times \dots \times \frac{100 - Cf_n}{100}$$

Description:

PCC : Physical Carrying Capacity (people) Cf : Correction Factor

The correction factors (Cf) that were used in this research are rainfall (Cf₁), duration of the high waves (Cf₂), the capacious of land cover (Cf₃). That correction factor was chosen because (1) it can affect the sustainability of the ecosystem in the tourism area visited, and (2) affect the visiting satisfaction of tourists. These correction factors become limiting factors for the sustainability of tourist interaction and the ecosystem in Pulau Merah beach.

Rainfall is a consideration in the correction factor because Pulau Merah Beach offers outdoor tourism activities. The rainy season will affect the number of tourist visits to tourism objects. When the intensity of the rain gets higher, it gave effects of discomfort feeling that visitors may feel during their visit to the tourism places. So that, there will be fewer tourist activities that can be enjoyed by visitors in the tourist area. The calculation of the rainfall correction factor (Cf₁) is obtained from the ratio of the number of rainy days to the number of days that the tourist attractions of Pulau Merah are opened. The data used are rainfall data and data on the number of open days in the period 2011-2019.

The duration of high waves was chosen as a correction factor because many of the Pulau Merah beach tourism activities are carried out in the sea or in coastal areas to determine the level of security in each tourist attraction. When high waves occur, the crashing waves reach the location of the tourism business and pass through the zone in which the visitors usually enjoy the view of the Pulau Merah beach. So that when the high waves occur, the tour manager was forced to close the tourist attractions for a while for the sake of security and safety. The calculation of the rainfall correction factor (Cf₂) is obtained from the comparison of the number of months of high waves to the number of months in a year.

The land cover affects the comfort of tourists. With the existence of the land cover , tourists will feel at home to enjoy the beach. The calculation of the land cover correction factor (Cf_3) is obtained from the comparison of the value of the Pulau Merah Beach Forest Cover Index (ITH) to the maximum ITH value. Correction factor (Cf_1) is from this calculation:

$$Cfn = \frac{M1}{Mt} \ge 100\%$$

Description:

Cfn = correction factor

M1 = Calculated Variable Value

Mt = Total Variable Value

Effective Carrying Capacity (ECC)

ECC =
$$RCC \times MC$$

Description:

- ECC : Effective carrying capacity based on the physical distancing
- MC : Management capacity based on the amount of staff and staff competence
- RCC : Real carrying capacity based on the physical distancing

$$MC = \frac{Rn}{Rt} \ge 100\%$$

Explanation:

- Rn : the amount of staff that already exist
- Rt : the amount of staff that needed

Tourism Carrying Capacity Status

The output of the tourism carrying capacity calculation is obtained by comparing the data from the previous three calculations of carrying capacity (PCC, RCC, and ECC). If the data on the

number of tourists per day exceeds the carrying capacity of the tourism, this indicates that the carrying capacity has been exceeded (Muta'ali, 2015). On the other hand, if the number of tourists is still below the carrying capacity, the tourism object area can still be developed again. Here is the classification of tourism carrying capacity status and recommendations that must be made to address this status:

Table 1. Classification of Tourism Carrying Capacity Status

No	Carrying Capacity Aspects	Carrying Capacity Status	General Recommendations
	PCC>Jkr		
1	RCC>Jkr	High CC	Can be developed
	ECC>Jkr		
	PCC <jkr< td=""><td></td><td>Controlled and</td></jkr<>		Controlled and
2	RCC <jkr< td=""><td>Exceeded CC</td><td>Deergapized</td></jkr<>	Exceeded CC	Deergapized
	ECC <jkr< td=""><td></td><td>Reorganizeu</td></jkr<>		Reorganizeu
	PCC=Jkr		Effective and
3	RCC=Jkr	Optimal CC	Efficient
	ECC=Jkr		Encient

Source: Muta'ali [18]

RESULT AND DISCUSSION

Characteristics of Pulau Merah Beach

Pulau Merah Beach located in Sumberagung Village, Pancer Hamlet, Pesanggaran District, Banyuwangi Regency (8°36'18.4" LS dan 114°01"31.8" E). The distance from Banyuwangi city to Pulau Merah is ± 69 kilometers or about 2 hours drive. The beach has white sand that spread out for three kilometers. In addition, there is a hill as high as 300 meters which becomes the beauty of Pulau Merah Beach. Tourism activities that could be done here are watching the sunsets and sunrises, boating, diving, and enjoying the view in the seashore. Several facilities have also been provided here, such as a food court, places of worship, toilet, control tower, information center, a place to rent umbrellas, and a surfing board. Furthermore, the homestay all over the beach makes the visitors more comfortable spending their time in Pulau Merah.

