



Spatial Analysis of Service Capacity and Distribution Patterns of Tourism Infrastructure on Mount Kelud, Kediri Regency

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ABSTRACT

This study aims to analyze the service capacity and distribution patterns of tourism infrastructure in the Mount Kelud area, Kediri Regency. After the 2014 eruption, the availability of Mount Kelud's tourism infrastructure is still unclear. No research has been conducted to analyze the service capacity and distribution patterns of infrastructure facilities on Mount Kelud. This raises the question of whether the tourism infrastructure at Mount Kelud is adequate to meet the needs of tourists and how it is distributed. This study uses a quantitative approach with a cross-sectional survey design. The researcher uses a scalogram analysis with a Guttman scale to analyze the service capacity of tourism infrastructure. The research sample consists of infrastructure located in Ngancar Subdistrict. The results show that six villages are categorized as adequate, while the other four villages are categorized as inadequate. The distribution pattern of facilities and infrastructure was analyzed using the IDW (Inverse Distance Weighted) interpolation method using QGIS software version 3.44.2. The distribution pattern of Mount Kelud's tourism facilities and infrastructure tends to be concentrated along the main access corridor to the Mount Kelud crater. These findings indicate an imbalance in the distribution of infrastructure that can affect the quality of the tourist experience and the distribution of economic benefits to the local community. Therefore, a spatial-based development strategy is needed to equalize infrastructure, so that villages in the inadequate category can serve as supporting areas and reduce environmental pressure on the core tourist villages. In addition to providing information for readers, this study is expected to contribute to regional tourism planning and policy.

Keywords: Spatial Analysis; Tourism Infrastructure; Tourism Service Capacity; Distribution Pattern; Mount Kelud.

ABSTRAK

Penelitian ini bertujuan untuk menganalisis daya layanan dan pola sebaran sarana prasarana wisata di kawasan Gunung Kelud, Kabupaten Kediri. Pasca erupsi 2014, ketersediaan sarana prasarana wisata Gunung Kelud masih belum diketahui dengan jelas dan belum ada penelitian yang dilakukan untuk menganalisis daya layanan dan pola sebaran sarana prasarana Gunung Kelud.

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Sehingga dapat memunculkan pertanyaan apakah sarana prasarana wisata Gunung Kelud sudah memadai untuk memenuhi kebutuhan wisatawan dan bagaimana pola sebarannya. Penelitian ini menggunakan pendekatan kuantitatif dengan desain survei cross-sectional. Peneliti menggunakan analisis skalogram dengan skala guttman untuk menganalisis daya layan sarana prasarana wisata. Sampel penelitian adalah sarana prasarana yang terdapat di Kecamatan Ngancar. Hasil penelitian menunjukkan bahwa enam desa masuk kategori memadai, sedangkan empat desa lainnya masuk kategori kurang memadai. Pola sebaran sarana prasarana dianalisis dengan metode interpolasi IDW (Inverse Distance Weighted) menggunakan perangkat lunak QGIS versi 3.44.2. Pola sebaran sarana prasarana wisata Gunung Kelud cenderung terkonsentrasi di sepanjang koridor akses utama menuju kawah Gunung Kelud. Temuan ini menunjukkan adanya ketimpangan distribusi sarana prasarana yang dapat memengaruhi kualitas pengalaman wisatawan serta distribusi manfaat ekonomi bagi masyarakat lokal. Oleh karena itu, diperlukan strategi pengembangan berbasis spasial untuk pemerataan sarana prasarana, sehingga desa-desa dengan kategori kurang memadai dapat berperan sebagai kawasan pendukung dan mengurangi tekanan lingkungan di desa inti wisata. Selain dapat memberikan informasi bagi para pembaca, penelitian ini diharapkan dapat berkontribusi pada perencanaan atau kebijakan pariwisata daerah.

