The Efficiency of Tourism in Central Java

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Abstract

One of the Indonesian provinces with promise for tourism is Central Java. This study uses data envelope analysis (DEA) to examine Indonesia's tourism industry's efficiency. The number of restaurants, lodging options, hotels, and tourist attractions as well as the number of employees in the tourism industry are the input variables that are used. The quantity of money received by the tourism industry and the number of visitors are the output variables. The Central Java Tourism Statistics for the years 2018–2022 contain data from the Department of Youth, Sports, and Tourism in Central Java. The analysis's findings demonstrate the efficiency of nearly every city district under investigation. The quality of Central Java's tourism infrastructure allows for a high level of revenue generation and workforce absorption.

Keywords: Data Envelopment Analysis (DEA), tourism, Central Java, efficiency

1.   INTRODUCTION

Indonesia has a lot of tourism resources from Sabang to Merauke. Tourism is one of the pillars of the Indonesian economy as well as a significant source of its foreign exchange revenues besides oil, gas, and coal (kemenparekraf.go.id, 2020). Based on Statistical Data 2022, tourism foreign exchange amounted to US$7.03 billion and contributed to 2.4% of GDP (Rainer, 2023). However, the contribution of tourism in Indonesia is still below other countries as shown in Figure 1. In 2023, highest domestic tourist destinations are in East Java. Meanwhile, the highest number of visits by foreign tourists is Bali.

Tourism generates revenue from hotel and restaurant taxes, and tourist levies. Tourism also creates jobs as well as preserves local culture (Mustofa dan Haryati, 2018). Tourism acts as an economic asset (Annamalah et al., 2023). Tourism efficiency is important

for better management. This is one of the attractions of tourist visits (Akhmad, Prambudia dan Rumanti, 2023). Infrastructure is an important determinant of tourism demand. The better their quality, the higher the number of tourist visits Ma, Yang dan Zheng, 2022). The infrastructure includes human resources, capital, cultural resources, and other supports. It needs to be audited, inventoried, maintained, developed, and managed efficiently (Cracolici dan Nijkamp, 2008).
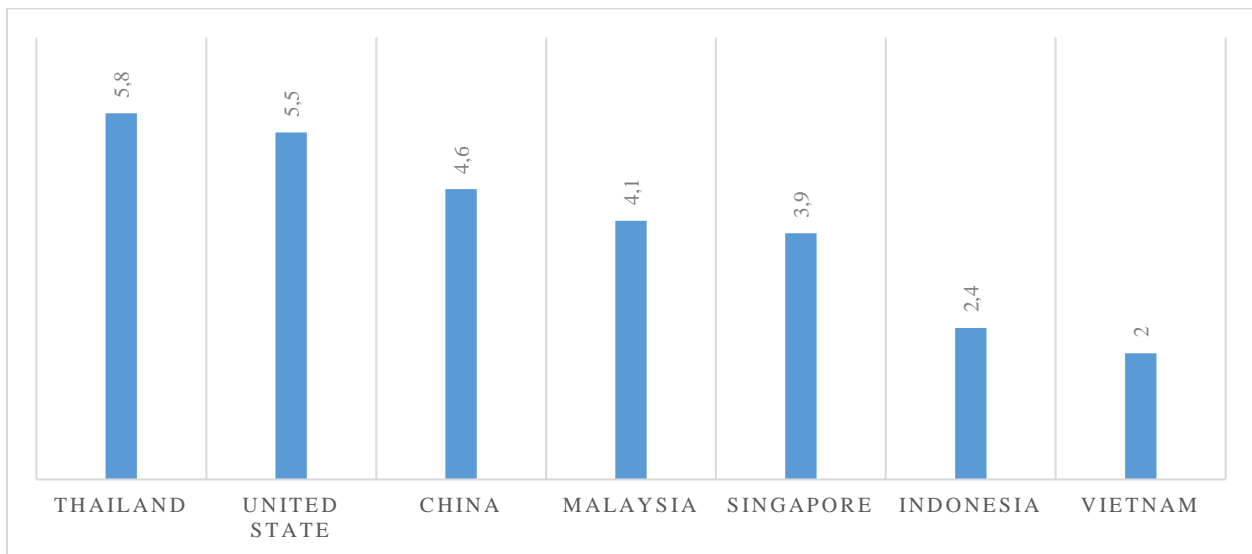

Figure 1. Contribution of Tourism in Several Countries (%)
Source: Rainer, 2023

Central Java is strategically located along the north coast of Java and between West Java, East Java, and Yogyakarta. This creates a variety of tourism potential in Central Java, including nature tourism, marine tourism, cultural tourism, and artisan tourism. However, Central Java has not been able to become a province that is attractive to domestic and foreign tourists such as East Java, Bali, and Jakarta. Thus, the regional income derived from the tourism sector is relatively small. This has led to concerns about the inefficiency of tourism. Therefore, this study aims to analyze the efficiency of tourism in Central Java.

