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TOURISM DEVELOPMENT IMPACT ON ECONOMIC GROWTH AND POVERTY ALLEVIATION IN WEST JAVA

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Abstract

Poverty alleviation is on the agenda of regional development in West Java. One of the priority sectors is tourism development, which supports inclusive economic growth and is expected to address poverty. Through various unit analyses, the study analyzed how tourism development in West Java impacts economic growth and poverty alleviation. These included indicators such as the number of tourist visits, hotel room occupancy rate, the number of hotels and restaurants, average length of stay, and the tourism sector's contribution to Original Local Government Revenue (PAD). Economic growth was assessed using indicators such as Gross Regional Domestic Product (GRDP), unemployment rate, Gini Index, and regional investment value. In contrast, the poverty variable used the percentage and number of people living in poverty, poverty line statistics, Poverty Depth Index, and Poverty Severity Index. Inferential statistical analysis, specifically Partial Least Square (PLS), was conducted using a quantitative approach and data from BPS - Statistics of West Java. Hypotheses were formulated based on the literature review, asserting that tourism development significantly and positively impacted economic growth and poverty alleviation in West Java. Results showed that tourism development significantly boosted economic performance, directly influencing economic growth. Additionally, high economic growth correlated with reduced poverty rates, highlighting the importance of inclusive growth for alleviation. Key indicators played crucial roles in poverty alleviation, including the number of hotels and restaurants, the tourism sector's contribution to regional revenue, GRDP, and regional investment value. These findings provided valuable insights for policymakers and stakeholders to develop effective strategies for leveraging tourism potential to promote inclusive economic growth and alleviate poverty in West Java.

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INTRODUCTION

The concept of poverty alleviation emerges as a major concern in many nations as one of the social development pillars of the Sustainable Development Goals (SDGs), which are designed as an enhancement of the Millennium Development Goals (MDGs) (Zhang et al., 2023). Under the tenet of "eliminating all forms of poverty", this aim is intended to be accomplished by 2030 (Q. Liu, 2022). Alibašić (2018), in terms of alleviating poverty, particularly in developing nations, emphasizes upholding human rights to avoid discrimination by lowering poverty and boosting financial stability (Hugo & Nyaupane, 2016). The global poverty alleviation agenda is relevant to Indonesia's development goals in the 2015 Sustainable Development Goals (SDGs) Presidential Regulation to end poverty and efforts to fight socio-economic inequality and injustice (Alisjahbana & Murniningtyas, 2018).

Efforts to alleviate poverty in Indonesia need to pay attention to supporting indicators that are measurably calculated for the sake of policy redistribution through poverty reduction efforts. According to the National Team for the Acceleration of Poverty Reduction (TNP2K) in 2020, poverty indicators are needed to ensure that development policies are aligned in achieving targets in line with planning (Alisjahbana & Murniningtyas, 2018). Statistics Indonesia (BPS, 2023) sets poverty indicators by considering the poverty line, the number of poor people, the percentage of poor people, the poverty depth index, and the poverty severity index. Poor status is the population at the poverty line (GK). The number at the poverty line is calculated every six months. The poverty percentage is obtained based on the accumulated calculation of the total population, showing that Indonesia's poverty percentage in March 2023 was 9.36% (BPS, 2023). Other indicators are the depth index and severity index of poverty in Indonesia; the depth index measures the average expenditure gap of each poor person, while the severity index provides a picture of the distribution of expenditure among the poor. The information and results of these calculations inform policies and development plans for addressing welfare inequality (Nugroho et al., 2020).

Poverty alleviation, according to literature, is conceptualized through various fields: industrial and technological development (M.-Y. Liu et al., 2021; Ye et al., 2022), financial funding support (Acheampong et al., 2021), improvement and development of education and health (Q. Liu, 2022) and not least tourism development (Gibson, 2009). As a multidisciplinary industry, tourism is designed to play a role in poverty alleviation and economic growth. This article attempts to test the narrative of tourism development as a strategy for economic growth and poverty alleviation.

The development of the tourism industry aims to increase economic growth and people's welfare, eliminate poverty, and overcome unemployment. Tourism significantly affects global welfare and needs to be used as a development strategy and policy direction (Brida et al., 2020; A. Liu & Wu, 2019). Tourism is a strategic sector that increases foreign exchange and has significant implications for a country's economy (Moenir et al., 2021). The increase in tourist destinations influences the improvement of the regional economy. The impact of tourism is based on the amount of tourist spending (Mardianis & Syartika, 2018) and exposure to tourism activities (Hugo & Nyaupane, 2016). The Organisation for Economic Co-Operation and Development (OECD) in the Tourism Trends and Policies

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Report 2023 states that in 2023 the tourism sector contributed 4.9% of Indonesia's Gross Domestic Product (GDP).

The impact of the tourism sector on economic growth attracts the attention of experts with various perspectives. An empirical study from Naseem (2021) finds significant growth in the micro and macro economy. Economic growth occurs at the grassroots, nationally, and among large-scale actors. Chidakel et al. (2021) and Singh and Alam (2024) explain tourism acts as an industry with a significant multiplier effect on the development of other sectors. Tourism improves the macro economy through job creation, increasing national income, and reducing income inequality (Ruan & Zhang, 2021; Turan & Abdiu, 2024). In addition, tourism provides opportunities for medium and small-scale enterprises to grow (Maziliauske, 2024; Son et al., 2021). Ashley et al. (2001) assess tourism as a pro-poor industry that impacts the community's economy through the provision of employment, income from the procurement of goods and services or side jobs, and profits earned from economic activities. Furthermore, the basic principle of tourism as a multidisciplinary industry requires support from various components that encourage the development of other sectors. Deng et al. (2020) and Zhuang et al. (2024) examined the development of accessibility, and Wilco et al. (2024) stated amenity has a positive impact on increasing added value and economic circulation. Substantially, tourism development successfully creates significant economic growth (Andolina et al., 2021).

On the contrary, many studies highlight the positive impact of the tourism industry on economic growth, and some highlight it from an opposing lens. Gilbert (2017) notes how tourism can lead to the dispossession of land rights, eliminate the livelihoods of indigenous people, and become an arena for neoliberal struggles (Gardner, 2012). The concept of tourism development that ignores the welfare and rights of grassroots communities is seen by Büscher and Fletcher (2017) as a means of capital accumulation. Several studies highlight the tourism industry and its role in capital accumulation, such as international tourism movements (Fitchett et al., 2021), commodification and privatization of resources (Hof & Blázquez-Salom, 2015), labor exploitation (Bullock et al., 2024), as well as the assertion that the economic benefits of tourism tend to be concentrated on capital owners, creating social inequalities (Koot, 2016). Tourism boosts the economy, however, it does not eliminate poverty (Lagos & Wang, 2023). Debating the impact of tourism in academic circles continues with different empirical studies. Pham and Nugroho (2022) claim that tourism contributes significantly to poverty reduction, while Lagos and Wang (2023) argue the opposite. At the same time, revamping tourism development models to provide more positive impacts requires further empirical testing. These studies show the complexity of tourism impacts, which can provide significant economic benefits while bringing negative consequences that need serious attention in planning.

Scientific debates on the impact of the tourism industry on socio-economic conditions continue to occur, indicating the urgency for further research. This study re-evaluates the impact of tourism development as an instrument of economic growth and its relation to poverty alleviation. Testing the economic contribution of tourism, UNWTO suggests the use of The International Recommendations for Tourism Statistics (IRTS) in 2008 (UNWTO, 2010) as the main concept, definition, and classification of tourism measurement by each country's statistical standards and provides an efficient methodological framework for data aggregation and compilation according to the indicators. The implementation of the indicator calculation is adjusted to the calculation in

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Indonesia (Mun'im, 2022), including the corporate services sector, provision of accommodation, food and beverage, transportation and warehousing, wholesale and retail trade; repair of cars and motorbikes, and other services (UNWTO, 2010) which are important indicators in measuring the contribution of tourism. The contribution of the tourism sector to regional income can be used as an indicator because tourist attractions affect the increase in community income through tourist visits and activities (Hugo & Nyaupane, 2016; Mardianis & Syartika, 2018; Moenir et al., 2021).

The researcher chose to sample tourism development in West Java. This region focuses on poverty alleviation and prioritizes the tourism industry of the 2024 Regional Government Work Plan (RKPD) as part of inclusive economic growth. The West Java government intensively conducts accelerated poverty alleviation programs, one of which is through the tourism sector. This article discusses economic growth and poverty alleviation, the role of tourism in accelerating economic growth, and its contribution to poverty alleviation in West Java. This study is expected to significantly contribute to the objective assessment of the effectiveness of tourism development as an instrument of economic growth and poverty alleviation at the regional level.

A similar study by Patera and Suardana (2015) examined the relationship between tourism development, economic performance, and poverty alleviation in Badung Regency, Bali. The indicators included the number of tourist visits, hotel and restaurant tax revenue, particularly from South Badung, the length of tourist stays, and tourist expenditures, all aligned with Badung government policies. GRDP, employment absorption, and investment levels measured economic performance. At the same time, poverty indicators included the number of poor people, the poverty line, the percentage of poor people, the poverty depth index, and the poverty severity index. The model showed a direct relationship between tourism development and poverty alleviation. In contrast, the current research in West Java aims to measure the indirect impact of tourism on poverty alleviation based on the belief that tourism-driven economic growth will eventually trickle down to the local poor through multiple channels, such as employment, public welfare, and family networks (Zhao & Ritchie, 2007). This study uses different variables and performance indicators aligned with West Java's fundamental planning policy to assess tourism's impact on economic growth and poverty alleviation in the region.

METHODOLOGY

This research was conducted with a quantitative approach. Creswell (2014) defined quantitative methods as suitable for examining specific theories. The testing of referenced theories or previous research findings was described using the Partial Least Squares (PLS) structural equation model to analyze the relationships between variables in this study. The quantitative approach was also employed to describe secondary data obtained from BPS or related institutions. The data used were based on previous theories or research, which were adjusted to fit with indicators utilized by West Java in assessing the impact of tourism development on economic growth and poverty alleviation.

The impact of the tourism sector on the economy can be reviewed from several variables. The contribution was calculated based on the number of tourist visits (Tai et al., 2022), hotel room occupation rate (Yamin et al., 2020), length of stay of tourists (Oklevik et al., 2021), the number of hotels and restaurants (Bastomi & Wijaya, 2023), and tourism

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sector contribution to Original Local Government Revenue (PAD) of West Java (Moenir et al., 2021), which was based on the amount of tourists expenditure (Mardianis & Syartika, 2018) and exposure to their activities (Hugo & Nyaupane, 2016). Economic growth is measured based on the macroeconomic indicators set by West Java's regional planning policies. These indicators include the tourism sector GRDP (following IRTS standards), unemployment rate, Gini index, and the amount of regional investment value. The economic impact of poverty is measured based on poverty indicators listed by BPS – Statistics of West Java, which includes the number of poor people, the poverty line, the percentage of poor people, the Poverty Depth Index, and the Poverty Severity Index.

Secondary data used referred to BPS – Statistics of West Java in 2014 – 2023 and related agencies in West Java, namely: Regional Development Planning Agency (Bappeda), Regional Revenue Agency (Bapenda), Investment and One-Stop Integrated Services Office (DPMPTSP), Communications and Informatics Agency (Diskominfo), and Tourism and Cultural Agency (Disparbud). Historical data from the past ten years were used to consider the fluctuations in demand during COVID-19 over the last five years, which affected the stability of the data in producing the model. Therefore, historical data were extended further back to 10 years to create a model that was more relevant, stable, and capable of capturing important trends and patterns for accurate results. The data obtained were explained in the compilation of structural equation models, which had been studied in advance based on theories or previous research results.

The available data were analyzed using descriptive statistical methods, first to provide information on the development conditions of the tourism sector, economic growth, and poverty in West Java. Then, the data were processed by inferential statistical analysis, Partial Least Square (PLS). PLS has been a popular alternative to Structural Equation Modeling (SEM). The strengths of using PLS are the sample used is not too large, the testing with the theories referenced is not too much, the prediction accuracy has been the most important thing, and the accuracy of model specifications that had not been guaranteed can be ascertained (Wong, 2013).

The PLS model does not require parametric techniques in testing significance because it does not assume the existence of a certain distribution for parameter estimation. The measurement model (outer model) with the reflexive indicator type was evaluated using convergent and discriminant validity of the indicator and composite reliability for indicator variables. In addition, structural models (inner model) were evaluated by the percentage of variance explained by R^2 (R-square) for the dependent latent variable using measurement of the Stone Geisser Q-Squares Test and based on the magnitude of the structural path coefficient. This stability and estimation were evaluated using t-statistical tests (Sholiha & Salamah, 2016). The SMART PLS-SEM ver 3.0 software assisted data processing and theory testing in this research. The systematics of the research workflow can be seen in the Figure 1 below.

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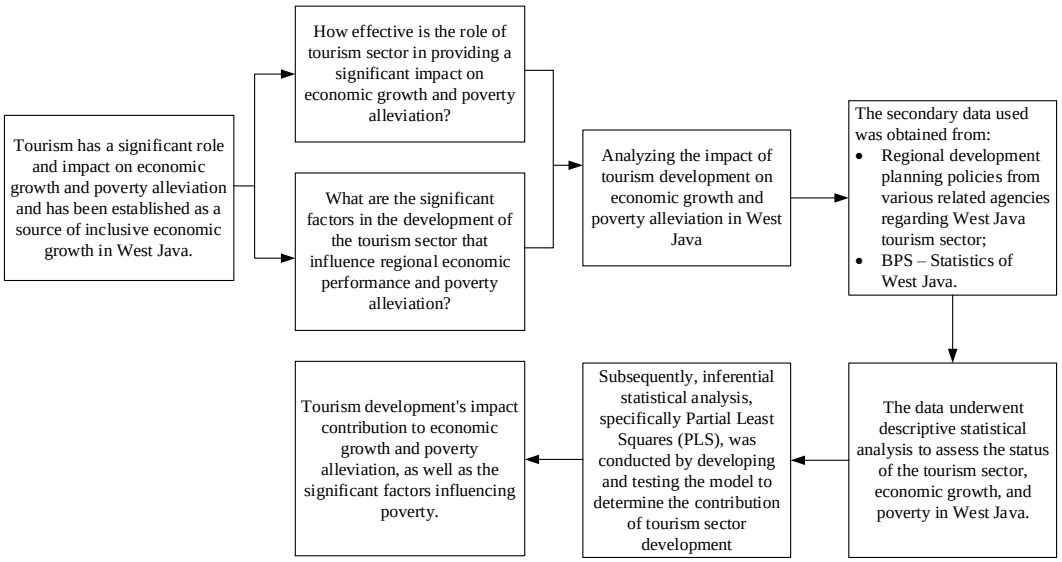

Figure 1. Research Workflow
Source: Author's results, 2024

FINDINGS AND DISCUSSION

Tourism Development in West Java

Tourism development is largely driven by supply and demand potential. Supply potential refers to the attractiveness of a tourist destination, while demand potential indicates the tourist influx from the origin area. The number of visits from domestic and foreign tourists measures the attractiveness of a destination. According to BPS – Statistics of West Java in 2019, tourist visits were higher near airports, terminals, and economic centers. From 2012 to 2019, the number of tourists in West Java increased by an average of 6.41% per year, but there was a 43.70% contraction due to the COVID-19 pandemic in 2020. BPS – Statistics of West Java 2023 showed that tourist visits rebounded to 59.33 million (Figure 2). However, higher hotel room occupancy rates did not always match this increase, which tended to fluctuate (Figure 3). Similarly, the average length of stay was inconsistent (Figure 4).

However, the tourism development of West Java has been directly proportional to the increase in hotels and restaurants (Figure 5). Hotels and restaurants are physical infrastructures directly relevant to tourism facilities (Mandić et al., 2018), which must exist and play a major role in increasing investment projects (Buhalis et al., 2023). The contribution of the tourism sector in PAD West Java showed a high (Figure 6), which highest increased in 2018, reaching IDR 1,931.4 Billion or 234.68% higher than the previous years. PAD mirrors regional independence of revenue resulting from the utilization of regional potential following applicable laws such as the revenue of taxes, retribution, segregated regional financial processing results, and other legitimate revenues.

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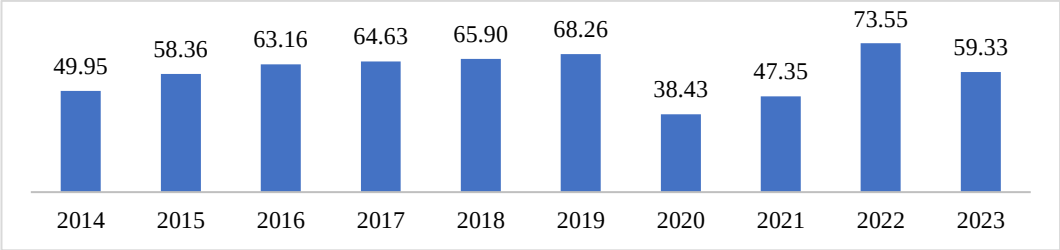

Figure 2. Number of Tourist Visits in West Java, 2014 – 2023 (Million tourists)
Source: BPS – Statistics of West Java 2014 – 2023 (reprocessed), 2024

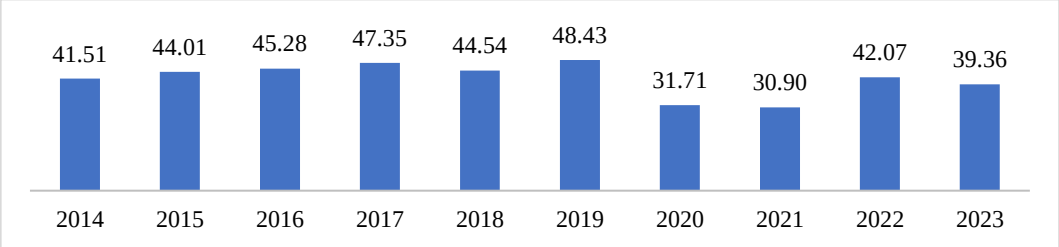

Figure 3. Hotel Room Occupancy Rate, 2014 – 2023 (%)
Source: BPS – Statistics of West Java 2014 – 2023 (reprocessed), 2024

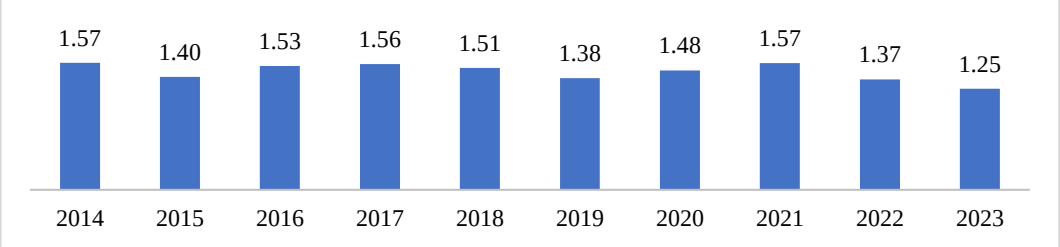

Figure 4. The Average Length of Stay, 2014 – 2023 (Day)
Source: BPS – Statistics of West Java 2014 – 2023 (reprocessed), 2024

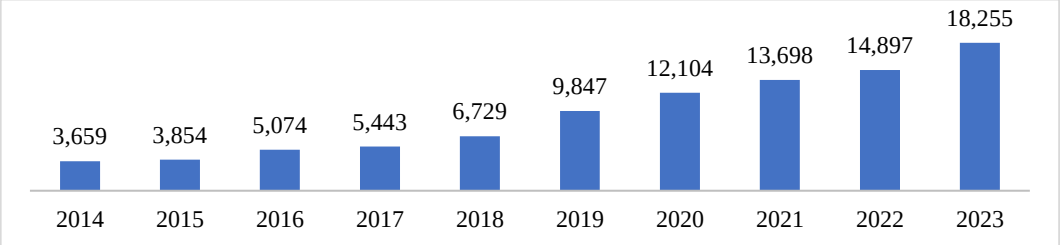

Figure 5. Number of Hotels and Restaurants, 2014 – 2023 (Number)
Source: BPS – Statistics of West Java 2014 – 2023 (reprocessed), 2024

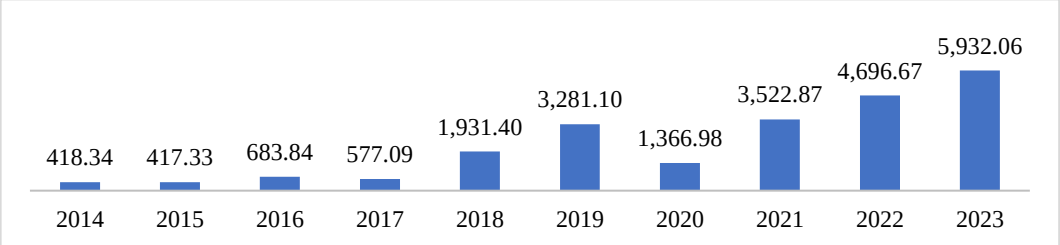

Figure 6. Tourism Sector Contribution to PAD of West Java, 2014 – 2023 (Billion IDR)
Source: Open Data (Diskominfo) and Disparbud of West Java 2014 – 2023 (reprocessed), 2024

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Economic Growth in West Java

One indicator that determines West Java's economic growth is the Gross Regional Domestic Product (GRDP). GRDP used was GRDP by field of business at current prices in West Java, consisting of the supporting sectors of the tourism industry according to IRTS standards, namely company services, provision of accommodation and food/beverage, transportation and warehousing, large and retail trade, and other services. During 2014 – 2023, GRDP at current prices increased from IDR 342,242 Billion in 2014 to IDR 684,016 Billion in 2023, or an average increase of 10.39% per year (Figure 7). Meanwhile, the Gini Index from 2014 – 2023 greatly fluctuated (Figure 8). Based on data from BPS – Statistics Indonesia 2023, West Java's Gini Index placed in the third highest position compared to other provinces in Indonesia, reaching 0.425. The condition of the GRDP and the value of the Gini Index indicate that the increase in per capita income in West Java is unevenly distributed throughout the region, resulting in greater income inequality.