Kata Kunci: Analisis Spasial; Infrastruktur Pariwisata; Daya Layan Wisata; Pola Distribusi; Gunung Kelud

1. Introduction

Tourism in Indonesia has experienced significant growth. Developments in the tourism sector can have a positive impact on other sectors. Tourism development can create infrastructure growth, generate employment, and increase regional income (Sari, 2024). In certain areas, the tourism sector can even become the backbone of the economy (Yuwono et al., 2024). One of the regions in Indonesia that has experienced rapid growth in the tourism sector is Kediri Regency. Kediri Regency has 123 tourist attractions consisting of 34 cultural heritage sites, 44 natural attractions, and 45 man-made attractions (Pascalisa & Rasyid, 2025). In addition, the number of tourists visiting Kediri Regency has increased to 2,808,461 tourists. This data was taken from visits by domestic tourists and foreign tourists. The number of domestic tourist visits to Kediri Regency in 2024 reached 2,808,392 tourists, while the number of foreign tourists was 69 tourists (Pascalisa & Rasyid, 2025). This data shows that Kediri Regency has made good progress in the tourism sector, making it a good alternative for tourists to visit.

One of the tourist destinations in Kediri Regency is Mount Kelud. This mountain is the only volcanic mountain tourist destination in Kediri Regency, so it has a high chance of becoming a major tourist destination for tourists. Mount Kelud is located in Ngancar District, directly bordering Blitar Regency and Malang Regency (Haqqi, 2021; Pascalisa & Rasyid, 2025). Mount Kelud can be used as an alternative to Mount Bromo to reduce environmental pressure and disperse the concentration of visits in one area. This is because environmental pressure due to the concentration of visits in one area can have a negative impact on the environment (Sibarani, 2023). However, there are still many problems in the tourism sector, especially on Mount Kelud.

Based on preliminary observations, it was found that the development of tourism infrastructure on Mount Kelud after the 2014 eruption was still very minimal. The 2014 eruption of Mount Kelud had an impact on the infrastructure and supporting tourism facilities. The eruption of Mount Kelud in 2014 caused severe damage to the infrastructure. These facilities and infrastructure included tourism support facilities, houses, and many buildings. Even the tunnels and shops of residents around Mount Kelud were buried in volcanic material and destroyed (Yusuf, 2021). As a result, after the 2014 eruption, many tourists who visited complained about the lack of tourism infrastructure to meet their needs. Some tourists complained about the lack of toilets and food stalls. The government has made efforts to develop the area, one of which is by

repairing the road leading to the Mount Kelud crater tourist area. However, the development of Mount Kelud tourism still needs to be improved (Anggraini et al., 2023). This raises the question of whether the service capacity of Mount Kelud's tourism infrastructure is adequate to meet the needs of tourists.

The availability of infrastructure can have a significant effect on various aspects of tourism, both from the perspective of managers and tourists. The availability of infrastructure can affect tourist satisfaction (Siagian & Mita, 2022). The availability of good infrastructure can increase satisfaction and have an impact on tourists' interest in returning (Praja, 2023; Hermanto et al., 2022; Sundaro & Yuliani, 2022). Therefore, facilities and infrastructure at tourist destinations must be well maintained, because if these two aspects are neglected, it can have a negative impact on the image or impression of a tourist attraction. Based on these issues, an analysis of the service capacity of tourism infrastructure is needed to determine whether the infrastructure at Mount Kelud is adequate or not.

An analysis of the service capacity of Mount Kelud's tourism infrastructure can be carried out to determine the level of availability of tourism infrastructure at Mount Kelud. Through the process of analyzing the service capacity of tourism infrastructure, data can be obtained in the form of adequate, sufficiently adequate, or inadequate infrastructure availability (Nuryadin & Sugiri, 2023). Even after analyzing infrastructure availability, research can be continued and directions for tourism development can be provided (Fahrudin T et al., 2021). The analysis of the service capacity of tourism infrastructure is very important because attractiveness, facilities, and accessibility have a positive and significant simultaneous effect on the decision of tourists to visit Mount Kelud (Nugroho, 2024). Research on Mount Kelud after the 2014 eruption has not been widely conducted, no one has analyzed the capacity of infrastructure services using scalogram analysis to map the capacity of infrastructure services. According to the 3A theory or concept (Attraction, Amenities, and Accessibility), facilities and infrastructure are very important for the development of a tourist destination (Noni, 2021). This is also supported by field observations which show that the availability of tourism facilities and infrastructure at Mount Kelud after the 2014 eruption is still unclear. Therefore, an analysis of the service capacity of Mount Kelud tourism facilities and infrastructure is urgently needed. Based on the above background, the purpose of this study is to analyze the service capacity and distribution patterns of Mount Kelud tourism facilities and infrastructure in Kediri Regency.