Physical Carrying Capacity (PCC) Pulau Merah Beach

Based on the results of observations and interviews with representatives of the Pulau Merah beach community groups, data on the area that is actively used as a tourist destination is 6.8 hectares. Pulau Merah beach opens for about 10 hours, from 07.00 AM until 05.00 PM. All the visitors can enjoy the beauty of Pulau Merah, such as sunset, sunrise, and a lot of photo spots all over the beach. There are also other attractions such as enjoying the island using a boat, surfing, and also swimming. However, those three activities can only be done on a special occasion, based on the condition of Pulau Merah itself. From the tickets statistic, most of the visitors came by four-wheeled vehicles. The amount of time they spend here is about two or three hours. For the calculating of rotation factor (Rf), the researcher used the mean value of the average visitor, so it is about 2.5 hours. Furthermore, the rotation factor that is used to enjoy the beauty of Pulau Merah is 4. According to Douglas (1975, 1979) calculation, the picnic area requirement is 2725-2726 ft² or equal to 253.25 m². Based on that data, the calculating of the physical carrying capacity (PCC) at Pulau Merah Beach is as follows:

$$PCC = A \times \frac{v}{a} \times Rf$$
$$= 68000 \times 1/253.25 \times 4$$
$$= 1074.037 \approx 1074$$

Based on the calculation results, the physical carrying capacity (PCC) value is 1074.037, or we can simply write it as 1074. It means that the Pulau Merah Beach can physically accommodate the number of tourist visits as many as 1074 tourists per day.

The Real Carrying Capacity (RCC) of Pulau Merah Beach

The calculation of the real carrying capacity at Pulau Merah Beach is influenced by correction factors, such as rainfall, the duration of high waves, and land cover area. Based on the secondary and primary data obtained, the value of each correction factor is as follows:

Table 2. The Value of Correction Factor (CF)

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Correction Factor Aspect	Calculated Value (Mn)	Total Value (Mt)	CF(%)
Rainfall	1360	3287	41.37
High Waves	3	12	25
Land Cover Area	99.723	114.456	87.12

Source: analysis result (2020)

Considering the results of the calculation on the correction factor value, the real carrying capacity (RCC) value in Pulau Merah Beach is as follows:

$$RCC = PCC \times \frac{100 - Cf_1}{100} \times \frac{100 - Cf_2}{100} \times \dots \times \frac{100 - Cf_n}{100}$$

= 1074 × $\frac{100 - 41.37}{100} \times \frac{100 - 25}{100} \times \frac{100 - 87.12}{100}$
= 1074 × 0.75 × 0.5862 × 0.991
= 1074 × 0.4358
= 468.1091 ≈ 468

Based on the calculation of the real carrying capacity with this correction factor, the ideal number of tourists to be accommodated on Pulau Merah Beach is 468 tourists per day.

The Effective Carrying Capacity (ECC) of Pulau Merah Beach

The calculation of the effective carrying capacity (ECC) is seen from the condition of the existing management capacity in the tourism destination. It is to determine if the number of existing officers and officers that are needed to conduct the tourism is already properly. Based on the results of interviews with Pulau Merah Beach Pokmas, the number of available officers is in accordance with the required number of officers. The total number of officers or tourism administrators of Pulau Merah Beach is 66 people. Amongst them, there are only 18 people who become daily officers, while the remaining officers/administrators are temporarily hired only when there are events or seasons where the number of visitors increased. The total daily staff and their job distribution are as follows:

Table 3. Job	Distribution	of the	staffs in	Pulau Merah
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Job	Number of Officers (person)
Ticket	4
Cleaning	8
Parking	2
lifeguard	3
Security	1
Total	18

Source: primary data, interviews and field observations

The distribution of the number of officers based on each job is divided effectively because the staff is capable of serving the tourists. Based on this, the calculation of the effective carrying capacity (ECC) of the Pulau Merah beach is as follows:

$$MC = \frac{Rn}{Rt} \times 100\%$$
$$= \frac{18}{18} \times 100\%$$
$$= 100\%$$
$$= 1$$

After the value of management capacity is known, which is 1, the value of the effective carrying capacity can be known by the equation:

$$ECC = RCC \times MC$$

= 468 x 1
= 468

Based on the calculation, it can be known that the value of the effective carrying capacity (RCC) is 468. It means that the maximum number of tourists that can be accommodated by the Pulau Merah Beach without damaging the ecosystem and can be served properly by officers is 468 tourists per day.