West Java, which has the largest population in Indonesia, faces more complex labor dynamics than other provinces. Although over the last ten years, the average Unemployment Rate (UR) has decreased by 0.41% per year (Figure 9), the value is categorized as poor. In 2020, the COVID-19 pandemic put great pressure on the employment sector in West Java. Based on BPS – Statistics Indonesia in 2020, there were 4.63 million people (12.16% of the working-age population) affected, consisting of unemployment due to COVID-19 (0.46 million people), Non-Labor Force (BAK) (0.17 million people), temporary unemployment (0.29 million people), and working residents who experience reduced working hours (3.71 million people).

Regarding regional investment, West Java is the province that absorbed the largest investment throughout 2023, capable of reaching IDR 210.61 Trillion or 14.84% of the total national investment realization. During 2014 – 2023, the value of regional investment tended to increase with an average growth of 5.61% per year (Figure 10). According to the former Governor of West Java, Mr. Ridwan Kamil, several policies that support increasing the value of regional investment are adequate infrastructure development, increasing the productivity of Human Resources (HR), ease of managing permits, and carrying out direct offers to potential investors regarding the advantages of investing in West Java. From 2020 to 2023, the COVID-19 pandemic hit the joints of the Indonesian economy, and West Java remained the investment champion for four consecutive years.

The investment value that consistently grew in crucial years was influenced by government policies that supported the investment climate and fiscal sustainability (World Bank, 2021), one of which was the issuance of an omnibus law. Similarly, the Tourism Travel Development Index showed significant improvement for Indonesia in the Travel and Tourism Policy sub-category, rising from 23rd place in 2019 to 4th place in 2021 (World Economic Forum, 2022), thereby supporting investment growth in the tourism sector, particularly in West Java. President Joko Widodo also revealed that West Java could top Indonesia's investment charts due to its extensive toll road infrastructure, citing that the region has seen the highest number of toll roads constructed in the country, accelerating mobility for both people and goods and attracting a surge of investors (BPMI Setpres, 2023).

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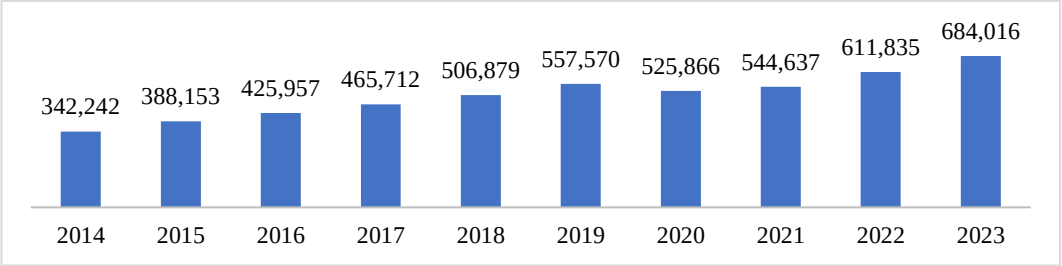

Figure 7. GRDP by Field of Business at Current Prices, 2014 – 2023 (Billion IDR)
Source: BPS – Statistics of West Java 2014 – 2023 (reprocessed), 2024

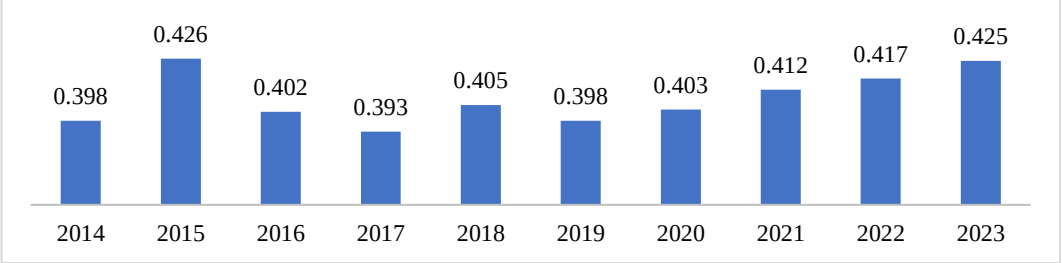

Figure 8. Gini Index of West Java, 2014 – 2023 (Point)
Source: BPS – Statistics of West Java 2014 – 2023 (reprocessed), 2024

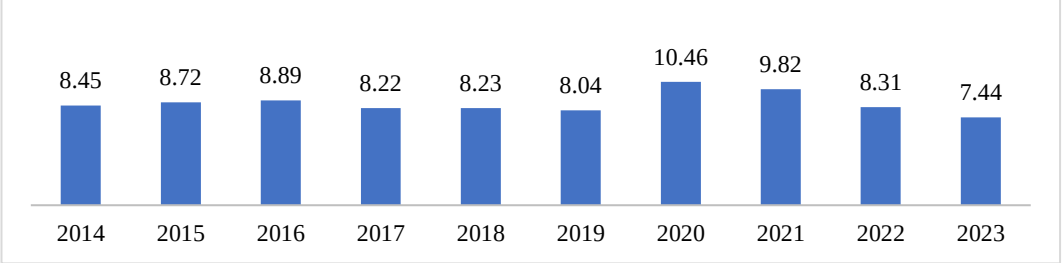

Figure 9. Unemployment Rate of West Java, 2014 – 2023 (%)
Source: BPS – Statistics of West Java 2014 – 2023 (reprocessed), 2024

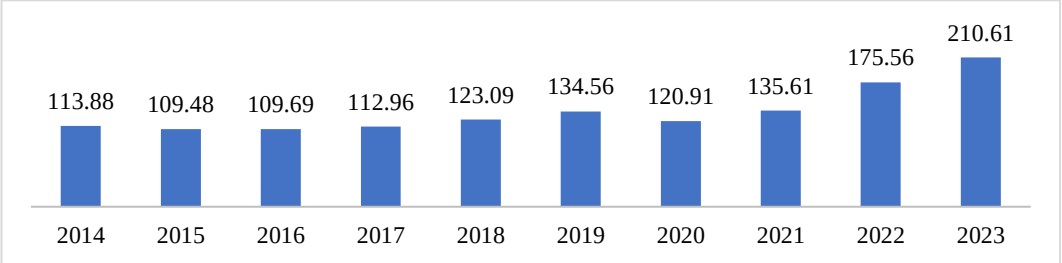

Figure 10. Regional Investment of West Java, 2014 – 2023 (Trillion IDR)
Source: DPMPTSP of West Java 2014 – 2023 (reprocessed), 2024

Poverty in West Java

The West Java Government implemented poverty reduction efforts for years, as shown by the decrease in West Java's poverty rate of 1.62% throughout 2014 – 2023. The percentage of poverty significantly increased during the COVID-19 pandemic. According to BPS – Statistics Indonesia of West Java, the economic contraction reached -2.52% in 2020 and increased West Java's poverty. The extraordinary condition of the COVID-19 pandemic began to spread in early 2020, implicitly causing misery to groups of people

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vulnerable to economic shocks. The economic shock caused the regressing of poverty alleviation efforts in West Java, shown by the number of poor people during the pandemic, only slightly different from the number of poor people in 2016 or as many as ±4.2 million people led into poverty.

Based on the West Java Regional Long-Term Development Plan (RPJPD) Evaluation Document, the percentage of poor people in West Java during 2005-2025 was consistently lower than the national average, with an average difference of 2.14%. The Central and West Java governments have been striving to alleviate poverty by focusing on poor groups. Social protection programs targeting the extremely poor help fulfill their basic needs in rural and urban areas. With the development of national policies, it became necessary to present data on extreme poverty, which showed that the number of extremely poor people in West Java decreased from 4.07 million in 2022 to 3.89 million in 2023, a reduction of 4.42%.

In addition to the number and percentage of poor people, other crucial dimensions include the depth and severity of poverty. Effective poverty policies must address these dimensions to reduce the number and percentage of poor people and the depth and severity of poverty. West Java's Poverty Depth Index spiked during the pandemic, rising to 1.47 points in 2021 from 1.13 points the previous year. Similarly, the Poverty Severity Index increased to 0.38 points in 2021 from 0.23 points in 2020. Table 1 illustrates the poverty situation in West Java based on these indicators.

Table 1. The State of Poverty in West Java, 2014 – 2023

Year	Number of Poor People (Million People)	Poverty Line (IDR)	Poor People Population (%)	Poverty Depth Index (Point)	Poverty Severity Index (Point)
2014	4.24	291,474	9.18	1.39	0.33
2015	4.44	306,876	9.53	1.63	0.43
2016	4.22	324,992	8.95	1.49	0.37
2017	4.17	344,427	8.71	1.45	0.37
2018	3.62	367,755	7.45	1.32	0.34
2019	3.40	386,198	6.91	1.09	0.24
2020	3.92	410,988	7.88	1.13	0.23
2021	4.20	427,402	8.40	1.47	0.38
2022	4.07	452,580	8.06	1.32	0.33
2023	3.89	495,229	7.62	1.17	0.27

Source: BPS of West Java Province in Figures 2014 – 2023 (reprocessed), 2024

Partial Least Square (PLS)Testing Results

Based on the literature reviewed earlier, hypotheses were formulated regarding the relationship between economic growth, poverty alleviation, and the development of the tourism sector in West Java. The hypotheses in this research are as follows:

H1: Tourism development significantly and positively impacts the economic growth in West Java.

H2: Economic growth significantly and positively impacts poverty alleviation in West Java.

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Then, these hypotheses were tested using the Partial Least Squares (PLS) model. Figure 11 illustrates the formulated hypotheses to test how tourism development impacts economic growth and poverty alleviation in West Java.

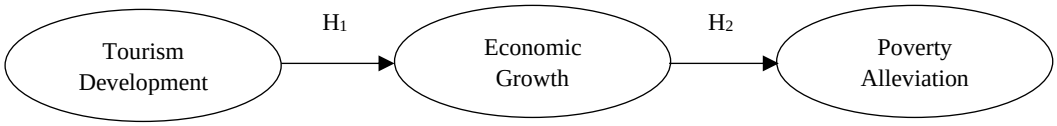

Figure 11. Hypothesis Framework for Structural Model
Source: Processed by Author, 2024

From the structural model (inner model) above, a measurement model (outer model) was constructed according to the indicators outlined in the methodology section. The structural and measurement models were depicted using the SMART PLS-SEM ver 3.0 software, as shown in Figure 12 below.

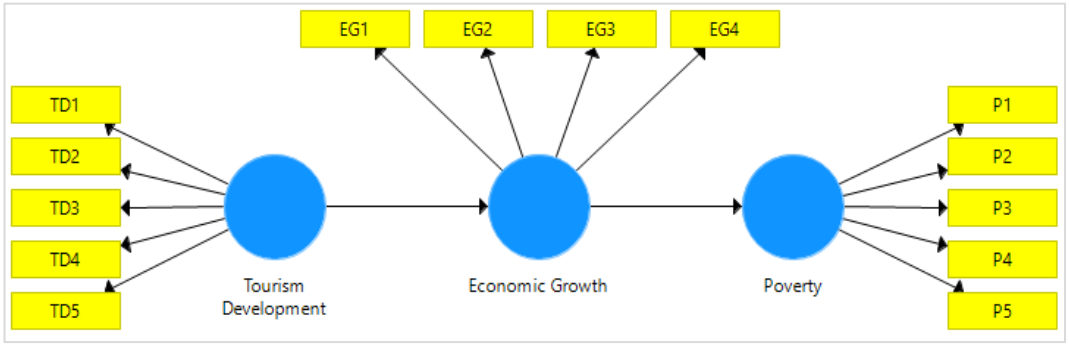

Figure 12. Structural and Measurement Model
Source: Processed Using SMART PLS, 2024

Measurement Model Testing

The measurement model (outer model) testing in the PLS model is carried out based on three criteria, namely convergent validity, discriminant validity, and composite reliability (Ghozali, 2016).

Convergent Validity

An indicator is considered reliable regarding convergent validity if its outer loading (loading factor) value is greater than 0.70. The reliability can be deemed sufficient for outer loading values ranging from 0.50 to 0.60, while indicators with outer loading values below 0.50 may be considered inadequate. Thus, the elimination or formation of a new model can be done with indicators with outer loading above 0.70. Table 2 shows the outer loading of each indicator.

Table 2. Outer Loading (Loading Factor) of Each Indicator

Indicator		Tourism Development	Economic Growth	Poverty
TD1	Number of tourist visits	0.540		
TD2	Hotel room occupancy rate	0.068		
TD3	Number of hotels and restaurants	0.848		
TD4	Average Length of Stay	-0.790		

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	Indicator	Tourism Development	Economic Growth	Poverty
TD5	Contribution of the tourism sector on Original Local Government Revenue (PAD)	0.940		
EG1	Gross Regional Domestic Product (GRDP)		0.965	
EG2	Unemployment Rate		-0.428	
EG3	Gini Index		-0.003	
EG4	The amount of regional investment value		0.717	
P1	Number of poor people			0.895
P2	Poverty Line			-0.834
P3	Percentage of poor people			0.976
P4	Poverty Depth Index			0.967
P5	Poverty Severity Index			0.919

Source: SMART PLS Data Processing Results, 2024

Based on the data processing results in the table above, several indicators did not meet the Convergent Validity criteria (outer loading value below 0.70). Those indicators included the number of tourist visits in West Java (TD1), hotel room occupancy rate (TD2), average length of stay (TD4), Unemployment Rate (EG2), Gini Index (EG3), and Poverty Line (P2). Consequently, the six indicators were eliminated from the model. This elimination aimed to identify tourism development and economic growth factors that significantly contributed to poverty alleviation in West Java. Each remaining indicator was expected to have an outer loading greater than 0.70 to ensure precise and accurate PLS model results. Table 3 presents the findings of the revised measurement model, and Figure 13 illustrates the outcomes of the revised model.

Table 3. Outer Loading (Loading Factor) of Each Indicator (Revised)

	Indicator	Tourism Development	Economic Growth	Poverty
TD3	Number of hotels and restaurants	0.974		
TD5	Contribution of the Tourism Sector on Original Local Government Revenue (PAD)	0.966		
EG1	Gross Regional Domestic Product (GRDP)		0.951	
EG4	The amount of regional investment value		0.856	
P1	Number of poor people			0.941
P3	Percentage of poor people			0.967
P4	Poverty Depth Index			0.980
P5	Poverty Severity Index			0.941

Source: SMART PLS Data Processing Results, 2024

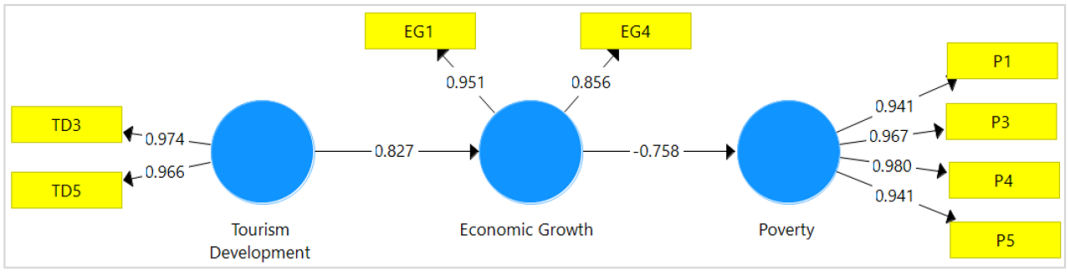

Figure 13. The Final Result of The Measurement Model
Source: Processed Using SMART PLS, 2024

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Discriminant Validity

Discriminant Validity testing is a reflective indicator assessed based on the cross-loading between the indicators and their respective variable or construct. Indicators are deemed valid if they have a higher cross-loading factor to the intended variable than cross-loadings for other variables. Suppose the correlation between the variable and its constituent indicators is smaller than the size of the other variables. In that case, it indicates that the indicator predicts the size of the variable worse than the size of other variables. The following table (Table 4) shows the cross-loading values for the indicators consisting of the variables tested.

Table 4. Cross-Loading of Each Indicator

Indicator		Tourism Development	Economic Growth	Poverty
TD3	Number of hotels and restaurants	0.974	0.851	-0.580
TD5	Contribution of the Tourism Sector on Original Local Government Revenue (PAD)	0.966	0.746	-0.673
EG1	Gross Regional Domestic Product	0.920	0.951	-0.784
EG4	The amount of regional investment value	0.483	0.856	-0.544
P1	Number of poor people	-0.483	-0.639	0.941
P3	Percentage of poor people	-0.696	-0.845	0.967
P4	Poverty Depth Index	-0.657	-0.729	0.980
P5	Poverty Severity Index	-0.596	-0.656	0.941

Source: SMART PLS Data Processing Results, 2024

The discriminant validity criterion was properly fulfilled based on the data processing results in the table above. It was observed from the correlation of indicators with their respective variable or construct, as indicated by the highest cross-loading values compared to the correlation of these indicators with other variables.

Composite Reliability

According to Ghozali (2008), the reliability of a variable composed of its indicators can be assessed through composite reliability, which measures internal consistency with a criterion value above 0.60. Table 5 shows the value of Composite Reliability for all variables that meet the expected reliability criteria.

Table 5. Composite Reliability of Each Variable

Variable	Composite Reliability
Tourism Development	0.970
Economic Growth	0.900
Poverty	0.978

Source: SMART PLS Data Processing Results, 2024

Structural Model Testing

The structural model depicts the relationships between variables or constructs formulated based on the referenced theories. Testing of the structural model begins by determining the R-square value for each dependent variable. The model testing results are used to observe the relationships between dependent variables by comparing the significance and R-square value of the research model (Ghozali, 2008). The structural

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diagram resulting from the structural model test can be seen in Figure 14, with the R-Square value also available in Table 6 below.

Table 6. R-square Value of Each Variable

Variable	R-Square
Economic Growth	0.820
Poverty	0.719

Source: SMART PLS Data Processing Results, 2024

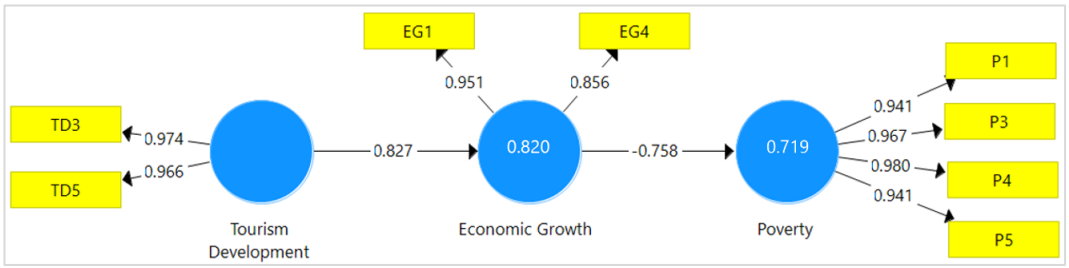

Figure 14. The Final Result of The Structural Model
Source: Processed Using SMART PLS, 2024

The R-square value of the poverty variable obtained 0.719, in which 71.9% of the variability in poverty is explained by tourism development and economic growth. In comparison, variables outside the constructed model illustrated 28.1% of the variability in poverty. Similarly, the economic growth variable had an R-square of 0.820, meaning that 82.0% of the variability in economic growth was caused by tourism development, and variables outside the model caused 18.0%.