2. Literature Review

Service capacity can be defined as the ability of a tourist attraction to provide a satisfying experience to visitors, accompanied by the quality of service provided (Ismail et al., 2022). Service capacity includes infrastructure facilities that can be determined by the amount of availability (Tyas & Pujilestari, 2024). In the context of tourism, capacity relates to the ability of a tourist attraction to attract and satisfy visitors (Jakaria et al., 2024). Meanwhile, service refers to the services provided to visitors while they are at the tourist location (Santoso et al., 2022). In research on tourist attractions, service capacity is measured through factors such as accessibility, service quality, and available facilities that support tourist comfort (Gado & Gare, 2022). The service capacity of tourism infrastructure can be measured through the process of identifying the availability of tourism infrastructure. One analysis technique that can measure the availability of tourism infrastructure (present/absent) is the scalogram analysis technique (Sanjayah, 2021).

The importance of service capacity in the tourism sector is closely related to tourist satisfaction resulting from their interaction with existing facilities and infrastructure. According to research, good service capacity can increase tourist loyalty and influence repeat visit decisions (Hanny & Setiawan, 2022; Putri, 2023). This method provides an objective picture of the availability of facilities and infrastructure through a structured quantitative approach. In addition, the service capacity of facilities and infrastructure affects the center of the service area, because

the distribution of tourists results in an increase in the number of facilities and infrastructure (Tuar et al., 2021). Therefore, service capacity analysis is crucial to understanding the dynamics between tourism service providers and tourist expectations.

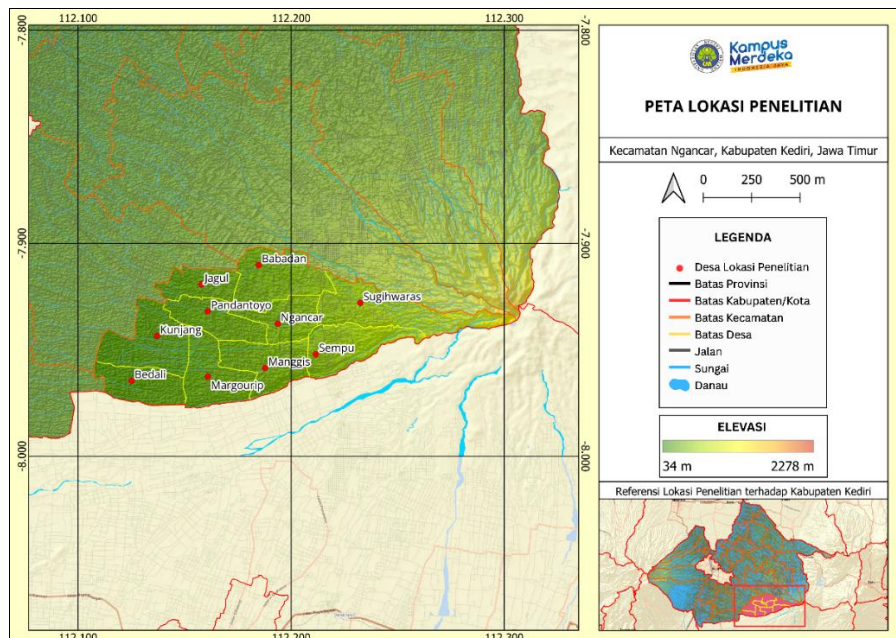
Facilities refer to all physical resources used to support tourism activities, such as road access, toilets, parking lots, and other public facilities (Koto & Asnur, 2021). Facilities, on the other hand, are structures that support the infrastructure of these facilities, such as electricity networks, water channels, and telecommunications systems (Mahardika A.P. et al., 2021). Thus, facilities and infrastructure can be summarized as a combination of all physical and infrastructure aspects necessary to create a comfortable and attractive tourism experience.