2.   LITERATURE REVIEW

Tourism encompasses a range of industries, services, and activities that offer a travel experience. These include accommodations, dining and drinking establishments, shops, entertainment venues, activity centers, and other hospitality services that are available to

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individuals or groups who are traveling far from home. This covers all service providers for visitors and services related to visitors (Hall and Williams).

The elements of tourism are:

1. Pleasant weather. As it will provide memorable holiday experiences, excellent weather is a critical requirement for the holidays.
2. Beautiful views. Mountains, lakes, waterfalls, glaciers, forests, deserts, and other natural landscape elements are powerful draws for tourists.
3. Cultural and historical aspects. Many people find great appeal in history and culture. Historical artifacts from their past serve as the primary draws for tourists in many nations that are growing their tourism industries.
4. Availability. Since accessibility is a way for visitors to get to the location of the attraction, it is a crucial component (Nguyen et al., 2019).

3. RESEARCH METHOD

Secondary data was obtained from the Central Java Youth, Sports and Tourism Department during 2018-2022. The Data Envelopment Analysis (DEA) with Banxia Frontier 3.1 was used as an analysis method. DEA is one of the nonparametric tools to measure efficiency (Shahraki & Keshtegar, 2019). DEA measures efficiency of DMU (Decision Making Units) which is the ratio of total output to total input (Farrell, 1957). There are several advantages of efficiency measurement using DEA. First, efficiency measurement is technical so it only takes into account the absolute value of variables. Units of measurement that reflect economic value such as price, weight, length, volume are not considered. Therefore, it is appropriate to measure various variables in different units. Secondly, the value of efficiency is relative, which is only valid within the set of units being compared.

Modifying previous research Nurmatov, Lopez dan Millan (2021); Wang dan Kim (2021); Guo dan Cao (2024), Wenhua (2021), the input variables included the number of tourist attractions, restaurants, accommodations, hotels and workers in the tourism sector. Meanwhile, the output variables are the number of tourists and the amount of revenue from the tourism sector. It assumes output-oriented DEA and VRS, i.e. the same input will produce more output.

$$E_k = \sum_{r=1}^{s} u_{rk}. Y_{rk} \qquad (1)$$

constraints:

$$\sum_{r=1}^{s} u_{rk} \cdot Y_{rj} - \sum_{i=1}^{m} v_{ik} \cdot X_{ij} \leq 0; j = 1, \dots, n \qquad (2)$$

$$\sum_{i=1}^{m} v_{ik} \cdot X_{ik} = 1 \qquad (3)$$

$$u_{rk} \geq 0; r = 1, \dots, s \qquad (4)$$

$$v_{ik} \geq 0; i = 1, \dots, m \qquad (5)$$

Y_{rk} : total output r of DMU as benchmark

Y_{rj} : total output r others DMU

X_{ik} : total input i of DMU as benchmark

X_{ij} : total input i others DMU

s : total of DMU

m : total input

u_{rk} : the weight of output r by each DMU

v_{ik} : the weight of input i by each DMU

E_k : optimized value as an indicator of the relative efficiency of each DMU

4.   RESULT

The analysis was conducted on 17 regencies/cities due to incomplete data during 2018-2022 in 35 regencies/cities in Central Java. The results show that Banjarnegara, Kebumen, Temanggung, Sukoharjo, Pati, Demak, Semarang, Pekalongan, Salatiga City, and Semarang City are consistently efficient. Less than 25 percent of regencies/cities in Central Java were inefficient in tourism management during that period.