Tourism Development Impact on Economic Growth and Poverty Alleviation

Hypothesis testing in the PLS model simulates each tested relationship between variables. In this case, the bootstrapping method was applied to the data. The bootstrapping method also served to minimize the issues of non-normality data in the research. In this study, the predetermined value of the T-table with a significance level of 5% and degree of freedom (df) of 11 yielded a value of 2.201 based on the two-tailed test table. Subsequently, from the data processing results, it is concluded that all path coefficient values or relationships between variables have a t-stat above 2.201 (see Table 7), indicating that all variables significantly influence each other. The testing of each hypothesis is explained as follows.

Table 7. Relationship Between the Variables

	Path Coefficient	Sample Mean	Standard Deviation	T Statistic	P Value
Tourism Development →Economic Growth	0.827	0.873	0.060	13.484	0.000
Economic Growth →Poverty	-0.758	-0.779	0.108	7.029	0.000

Source: SMART PLS Data Processing Results, 2024

The results of the first hypothesis test indicated that the impact of tourism development on economic growth showed a path coefficient value of +0.827. This finding suggests that tourism development has a positive impact on economic growth. It means that the better the tourism development in West Java is, the better its economic growth will be.

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An increase of one unit in tourism development increases the regional economy by 82.7%. Therefore, tourism can be considered one of the "driving forces" of the economy in West Java. Additionally, based on Table 7, the p-value of the first hypothesis is less than 0.05 (P value < 0.05). The value indicates that the first hypothesis is accepted, demonstrating a statistically significant direct impact of West Java's tourism development on regional economic growth.

Goeldner et al. (2000) stated that tourism has long been recognized as part of the economic activities that attract tourists, meet their needs, and rapidly grow into one of the world's largest industries. This statement is supported by the research conducted by Hrubcova et al. (2016), who concluded that tourism is a relevant economic sector for many developing countries and can be seen as a viable and sustainable economic development option. In the regional development priorities listed in the West Java Provincial Government Work Plan (RKPD) document for 2024, the main priorities for West Java's development include Innovation-based Economic Growth, Strengthening Sustainable Food Security Systems, and Tourism Development. In this regard, the government has recognized that tourism is one of the leading sectors that must be developed annually because of its significant economic impact. Therefore, the economic impact of tourism must be considered at any stage of its development.

The results of the second hypothesis testing indicated a significant impact of the economic growth variable on poverty, with a path coefficient value of -0.758. The negative sign of the path coefficient demonstrates that economic performance has a significant negative impact on poverty. It suggests that higher economic performance leads to decreased poverty, and a one-unit increase in economic performance will reduce poverty in West Java by 75.8%. According to Table 7, the p-value of the second hypothesis is also below 0.05 (P value <0.05). Therefore, the second hypothesis is accepted and states that economic growth significantly impacts poverty alleviation in West Java. This finding is consistent with the research from Jonnadi et al. (2012) and Dewanto et al. (2014), who found that the impact of the economy on poverty, measured by GRDP growth and regional investment, had an impact on poverty alleviation. Economic growth and poverty are important indicators to see the success of regional development.

In the context of economic growth and poverty alleviation in West Java, significant tourism development indicators can be identified based on the path coefficients obtained from this research (see Table 8). First, the "number of hotels and restaurants" indicator showed the greatest impact with the highest path coefficient of 0.974. Then the "contribution of the tourism sector on Original Local Government Revenue (PAD)" also had a high path coefficient of 0.966. These findings indicate that an increase in the number of hotels and restaurants and the revenue from the tourism sector play a significant role in driving the local economy in West Java. It will support the increase and significance of Gross Regional Domestic Product (GRDP) and the amount of regional investment value (economic growth variables) in poverty alleviation, with path coefficient contributions for GRDP and investment valued at 0.951 and 0.856, respectively (see Table 8).

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Table 8. Contribution of Each Indicator Constituting the Variables

Indicator		Path Coefficient	Sample Mean	Standard Deviation	T Statistic	P Value
TD3	Number of hotels and restaurants	0.974	0.969	0.020	49.781	0.000
TD5	Contribution of the Tourism Sector on Original Local Government Revenue (PAD)	0.966	0.964	0.023	42.185	0.000
EG1	Gross Regional Domestic Product	0.951	0.971	0.020	46.549	0.000
EG4	The amount of regional investment value	0.856	0.812	0.212	4.028	0.000

Source: SMART PLS Data Processing Results, 2024

The impact of tourism development on economic growth and poverty alleviation in West Java can be profound. The tourism sector creates employment opportunities with more hotels and restaurants. It stimulates local businesses and services, contributing significantly to the Gross Regional Domestic Product (GRDP). It aligns with the Strategic Plan (Renstra) of the Tourism and Cultural Agency of West Java, 2018 – 2023, which aims to enhance tourism-supporting facilities through the establishment of restaurants, eateries, cafes, as well as both starred and non-starred hotels, tourism travel businesses, and recreational or entertainment facilities in West Java, all supported by the use of digital platforms for promotional purposes.

Moreover, as the tourism sector flourishes, it enhances the tourism sector's contribution to Original Local Government Revenue (PAD), providing additional resources for public services and infrastructure development. This growth in economic activity attracts regional investments, further boosting the regional investment value. Therefore, the cumulative impact of tourism development has the potential to alleviate poverty and improve people's living standards through economic improvement (Li et al., 2022). Although the results of our analysis regarding the significant contribution of the tourism sector to economic growth and poverty alleviation in West Java, this finding can be debated considering that the benefits may not be equally distributed among all segments of society, particularly the lower strata. The great benefits of tourism tend to be felt by those with the knowledge, skills, connections, and capital, consequently, income inequality is possible (Truong et al., 2014).

Researchers reiterate that the indicators used to measure the impact of tourism development on economic growth and poverty alleviation in West Java include the number of hotels and restaurants, the tourism sector's contribution to local government revenue, GRDP, the amount of regional investment value, the percentage and number of people living in poverty, Poverty Depth Index, and Poverty Severity Index. However, research on the relationship between tourism and poverty alleviation in developing countries, as conducted by Odhiambo (2021), indicates that measuring tourism development depends on defined analytical indicators; consequently, research using different indicators may yield disparate findings. It highlights the importance of selecting appropriate indicators that effectively capture the nuanced impacts of tourism on local economies and poverty levels and are tailored to the conditions of each region.

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CONCLUSION

The research underscores the pivotal role of tourism development in fostering economic growth and alleviating poverty in West Java. It accentuates the substantial positive impact of tourism on the region's economy, establishing this sector as a crucial contributor to economic growth. Furthermore, the study reveals a correlation between robust economic performance and poverty reduction, emphasizing the importance of inclusive economic growth in poverty alleviation. Tourism Development (TD) is represented by two indicators: the number of dining establishments or restaurants and hotels (TD3), as well as the contribution of the tourism sector to regional income (TD5), which collectively contributes 82.7% to economic growth. The other two indicators: GRDP (EG1) and regional investment (EG4) represent economic growth and contribute 75.8% to poverty alleviation. The interconnectedness of the hotel, culinary, and tourism sectors underscores the need for tailored policies across various supply chain stages to maximize economic benefits for small businesses and ensure equitable distribution of tourism revenues.

Policy implications for West Java's tourism sector include the need for targeted strategies to enhance infrastructure, promote tourism attractions, and support the hospitality and culinary industries. Specific policies should focus on improving access to tourism sites through strategic investments in transportation and accommodation facilities. Moreover, fostering a conducive business environment through regulatory frameworks that support Small and Medium Enterprises (SMEs) in the tourism supply chain is crucial. Additionally, initiatives aimed at promoting sustainable tourism practices and preserving cultural heritage will attract tourists and ensure long-term economic benefits for local communities. By implementing these policies effectively, West Java can leverage its tourism potential to drive economic growth, create employment opportunities, and enhance overall prosperity while mitigating poverty through inclusive economic development strategies.

It is essential to note the limitations of this research, which focuses on examining the relationship between tourism development, economic growth, and poverty using indicators based on statistical data. This analysis employs the PLS model in conjunction with regional development indicators specifically tailored to the data provided by the West Java Government. Future research could delve into each district/city of West Java to identify specific challenges, providing valuable insights for tailored policies and interventions to maximize tourism's benefits for poverty alleviation across the region. Further exploration of tourism's impact on social and environmental dimensions and investigating its direct role in poverty alleviation is necessary. Utilizing additional measurement indicators based on referenced theories and previous research could describe structural variables more comprehensively.

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ANALYSIS OF TOURISM PERFORMANCE IN TEN PRIORITY TOURISM DESTINATIONS IN INDONESIA

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Abstract

This research aimed to analyze the influence of tourism indicators on performance in 10 priority tourism destinations. The indicators were reviewed using hotel room occupancy rate (TPK) for government spending on the tourism sector (PPP), crime rate (CR), inflation, air quality index (IKU), and number of college graduates. Additionally, the research was carried out with Fixed Effect Model (FEM) with estimation method Feasible Generalized Least Square (FGLS). The result showed that TPK of star hotels (TPKB), workforce, PPP, college graduates improved tourism performance. Meanwhile, the variables inflation and TPK for non-star hotels (TPKNB) provided a negative effect on improving performance in the elite tourism sector. In conclusion, the result helped in identifying relevant indicators that influenced the improvement of tourism performance, as well as ensured related parties adopted appropriate.

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INTRODUCTION

Tourism is a leading sector that significantly influences national growth and other economic fields (Verya & Afrizal, 2017). Based on previous achievements, it has contributed immensely to Gross Domestic Product (GDP) from 2015 to 2019, and is the highest foreign exchange contributor after the palm oil industry. This fastest-growing sector (Xia et al., 2022) is one of the fundamental financial columns due to the positive impact on GDP development (Purwomarwanto & Ramachandran, 2015). In addition, tourism sector provides broad and important regional economic benefits in the long term, validated by a 10% rise in local income generation, resulting in a relative increase of 2.5% and 2% in employment and benefits obtained, respectively. According to Faber and Gaubert (2019), the progress of residents depended on the production of locally traded goods and services. The role of this leading sector shows a causal relationship exists between tourism and GDP (Çağlayan et al., 2012). Therefore, tourism performance needs to be improved through sustainable development in order to realize high competitiveness. Indonesian government had designated tourism as 1 of the 9 missions that must be carried out in the next 5 years, included in the second point regarding a productive, independent and competitive economic structure (Kemenparekraf, 2021). Tourism was also contained in the 2015 to 2019 National Medium Term Development Plan (RPJMN) which focused on 5 development program namely Infrastructure, Maritime, Energy, Food and Tourism (IMEPP) for the next 5 years (Kemenpar, 2018).

Indonesian tourism mainly focuses on Bali, therefore tourism growth in other areas is still small. Therefore, the government through Cabinet Secretariat letter Number B-652/Seskab/Maritim/2015 (Setkab, 2019) prioritized 10 new tourism destinations, namely Morotai, Mandalika, Labuan Bajo, Wakatobi, Lake Toba, Tanjung Kelayang, Tanjung Lesung, Seribu Islands, Borobudur, and Bromo-Tengger-Semeru in North Maluku, West Nusa Tenggara, East Nusa Tenggara, Southeast Sulawesi, North Sumatra, Bangka Belitung Islands, Banten, DKI Jakarta, Central, and East Java, respectively (Kemenparekraf, 2021). According to the Ministry of Tourism and Creative Economy, the determination of these 10 tourism destinations is inseparable from nursed potentials and experiences offered tourists.

The possessed potentials include Lake Toba, the largest volcanic lake in Southeast Asia and Tanjung Kelayang beach which has quite large granite rocks. Additionally, the appealing Seribu Islands have advertising offices and resorts, as well as Borobudur, a world-class legacy location built in the 8th century. Tanjung Lesung is currently being transformed into an extraordinary financial zone, offering diverse experiences such as climbing Mount Anak Krakatau, Bromo-Tengger-Semeru, a favorite spot for tourists due to the history of Majapahit Kingdom, including other common attractions namely Lake Kumolo, known as being over the clouds. In the eastern part, Mandalika, a special economic area characterized by white sand beaches and clear blue seas is also regarded as an international circuit zone, Labuan Bajo beautifies the entrance to Komodo Island, Wakatobi, which offers 112 distinctive types of coral, including 750 of the 850 corals found globally, Morotai region containing remnants of war namely plane wreckage and the split sea phenomenon on Dodola Island.

Government Regulation (PP) Number 50 of 2011 concerning the National Tourism Improvement Ace Arrange (RIPPARNAS) for 2010 to 2025 focuses on regional tourism

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destination development, attractiveness, availability, open foundation, and offices, including community strengthening, and the establishment of ventures in this sector. The national development process certainly applies to each province in implementing tourism growth. Based on this, the inclusion of 10 priority tourism destinations accompanied by the national development process was expected to further improve performance. Despite the increased performance recorded from 2015 to 2019, the established policies were still not optimal. A few unrealized tourism execution objectives implemented by the government, are shown in Table 1.

Table 1. National Tourism Sector Achievements

Years	Target and Realization	Indicator			
		Contribution to GDP (%)	Foreign Exchange (Trillion IDR)	Labor (Million people)	Foreign Tourists (Million Visits)
(1)	(2)	(3)	(4)	(5)	(6)
2015	Target	4.32	144	11.4	10
	Realization	4.25	175.71	10.36	10.41
2016	Target	4.5	172	11.8	12
	Realization	4.13	176.23	12.28	12.02
2017	Target	5	200	12	15
	Realization	5	202.13	12.6	14.04
2018	Target	5.25	223	12.6	17
	Realization	5.25	224	12.7	15.81
2019	Target	5.5	280	13	20
	Realization	4.8	197	12.9	16.1

Source: Kemenparekraf/Baparekraf Strategic Plan 2020-2024, 2020

This showed that certain contributions to Gross Domestic Product (GDP) have not been realized optimally. In 2016 and 2019, realization of tourism contribution did not reach the target set by the government. Similarly, foreign exchange experienced a decline in 2015 and 2019. Regarding tourism sector workforce during these years, the intended labor absorption was not achieved. The number of foreign tourist visits in 2017 to 2019 did not reach the proposed target, even though an increase was reportedly recorded from 2015 to 2019. The inability to reach specific target is certainly not in line with the intended objectives of the government in implementing development policies to improve tourism performance.

Based on the perspective, this current research aimed to measure tourism performance in 10 priority destinations, using the variables of hotel room occupancy rate (TPK), government spending on tourism sector (PPP), crime rate (CR), inflation, air quality index (IKU), and number of college graduates. These variables also represent tourism performance indicators, and have been adjusted at the provincial level. Additionally, the results obtained were intended to determine the influence of the indicators, including aiding the relevant parties in formulating laws intended to improve and optimize tourism performance.

The Law of Indonesia Number 10 of 2009 concerning Tourism, stated that this sector comprised an assortment of visitor exercises, supported by different offices and administrations established by the community, business visionaries, and territorial governments. Furthermore, United Nations World Tourism Organization (UNWTO) characterized tourism as a social, cultural and economic phenomena connected to the

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development of places outside the homes of tourists, as well as delightfully carrying out visitor exercises.

Tourism is a multidimensional and complex economic sector, characterized by related execution. It is impacted by numerous indicators, namely infrastructure quality, financial conditions, security and wellbeing, cost levels, government arrangements, natural supportability, workforce abilities, including social assets (Assaf & Josiassen, 2012). Tourism performance in terms of quality, focuses on tourists, employees and management processes in balancing needs, associated with managing this sector. This crucial element determines the prosperity of related businesses and can be viewed from the quality of services provided (Marlyana & Khoiriyah, 2015). Meanwhile, the measurements of tourism benefit incorporate security, consolation, environmental protection, invitingness, competence, compassion, unwavering quality, responsiveness, respectfulness and trustworthiness (Sangkaeng et al., 2015). Tourism performance in terms of quantity focuses on contribution to the development process of this sector, including diverse economic activities. Croes and Kubickova (2013, as cited in Hanafiah & Zulkifly, 2019) stated that this variable was assessed using performance indicators over time, such as growth perceived as a measure of the industrial foundation economic structure (tourism added value to Gross Regional Domestic Product (GRDP)). Therefore, tourism performance was measured through the growth of GRDP in the accommodation, food and beverage sectors.

Based on research conducted by Assaf and Josiassen (2012), tourism performance is influenced by several indicators, considering the complex segment of this sector. Few indicators that impacted this framework was viewed from TPK of star hotels (TPKB) and TPK of non-star hotels (TPKNB), financial conditions in terms of government consumption and tourism workforce, as well as security and wellbeing represented by wrongdoing rates. Cost levels were assessed based on the expansion rate, while natural maintainability measured through workforce abilities impacted the quality of instruction.

Windayani and Budhi (2017) stated that TPK, tourist expenditure, and labor absorption improved tourism sector economy. However, Mataković and Mataković (2019) stated that crime levels reduced tourism performance. Yazgan-Pektaş and Ünlüönen (2020) also reported that it was negatively affected by inflation, for example high inflation rate reduced tourist spending. According to Vaduva et al. (2020), college graduates who work in tourism sector offered better performance in terms of improving tourism. Eusébio et al., (2021) stated that good air quality increased the number of tourist visits. Additionally, the results are consistent with the research by Haribudiman et al. (2023) that the restoration of natural resources and the ecosystems, incorporating integrated planning in land use, economic growth, strengthening socio-demographics, and a sustainable environment increased carrying capacity in tourism development. Popato'on et al. (2021) further stated that the financing of this sector by the government played a positive role in improving performance.

Tourism performance was measured through the growth of GRDP in the accommodation, food and beverage sectors. According to Assaf and Josiassen (2012), it is also influenced by several indicators, namely infrastructure assessed by TPK, economic conditions measured in respect to government spending on tourism sector, employment, security, safety and health depicted by the crime rate, price level incited in respect to inflation rate, environmental sustainability determined through air quality, including the

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skills and training of workforce which are impacted by the quality of education. Based on the research, qualitative method focused on countries level was used to measure tourism performance. Therefore, by using variables from the investigation conducted by Assaf and Josiassen (2012), the research novelty assessed tourism performance using quantitative methods focused on 10 priority destinations in Indonesia.

METHODOLOGY

This research used secondary data, sourced from BPS, Ministry of Finance DJPb, Ministry of Education and Culture Ristekdikti, Ministry of Environment and Forestry (Menlhk). This consisted of TPKB, TPKNB, workforce, PPP, college graduates, inflation, crime rate, and IKU from 10 provinces categorized as priority destinations from 2015 to 2019.