Based on research that has been conducted, good management of facilities and infrastructure greatly determines the quality of service (Anggraeni & Meirinawati, 2022). One study shows that improving the quality of facilities and infrastructure can have a positive effect on tourist satisfaction and can lead to an increase in the number of visits (Muslimin & Kartiko, 2021). Another study found that the availability of adequate facilities and infrastructure greatly influences tourists' assessment of a tourist attraction (Ananda & Chair, 2020; Anggina & Asnur, 2022). Overall, effective management of facilities and infrastructure can increase attractiveness and managerial expertise in the tourism industry.

3. Method

This study uses a quantitative approach with a cross-sectional survey method. This design is commonly referred to as a one-shot study, which is a study in which data collection is conducted at one time on a sample. This survey design was chosen to collect information related to the facilities and infrastructure of Mount Kelud Tourism. The study will be conducted in the Mount Kelud Tourism Area located in Ngancar District, Kediri Regency.

Figure 1. Research Location Map



Source: Primary Data Processed (2026)

Data collection techniques were carried out through observation and documentation. The population of this study was the tourism facilities and infrastructure of Mount Kelud in Kediri Regency, which covers 26 subdistricts. Sampling was determined using the area sampling technique. The criteria for determining the sample were subdistricts that provided access to Mount Kelud Tourism. Based on the criteria set, the research sample was determined to be

Ngancar Subdistrict, which consists of 10 villages, including Sugihwaras, Ngancar, Babadan, Sempu, Manggis, Pandantoyo, Margourip, Jagul, Kunjang, and Bedali.

The infrastructure data collected includes pharmacies, ATMs, banks, travel agencies, cafes, churches, hotels/lodgings, post offices, karaoke, clinics, mosques, prayer rooms, massage parlors, clean water supplies, public health centers, rest areas, restaurants, gas stations, playgrounds, sports facilities, souvenir shops, and food stalls (Istiqomah, 2019). The Guttman scale provides two answers, yes or no, ever or never, and so on. This analysis can be done with binary (definite) answers with the highest score of 1 meaning yes and the lowest score of 0 meaning no (Sanjayah, 2021). The Scalogram method is an analysis technique used when identifying the availability of infrastructure. The resulting scalogram is sorted based on the number of types of facilities owned by the group. The higher the number of types of facilities, the higher the group's position in the scalogram. It is assumed that the area with the highest service capacity is at the top and so on, decreasing to the bottom group.

$$KF_a = \frac{JFa}{JF\ Total}$$

Description:

JFa : Number of Facilities and Infrastructure

KFa : Availability of Facilities and Infrastructure for each type of facility

JF Total : Total Facilities and Infrastructure

The results of KFa will be categorized into 3 categories, namely inadequate, adequate, and sufficient, using the formula in Table 1.

Table 1. Categories of availability levels for tourism facilities and infrastructure

No	Availability Level Score Formula	Availability Level Category
1	$r-1/2STDEV$	Inadequate
2	$r-1/2STDEV - r+1/2STDEV$	Sufficiently Adequate
3	$r+1/2STDEV$	Adequate

The second objective is to analyze the distribution pattern of tourism facilities and infrastructure on Mount Kelud. To achieve this objective, the researcher used the IDW (Inverse Distance Weighted) interpolation method. The analysis process will be carried out using QGIS software version 3.44.2. The analysis process is expected to show the distribution pattern of Mount Kelud tourism infrastructure as clustered, scattered, or following the main road to Mount Kelud.