Analysis of the Status of the Carrying Capacity of Pulau Merah Beach

To see the status of the tourism carrying capacity of Pulau Merah Beach, researchers used data on the number of visits to Pulau Merah beach tourists in 2019, which is 209,587 tourists or an average of 574 tourists per day. This number has not exceeded the physical carrying capacity but has exceeded the real and effective carrying capacity. Further analysis will be revealed in which the number of tourists exceeds the carrying capacity of the Pulau Merah Beach.

Table 4. The number of tourists that visited Pulau Merah
beach during 2019

Month	The amount of visitors each month	The amount of daily visitors
January	12.978	418
February	1.599	57
March	14.774	476
April	15.935	531
May	5.469	176
June	55.005	1.833
July	21.822	703
August	12.044	388
September	11.744	391
October	12.926	416
November	14.008	466
December	31.293	1009

Based on the number of tourists in June 2019, there was the highest number of visits and exceeded the carrying capacity, both physical, real, and effective. It happened because June coincided with the momentum of Eid. That is why many tourists, both local and out of town, take the time to travel.

Meanwhile, based on the results of interviews with the Pulau Merah beach community, the highest tourist visits occurred on weekends, national holidays, and during long holidays, such as school holidays and Eid holidays (June-July), which is an average of 1500- 2000 tourists per day. Besides that, on normal days, the number of visitors looks normal, ranging from 150-200 tourists, so there is no visible tourist density on Pulau Merah Beach. From these data, it means that during the peak season, the Pulau Merah Beach has exceeded its physical, real, and effective carrying capacity. The highest percentage of visits reached up to 116%, more than the real and effective carrying capacity value of Pulau Merah Beach. To overcome this, the Pulau Merah Beach manager needs to control and rearrange them. So that the number of tourists visiting does not exceed the carrying capacity of the Pulau Merah Beach.

The Evaluation of the maximum number determination in Pulau Merah Beach on New Normal Era

Since July 2020, the local government of Banyuwangi Regency has prepared new openings for several tourism destinations that have the potential to become places of visit during a pandemic and post-pandemic. Pulau Merah Beach is one of the destinations that was allowed to reopen the tourism place in the new normal era. In addition, Pulau Merah Beach also determines the maximum number of visitors who can visit in one day, which is 750 people.

If the analysis uses tourism carrying capacity, the determination of the visit limit on Pulau Merah Beach is in accordance with the physical carrying capacity of tourism and the health protocol policy, which has reduced 30% of the number of tourists that can be accommodated based on the physical carrying capacity of the Pulau Merah beach. However, the determination of this amount is still beyond the limit when compared with the real and effective carrying capacity on Pulau Merah Beach. It means that at least those 750 tourists are practically safe for the tourist limit in the new normal covid-19 because it does not cause tourists to jostle at the tourism places. However, it is still not good for the sustainability of the tourism environment because it still exceeds the real and effective carrying capacity. To overcome this, the Pulau Merah Beach tourism manager indirectly has implemented a policy of closing tourist attractions for one day. For example, every Monday, to conduct sterilization related to the Covid-19 health protocol on the Pulau Merah Beach. The closure of the tour for one day a week also provides time for nature to rest and the tourism environment from tourism activities.

CONCLUSION

The physical carrying capacity of Pulau Merah Beach is 1074 people per day. Meanwhile, the real and effective carrying capacity is 468 people per day. Based on these calculations, the status of the physical carrying capacity of Pulau Merah Beach has not been exceeded yet. However, the status of the real and effective carrying capacity of Pulau Merah Beach has been exceeded. Tourist limitation in the new normal era, which is 750 people each day, can be said to be taken care of safely and has already decreased by 30% of the physical carrying capacity of Pulau Merah Beach. However, from the real and effective carrying capacity, this number still exceeds the tourism carrying capacity. It means that limiting the number of visitors is safe from the point of view of preventing the spread of covid-19 in tourism places, but it is still not good for the sustainability of the Pulau Merah Beach environment.

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