The panel data regression analysis was used to examine the implications of these indicators on tourism performance in 10 priority destinations. In addition, this analytic method comprised several stages (Baltagi, 2005), namely:

1. Model specifications consisted of Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). CEM is the simplest estimation on panel data, and according to Gujarati and Porter (2013), the model assumes that individual behavior regarding explanatory variables occasionally was not differentiated. The estimation used is Ordinary Least Squares (OLS) due to the provision of consistent and efficient estimates of the common α and slope vector β, represented the following equation (Greene, 2012):

$$y_{it} = \alpha + x'_{it}\beta + u_{it} \quad \text{...(1)}$$

with,

$$u_{it} = u_i + v_{it} \quad \text{...(2)}$$

FEM focuses on the assumption that the slope of the regression coefficient does not vary between individuals in other words, the slope is occasionally constant between cross-section units. The formula for fixed effects also shows that differences between groups can be captured. This model is estimated using OLS, Generalized Least Square (GLS), Feasible Generalized Least Square (FGLS), and FGLS-Seemingly Unrelated Regression (SUR). FEM equation is generally stated as follows:

$$y_{it} = x'_{it}\beta + \alpha + u_{it} \quad \text{...(3)}$$
$$y_{it} = x'_{it}\beta + (\alpha + u_i) + v_{it} \quad \text{...(4)}$$
$$y_{it} = \alpha_i + x'_{it}\beta + v_{it} \quad \text{...(5)}$$

REM accommodates differences in characteristics between cross-section and inter-time units, as stated in the error component. This consists of two components, namely cross-section and time errors. Meanwhile, the individual effect on REM was characterized as a random component due to the relations with

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the population from which the sample was randomly drawn. REM was estimated using GLS which accommodates the possibility, the resulting individual effects correlated with respective error and time. The model equation is stated as follows:

$$y_{it} = x'_{it}\beta + (\alpha + u_i) + v_{it} \quad ...(6)$$

The model equation used in this research is as follows:

$$\widehat{lnPDRB}_{it} = \alpha_i + \beta_1 TPKB_{it} + \beta_2 TPKNB_{it} + \beta_3 lnTK_{it} + \beta_4 PPP_{it} + \beta_5 lnLPT_{it} + \beta_6 Inflasi_{it} + \beta_7 IKU_{it} + \beta_8 CR_{it} \quad ...(7)$$

Where:
lnPDRB : natural log of tourism GRDP (percent)
TPKB : star hotel room occupancy rate (percent)
TPKNB : non-star hotel room occupancy rate (percent)
lnTK : natural logarithm of tourism sector workforce (percent)
PPP : proportion of government spending (percent)
lnLPT : natural logarithm of college graduates (percent)
Inflation : general inflation per province (percent)
IKU : air quality index (value)
CR : crime rate (cases)
i : 1, 2, 3, …, N
t : 1, 2, 3, …, T
α : intercept

2. Selection of the Best Model. Several methods such as Chow, Hausman, and Breusch-Pagan Lagrange Multiplier (BP-LM) Tests can be used to identify the best model. Chow test is used to determine the best model between CEM and FEM. The tested model is FEM following the Fisher distribution. However, Hausman test was used to ascertain the best model between REM and FEM. The tested model is REM, based on the chi square asymptote distribution (χ^2). According to Gujarati and Porter (2013), REM does not allow the correlation between individual error components, as well as autocorrelation in both cross-section and time series units. The error effects of the regression components must also not correlate with any of the explanatory variables included in the model. Meanwhile, BP-LM was used to decipher the best model between CEM and REM. The tested model is REM following the chi square distribution with one degree of freedom, $\chi^2_{(1)}$.
3. Test the residual variance-covariance structure during analysis using panel data regression. The classical assumption test is often violated, and this incident is unavoidable. However, this violation was overcome by adjusting an estimate using the residual variance-covariance structure test. The aim was to ascertain whether there was a violation of the heteroscedasticity assumption (LM test) and cross-sectional correlation (λLM test).
4. Classical assumption test, comprising normality, homoscedasticity, autocorrelation tests, focused on multicollinearity. This test was conducted to

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ensure that the selected model showed parameter estimation results of several desired statistical properties.

5. Test the significance of the model, by determining how well the independent variables can explain the dependent variable in the model. This was realized using F and t tests, through the adjusted R^2 value. The coefficient of determination (R^2) showed the sample regression line would fit the data. Additionally, simultaneous tests were carried out to determine the overall significance of the estimated regression model. This included testing the influence of the independent variables on the dependent variable. Hypothesis testing of independent variables as individual partial regression was carried out using t test. It was implicitly assumed that each significance test was based on a separate sample when evaluating the individual significance of observed partial regression coefficients.
6. Model interpretation is in accordance with the results of the estimation obtained.

FINDINGS AND DISCUSSION

Tourism performance was assessed based on the economic growth of this sector. The provision of accommodation, food and beverage played a significant role in contributing to income generation. Therefore, economic growth was assessed based on GRDP in the accommodation, food and beverage sector. Tourism GRDP increased by an average of IDR 19 to 25 Trillion, considering the total share there was no significant increase from 2015 to 2019. This implied that the share of tourism GRDP was relatively constant for 10 priority destination provinces. DKI Jakarta, Central Java, and East Java were the 3 provinces that contributed the highest from 2015 to 2019. Meanwhile, West Nusa Tenggara, and East Nusa Tenggara, Southeast Sulawesi and North Maluku contributed the lowest share of tourism GRDP. The provinces of East Nusa Tenggara, Southeast Sulawesi, and North Maluku contributed less than 1% of the total GRDP share, as shown in Figure 1.

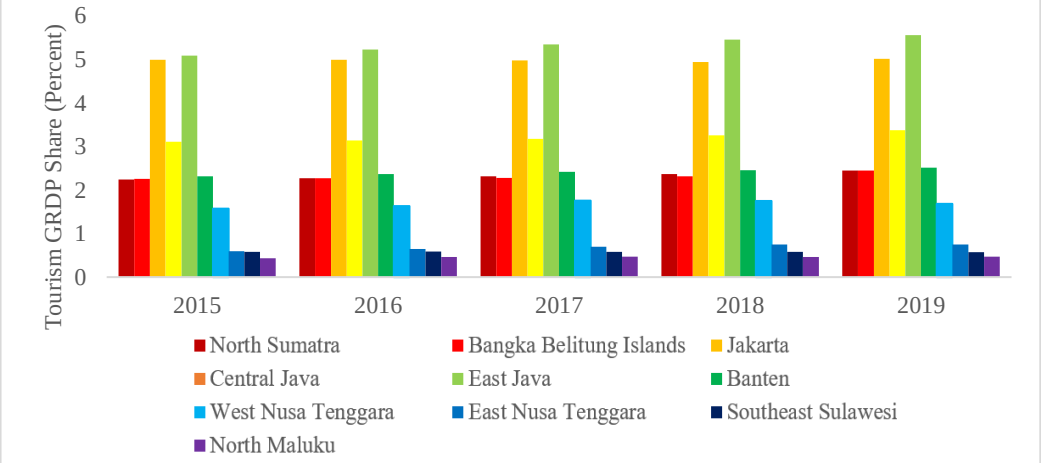

Figure 1. Share tourism GRDP in 10 provinces as priority destinations 2015 – 2019 (percent)
Source: Data processed, 2024

TPK was the main indicator used to measure the availability of accommodation at a destination. This indicator was divided into two parts, namely TPKB and TPKNB. The

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development of TPKB in 10 priority destinations fluctuated and tends to increase with an average of 48.58% to 51.39% from 2015 to 2018 but reduced to 48.71% in 2019. Meanwhile, the development of TPKNB decreased with an average of 36.00% to 29.78% from 2015 to 2019. The decline in TPKB and TPKNB was due to a decrease in the number of tourist visits, mainly caused by natural disasters. A typical example is the earthquake incident that occurred in Lombok in August 2019, resulting in the cancellation of more than 75% of foreign tourist visits from August to December 2019.

Labor is another indicator used to measure tourism performance. The development tends to increase, where DKI Jakarta, Central Java, and East Java had high labor absorption in tourism sector compared to other provinces. In addition, PPP is part of the fiscal policy that regulates income and costs recorded in the State Revenue and Expenditure Budget (APBN). PPP from 2015 to 2019 fluctuated, with the highest expenditure recorded in DKI Jakarta, followed by West Nusa Tenggara and North Sumatra. This is in line with the significant increase in PPP channeled to the 10 provinces.

Education level was used to measure the ability and knowledge of Human Resources (HR). In measuring the performance of tourism sector, college graduates were used to describe individual qualities and abilities. An increase was recorded in the number of college graduates from 2015 to 2019, which was observed in the following four provinces Bangka Belitung Islands, Central Java, East Java, and Banten. A consistent increase in the number of college graduates tend to have an impact on the quality of human resources every year. The high and low number of college graduates is inseparable from the influence of the number of universities in a region. Therefore, the inequality in the number of graduates depends on the development of universities in each region. This also has an influence on the acceptance quota for prospective students, who are expected to work or create jobs on graduation. The role of college graduates is important in tourism performance.

Inflation is defined as an increase in the prices of goods that occurs in a certain year. Therefore, in measuring tourism performance, it is used to determine price levels in an area. The following 8 provinces, DKI Jakarta, Central Java, East Java, Banten, West Nusa Tenggara, East Nusa Tenggara, Southeast Sulawesi, and North Maluku, maintained stable inflation rates. Meanwhile, North Sumatra and Bangka Belitung Islands recorded unstable inflation rate. In 2016, it rose to approximately 6% due to the spike in prices of basic commodities.

Several tourists tend to visit destinations that are environmentally friendly and have good air quality. Based on this, the IKU was used to measure air quality in the following provinces North Sumatra, Bangka Belitung Islands, Central Java, East Java, West Nusa Tenggara, East Nusa Tenggara, Southeast Sulawesi, including North Maluku. The development of IKU shows a trend of increasingly better air quality. In DKI Jakarta and Banten, IKU development tends to decline, while the alert category seemed quite good. Furthermore, crime rate was used to describe the risk of being exposed as result of an offence committed in an area. From 2015 to 2019, a decrease was observed in crime rate. A similar incident was also reported in the development of the national crime rate.

Panel data regression analysis was conducted to evaluate the influence of the following variables TPKB, TPKNB, workforce, PPP, college graduates, inflation, crime rate, and IKU on tourism performance in 10 priority destination from 2015 to 2019. The

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results of Chow test showed that F-statistic and p-value were 413.12 and 0.0001, resulting in the selection of FEM model. Subsequently, the Hausman test was carried out, obtaining a chi square and p-value of 41.81 and 0.0001, also leading to the selection of FEM. Based on the results, it is evident that the best model is FEM. Furthermore, the residual variance-covariance structure test showed that the model was heteroscedastic and there was no cross-sectional correlation. A suitable method for estimating the model, characterized by the ability to accommodate violations of heteroscedasticity, is FGLS. The selection of this method ensured the classical assumption test was only used to determine normality, while identifying multicollinearity. The results of the classical assumption test also showed that the model did not violate normality, or the occurrence of multicollinearity. The significance of the model was determined by ascertaining the adjusted R^2 value, F (simultaneous), and t tests (partial), as shown in Table 2.

Table 2. Summary of Model Significance Tests

Independent Variable	**Coefficient**	***t-table***	***t-Statistic***
(1)	(2)	(3)	(3)
C	6.8371	1.6938	19.6199
TPKB*	0.0052	1.6938	2.0675
TPKNB	-0.0093	1.6938	-5.0785
lnTK*	0.1036	1.6938	4.0023
PPP*	1.6123	1.6938	4.8108
lnLPT*	0.1052	1.6938	3.4299
Inflasi*	-0.0161	-1.6938	-2.0469
IKU	-0.0005	1.6938	-0.3249
CR	0.0001	-1.6938	0.4572
Summary Statistics			
R-squared:0.9998		*F-Statistic:* 10,600.9700	
Adjusted R-squared: 0.9997		*Prob(F-statistic):* 0.0001	

Source: Data processed, 2024

Considering the results of the model significance test, the adjusted R^2 had a value of 0.9997%. This implied the independent variables were used to explain the diversity of tourism GRDP by 99.97%, while the remaining was described by other variables not included in the model. The equation formed from the estimation results using FGLS is:

$$\begin{aligned} \widehat{lnPDRB_{it}} = (6.8371 + \mu_i) + 0.0052TPKB_{it}{}^{*} - 0.0093TPKNB_{it} \\ +0.1036lnTK_{it}{}^{*} + 1.6123PPP_{it}{}^{*} + 0.1052lnLPT_{it}{}^{*} \\ -0.0161Inflasi_{it}{}^{*} - 0.0005IKU_{it} + 0.000189CR_{it} \end{aligned} \quad \text{...(8)}$$

Based on Equation 8, variables that possessed a significant influence on tourism GRDP were TPKB, workforce, PPP, college graduates, including inflation at a significance level of 5%. PPP, college graduates, tourism sector workforce, and TPKB, had a positive and significant effect on increasing GRDP. However, inflation had a negative and significant effect on increasing tourism GRDP. TPKNB, air quality (IKU) and crime rate variables did not have a significant effect in the current research. These results are in accordance with the research objective that certain indicators or variables influence tourism performance, specifically in 10 priority destinations in Indonesia.

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The proportion of government outlay (PPP) had a positive and significant effect on increasing tourism GRDP, in accordance with the proposed hypothesis. The coefficient value of 1.61 implied that every 1% growth in PPP led to a rise of 1.61% of tourism GRDP, assuming the other variables were constant. PPP was perceived as capital in tourism development which improved performance. This variable had a positive impact on tourism performance, implying PPP was a crucial indicator. The rise in a particular year provided an indication that every increase in finance spent had an effect on tourism performance. The influence was proven by increased development of a destination, such as infrastructure which incited the attractiveness of an area, thereby further improving tourism performance. The results are in accordance with the research by Popato'on et al. (2021) that PPP serves as a capital in the growth of this sector, significantly and favorably impacting performance. The PPP variable, and building of public facilities that support tourist comfort reportedly improved performance. Revitalization and maintenance of tourist attractions enhanced the beauty of destinations, thereby increasing the number of visits. The government need to always increase spending on this sector annually to carry out sustainable development. The results of this research were also supported by Dritsakis (2012), which stated the government played an active role reflected in expenditure policies in terms of developing tourism sector.

College graduate variable has a positive and significant effect on increasing tourism GRDP, in accordance with the research hypothesis. The coefficient value of 0.105 implied that every 1% growth in college graduates increased tourism GRDP by 0.105%. assuming other variables were constant. In addition, college graduates are an important indicator for tourism sector. Human resources, and college graduates are bound to contribute skilled labor with the ability to absorb knowledge, as well as develop new ideas or innovations in tourism. Therefore, education plays an important role in terms of improving tourism performance. The results are in line with Vaduva et al. (2020), who stated that employees have better abilities in theoretical and practical terms. Individuals who had focused on studying tourism were able to understand tourism both from a theoretical and practical perspective. Learning related to this segment implied planning individual expectation for tourism programs, leading to more preparedness to work with the information obtained. The results were also in line with Chehat and Akacem (2022) that a co-integrated vector consisted of four variables, namely economic growth, tourism earning, human capital and gross fixed capital formation influencing tourism performance. Furthermore, the government is needed to increase Human Resources (HR), such as providing special scholarship assistance to tourism majors, or expand the number of universities which are still few in several destinations.

Workforce variable has a positive and significant effect on increasing tourism GRDP, in accordance with the research hypothesis. The coefficient value of 0.104 implied that every 1% growth in workforce variable increased tourism GRDP by 0.104%, assuming other variables were constant. Labor-intensive capital improves the quality of services offered, ensuring tourists are satisfied, thereby resulting in the creation of memorable experiences. Workforce also improves performance through the services provided, increasing the trust and desire of tourists to want to revisit a particular destination. The results of this research are in line with Zha and Li (2016) that labor is an important factor in improving tourism performance. In this sector, the presence of workforce enhances the

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quality of services by meeting certain needs such as providing information related to tourism destinations. Additionally, trained personnel helps in developing tourism products, preserving the environment, improving the quality of destination comfort, and establishes cordial relationships with tourists. In this case, the government also plays a role in motivating individuals to work in tourism sector by providing outreach, employment training or business credit assistance.

TPKB has a positive and significant effect on increasing tourism GRDP, in accordance with the research hypothesis. The coefficient value of 0.005 depicted that every 1% growth in TPKB increased tourism GRDP by 0.005%, assuming other variables remained constant. The development of TPKB, led to an increase in the number of rooms available, an indication of the rising tourist visits. According to Karsadi (2002, as cited in Udayantini et al., 2015), the number of visits has a significant influence on hotel occupancy levels, a decrease in tourist visits led to a decline in hotel occupancy levels. Meanwhile, an increase in the number of visits, causes a rise in occupancy rate. The results were in line with Hasanah and Fadly (2019) and Dirgantara and Agustina (2022), that foreign tourists who visited Indonesia from 2010 to 2019 were dominated by youths, most of whom spent money on accommodation, food, and beverages.

Inflation has the greatest influence on reducing tourism GRDP with a variable size of 0.016. This depicted that every 1% growth reduced tourism GRDP by 0.016%, in accordance with the research hypothesis. Inflation defined as a determinant of price levels at a destination also influences tourism GRDP growth. The level of inflation in a destination affects the price levels in tourism sector, thereby influencing tourists desire to spend money. High inflation leads to exorbitant prices, restricting shopping or spending at a particular destination. This is in line with research by Yazgan-Pektaş and Ünlüönen (2020) that inflation is a determining factor in the holiday budget spent by tourists. In addition, this result is in line with Göral and Akgöz (2017), which stated guests are mindful of the prices of traveler products. A consideration of the visit bundles including traveler merchandise and administrations in respect to set objectives, led to a rise in cost competition. An increase in costs, causes a decline in the domestic market demand for tourism. In this case, the government plays a significant role in regulating inflation in 10 priority destinations, to ensure low prices are offered during tourism activities.

Table 3. Individual effects of 10 provinces as priority destinations

No.	Province	Individual Effects
(1)	(2)	(3)
1	DKI Jakarta	3.0309
2	East Java	2.6003
3	Central Java	1.5611
4	Banten	0.6647
5	North Sumatera	0.8989
6	Bangka Belitung Islands	-0.7661
7	West Nusa Tenggara	-0.8569
8	Southeast Sulawesi	-1.9001
9	East Nusa Tenggara	-2.0803
10	North Maluku	-3.1525

Source: Data processed, 2024

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FEM estimation model was used, resulting in the assumption that there were differences in characteristics between individual effects. Therefore, each province is expected to have a different intercept. The individual effect value shows tourism performance as viewed from GDP of each priority destination, assuming all other independent variables are constant. Both positive and negative individual effect values tend to increase and decrease the percentage of tourism GDP, respectively. The estimation results showed that the 3 provinces with the largest individual effect values were DKI Jakarta, Central Java, and East Java, as shown in Table 3. The highest and lowest individual effect values of 3.0309 and -3.1525 were realized in DKI Jakarta and North Maluku, respectively. This is also in line with the results of the descriptive analysis of variables thought to influence tourism performance. Additionally, DKI Jakarta, Central Java, and East Java showed better performance than other priority destination provinces.

CONCLUSION

In conclusion, this research aimed to examine the impact of indicators on tourism performance in 10 priority destinations. Tourism performance was measured based on GRDP of this sector. However, the indicators were reviewed using the variables TPK, PPP on tourism sector, crime rate, inflation, IKU, and number of college graduates. By using these indicators, the provinces with the greatest influence in improving tourism performance were DKI Jakarta, East Java, and Central Java, while the lowest was North Maluku.

Based on the results, TPKB, workforce, PPP, and college graduates had a positive influence on tourism performance in 10 priority destinations. Inflation had a negative effect, while TPKNB, crime rate and IKU had no influence on tourism performance.

The results are expected to offer information and guidance for related parties in providing an overview of tourism conditions in Indonesia, specifically in 10 priority destinations which had great potential to be further improved. The contribution of this research could also be useful for enhancing collaboration among the various factors explored. The exceptional coordination qualities from stakeholders led to the advancement of tourism, both quantitatively and qualitatively, such as perceptions of tourist experiences and pleasant feelings.

In order to improve tourism performance, cooperation between the community and the government was needed, through increased promotion of tourism destinations, specifically 10 priority destinations. Promotion was realized by taking advantage of increasingly advanced technological developments such as the development of social media with various platforms namely YouTube, TikTok, Instagram, Twitch, etc. In addition, tourism promotion included the participations of public figures or influencers. This was also supported by improving and enhancing infrastructure such as building roads, and funding facilities that sustained tourist accessibility. TPK needed to be increased to have a greater influence on tourism performance. This was realized by focusing on marketing or collaborating with travel aggregators namely Traveloka, Tiket.com, and Airy Rooms. Non-star hotels required special attention both in terms of service from workers, to increasing the number of rooms, and quality of experience offered to tourists. A specific way to provide an impressive experience and service from hotel accommodation was to show friendly attitude and respect for tourist privacy.

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The variables related to inflation had a negative influence on tourism performance. Therefore, the government should be able to maintain inflation stability through various regulations, including monetary and other fiscal policies that could ensure inflation rate remained consistent. IKU and crime rate were not significant, because the selection of variables were inappropriate in describing the impact of environmental and social conditions on tourism performance. In addition, crime rate and intervention events did not always have a significant influence on the number of tourists visits. These indicators caused a decrease in the number of visits, where the pattern of immediate or non-delayed impacts was only observed in terrorism and natural disasters.

Due to the availability of data, there were limitations in the use of several research variables. Some of the variables used did not specifically describe tourism, such as the general investment. Therefore, future research needed to use variables that could specifically describe tourism indicators, such as investment, college graduates majoring in tourism, and number of workers.