4. Results

Ngancar Subdistrict is one of the subdistricts in Kediri Regency that serves as the sole access point to the Mount Kelud Tourism Area. Therefore, through area sampling, this subdistrict was designated as the research sample. Ngancar Subdistrict consists of 10 villages, namely Bedali, Jagul, Kunjang, Ngancar, Pandantoyo, Sugihwaras, Babadan, Manggis, Margourip, and Sempu. The selection of Ngancar Subdistrict as a sample was supported by the 3A theory (Attraction, Amenities, and Accessibility). This theory provides a perspective that attraction, amenities, and accessibility are very important to support tourism. Accessibility is one of the most important aspects. Access to tourist attractions is an important aspect of tourism, especially if there is only one access point. In addition to accessibility, amenities or infrastructure are also important aspects. If there is only one access point to a tourist attraction, the infrastructure around that access point must be well developed. This is also something that must be considered in Mount Kelud Tourism. Based on a scalogram analysis of 23 tourism infrastructure variables covering ten

villages in Ngancar Subdistrict, this study successfully mapped the service capacity of the Mount Kelud tourism area. The results of the data analysis show that tourism infrastructure in Ngancar Subdistrict is uneven between villages in the adequate and inadequate categories. The results show that no village is in the adequate category. Six villages, namely Bedali, Jagul, Kunjang, Ngancar, Pandantoyo, and Sugihwaras, were classified as adequate, indicating that the facilities and infrastructure are optimal and can support tourism activities. Meanwhile, four other villages, namely Babadan, Manggis, Margourip, and Sempu, are classified as inadequate, reflecting the lack of facilities and infrastructure to meet the needs of tourists.

Table 2. Recapitulation of Tourism Infrastructure Availability Results using the Guttman Scale

Village	Babadan	Bedali	Jagul	Kunjang	Manggis	Margourip	Ngancar	Pandantoyo	Sempu	Sugihwaras	Total Variables	Total Units
Pharmacy	0	0	1	0	0	0	2	1	0	0	3	4
ATM	0	0	1	0	0	0	1	1	0	0	3	3
Bank	0	2	0	0	0	0	0	1	0	0	2	3
Travel Agency	0	0	0	1	0	1	0	0	0	0	2	2
Cafe	0	0	0	0	1	0	0	1	0	0	2	2
Church	3	4	0	4	0	2	1	1	1	1	8	17
Hotel/Lodging	0	0	0	1	0	0	1	0	1	5	4	8
Post Office	0	0	1	0	0	0	0	1	0	0	2	2
Karaoke	0	1	0	0	0	0	0	0	0	0	1	1
Clinic	0	1	0	2	1	0	1	0	0	0	4	5
Mosque	4	10	6	7	5	17	3	5	4	4	10	65
Prayer Room	9	11	5	8	5	7	9	7	8	4	10	73
Massage Parlor	0	0	0	0	1	0	0	0	0	0	1	1
Clean Water Supply	0	0	1	0	0	1	0	2	0	0	3	4
Pure	0	1	1	0	0	0	0	0	0	0	2	2
Community Health Center	0	1	0	0	0	0	1	0	0	1	3	3
Rest Area	0	0	0	0	0	0	0	0	0	3	1	3
Restaurant	0	1	0	1	0	0	3	0	0	0	3	5
Gas Station	0	2	0	2	0	1	2	2	1	0	6	10
Playground	0	0	0	0	0	0	0	0	0	1	1	1
Sports Facility	3	1	1	2	3	1	3	1	2	0	9	17
Souvenir Shop	0	0	0	1	0	0	0	0	0	3	2	4
Food Stall	3	40	13	13	14	17	23	22	3	23	10	171
Total Variables	5	12	9	11	7	8	12	12	7	9		
Total Units	22	75	30	42	30	47	50	45	20	45		

Source: Primary Data Processed (2026)