Table 1. Efficient Districts in Central Java

Year	Regencies/ Cities
2018	Banjarnegara, Kebumen, Wonosobo, Temanggung, Sukoharjo, Pati, Demak, Semarang, Pekalongan, Salatiga City, Semarang City
2019	Banyumas, Banjarnegara, Kebumen, Temanggung, Wonosobo, Sukoharjo, Rembang, Pati, Demak, Semarang, Pekalongan, Salatiga City, Semarang City
2020	Banjarnegara, Kebumen, Temanggung, Wonosobo, Sukoharjo, Rembang, Pati, Demak, Semarang, Pekalongan, Salatiga City, Semarang City
2021	Cilacap, Banyumas, Banjarnegara, Kebumen, Temanggung, Wonosobo, Sukoharjo, Rembang, Pati, Demak, Semarang, Pekalongan, Salatiga City, Semarang City

Year	Regencies/ Cities
2022	Banyumas, Banjarnegara, Kebumen, Temanggung, Sukoharjo, Rembang, Pati, Demak, Semarang, Pekalongan, Salatiga City, Semarang City, Surakarta City.

Most of Central Java has been efficient in tourism management. It proves that tourism is reliable in Central Java and has great capacity to attract domestic and foreign tourists. Mapping by region is presented in Figure 2.
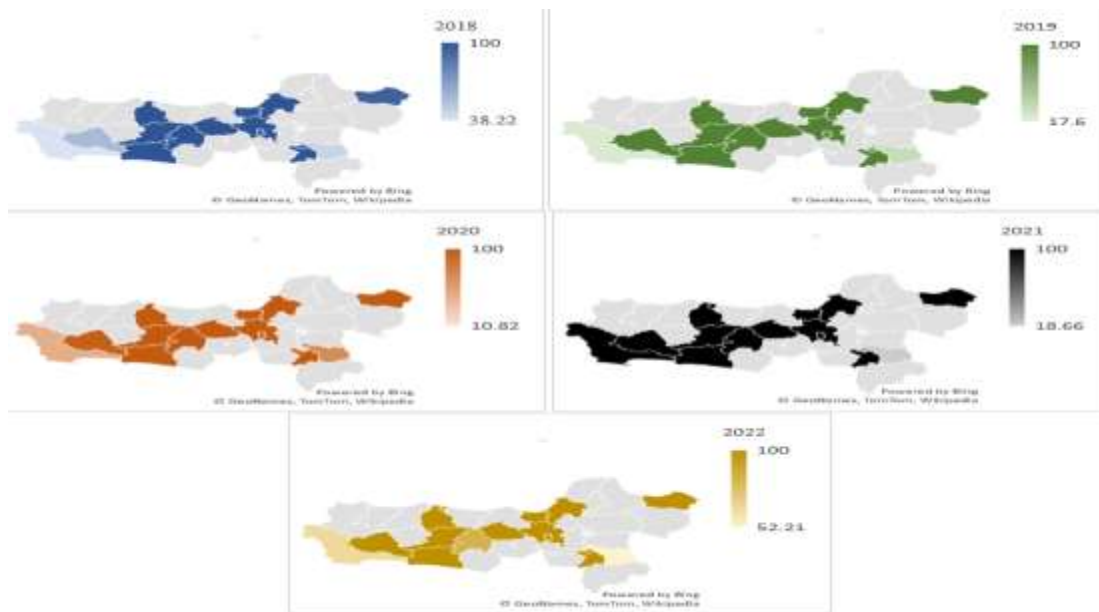

Figure 2. Efficiency in 2018-2022

Table 2. Efficiency Score by Region 2018-2022

	2018	2019	2020	2021	2022
Cilacap	38.22	21.73	45.87	100	63.72
Banyumas	55.75	100	96.31	100	100
Banjarnegara	100	100	100	100	100
Kebumen	100	100	100	100	100
Wonosobo	100	100	100	100	82.77
Sukoharjo	100	100	100	100	100
Karanganyar	44.73	31.85	67.82	18.66	52.21
Rembang	94.51	100	100	100	100

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Pati	100	100	100	100	100
Demak	100	100	100	100	100
Semarang	100	100	100	100	100
Temanggung	100	100	100	100	100
Pekalongan	100	100	100	100	100
Surakarta City	97.97	81.12	18.41	35.92	100
Salatiga City	100	100	100	100	100
Semarang City	100	100	100	100	100
Pekalongan City	42.05	17.6	10.82	99.98	89.42
Average	86.66	85.43	84.66	91.44	93.42

Tourism infrastructure includes basic facilities, complementary facilities and supporting facilities. Main facilities include hotels, villas, restaurants. Complementary facilities include cultural tourism and nature tourism. Supporting facilities are art markets, culinary, souvenirs and local merchandise Sekarsari et al. (2020). The diversity of tourism in Central Java is supported by these facilities (Adeola and Evans, 2019). All tourism infrastructure facilities must be available, so that promoted tourism will have an economic impact on the region (Sekarsasi et al., 2020). Comfortable hotels attract tourists to visit (Hsieh and Chuang, 2019; Abdullah and Lui, 2018). Restaurants can also be an attraction in themselves (Sparks, Bowen and Klag, 2003; Mohamed, 2022).