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THE EFFECT OF TRAVEL CONSTRAINTS ON TRAVEL INTENTIONS OF PEOPLE WITH DISABILITIES: THE MEDIATING ROLE OF TRAVEL MOTIVATION

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Abstract

According to WHO, 16% of the world's population are people with disabilities. Given this high number, disability-friendly tourism can be utilized as a special tourism market. This study aims to analyze the effect of travel constraints on travel intention through travel motivation for people with disabilities in Bandung. Over the past few years, Indonesia has begun to develop disability-friendly tourism infrastructure and services. The theory used in this study is the Theory of Planned Behavior, which has proven effective in shaping the behavioral intentions of tourists. This research was conducted using quantitative methods with structural equation modelling analysis procedures using CB SEM. The data collection technique used was non-probability sampling, targeting people with visual impairments, hearing impairments, physical disabilities, and mild mental disabilities. There are 200 pieces of data collected using a questionnaire. The results showed that travel constraints significantly positively affect travel intention through travel motivation among people with disabilities in Bandung. Existing literature finds a direct effect of travel constraints on travel intention in the tourism industry. This study contributes to the existing literature by including travel motivation as a mediating variable in mediating the effect of travel constraints on travel intention among people with disabilities in Bandung.

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INTRODUCTION

Human rights ensure equality among individuals regardless of their ethnicity, race, religion, nationality, or physical abilities (W. Afifah & Hadi, 2018). In Indonesia, one way human rights are upheld is through the promotion of inclusive tourism activities (Sandang, 2019). Essentially, tourism activities are everyone's right (Pradana, 2019). According to Law Number 10 of 2009 concerning Tourism Article 18, paragraph 1 point states, "Everyone has the right to have the opportunity to fulfill tourism needs" (Paramarta & Hendiawan, 2020). Every person, including those with disabilities, has the right to participate in travel experiences (Sari & Soeskandi, 2021). In essence, every individual has the same rights to access and enjoying tourism, including people with disabilities (Amini et al., 2021).

The United Nations Convention on the Rights of Persons with Disabilities defines individuals with long-term physical, mental, intellectual, or sensory impairments as those whose full and effective participation in society may be hindered by various barriers. People with disabilities are citizens of the Republic of Indonesia who are guaranteed equal positions, rights, obligations, and roles with other citizens by the 1945 Constitution (Itasari, 2020). The Equality of rights is regulated by Law Number 8 of 2016 concerning Persons with Disabilities, which includes rights related to culture and tourism (W. Afifah & Hadi, 2018). People with disabilities have the same opportunities and rights to enjoy culture and tourism as other citizens. According to Law Number 10 of 2009, tourism encompasses various activities supported by facilities and services provided by the community, private sector and government (Abidin et al., 2020). It is essential for the government, private sector, and society to focus on accommodating individuals with disabilities in the tourism sector to prevent discrimination (Hastuti et al., 2020). Additionally, it is important to fulfill their rights in the context of tourism so that the government can ensure the fulfillment of human rights for people with disabilities in Indonesia (Richadi, 2018).

Disability groups encompass a wide range of individuals across different age groups, from children to the elderly. Children with disabilities, such as autism, cerebral palsy, down syndrome, or other developmental disorders, often require special attention and appropriate accessibility when traveling. Tourism facilities and services must accommodate these needs to ensure a comfortable vacation experience. Adolescents and young adults with disabilities, including those with physical, sensory, or intellectual impairments, also require special assistance or facilities when traveling. For instance, they need disability-friendly accessibility in hotels, public transportation, tourist attractions, and restaurants. Adults with disabilities are another important segment of the disability group in tourism. They may have different mobility needs or require additional assistance in planning and executing travel. Finally, elderly individuals who experience disabilities due to age or health conditions must also be considered in the context of tourism. Their needs include improved accessibility, nearby medical facilities, or care assistance during travel.

According to a 2018 study by Indonesia's Central Statistics Agency, the number of people with disabilities reached 21.8 million and is expected to continue growing to 23 million by 2023. The increase in the population of individuals with disabilities in Indonesia presents an advantageous opportunity for the advancement of the country’s tourism sector (Simanjuntak et al., 2018). In October 2023, during the opening remarks of the ASEAN High-Level Forum, the Minister of Social Affairs said that disability is not only an issue in

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ASEAN, but also a global issue because the number of people with disabilities is quite large. In ASEAN, there are around 62 million people with disabilities. Meanwhile, in Indonesia, there are around 22.9 million people. For this reason, AHLF invited participants from the United States, the United Kingdom, and Australia to observe how ASEAN countries have addressed disability issues and to discuss and exchange experiences. (Mufida, 2023). According to the data from the 2021 and 2022 census, the population of individuals with disabilities in Bandung is as follows:

Table 1. Total of Persons with Disabilities in Bandung

No	Type of Disability	Year		Description
		2021	2022	
1	Physical Disability	513	696	People
2	Blindness	144	304	People
3	Deaf / Speech Disability	168	625	People
4	Mental disabilities	187	2,326	People
5	Physical and mental disabilities	63	83	People
6	Other disabilities	348	410	People
Total		**1,423**	**4,444**	

Source: BPS West Java Province in Figures, 2023

The information provided in Table 1 indicates that in 2021, there were a total of 1,423 individuals with disabilities in Bandung. These disabilities were categorized as follows: 513 individuals had physical disabilities, 144 had visual or blind disabilities, 168 had hearing or speech impairments, 187 had mental or spiritual disabilities, 63 had physical and mental disabilities, and 348 had other types of disabilities.

The number of people with disabilities increased by 67.9% in 2022, reaching a total of 4,444 individuals in Bandung. The disability categories are divided as follows: 696 people with physical disabilities, 304 people with visual/blind disabilities, 625 people with hearing/speech disabilities, 2,326 people with mental/spiritual disabilities, 83 people with physical/mental disabilities, and 410 people with other disabilities. Seeing this high number, disability-friendly tourism should be the focus of attention for tourism activists in Indonesia because this can be utilized as a specific market (Sumiarsa et al., 2022). Based on data on the types of disabilities that exist in Bandung, the types of disabilities they have will have an impact on their activities in conducting tourism activities.

Based on data from the Social Service of the Bandung Government in October 2023, there were around 6,045 people with disabilities recorded (Bandung Regency Government, 2023). Based on data on tourist visits to Bandung, a very significant increase was recorded from 2020 to the end of 2023, reaching a percentage of 340% (Disbudpar Kabupaten Bandung, 2024). The precise figure will be significantly higher, with the majority falling within the working-age bracket. The Bandung Government is determined to create a district that is friendly to people with disabilities. The Regent of Bandung revealed that in planning the preparation of the disability regulation, the Bandung Government implemented various measures to ensure the rights of individuals with disabilities, such as establishing an inclusive educational program, enhancing pedestrian accessibility, providing sports amenities, and promoting disability-friendly tourism. (Bandung Regency Government, 2023). The following is a detailed table of tourists visiting Bandung.

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Table 2. Total of Domestic Tourists and Foreign Tourists

No	Year	Domestic Tourists	Foreign Tourists	Total of Tourists
1	2020	-	-	2,072,697
2	2021	-	-	3,880,600
3	2022	6,548,815	1,748	6,550,563
4	2023	-	-	7,044,300

Source: BPS Bandung Regency in Figures, 2024

Based on Table 2, it can be explained that the number of domestic tourists and foreign tourists visiting Bandung in 2020 there were 2,072,697 visitors, in 2021 there were 3,880,600 visitors, in 2022 there were 6,550,563 visitors and in 2023 there were 7,044,300 visitors. The rise in the number of travellers with disabilities presents a significant market opportunity for the tourism industry (Y. Afifah, 2023). To address the rights of disabled individuals in tourism, it is crucial to embrace the concept of disability-friendly tourism. The research by Simarmata (2020) explains the number of visitors with disabilities who visited the Uluwatu Luhur Temple Area, as shown in the Table 3.

Table 3. Total Number of Visitors with Disabilities to Uluwatu Temple 2016-2019

No	Year	Disability Visit
1	2016	2,852
2	2017	3,429
3	2018	4,164
4	2019	5,089
	Total	**15,534**

Source: The Uluwatu Temple Management, 2019

Based on data from Table 3, it can be seen that in 2016 the number of visitors with disabilities was 2,852, in 2017 it was 3,429, in 2018 it was 4,164, and in 2019 it was 5,089. This shows that the number of visitors with disabilities to Uluwatu Temple has increased over the last four years, but the increase is not significant.

Travelling activities may present certain challenges and obstacles that can affect the experience of participating in such activities (Hastuti et al., 2020). Problems faced by people with disabilities during travel can negatively influence their intention to travel (Audina et al., 2022). The primary challenges faced by individuals with disabilities when engaging in tourism include the need for accessible physical infrastructure, accommodation, and access to tourist destinations and attractions (Elfrida & Noviyanti, 2019). Travel constraints are variables that cause tourists to decide whether to start or end a trip (Rinandiyana et al., 2022).

Travel constraints are factors that can impede or prevent travel, leading to a halt or reduction in travel frequency, ultimately negatively impacting a trip (Indriyani & Artanti, 2020). These constraints are elements that limit continuous travel and may prevent potential travelers from starting their journey (Hung & Petrick, 2012). Individuals may experience internal and external constraints that inhibit their intention to travel (Crawford et al., 1991).

Based on interviews with the manager of the Sae Cipta Mandiri Soreang Foundation in Bandung, it was found that travel constraints faced by people with disabilities, especially those who are deaf or speech-impaired, include communication barriers related to sound, societal stigma that individuals with disabilities have lower

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cognitive abilities, and feelings of shame some parents have about their children's limitations.

Extensive discussions on travel constraints have been a focal point in the tourism literature since the introduction of the Leisure Constraints Model (LCM) by Crawford and Godbey (1987). This model has been further reinforced through subsequent studies by Crawford et al. (1991). Over the last thirty years, numerous studies have explored the LCM, examining the impact of travel constraints on travel intentions, leading to significant insights from research by Mei and Lantai (2018). Travel constraints, as limitations and barriers, significantly impact individual preferences and engagement in tourism activities (Wong & Kuo, 2021). From this literature, it can be concluded that travel constraints encompass various difficulties, challenges, or disturbances that individuals or groups face when they want to start a tourism activity.

Shin et al. (2022) emphasized the significance of understanding how travel constraints affect travel intentions to develop effective marketing strategies for tourism recovery amid the COVID-19 pandemic (Aziz et al., 2022). Załuska et al. (2022) highlighted the impact of various travel constraints on individuals with sensory disabilities, underscoring the negative influence these constraints have on their activities. Additionally, Indriyani and Artanti (2020) found that travel adversely affect individuals' intention to visit Kenjeran Beach.

In contrast, Chen et al. (2021) found that travel constraints have a positive effect on travel intention. These findings align with research on travel constraints faced by the elderly, and the study by Xie and Ritchie (2019) on international student travelers in Australia indicates that higher travel intentions among Roadtrippers leads to increased investment of time and money in visiting destinations. The research also suggests that road travelers are less likely to view road travel constraints as a significant obstacle to visiting a destination. This lack of concern is attributed to the lower financial risks and time commitments associated with road travel. Furthermore, the findings imply that individuals can effectively manage challenging situations despite experiencing emotional and social setbacks during crisis (Doğan et al., 2021).

As barriers to travel are identified, it is important to understand the travel behavior of disabled travelers to encourage the development of inclusive tourism activities (Simanjuntak et al., 2018). Tourist behavior, as explained by Latif et al. (2020), is intricately linked to psychological factors that shape the intention to visit tourist destinations. This travel intention encompasses the attitudes and behaviors experienced by potential tourists, which help them form perceptions that influence their decisions on which destination to explore (Kanzenna, 2020). The Theory of Planned Behavior (TPB) developed by Yuzhanin and Fisher (2016), is used to analyze tourist behavior concerning travel intentions.

The Theory of Planned Behavior (TPB) suggests that an individual's actions are influenced by their intentions or planned behavior. Research has demonstrated that the TPB model effectively impacts tourists' decision-making processes when choosing a destination to visit. A study conducted in Indonesia revealed that the TPB model significantly contributes to the intention to visit local tourist spots (Pahrudin et al., 2021). This finding aligns with Ghani (2023), who supports the effectiveness of the TPB in explaining tourists' decisions to engage positively within the hotel industry in Bandung City.

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Based on several studies, it is evident that there is a research gap concerning the inconsistency results regarding the impact of travel constraints on travel intention. Therefore, a practical suggestion to address this issue is to mediate the effect of travel constraints on travel intention through travel motivation. Motivation is an inner psychological drive that originates from unmet needs and then compels an individual to engage in specific actions or behaviors to fulfill those needs (Khan et al., 2019). Travel motivation is considered the primary source of influence in driving tourist behavior (Widiyastuti, 2017). It refers to the socio-psychological needs of tourists, which represent the driving motivational force, making it essential to understand motivation in the tourism sphere, especially during times of crisis (Volgger et al., 2021).

The study of travel motivation as a mediator between travel constraints and travel intention has been widely examined. Research conducted by Eusébio et al. (2023) highlights that individuals with disabilities exhibit a strong inclination to engage in tourism activities, yet they encounter numerous challenges, as identified by Portuguese Social Organizations (PSOs). Additionally, Khan et al. (2019) found that travel motivation serves as a crucial factor in mitigating the adverse impact of travel constraints on the travel intentions of young tourists visiting India. Specifically, their study reveals that travel motivation plays a significant role in alleviating structural constraints while positively influencing intrapersonal and interpersonal constraints related to travel intentions.

The empirical gap in this study is that research on people with disabilities from a tourism perspective, especially in Indonesia, is still relatively rare. Generally, research in Indonesia has focused more on qualitative studies that discuss the availability of facilities and accessibility for people with disabilities, as seen in journal by Abidin et al. (2020). However, studies that explore the behavior of people with disabilities in accessing tourism have not been extensively researched. This research offers novelty compared to existing studies.

The purpose of this study is fourfold: First, to determine the effect of travel constraints on travel intention for people with disabilities in Bandung. Second, to assess the effect of travel constraints on travel motivation for people with disabilities in Bandung. Third, to examine the effect of travel motivation on travel intention for people with disabilities in Bandung. Finally, to evaluate the effect of travel constraints on travel intention through travel motivation for people with disabilities in Bandung.

Based on the background presented, the problem identification in this study is as follows: The participation level of persons with disabilities in travel activities remains relatively low in Bandung Regency. Travel barriers are a significant factor contributing to the limited travel participation of persons with disabilities in Bandung Regency. Furthermore, research examining the behavior of persons with disabilities in the context of tourism is still limited in Indonesia.

METHODOLOGY

Initially, this research employed an observation technique, a data collection method involving the systematic observation of physical facilities at tourist attractions. Many tourist attractions in Bandung Regency have made modifications to ensure accessibility for visitors with disabilities, including special pathways, wheelchair ramps, and toilets designed for wheelchair users. For instance, several recreational parks and

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entertainment centers in the area have been equipped with such facilities. Additionally, the Alamendah Tourism Village offers specialized services, such as tour guides who understand the needs of visitors with disabilities, making the travel experience more comfortable and enjoyable. Although tourism destination in Bandung city aims to be inclusive for all tourist groups, in practice, limited accessibility often leads to reduced ease, security, and comfort for tourist with disabilities (Herdiana & Widharetno, 2022). One of the research methods used in this study is a descriptive method, which describes certain phenomena, characteristics, or situations without manipulating existing variables (Sugiyono, 2019).

The main objective of this research is to determine the effect of travel constraints on travel intention through travel motivation for people with disabilities in Bandung. The starting point of this research is a formulation of a hypothesis, which provides an overall framework for the study, as illustrated in Figure 1 below:

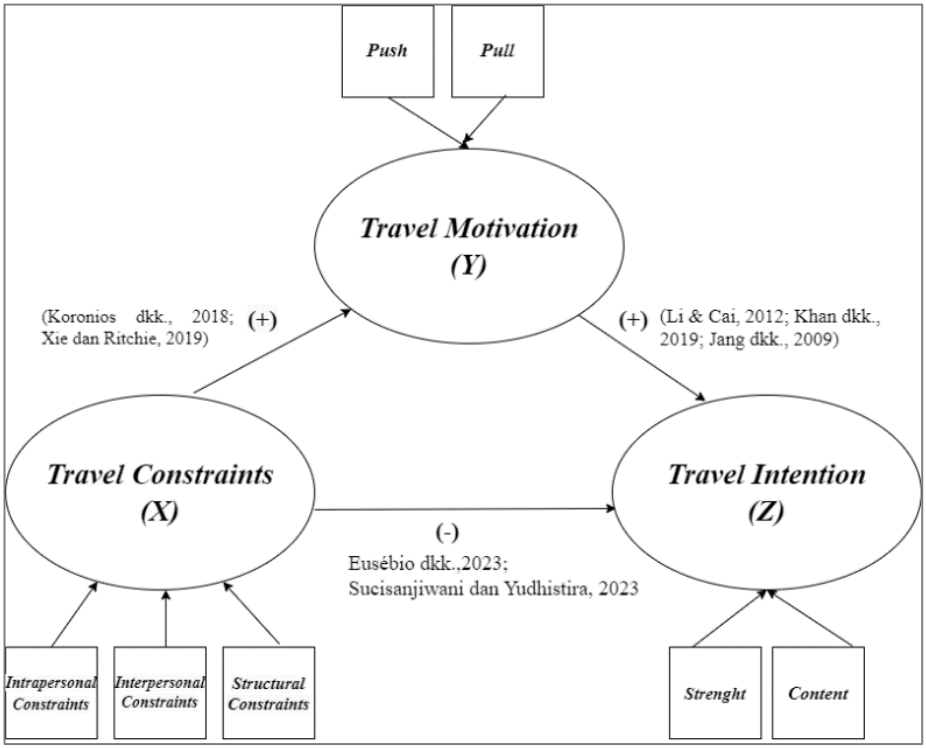

Figure 1. Research Proposition of Travel Constraints Variables on Travel Intention Through Travel Motivation
Source: Author's processing analysis, 2023

The research hypotheses based on the framework in Figure 1 and the described research methodology are as follows:

H1: Travel constraints negatively influence travel intention for people with disabilities in Bandung.
H2: Travel constraints positively influence travel motivation for people with disabilities in Bandung.
H3: Travel motivation positively influence travel intention for people with disabilities in Bandung.

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H4: Travel constraints positively influence travel intention through travel motivation for people with disabilities in Bandung.

Investigating this hypothesis requires identifying and evaluating the opinions and attitudes of people with disabilities, necessitating an appropriate research method to meet the quantitative nature of this study. Consequently, the research instrument used was a structured, self-administered questionnaire. The development of the questionnaire was based on a total of 35 items measuring travel constraints, travel motivation and travel intention, derived from previous studies by Devile and Kastenholz (2018)¸ Eusébio et al. (2023), Khan et al. (2019), S. (Shawn) Jang et al. (2009), and Wang et al. (2017). Additionally, the questionnaire includes several questions to measure respondents' personal characteristics, such as gender, age, type of work, monthly income, type of disability, presence of multiple disabilities, and frequency of travel.

This study adopted a quantitative methodology using descriptive and verification techniques. The sampling method used was non-probability sampling with 200 respondents with various disabilities such as blindness, deafness, physical disabilities, and mild disabilities in Bandung. Surveys were administered using a Likert scale ranging from 1 to 7 through both offline questionnaires and Google Forms. Data analysis was performed with CB-SEM using AMOS version 24 software. The operational variables for the detailed questionnaire were derived from the research background and theoretical framework, as outlined in Table 4.