Bedali Village is the area with the highest level of completeness, with 15 variables fulfilled out of a total of 23 variables. The facilities available in this village cover a wide spectrum, ranging from basic facilities such as banks (2 units) and gas stations (2 units), complementary facilities such as sports facilities (1 unit), to supporting facilities such as pharmacies, ATMs, and post offices. This level of completeness is supported by the highest total number of facilities, namely 76 units. The infrastructure in Bedali Village is dominated by food stalls (40 units) and prayer rooms (11 units). A similar condition but with slightly different variations can be seen in Ngancar Village, which, despite having a lower total number of variables (13 variables), excels in the availability of restaurants (3 units) and health centers (1 unit). Pandantoyo Village has 12 variables with a fairly even distribution, including health facilities (clinics) and banking (banks and ATMs).

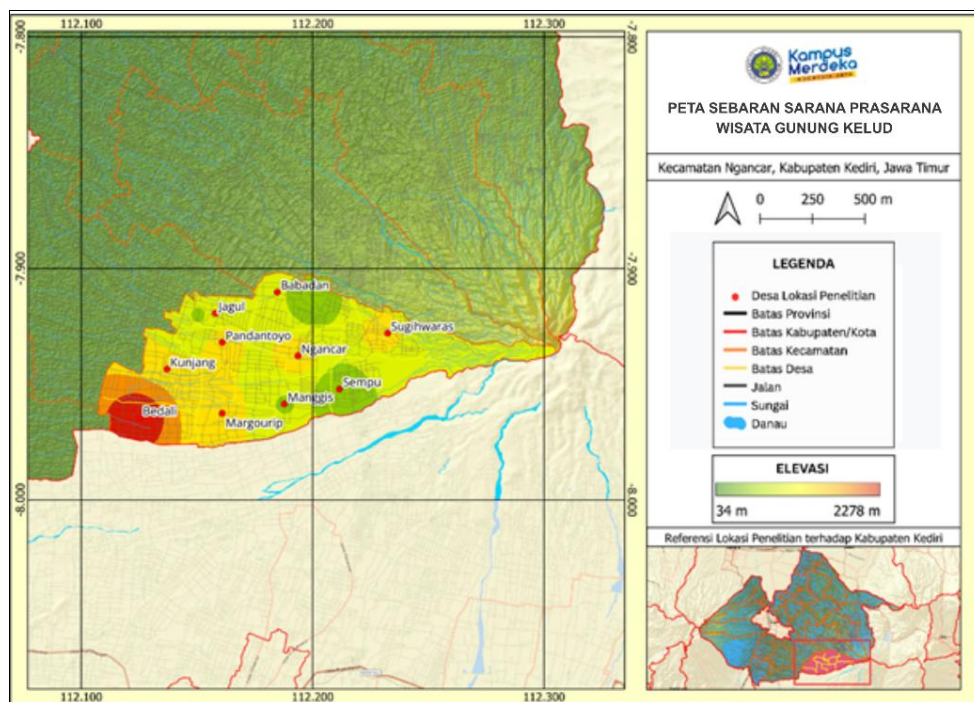
Sugihwaras Village shows unique characteristics with a notable concentration of hospitality facilities. This village has the highest number of lodgings (5 units) and the second highest number of food stalls (23 units) after Bedali, but has weaknesses in terms of public infrastructure such as electricity and clean water, which are not recorded in the data. This pattern indicates that Sugihwaras functions as a commercial and accommodation hub for tourists, although the basic

infrastructure still needs attention. Kunjang and Jagul villages, although classified as adequate, have 11 and 10 variables, respectively. Kunjang excels in religious facilities (churches) and travel agencies, while Jagul has advantages in pharmacies and ATMs, but both have limitations in supporting facilities such as souvenir shops and massage parlors.