Law No. 10/2009 states that the purpose of tourism is to increase economic growth, improve people's welfare, eliminate poverty, overcome unemployment, preserve the natural environment and resources, advance culture, raise the nation's image, foster a sense of love for the country, strengthen national identity and unity, and strengthen friendship between nations. Thus, tourism has a broad impact on people's lives including improving the quality and standard of human life. Therefore, tourism resources are needed as capital for quality tourism development. Quality resources will increase tourism demand effectively and efficiently (Ashoer et al., 2021).

One of the tourism resources is the workforce. Human resources are a key factor for successful performance Evans, Campbell dan Stonehouse (2003). Humans act as a driving motor for the continuity of the tourism industry in a country (Setiawan (2016),. The community is the human resource of tourism itself because it directly welcomes the presence and provides services for tourists Jithendran dan Baum (2000). The community has provided good services, so that tourist visits are high and sustainable in absorbing labor

(Andriyani dan Salam, 2022). Therefore, the role of human resources is very important in building and developing the tourism sector.

Based on statistical data of Central Java, the number of domestic tourist visits in 2022 is ranked third nationally at 110,345,715 people, under East Java and West Java Provinces. In addition, revenue from the tourism sector topped the fifth rank in 2020 after West Java, DKI Jakarta, Banten and East Java, which amounted to Rp 33,019,516 trillion.
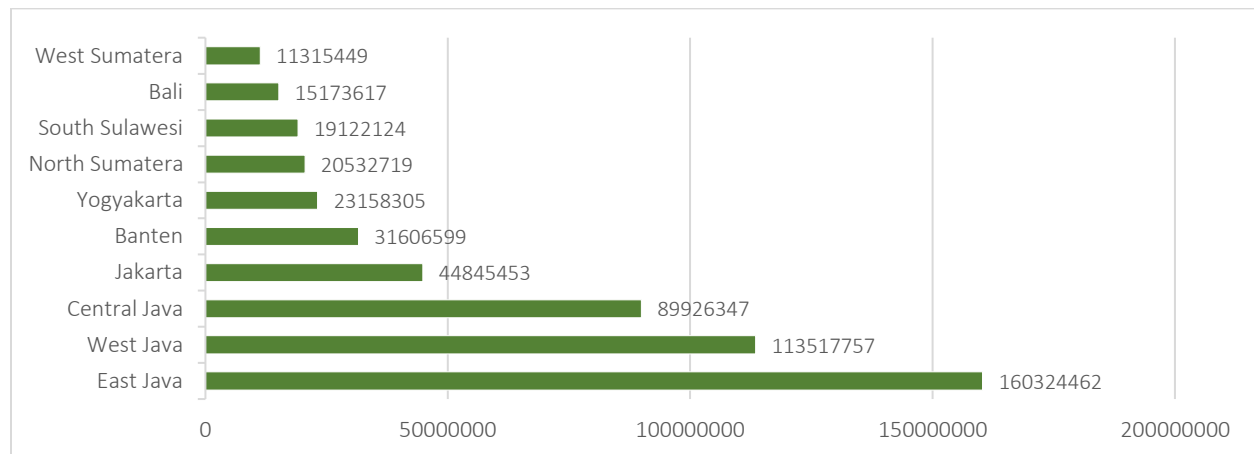
Figure 3. Total of Domestic Tourist Visits in several Provinces of Indonesia
Source: Statistical Bureau, 2023

5.   CONCLUSION

The achievement of tourism efficiency in Central Java shows that the majority of regencies/cities have been efficient. This is because the infrastructure has successfully supported tourist destinations in each region. Central Java tourism has proven to be able to accommodate a lot of workforces. Income from the tourism sector in Central Java is high. The variety of tourist attractions makes high visitor interest for traveling around Central Java.

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