Table 4. Summary of Measurement Scales

Variable	Dimensions	Measure	Item
Travel Constraints (X) (Devile & Kastenholz, 2018)	Intrapersonal Constraints	Limitation on travel choice	X_1
		Feelings of insecurity in unfamiliar environments	X_2
		Anxiety and worry are caused by anticipating problems in an unfamiliar environment	X_3
		Feelings of lack of freedom	X_4
	Interpersonal Constraints	Avoid direct social contact	X_5
		Difficulties in moving in unfamiliar surroundings	X_6
		Unhelpful attitude	X_7
		Think of the disabled as homogeneous	X_8
		Increased caregiving burden during the holidays	X_9
		Fears expressed by members of the family	X_10
	Structural Constraints	Lack of attention to customers with disabilities	X_11
		Lack of sensory/communication accessibility equipment and services: audio guides, tactile experiences, Braille publications and labeling	X_12
		Lack of information on accessibility	X_13
		Difficulty handling food	X_14
		Lack of equal rights for disabled people, especially in public places	X_15
		Difficulties in finding suitable accommodation for the journey	X_16
		Difficulties in moving in the subway and train stations	X_17
		Lack of guided tours	X_18
		Lack of accessible routes for disabled people	X_19
Travel Motivation (Y)	Pull Factors	Understanding of the history, traditions, customs, language, food, traditional dress, and other aspects of a particular culture	Y_1

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Variable	Dimensions	Measure	Item
(Eusébio et al., 2023; Jang et al., 2009; Khan et al., 2019)		Getting to know the world and different local customs	Y_2
		By measuring the distance traveled and tourist destinations, you will know different places	Y_3
	Push Factors	Measuring stress levels before and after a trip can give an idea of how effective the destination is for relaxation purposes	Y_4
		Availability of various adventure activities in tourist destinations	Y_5
		Visitor satisfaction is an important indicator of a successful tourism experience	Y_6
Travel Intention (Z) (Wang et al., 2017)	Strength	Monitoring tourist attractions through social media	Z_1
		Include personal experiences, cultural connections, and the impact of stories shared by family and relatives	Z_2
		Researchers can gather valuable information about what interests them in a particular attraction by asking close friends or family about their preferences and motivations	Z_3
		Variety of tourist attractions	Z_4
	Content	How long it takes to travel to tourist sites	Z_5
		Repeat visitors	Z_6
		Communication skills of travel companions	Z_7
		Tourist destination ticket prices	Z_8
		Personal preferences	Z_9
		Use of convenient modes of transportation	Z_10

Source: Processed from secondary data, 2023

The steps in this research are illustrated in Figure 3 below:

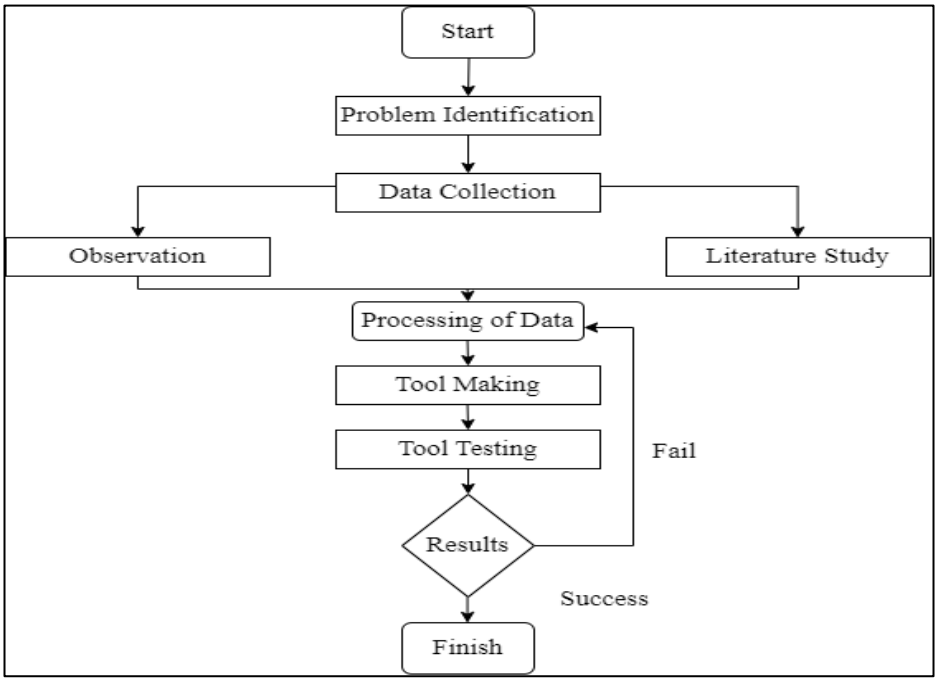

Figure 2. Steps of the research
Source: Author's processing result, 2024

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FINDINGS AND DISCUSSION

A total of 200 respondents were eligible to participate in this survey. Table 5 below summarizes the results of processing the respondents' data based on gender, age, type of work, monthly income, type of disability, multi-disability criteria, and criteria for having traveled.

Table 5. Respondents Characteristic

Characteristic	Classification	Frequency	Percentage (%)
Gender	Male	94	47%
	Female	106	53%
Age	17-27 years	123	62%
	28-38 years	25	13%
	39-49 years	32	16%
	>50 years	20	10%
Type of Work	Student	112	56%
	Entrepreneur	47	24%
	Employee	8	4%
	Self-employed	3	2%
	State Civil Servants	2	1%
	Others	28	14%
Monthly Income	<2.5 million	59	30%
	2.5 million-5 million	9	5%
	5-7.5 million	1	1%
	>7.5 million	0	0%
	No Income	131	66%
Type of Disability	Disabled	42	21%
	Deaf	108	54%
	Visually Impaired	17	9%
	Impaired	15	8%
	Multi-disability	18	9%
Multi-disability	Yes	18	9%
	No	182	91%
Ever Traveled	Yes	200	100%
	No	0	0%

Source: Processed from primary data, 2024

Based on Table 5, the survey results from 200 respondents with various demographic characteristics show that there are 94 males (47%) and 106 females (53%). There are 123 respondents aged 17-27 years (62%), 25 respondents aged 28-38 years (13%), 32 respondents aged 39-49 years (16%) and 20 respondents aged more than 50 years (10%). One hundred twelve respondents are working as students (56%), 47 respondents as entrepreneurs (24%), 8 respondents as employees (4%), 3 respondents as self-employed (2%), 2 respondents as State Civil Servants (1%) and the other 28 respondents are working as NGOs, photographers, athletes, teachers, housewives, traders. Fifty-nine respondents earned less than 2.5 million rupiahs per month (30%), 9 respondents earned 2.5 million to 5 million rupiahs (5%), 1 respondent earned 5 million to 7.5 million rupiahs, 0 respondents earned more than 7.5 million rupiahs (0%) and 131 respondents with no income (66%).

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Then there were 42 respondents with disabilities (21%), 108 respondents with deafness (54%), 17 respondents with visual impairment (9%), 15 respondents with tunagrahita (8%), and 18 respondents with multiple disabilities (9%). Then, 18 respondents with multiple disabilities (9%) and 182 respondents with non-multiple disabilities (91%). Finally, all respondents stated that they had travelled (100%).

The application of SEM facilitates researchers in the examination of the relationship between complex variables in order to have a comprehensive picture of the entire model (Wadud & Huda, 2023). In this study, the Covariance - Structural Equation Modeling analysis procedure will be used to assist in data processing and hypothesis testing. The AMOS version 24 application will be used. Hypotheses are statistically defined as statements about the state of the population that will be tested for validity by means of data from research samples (Zaki & Saiman, 2021). The statistical data analysis techniques used in this study include tests of validity, tests of reliability, and tests of goodness of fit. Partial tests and mediation analysis tests are used to test hypotheses.

Table 6. Results of Principal Component Analysis for Constructs

Construct	Item	Statements	Loading Factor
Travel Constraints	X_1	I have limitations in the choice of travel	0.716
	X_2	I feel a sense of insecurity in an unfamiliar environment on a sightseeing trip	0.315
	X_3	I feel a sense of anxiety in an unfamiliar environment on a tour	0.315
	X_4	I feel a lack of freedom on a tour	0.530
	X_5	I avoid contact with other people on travel trips	0.601
	X_6	I have difficulty moving around in an unfamiliar environment on a tour	0.477
	X_7	I have experienced unfavorable treatment by tourism staff	0.392
	X_8	I am seen by others as equal to other types of disabilities	0.461
	X_9	I feel afraid of burdening others when traveling	0.546
	X_10	I am worried about my family when traveling	0.612
	X_11	I don't get enough attention from tourism service providers	0.677
	X_12	I don't receive adequate facilities and services at tourist attractions	0.581
	X_13	I lack the availability of information at tourist attractions	0.673
	X_14	I have difficulties related to taking food served at tourist attractions	0.341
	X_15	I lack equal rights at tourist attractions	0.697
	X_16	I have difficulty finding suitable accommodation on a tour	0.342
	X_17	I have difficulty moving using public transportation services on my trip	0.417
	X_18	I did not receive a tour guide who understood my disability	0.539
	X_19	I did not receive information on accessible travel routes in tourist attractions	0.540
Travel Motivation	Y_1	I travel to learn about different culture and traditions	0.601
	Y_2	I travel to discover new things at tourist destinations	0.869
	Y_3	I travel to experience the uniqueness of tourist destinations	0.824
	Y_4	I travel to learn about different cultures and traditions	0.824
	Y_5	I travel to discover new things in tourist destinations	0.838
	Y_6	I travel to experience the uniqueness of tourist destinations	0.863
Travel Intention	Z_1	I have a desire to visit tourist attractions based on information obtained through social media	0.866
	Z_2	I have a desire to visit tourist attractions based on family recommendations	0.677
	Z_3	I have a desire to visit tourist attractions due to curiosity about the places to be visited	1.035

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Construct	Item	Statements	Loading Factor
	Z_4	I choose tourist destinations based on the attractions they offer	0.698
	Z_5	I consider the estimated time needed to travel to tourist sites	0.543
	Z_6	I visit the same tourist sites multiple times	0.412
	Z_7	I need a travel companion	0.687
	Z_8	I first calculate how much money will be spent during travel	0.192
	Z_9	I have my own preferred way of traveling	0.380
	Z_10	I require a comfortable and safe mode of transportation	0.829

Source: Author's processing analysis, 2024

Based on Table 6, validity test results indicate that several items effectively explain the constructs of travel constraints, travel motivation and travel intention, as they have loading factor values above 0.5. This suggests that these indicators are suitable for explaining the respective constructs. Items with loading factor values below 0.5 were eliminated from the analysis.

Table 7. Loading Factor, Composite Reliability and Average Variance Extracted for The Revised Measurement Model

Construct	Item	Loading Factor	CR	AVE
Travel Constraints	x_1	0.678	0.862	0.388
	x_5	0.598		
	x_9	0.555		
	x_10	0.609		
	x_11	0.697		
	x_12	0.558		
	x_13	0.700		
	x_15	0.739		
	x_18	0.537		
	x_19	0.517		
Travel Motivation	y_1	0.595	0.918	0.655
	y_2	0.870		
	y_3	0.821		
	y_4	0.826		
	y_5	0.843		
	y_6	0.869		
Travel Intention	z_1	0.904	0.913	0.612
	z_2	0.676		
	z_3	1.043		
	z_4	0.710		
	z_5	0.507		
	z_7	0.685		
	z_10	0.832		

Source: Author's processing analysis, 2024

Based on Table 7 the reliability test results show that the goodness of fit test for the travel constraints construct has a Composite Reliability (CR) value of 0.862, which is above the threshold of 0.70. However, the Average Variance Extracted (AVE) value is 0.388, which is below the ideal value of 0.50. For the travel motivation construct, the CR value is 0.918 and the AVE value is 0.655. Finally, the travel intention construct has a CR value of 0.913 and an AVE value of 0.612. These results indicate that the reliability test of

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the model meets the established criteria. According to Doğan et al. (2021), if the AVE is less than 0.50 but composite reliability is greater than 0.60, the construct's convergent validity is still adequate. Since AVE is a conservative measure, experts suggest that using CR alone can be sufficient to conclude convergent validity (Doğan et al., 2021). Additionally, Achmad and Yulianah (2022) recommend assessing indicator reliability (outer loadings > 0.70) along with AVE to measure convergent validity. Therefore, the reliability test results for this model are considered appropriate.

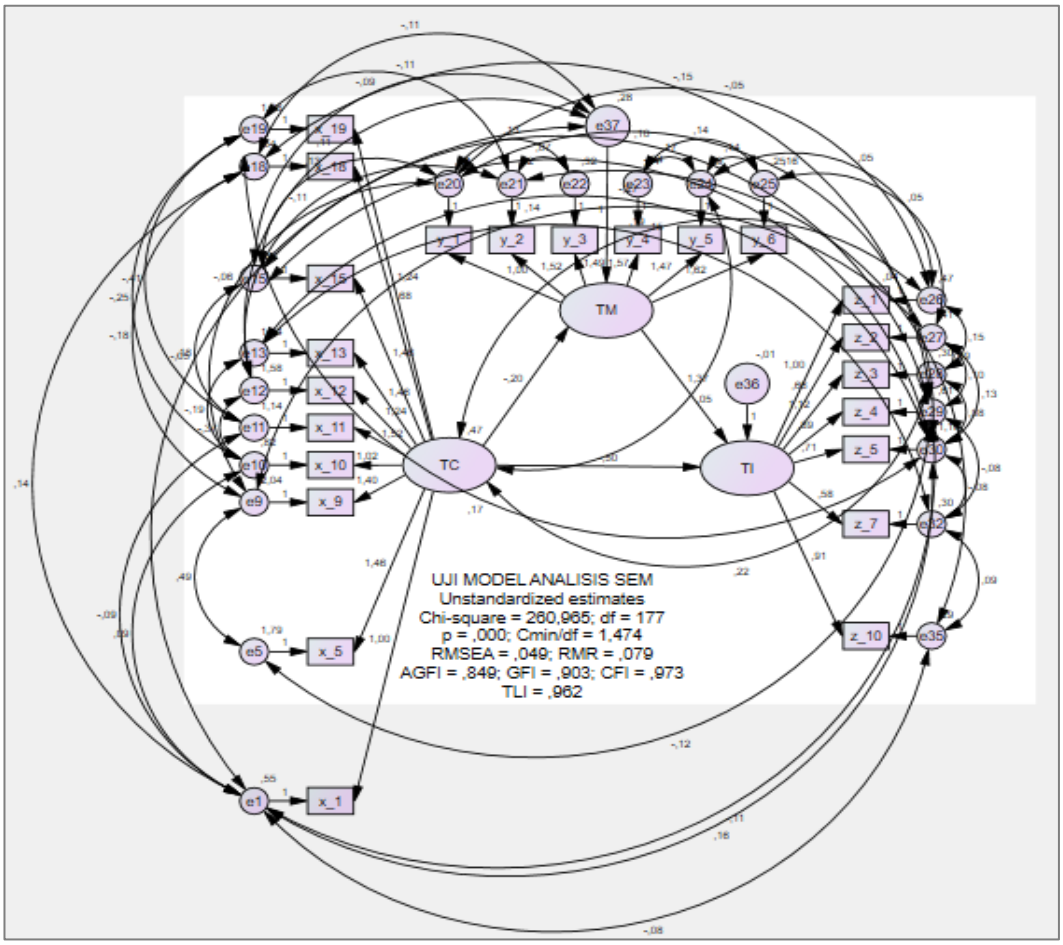

Figure 3. Test Results Goodness of Fit
Source: Author's processing result, 2024

Based on Figure 3, the marginal goodness-of-fit statistics indicate that the chi-square value is 260.965 with a probability of 0.000. The Goodness-of-Fit Index (GFI) is 0.903, which suggests a well-fitted model. The Root Mean Square Error of Approximation (RMSEA) is 0.049, indicating an almost good fit. The Tucker-Lewis Index (TLI) is 0.962 and the Comparative Fit Index (CFI) is 0.973, both of which suggest a good fit. Therefore, the model is deemed acceptable.

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Table 8. Partial Test

			Estimate	S.E.	C.R.	P	Label
TM	<---	TC	-0.198	0.066	-3.016	0.003	H2
TI	<---	TC	-0.504	0.079	-6.361	***	H1
TI	<---	TM	1.368	0.171	8.007	***	H3

Source: Author's processing analysis, 2024

Based on Table 8, the effects between variables are as follows: Effect of Travel Constraints on Travel Intention (H1), shows the estimated value is -0.504, which is negative and the p-value is very small (0.000). This indicates a statistically significance negative effect, meaning that travel constraints have a significant negative impact on travel intention. Then, Effect of Travel Constraints on Travel Motivation (H2), shows the estimated value is -0.198, indicating a negative direction of influence between the observed variables. The p-value is very small (0.003), showing that this effect is statistically significant and negative. This suggests the travel constraints significantly negatively affect travel motivation. The last, Effect of Travel Motivation on Travel Intention (H3), shows the estimated value is 1.368, which is positive, and the p-value is very small (0.000). This indicates a statistically significant positive effect, meaning that travel motivation has a significant positive impact on travel intention.

Table 9. CB-SEM Mediation Analysis

The Standardized Direct Effects			
	TC	**TM**	**TI**
TM	-0.198	0.000	0.000
TI	-0.504	1.368	0.000
The Standardized Indirect Effects			
	TC	**TM**	**TI**
TM	-0.25	0.000	0.000
TI	-0.387	0.836	0.000

Source: Author's processing analysis, 2024

Based on Table 9, the influence between variables- namely the results of travel constraints on travel intention through travel motivation- is detailed as follows: The regression coefficient for the direct effect of travel constraints on travel intention is -0.504, which means that for each one unit increase in the travel constraints variable, the travel intention variable decreases by 0.504 units. The regression coefficient of the indirect effect of travel constraints on travel intention is -0.387, indicating that the travel motivation variable additionally affects the travel intention variable. This shows that the travel constraints variable has a negative impact on the travel intention variable, part of which is mediated by the travel motivation variable.

The results of the analysis also show the strength of the effect of travel constraints on travel motivation. The regression coefficient for the direct effect of travel constraints on travel motivation is -0.198, meaning that for each one- unit increase in the travel constraints variable, there is a 0.198 unit decrease in the travel motivation variable. The regression coefficient of the indirect of travel constraints on travel motivation is 0.000, indicating that

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there is no indirect effect. This means that the influence between the two variables is direct and not mediated by other variables.

Finally, the results of analyzing the effect of travel motivation on travel intention show that the regression coefficient for the direct effect of travel motivation on travel intention is 1.368. This indicates that a one-unit increase in the travel motivation variable will increase the travel intention variable by 1.368 units. The indirect regression coefficient of 0.000 indicates that there is no indirect effect.

The questionnaire included identity criteria such as gender, age, type of employment, income, type of disability and travel history, which are crucial elements in completing the questionnaire. These criteria provide valuable insights into the demographics and behavior of respondents, allowing researchers to analyze and interpret the data effectively. Based on the results of research on travel constraints for people with disabilities in Bandung, it was found that the actual score obtained from all statements that comprise the travel constraints variable, totaling 18.987, falls within a fairly poor category. This indicates a considerable level of difficulty for tourists with disabilities in overcoming these obstacles. Within the travel constraints variable, it is noted that the highest and lowest actual score assessments are found in the structural constraints dimension. The structural constraints dimension for people with disabilities shows the highest actual score value, such as public transportation accessibility, which can significantly affect the respondents' quality of life and hinder their ability to participate fully in tourism activities. Conversely, the lowest actual score within this dimension pertains to the lack of a suitable tour guide for their type of disability. Nonetheless, the low contribution of this factor to the overall score may suggest that positive steps can be taken to reduce structural constraints for respondents.

In the field findings, the researcher identified financial hardship as the primary factor preventing respondents from traveling, making it impossible for them to save money for trip expenses. The findings also indicate that time constraints can hinder employed respondents from taking time off work for a vacation. This observation aligns with Doğan et al. (2021), who noted that people are less likely to travel when faced with significant obstacles or challenges. It is also consistent with Crawford et al. (1991), who identified three types of travel constraints- intrapersonal, interpersonal, and structural- that can inhibit participation in activities related to travel intentions.

Based on the results of research on travel motivation among people with disabilities in Bandung, it was found that the actual score obtained from all statements comprising the travel motivation variable, totaling 7.461, falls within a very good category. This indicates that the travel motivation variable has a very positive and significant influence on a person’s decision to travel. Within the travel motivation variable, the highest actual score is found in the push factors dimension, while the lowest is in the pull factors dimension. This suggests that travel motivation for respondents is more strongly driven by internal factors, such as the desire for a vacation. However, external factors or pull factors, such as the desire to experience different cultures and traditions, still pose a challenge in influencing their travel motivation. Thus, the deeper understanding of the travel motivation variables for respondents can aid in designing more inclusive travel programs that better support their needs.

This finding aligns with Khan et al. (2019), who state that travel motivation is a psychological need that generates and combines the behavior and activities of potential

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tourists, acting as a driving force that directs them to engage in tourist activities. Therefore, push factors and pull factors in travel motivation are crucial for motivating people with disabilities to feel more encouraged and have a positive experience while traveling.

In terms of push factors, it is important for respondents in Bandung to recognize the internal drive that creates a strong desire to engage in tourism activities. As for pull factors, offering a variety of tourist destinations in Bandung that are accessible and welcoming to respondents can be a significant draw. The diversity of attractions will provide respondents with opportunities to explore new places that aligns with their preferences and needs. Additionally, providing a positive experience during a tour is a crucial pull factor, by offering quality services, strong support, and memorable experiences, individuals with disabilities will feel valued and motivated to return for future visits.

Based on research on travel intentions among people with disabilities in Bandung, the actual score obtained from all statements making up the travel intention variable, totaling 12.328, indicates that it falls into "very good" category. This reflects a high level of positive intention and interest among respondents to travel. The excellent score suggests strong alignment with the constructs measured in travel intention. Within this variable, the content dimension recorded both the highest and lowest actual scores. The content dimension is crucial in shaping a person's overall travel intention, encompassing factors like the need for companions, practical considerations (such as cost and time), and personal constraints.