Meanwhile, the four villages in the inadequate category show complex and varied patterns of limitations. Margourip Village is the most interesting case with a relatively high total number of facilities (48 units), even surpassing several villages in the adequate category such as Jagul (30 units) and Kunjang (43 units). However, these facilities are concentrated in only eight types of variables, with a striking dominance of food stalls (17 units) and mosques (17 units). This abundance is not balanced by the availability of basic facilities such as accommodation, restaurants, or travel agencies, which are completely absent. This phenomenon shows that the completeness of types (variables) is more crucial in assessing service capacity than simply the number of physical units. Babadan Village recorded the worst condition with only 6 variables fulfilled, which were dominated by religious facilities (prayer rooms and mosques) and sports venues, without any basic tourism facilities such as accommodation, restaurants, or cafes. Manggis and Sempu villages, despite having the same number of variables (8 variables), show different profiles. Manggis has health facilities (clinics) and cafes, while Sempu only relies on basic facilities such as food stalls, prayer rooms, and mosques with the lowest total units (25 units).

Spatially, villages in the adequate category are concentrated along the access corridor to the Kelud volcano crater. Conversely, villages in the inadequate category tend to be located on the outskirts or in areas that are geographically more isolated from the center of tourist activity. These findings not only confirm the existence of service gaps between regions within the same tourist area, but also highlight the need for a more integrated development approach that considers spatial aspects in community-based tourism development.

Figure 2. Infrastructure Distribution Pattern Map



Source: Primary Data Processed (2026)

The distribution of infrastructure tends to be concentrated in one village, namely Bedali Village. This is because Bedali Village is the main access point to Mount Kelud and the main road connecting Ngancar Subdistrict with Blitar Regency. This pattern is illustrated in red on the

map of infrastructure distribution (Figure 2), which shows that infrastructure is concentrated in Bedali Village and gradually decreases towards Mount Kelud, especially in villages that are not the main access points. This is due to the morphological conditions of the villages, which become increasingly steep or high towards Mount Kelud, resulting in the complexity of physical development in the area. Villages classified as having inadequate infrastructure have the potential to serve as supporting areas for villages with adequate infrastructure, thereby dispersing tourist activity and reducing pressure on the environment. This option is a good choice for reducing the risk of conflict between tourists and local residents.

5. Discussion

The capacity of tourism infrastructure can have implications for many factors in tourism, including tourist satisfaction, repeat visitor interest, and length of stay (Prajna, 2023; Siagian & Mita, 2022). The results of this study reveal significant disparities in the distribution of tourism infrastructure in the Mount Kelud area. The findings show that six villages in Ngancar Subdistrict have adequate infrastructure, while the other four villages are still in the inadequate category. The analysis shows that villages in the adequate infrastructure category tend to be located along the main route to the crater, forming an integrated tourism service corridor. This is in line with previous research, which found that the development of tourism infrastructure after the 2014 eruption was still concentrated in areas with high accessibility (Anggraini et al., 2023). Therefore, it is necessary to distribute the development of facilities and infrastructure evenly, as they are very important for the development of a tourist destination (Noni, 2021).

An interesting finding is the variation in the characteristics of facility availability between villages. Bedali Village emerges as the area with the most optimal facilities (15 variables), supported by the availability of health, banking, and accommodation facilities. The even distribution of infrastructure is very important in supporting a quality tourist experience (Hermanto et al., 2022). Meanwhile, Sugihwaras Village shows specialization in hospitality facilities with the highest number of lodgings, despite its limitations in basic infrastructure. This is because Sugihwaras Village is the closest village to the Mount Kelud tourist area. This trend in tourism facility development may occur as a result of following market demand organically (Nuryadin & Sugiri, 2023).

A unique phenomenon is observed in Margourip Village, which has a relatively high number of facilities (48 units) but is concentrated in a limited type, specifically food stalls and places of worship. This condition shows that the quantity of facilities does not automatically guarantee service capacity. In the context of sustainable tourism development, this imbalance in the availability of infrastructure has the potential to affect the quality of the tourist experience and the distribution of economic benefits to the local community. Limited facilities in buffer zones can reduce the length of stay of tourists and the economic value generated (Yuwono et al., 2024). This statement is relevant to the condition of Mount Kelud, where villages in the category of inadequate infrastructure are potentially experiencing economic leakage due to the unpreparedness of supporting facilities. These findings reinforce the importance of a holistic approach in planning tourism infrastructure development that considers the completeness and distribution of facility types. This can be done because Kediri Regency has good tourism development, and according to tourism development, it can create infrastructure growth (Sari, 2024).