This finding aligns with Nguyen and Hsu (2024), who state that travel intention is the transformation process from tourist travel motivation to manifested travel behavior. Tourist's travel in intention is shaped by their views or attitudes towards a particular destination, which may lead respondents to visit that destination within a certain period. To foster travel intention among people with disabilities in Bandung, a multi-faceted approach is needed. This approach should address accessibility constraints, raises awareness, offering training opportunities for tourism staff- such as becoming sign language interpreters- and involve collaboration with disability organizations.

CONCLUSION

Based on the analysis of travel intentions among people with disabilities in Bandung, the following conclusions can be drawn: First, there is a significant negative effect of travel constraints on the travel intention people with disabilities in Bandung. Field findings reveal that the primary factor preventing respondents from traveling is financial difficulties, which hinder their ability to save enough money for travel expenses. This finding is consistent with Załuska et al. (2022), which specifically highlights the impact of travel constraints on individuals with sensory disabilities, showing how much constraints negatively affect their activities. Similarly, the research by Indriyani and Artanti (2020) indicates that travel constraints negatively influence travel intention to Kenjeran Beach.

Second, there is a significant negative effect of travel constraints on the travel motivation of people with disabilities in Bandung. Field findings indicates that factors such as time constraints can make it difficult for working respondents to take time off for vacations. This finding aligns with Doğan et al. (2021), who found that people tend to avoid traveling when they encounter significant obstacles or challenges.

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Third, there is a significant positive effect of travel motivation on the travel intention of people with disabilities in Bandung. Field findings indicate factors such as previous pleasant travel experiences and a strong desire to visit tourist destinations, often fueled by information seen on social media, have a positive impact on respondents. This finding is consistent with Friani et al. (2021), who found that increased travel motivation is associated with higher travel intention among people with disabilities in Bandung. Similarly, a study by Sudiarta et al. (2022) also explored the relationship between these two variables among travelers with disabilities in Indonesia, with results aligning with those of Friani et al. (2021), showing a strong positive correlation between travel motivation and travel intention. These findings underscore the importance of understanding the role of travel motivation in shaping travel intention for people with disabilities.

Fourth, there is a significant positive effect of travel constraints on travel intention through travel motivation for people with disabilities in Bandung. This study's findings indicate that the negative direct effect of travel constraints on travel intention is mediated by the travel motivation variable.

This study suggests several policy implications for tourism, particularly in addressing the unique challenges faced by tourists with disabilities when traveling and exploring destinations in Bandung. Since tourism is a significant economic driver, the needs and preferences of tourists with disabilities must be considered to ensure inclusivity and accessibility in the sector. The implications include implementing policies that focus on enhancing accessibility infrastructure, such as wheelchair ramps, accessible transportation, and tactile pathways, which can significantly improve the travel experience for tourists with disabilities in Bandung. Although, policies should be established to provide training for tourism industry professionals on how to cater to the specific needs of travelers with disabilities. This includes understanding various types of disabilities, effective communication strategies, and appropriate assistance techniques. Developing inclusive tourism programs specifically designed for tourists with disabilities can also promote diversity and inclusivity in Bandung's tourism sector. These programs may include specialized tours, activities, and accommodations tailored to different types of disabilities.

This study recommends is building partnerships with disability organizations to gain insight into the specific needs and preferences of tourists with disabilities. Such collaboration can aid in designing customized services and facilities. Additionally, it is important to provide comprehensive information on tourist attractions, accommodations, and facilities through official websites, brochures, and tourist information centers. This will enable travelers with disabilities to plan their trips effectively. Furthermore, introducing a certification program for tourism businesses that meet certain accessibility standards could incentivize these businesses to improve accessibility infrastructure and services for travelers with disabilities.

By implementing inclusive policies and concrete recommendations, Bandung can create a more welcoming and accessible environment for travelers with disabilities. This not only enhances the overall tourist experience but also promotes social inclusion and diversity within the community. The Bandung District Government is currently drafting a local regulation on disability to support inclusive tourism. This will ensure that all members of society, including tourists with disabilities, can fully enjoy tourism activities.

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This research focuses solely on the travel only analyzes travel intentions of people with disabilities in Bandung. For future studies, it is recommended to include other relevant aspects and expand the scope of research. This approach will provide a more comprehensive and in-depth understanding of the factors influencing the travel intentions of people with disabilities, such as social support, perceptions, and experiences. Additionally, conducting comparative studies between Bandung and other regions can be an important step in identifying differences in the travel intentions of people with disabilities across various geographical contexts.

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EFFECTS OF TOURISM VILLAGE ON SUSTAINABLE LIVELIHOODS AND PANDEMIC RESILIENCE IN SERANG VILLAGE

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Abstract

This research explores the policy approach adopted by the management of Serang Tourism Village for village development, with an emphasis on the five livelihood capitals and the community's strategies for sustaining livelihoods after development. Employing a mixed-methods sequential exploratory approach, the research identifies the key policy strategy as the creation of BUM Desa. This initiative has boosted PADes contributions to villages, thereby advancing local development. Consequently, this has improved access to the five livelihood capitals, fostering more sustainable livelihoods. The research also underscores the community's susceptibility to the impacts of the Covid-19 pandemic, emphasizing the importance of both the tourism and agriculture sectors in sustaining livelihoods during crises. It concludes that the tourism village strategy implemented by BUM Desa plays a significant role in supporting the community's well-being through the five capitals, thereby protecting their living conditions from potential vulnerabilities. The results should prompt local authorities to focus on enhancing the capabilities of BUM Desa, aiming to offer more sustainable livelihoods for the community.

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INTRODUCTION

Serang Tourism Village has rapidly become one of the leading agro-tourism destinations in Central Java Province. The increase in strawberry farming in early 2003 motivated the local residents to develop a fruit-picking agro-tourism attraction. Situated at an elevation ranging from 650 to 1,650 meters, the region enjoys a cool mountain climate that attracts tourists from urban areas in Purbalingga Regency. This favorable condition eventually facilitated the development of tourism activities in the area.

In reaction to the growing trend in tourism, the Regent of Purbalingga Regency officially recognized Serang Village in Karangreja District as a tourism village, as stated in Decree No. 4131/181 of 2010. The village authorities backed this move by initiating community-led efforts to develop tourism attractions, enhancing the socio-economic activities of the rural population. This approach is consistent with outcomes by Su et al. (2018), which indicated that tourism can offer alternative sources of income for villagers, delivering beneficial economic effects even with limited tourist engagement.

When it was first established, Serang Tourism Village featured just one attraction, Desa Wisata Lembah Asri Serang, commonly known as D'las. The management of this tourism village falls under the Village-Owned Enterprise (BUMDes) Serang Makmur Sejahtera, which was created on October 18, 2010, following Village Regulation (Perdes) No. 5 of 2010. By leveraging 20 hectares of village land, the development of the strawberry farm agro-tourism included the addition of various attractions, such as playgrounds for children, family recreational areas, lodging options, and annual cultural celebrations like the Mount Slamet Festival. These enhancements aimed to diversify the offerings and attract more visitors. Such initiatives highlight how effective tourism management can boost the economic growth and well-being of rural communities. Even during the COVID-19 pandemic, D'las successfully boosted its profitability (Figure 2), despite experiencing a decrease in tourist visits (Figure 1) due to the restrictions imposed by the pandemic.

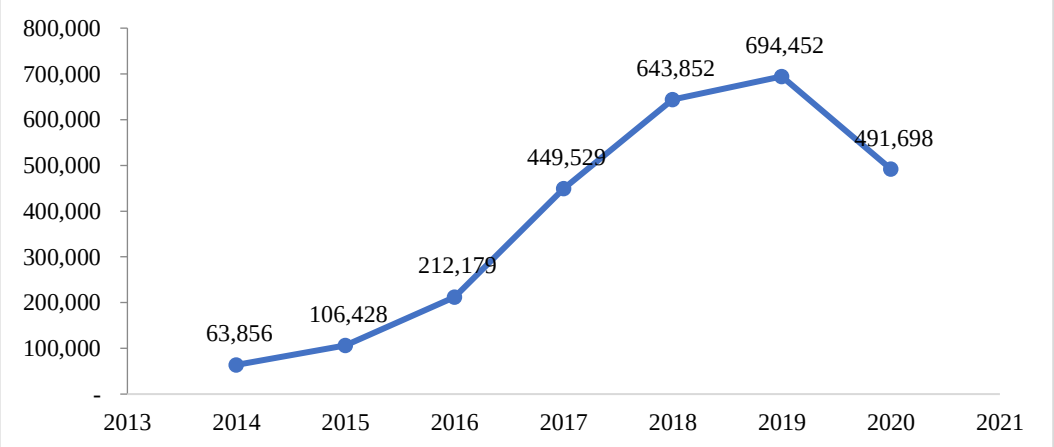

Figure 1. A Graph of Tourist Visits to D'las 2013–2021
Source: D'las, 2021

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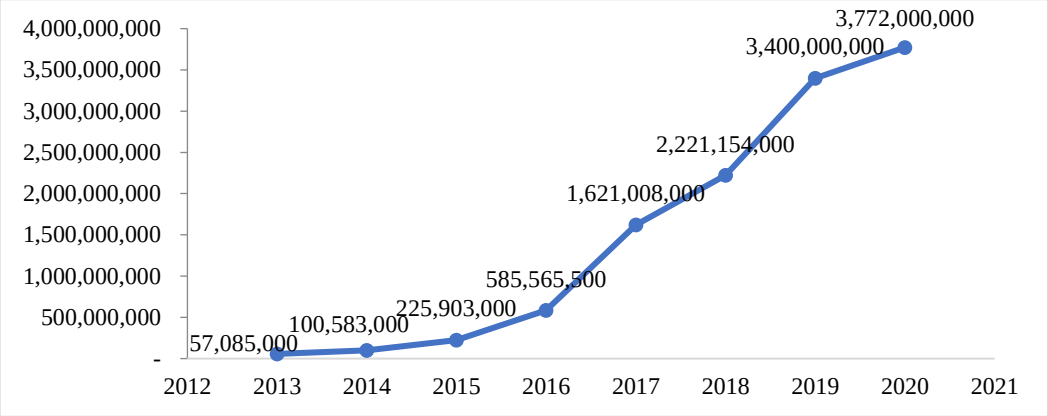

Figure 2. Income Data from D'las Management (IDR) 2012–2021
Source: D'las, 2021

Serang Tourism Village managed to sustain its business activity successfully thanks to the strategies it employed. For example, during the COVID-19 pandemic, the management of the tourism village implemented adaptive measures by introducing new attractions, which were developed based on market behavior research and adjusted to the pandemic's conditions. These attractions focused on drawing in local community members, regional inhabitants, or residents of the county. Although this approach did not boost the total number of visitors, it improved access to tourism services for paying guests. This strategy effectively mitigated the drop in revenue and provided support to the impacted community (J. Prayitno et al., 2022), particularly those employed in agriculture.

During the COVID-19 pandemic of 2020-2021, the tourism industry faced severe challenges in sustaining the regional economy (UNWTO, 2021). The global lockdowns associated with the pandemic significantly disrupted livelihoods and had a detrimental effect on the worldwide economy (Cheng et al., 2022). Research outcomes reveal that the downturn in tourism revenue impacted not only the local economy but also exacerbated social welfare issues and diminished environmental conservation efforts. In certain tourism villages, this decrease in income resulted in job losses and a deterioration in the quality of life for local residents (Phillipson et al., 2020). Despite the pandemic, Serang Tourism Village's revenue remained relatively stable, and as a result, the crisis brought on by COVID-19 did not lead to any restrictions or layoffs. Additionally, the rapid growth of rural tourism destinations, both internationally and within Indonesia, poses risks to the environmental and cultural sustainability of villages (Bowers, 2016), particularly for traditional communities that rely on agriculture as their primary means of livelihood (Dipayana & Sunarta, 2015).

The approach adopted by Serang Village has been crucial in positioning Serang Tourism Village as a sustainable business entity over time. To analyze the strategies employed by Tourism Villages, business-oriented frameworks like the Balanced Scorecard (BSC) can be effective (Nugroho & Nurhaliza, 2024). The BSC's criteria—financial performance, customer satisfaction, internal processes, and learning and growth—are well-established in enhancing strategic decision-making and improving overall well-being (Heebkhoksung et al., 2023).

To grasp how rural communities, particularly those reliant on agriculture, attain sustainable livelihoods through the Tourism Village initiative, it is crucial to examine the

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strategies applied in Serang Tourism Village. The Sustainable Livelihoods Framework (SLF), created by Chambers and Conway (1992), offers a valuable approach for understanding sustainable livelihoods. The Sustainable Livelihoods Framework (SLF) is a tool for analyzing and tackling poverty by concentrating on community resources and livelihood strategies. It encompasses several interconnected components, including human, social, physical, financial, and natural capital (Scoones, 2015).

Asset analysis helps in pinpointing the community's strengths and weaknesses. The Sustainable Livelihood Framework (SLF) also offers insights into the vulnerability context, encompassing external factors that impact the livelihoods and well-being of individuals or communities (Scoones, 2015), such as the COVID-19 pandemic experienced during this research. This approach facilitates the assessment of how tourism affects community livelihoods by analyzing shifts in assets and livelihood strategies that arise from the management practices adopted by the tourism village.

This article offers a comprehensive analysis of tourism village development by exploring both the business strategies employed and their effects on community livelihoods. It utilizes the Balanced Scorecard (BSC) approach, which encompasses four key perspectives: financial, customer, internal processes, and learning and growth. By incorporating the Sustainable Livelihood Framework (SLF), which highlights sustainable livelihood resources and strategies, the evaluation of performance becomes more inclusive and well-rounded. This integration enables organizations to assess their performance impact from not only a business standpoint but also from the perspectives of sustainability and community welfare. Prior studies (Afandi, 2019; Irsyad, 2020; Junaid, 2022; Padmasari, 2014; Tan & Sitikarn, 2019) have not thoroughly examined how the strategic planning of tourism village development by management affects community livelihood sustainability. Current research predominantly addresses empowerment processes, program initiatives, and business governance individually. However, there is a significant lack of comprehensive studies exploring how these elements are strategically integrated by management and their combined effect on the sustainability of community livelihoods. Previous research often examines these components separately, without considering their combined impact on overall development and sustainability. To address this gap, the current research introduces a novel approach by integrating the balanced scorecard theory with livelihood theory, which considers the five capitals, to map out strategic approaches.

METHODOLOGY

The research examined how the formulation of the Tourism Village strategy contributed to the development of the Tourism Village. It then analyzed how this development impacted the five aspects of community livelihood capital and the strategies employed to leverage the resources of Serang Tourism Village (Figure 4). The assessment is guided by the five components outlined in the Sustainable Livelihood Framework: human capital, financial capital, social capital, physical capital, and natural capital. Additionally, the elements associated with the Tourism Village are used as key references for evaluation.

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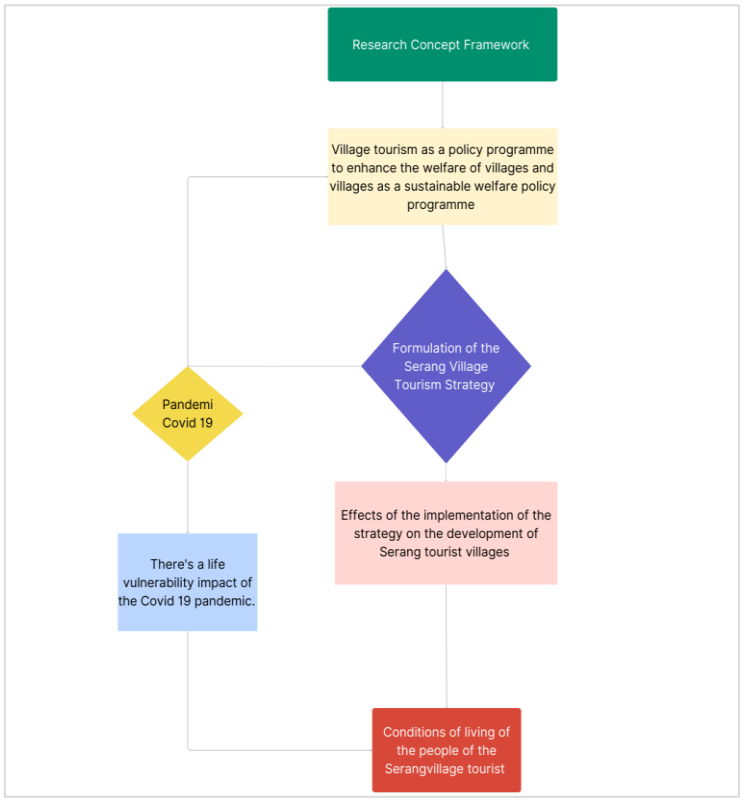

Figure 4. Research Concept Framework
Source: Author analysis, 2024

A mixed-methods approach was deemed suitable for this research as it involved gathering both quantitative and qualitative data. This approach integrates two distinct types of data, each with its own philosophical assumptions and theoretical frameworks (Creswell & Creswell, 2018). This research utilized a sequential exploratory strategy, a mixed-methods approach where qualitative methods were employed first, followed by quantitative methods (Creswell, 2015). Initially, the focus was on qualitative data, which was later enhanced with quantitative information. The integration of both methods provided a comprehensive analysis.

This research employed a quantitative method through a detailed indicator framework to assess the livelihood capital of rural communities. The framework, based on the Sustainable Livelihoods Framework (SLF), incorporates five components. The SLF framework is designed to provide insights into community and public well-being by evaluating each of these components. This framework serves as a tool for planning development initiatives or assessing the effectiveness of activities aimed at promoting the sustainability of rural communities (Budiharsono, 2018). It identifies five key components that contribute to the sustainability of individuals or communities: human capital, social capital, natural capital, physical capital, and financial capital (Rijanta et al., 2014).

Since its creation by Chambers (1992), the Sustainable Livelihood Framework (SLF) has undergone significant development. This framework is designed to help analyze and understand the intricate interplay between various factors that affect villagers' livelihoods. Scoones (2015) develops the Sustainable Livelihood Framework (SLF) by

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connecting various aspects of rural communities' lives, with a focus on institutional processes that integrate expertise in strategic implementation.

The indicators were quantified using numerical values to reflect household characteristics related to each component. The scoring of livelihood capital can assess the impact of Tourism Villages on the well-being of rural communities. Five key variables of livelihood capital served as parameter variables. Additionally, these variables were refined based on indicators identified in prior research studies.

In this research, data for each variable were collected through a survey administered to 100 participants. The survey included 25 questions, with five questions dedicated to each of the five components of sustainable livelihood capital (Table 1). Responses were recorded using a Likert scale, where scores ranged from 1 to 5 for each question. Higher assessment scores indicated greater agreement with the proposed improvements outlined in the survey. In this research, the validity was assessed using the significance value or the Pearson correlation coefficient. Reliability was evaluated with Cronbach's alpha. The validity assessment verified that the indicators were valid (Sig. $\leq \alpha$) and demonstrated strong reliability ($0.60 < r < 0.80$).

Table 1. Research Quantitative Variabel

Parameter	Variable	Indicator	Question
Financial Capital	Income	Total income	Since tourism (tourist villages) was developed, has your income increased compared to before?
		Source of income	Since tourism (tourist villages) was developed, income has been opened up for other family members?
	Expenditure	Amount of consumption	The growth of tourism has enabled you to fulfill your needs more efficiently than ever before?
	Loan	Bank credit	Since the advancement of tourism, have you been able to acquire assets through banking, secure loans, or raise funds?
	Financial Reserve	Savings	With the advancement of tourism, you can now allocate savings for either business investments or livestock, unlike in the past.
Social Capital	Communication	Communication conditions	As tourism has expanded, interactions and communication between communities have become more effective.
	Participation	Participation rate	With the expansion of tourism, there has been a greater engagement from the community in local development efforts.
	Conflict	Potential conflict	Has the incidence of conflicts between communities decreased with the growth of tourism (tourist village)?
	Security and Order	Conditions of security and order	Following the expansion of tourism (tourist village), have there been improvements in safety and order within the village?
	Culture	Cultural activities	With the rise of tourism in the village, have cultural activities become more common and actively participated in by the local community?