The analysis shows that the distribution of tourism infrastructure in the Mount Kelud area is uneven. The villages of Bedali, Ngancar, and Pandantoyo have the most varied types of infrastructure, with 12 types. Meanwhile, Babadan Village has the least, with only 5 types of infrastructure. Musholla, mosques, and food stalls are variables that are available in all villages. Shops are the variable with the highest total number of units, namely 171 units. Conversely, karaoke, massage parlors, and playgrounds are the least available variables, with only 1 unit

each. Karaoke is only available in Bedali Village, massage parlors are only found in Manggis Village, and playgrounds are only found in Sugihwaras Village. This can be a challenge because tourist facilities and infrastructure are important as they can increase tourist appeal (Sundaro & Yuliani, 2022).

Hotels and lodgings are one of the important variables in supporting the length of stay of tourists. Hotels and lodgings in Ngancar Subdistrict are available in 4 villages, namely Kunjang, Ngancar, Sempu, and Sugihwaras. The largest number of hotel and lodging units are in Sugihwaras, which is very good because Sugihwaras Village is the closest village to the entrance of Mount Kelud Tourism. Although according to (Yusuf, 2021), after the 2014 eruption the infrastructure around Mount Kelud was buried by volcanic material, there were already 5 hotels and lodgings in Sugihwaras Village at the time of the study. This is a good thing because the availability of good infrastructure can increase satisfaction and have an impact on tourists' interest in returning (Praja, 2023).

Places of worship in Ngancar District can be considered adequate, as this district has all types of places of worship that are variables in the study. These places of worship include mosques, prayer rooms, churches, and temples. Prayer rooms are the most numerous places of worship with a total of 73 units, followed by mosques with a total of 65 units, churches with a total of 8 units, and temples with a total of 2 units. Churches are available in almost every village, with only two villages not having churches, namely Jagul Village and Manggis Village. Meanwhile, temples are found in two different villages, namely Bedali Village and Jagul Village. The availability of places of worship is very important because the availability of infrastructure, including places of worship, can affect tourist satisfaction (Siagian & Mita, 2022).

Through scalogram analysis, it was found that 6 (six) out of 10 (ten) villages already have adequate tourism infrastructure, indicating that the development of Mount Kelud's tourism infrastructure has been carried out in areas that fall into the category of adequate infrastructure. However, immediate action is needed in the 4 (four) villages that fall into the inadequate category. One strategy that can be implemented is to make villages that fall into the inadequate infrastructure category as alternative destinations to increase the length of stay of tourists. This is because Mount Kelud is strategically located to become a major tourist destination, as it borders Blitar Regency and Malang Regency (Haqqi, 2021). Therefore, this analysis of the service capacity of Mount Kelud's tourism infrastructure can be used as a reference for planning and developing tourism (Fahrudin T et al., 2021).

6. Conclusions

Based on the results of the analysis and discussion, this study concludes that there is a significant imbalance in the distribution of tourism infrastructure in the Mount Kelud area, Kediri Regency. The service capacity of infrastructure in six villages is adequate, while in four other villages it is inadequate, with no villages falling into the category of sufficiently adequate Hierarchy 2. These results indicate a gap in tourism infrastructure development that needs to be addressed immediately. The distribution pattern of tourism infrastructure in Mount Kelud in Ngancar Subdistrict tends to follow and center on villages located on the main road to Mount Kelud. As a direction for future research, further studies can focus on identifying the length of stay of tourists in relation to the availability of tourism infrastructure. This research will identify the length of stay of tourists, which is an indicator in measuring the economic impact of community-based tourism in the Mount Kelud area.

7. Acknowledgment

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8. Conflict of Interest

The authors declare no conflict of interest.

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