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Parameter	Variable	Indicator	Question
Human Resources Capital	Education	Level of education	As tourism has progressed, have you and the surrounding community noticed an improvement in educational standards?
	Skills	Diversity of expertise	Since the advent of tourism, has there been an increase in the diversity of skills and knowledge within your community and yourself?
	Urbanization	Urbanization rate	As tourism has expanded, young people in the villages have fewer reasons to migrate to urban areas or relocate to other regions.
	Health Access	Easy access to health	The growth of tourism has led to improved public healthcare access.
	Unemployment	Unemployment rate	The development of tourism has contributed to a reduction in unemployment rates.
Physical Capital	Infrastructure	Access road	The advancement of tourism has led to improvements in the access roads to and from the village of Serang.
	Clean water	Access to clean water	With the growth of tourism, the availability of clean water in the village of Serang has improved.
	Medical Facility	Encouraging to be actively involved in village development	Due to the development of tourism, the quality of facilities such as Puskesmas in villages has seen significant enhancement.
	Communication	Internet network access	With the growth of tourism, internet connectivity in the village has improved significantly.
	Education facility	Increase the sense of family and cooperation	The advancement of tourism has led to enhanced educational resources in the village.
Natural Capital	Agriculture	Rate of conversion of agricultural land	Following the development of tourism, there has been no change in the use of agricultural land.
	Garbage	Waste management	With the development of tourism, waste management has seen improvements.
	Forest Ecology	Forest sustainability	Following the development of tourism, the sustainability of the village forest has remained secure.
	Pollution	Air pollution	Does the development of tourism avoid contributing to air pollution from tourist activities?
	Disaster	Potential disaster	With the growth of tourism, is there no risk of potential disasters such as landslides?

Source: Author's analysis, 2023

Qualitative research was employed to examine how a system operates and the impacts of its dynamics. This approach focuses on understanding the context and effects experienced by individuals, groups, communities, or systems that are the subject of the research (Patton, 2015).

The research was structured using a descriptive approach combined with the case research method. The descriptive design aimed to offer a detailed account of naturally occurring phenomena to better understand these events or interventions. The case research component was included to allow for an in-depth examination of specific instances, such

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as tourism village programs and sustainable livelihoods, focusing on programs, events, processes, and activities (Creswell & Creswell, 2018).

A qualitative methodology was employed to develop strategies based on Balanced Scorecard theory. This approach is intended to assess a company's performance. In this research, the balanced scorecard framework serves as a tool for mapping out strategies crucial to the organization's success (Kaplan & Norton, 2004). A balanced scorecard is an efficient and thorough management tool that offers a clear and detailed view of business performance (Yuwono et al., 2004). Kaplan and Norton (1996) emphasized that a key element of the balanced scorecard management system is the development of strategic maps. These maps are designed to illustrate how an organization delivers value or benefits as anticipated and how this relates to both the execution and formulation of its strategies (Figure 5).

Data were gathered through interviews and observations. The outcomes were then analyzed using balanced scorecard theory. To identify the strategy with the greatest impact on the performance of the Tourist Village, informants provided ratings expressed as percentages, reflecting the effectiveness of the organization's management strategies.

In this research, the selection of informants was carried out using non-probability sampling, specifically judgmental or purposive sampling. This method was chosen because it allows researchers to identify and select individuals who can provide the most relevant and insightful information for the research's objectives. The process began by establishing specific criteria to ensure that the sample was representative of the case being studied (Merriam & Tisdell, 2016). This research employed a snowball sampling technique, starting with a few key informants who then referred other relevant individuals to provide additional insights into the case. This approach was used to enhance the validity of the research and ensure the accuracy of the data by incorporating a broad range of sources (Patton, 2015).

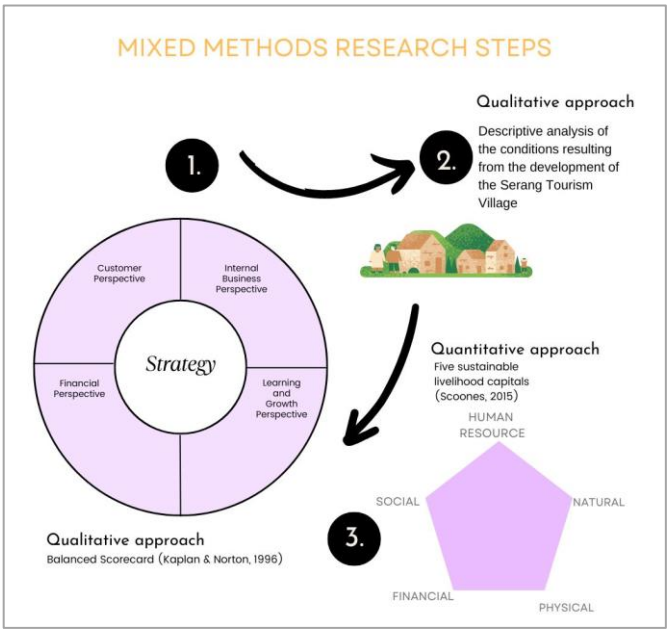

Figure 5. Mixed methods research steps
Source: Adapted from Creswell, 2015

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FINDINGS AND DISCUSSION

Sustainable tourism is designed and sustained within a specific area to ensure its long-term viability, while preserving the Earth's life support systems that current and future generations rely on (Fennell & Cooper, 2020). A Tourism Village represents a model for creating sustainable tourism environments. According to Inskeep (1991), a tourist village is characterized by a small group of visitors residing near traditional settings, often in secluded villages, where they experience and learn about rural lifestyles and local ecosystems (Tanaya, 2019).

Serang Tourism Village Development

Tourism development in Serang Village began in 2003 with local residents initiating strawberry (Fragaria Anannasa) agro-tourism. The strawberry seeds used were remnants from PT. Zeta Agro, a company previously operating in the area, originating from California's Oso Grande variety. Subsequently, strawberry farmers received additional seed support from the local government for this same variety (Widiastuti, 2015). Due to its strategic position along the route to popular tourist spots like Mount Slamet Climbing, Batu Raden (Purwokerto), Goa Lawa, and Gucci Hot Spring (Tegal), Serang Village has become a notable stop for visitors seeking to enjoy strawberry picking. This has transformed strawberry picking into a prominent attraction, with the village now widely recognized in Purbalingga and throughout Central Java for its strawberry farms and tours.

The strong interest in strawberry-related tourist spots eventually led to the creation of the Tourism Village. In 2010, following the designation as a tourist village, the Village Government began developing the Asri Serang Valley Tourism Village (D'las), which was integrated with the local economic organization known as Village-Owned Enterprises of Serang Makmur Sejahtera. Village-Owned Enterprises were selected to oversee D'las activities due to their requirement to contribute to Village Original Income (PADes). It is anticipated that managing tourism through these enterprises will positively impact overall village development. Applying the balanced scorecard theory revealed several strategies implemented by the tourism village manager to advance the development of tourist villages, including as seen in Table 2 below.

Table 2. Balanced Scorecard, strategic objectives, initiatives, and performance measures

Balanced Scorecard Perspective	Strategic Objective	Initiative	Performance Outcome Measures*
Financial Perspective	Creating Profit	Creating income opportunities. Establishing investment cooperation.	85%
	Cost Efficiency	Optimizing the use of HR;	97.5%
	Increase Customer Value	Increasing repeat visits by freeing tickets for the Serang Village people and Promotional activities.	100%
Customer Perspective	Price	Adjusting to the purchasing power of rural communities.	95%
	Product Variations	Providing various forms of attractions to reach all circles.	85%
	Brand	Creating a Brand that increases the sense of belonging to the Village Community.	80%

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Balanced Scorecard Perspective	Strategic Objective	Initiative	Performance Outcome Measures*
	Service	Inspection and evaluation of service quality, both related to cleanliness and safety, were carried out every day.	100%
Internal Business Perspective	Operational Governance	Accountable and professional operations; The public-owned shares.	92.5%
	Innovation Process	Fast data-driven research.	75%
	Customer Governance	Excellent service according to the customer's character.	95%
	Social Policy and Process	Processes that increase the carrying capacity of the environment and society.	90%
Learning and Growth Perspective	Human Resources	Honest HR with a minimum qualification standard of high school education.	100%
Financial Perspective	Information	Digitalization.	85%
	Organization	In the form of a village-owned enterprise.	100%

Source: Data processed, 2021
Note: ***)** *Performance calculation was the result of triangulation with expert informants.*

The research involved five informants, including village heads, BUM Desa leaders, youth group representatives, community leaders, and hamlet heads. Once the strategies were developed, each informant assigned scores ranging from 1% to 100%. These scores were then averaged to determine the overall percentage, and the strategies were ranked based on the informants' evaluations.

Following the percentage-based ranking results, a further triangulation process was conducted to validate the primary strategies deemed crucial for advancing tourist villages. The consensus among informants was that adopting BUM Desa as the organizational structure was identified as the key strategy for the swift development of tourist villages. The decision to establish a Village-Owned Enterprise (BUM Desa) as the business entity was made from the outset during the development of D'las in 2010, in accordance with the regulations set by the Ministry of Home Affairs in Number 32 of 2004. Eventually, the oversight and authority for BUM Desa transitioned to the Ministry of Village PDTT under Law No. 6 of 2014 concerning Villages.

BUM Desa was chosen as the primary strategy over other approaches because other strategies can only be effective when the organizational framework is established as BUM Desa. The development of local tourism plans can only fully consider the village's overall impact with BUM Desa in place. The primary aim of BUM Desa is to enhance the well-being of the village's residents.

BUM Desa is required to allocate 5% of its earnings as Village Original Income (PADes). Consequently, the advancement of BUM Desa will significantly support village development efforts focused on enhancing community welfare. Although profit is a primary objective for the sustainability of the Tourism Village, the operational goals of the Serang Tourism Village also include delivering economic benefits to improve local well-being.

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The organization and performance of BUM Desa are legally binding, as they are governed by Village Regulations that are endorsed by various community sectors. This framework ensures that accountability reports are presented to the public, providing a legal assessment of the organization's leadership that incorporates community input. As a community-based economic institution, the work culture emphasizes core values like honesty and professionalism while fostering a communication style that aligns with village traditions. This approach encourages evaluation and interaction through informal, family-oriented communication, rather than rigid or formal methods. These three work culture values provide straightforward approaches to problem-solving in the management of tourism, which is inherently dynamic and heavily reliant on community involvement.

The growth of BUM Desa and its various business units allows for the establishment of multiple ventures. When a BUM Desa is created, it paves the way for the development of additional business units, creating a village-scale business ecosystem that enhances profitability and overall benefits. For instance, in Serang Tourism Village, if one unit experiences a drop in revenue, a well-performing business unit can quickly step in to support the struggling one.

This indicates that we had the financial resources necessary for innovation. Even during the pandemic, when visitor numbers were restricted, the management introduced new attractions and adjusted prices. The expenses associated with these innovations were covered by funds drawn from various business units, which not only focus on tourism but also handle other services like clean water supply, waste management, and more. Maulidiah and Megawati (2022) research examines the role of BUMDes Sambimadu in the development of Agrowisata D'ganjaran in Sidoarjo district. Their outcomes highlight that the financial backing from BUM Village's village funds was instrumental in ensuring the sustainability of these tourist destinations.

Effect of Strategy for Development of Serang Tourism Village

Serang Tourism Village has been in operation for over a decade, initially beginning with a single attraction, D’las, and gradually expanding to include several other tourist destinations. While these tourist attractions operate independently in terms of management, the support and incentives from the D’las management, overseen by BUM Desa, serve as the central hub of the tourism village. Serang has demonstrated positive growth, particularly in enhancing the financial performance of the Village-owned Enterprise responsible for tourism operations and tracking tourist visit data.

The D’las had a ripple effect, spurring the growth of other tourist attractions in Serang Village. The expansion of a central growth area led to the development of the surrounding regions, fostering their growth as well. As a result, several new tourist spots emerged in Serang Village, attracting visitors and benefiting from the momentum created by the development of D’las. Tourist attractions in Serang Village were categorized into nature-based, culture-based, and man-made attractions. Alongside the Asri Valley Tourism Village (Dlas), several other man-made attractions emerged, capitalizing on the influx of tourists. These include Pinesan Serang, Sekar Bintang Selfie Park, Serang High Land Camping Ground, Surup Lawangan, and the Mount Malang Viewpoint.

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Pentagon Assets of Sustainable Livelihoods Serang Society

The research data on the five sustainable livelihood capitals, measured using a Likert scale, was analyzed through a scoring method that involved determining initial weights as seen in Figure 6.

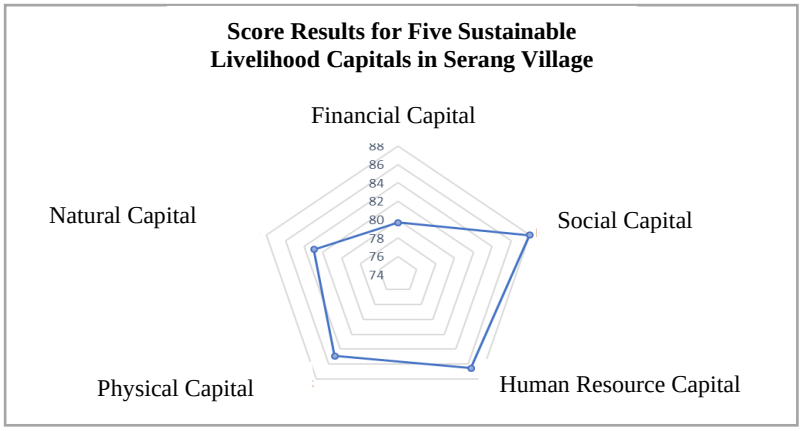

Figure 6. The Chart of Pentagon Assets in Five Sustainable Livelihoods
Source: Data Processed, 2021

Financial Capital

Financial capital refers to an economic resource that indicates a household's ability to manage and access financial resources easily, including savings, wages, loans, credit, or economically valuable assets (Scoones, 2015).

Table 3. Scoring Value of Financial Capital

Variable	Indicator	Weight	Score	Results
Income	Total income	4	4.19	16.76
	Source of income	4	3.90	15.60
Expenditure	Amount of consumption	4	4.23	16.92
Loan	Bank credit	4	3.64	14.56
Financial Reserve	Savings	4	3.96	15.84
Total				**79.68**

Source: Data processed, 2021

The development of tourism in Serang Village has led to improved access to financial capital for the local community. A clear example is seen among farmers participating in strawberry picking activities at the D'las Tourism site, where their income has surged by 30% compared to traditional horticultural farming methods. This boost in earnings highlights the financial benefits that the tourism industry has brought to the village.

The influx of tourists has created new market opportunities for agricultural products in the area, particularly for ventures like strawberry picking gardens and culinary businesses that cater to visitors. This boost in tourism has also helped lower the supply chain costs for producing agricultural goods. Economically, the growth of tourism in Serang Village has provided additional income opportunities for family members who have taken up jobs in the tourism sector. Typically, fathers focus on gardening, while mothers, daughters, and older sons find employment at local tourist sites. During specific times, such

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as the harvest season, they manage their gardening tasks in the morning before heading to work in the tourism industry.

The development of the Tourism Village has largely enhanced the capacity of village households to fulfill their needs, as reported by the majority of the residents (Table 3). This improvement indicates that households can now meet their basic needs through the additional income generated, allowing them to save a portion of their earnings for business ventures or livestock investments. Furthermore, there has been a notable increase in people's ability to engage with financial institutions, such as banks. Many community members now understand how to take out loans for purchasing assets like motorbikes, cars, or communication devices. However, despite these advances, the community still faces challenges in qualifying for business capital loans.

Social Capital

Social capital offers households valuable support, both formally and informally, serving as a crucial foundation for sustaining their livelihoods (Scoones, 2015).

Table 4. Social Capital Scoring Score

Variable	Indicator	Weight	Score	Result
Communication	Communication conditions	4	4.39	17.56
Participation	Participation rate	4	4.47	17.88
Conflict	Potential conflict	4	4.16	16.64
Security and Order	Conditions of security and order	4	4.44	17.76
Culture	Cultural activities	4	4.54	18.16
Total				**88.00**

Source: Data processed, 2021

The establishment of a tourist village enhances the community's ability to build shared social capital (G. Prayitno et al., 2024). From a communication standpoint, the community views the Tourism Village as a factor that strengthens communication between different groups (Triyono, 2012). The village community, known for its friendliness, has found that programs conducted collectively foster more active communication between residents of different hamlets. However, communication gaps and misunderstandings often arise, particularly in the socialization of programs related to tourism development.

Regarding community involvement, the participation of local communities in the development of Tourism Villages is essential to ensure they have equal opportunities to contribute alongside other stakeholders. The integration of all parties involved in tourism development, including local communities, is crucial (Adikampana, 2017). While most of the community believed they were actively involved, their involvement was actually more in line with Passive Community Participation. This form of participation has engaged the community only minimally in the implementation of decisions, with the policy approach remaining largely top-down (Alfandi et al., 2019). It meant that the community's role was not as decision-makers but as decision-takers. This form of participation necessitated a decision-making process that prioritized both efficiency and effectiveness.

From the community's perspective, there was a strong tendency to place high trust in the village government and the Tourism Village management. This trust led to a reluctance to engage deeply in understanding the governance process. Nevertheless, they consistently supported the decisions made by the management. Community involvement

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has been integral since the inception of Tourism Village development, beginning with the creation of D'las. Initially funded by Non-Governmental Funds, D'las eventually evolved into a Village-owned Enterprise, with participation as its core principle. This participation was evident in the open opportunities for individuals and groups to become operators of tourist attractions. By offering equal opportunities, the goal was to enhance the standard of living within the village. However, the development of programs aimed at benefiting the village community did not completely eliminate the potential for conflicts arising from the shift toward tourism-related business activities.

In Serang Village, while conflicts were rare, they had the potential to create divisions within the community (Table 4). Some of these conflicts were triggered by social jealousy, as the benefits of tourism development began to alter the lives of those involved. However, these disputes have not disrupted security or order in the village. The community's strong adherence to religious values and traditional customs, such as showing respect and deference to elders, has maintained a safe and harmonious environment, even with the influx of tourists from various areas.

The cultural development in Serang Tourism Village became a highlight of its existence. The community eagerly anticipated the annual Mount Slamet Festival Cultural Carnival, viewing it as a significant event. The festival blended rich traditional elements with modern aspects, including stage performances by national artists, creating a sense of heightened entertainment for the village residents and showcasing the cultural vibrancy of Serang Tourism Village. This enthusiasm fostered a positive outlook within the community regarding the Tourism Village, as it enabled the preservation of culture (Widyaningsih, 2019) and provided access to arts and cultural activities that were previously not part of the village's annual events or agenda.

Human Resource Capital

Human resource (HR) capital refers to an individual's capacity to access and utilize resources that support their livelihood. This capital encompasses skills, health, and personal experiences, which together contribute to an improved quality of life (Scoones, 2015). In this research, HR capital was evaluated by examining factors such as education, skills, employment opportunities, and health (Table 5).

Table 5. Scoring Value of Human Resources Capital

Variable	Indicator	Weight	Score	Results
Education	Level of education	4	4.29	17.16
Skills	Diversity of expertise	4	4.40	17.60
Urbanization	Urbanization rate	4	4.14	16.56
Health Access	Easy access to health	4	4.45	17.80
Unemployment	Unemployment rate	4	4.35	17.40
Total				**86.52**

Source: Data processed, 2021

Respondents indicated that access to education in Serang Tourism Village has improved since tourism became a significant source of income for households. Previously, it was uncommon for families in Serang Village to send their children to college, with most students only completing high school. However, as the local economy has grown, more families are now able to support their children's pursuit of higher education.

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Before the rise of tourism, young people in Serang Village typically spent their time assisting their parents with farming. If there was an urgent need for income, they would often seek work outside the village in places like Jakarta, Bandung, or Purwokerto, usually taking jobs as domestic helpers, construction workers, or factory employees. However, with the development of tourism, these young people have found new opportunities to earn a living within the village by working as tour operators or in various tourism roles, such as horse jockeys, ticket counter attendants, and operational staff.

Improved job prospects have led many young people who once worked in big cities to return to Serang Village. The village's infrastructure has also seen upgrades, including a well-equipped Primary Health Care center in Karangreja Sub-district, featuring an emergency unit (ER), ambulance services, and skilled medical personnel. During the COVID-19 pandemic, this center provided swab and PCR testing to help residents protect themselves from the virus. Additionally, the village had a complementary health center that served as a venue for health education and housed an Integrated Healthcare Center (posyandu).

Physical Capital

Physical capital refers to the control and access to physical resources that support households in sustaining their livelihoods. This includes infrastructure like roads, clean water, transportation, internet connectivity, and educational facilities (Scoones, 2015).

Table 6. Scoring Value of Physical Capital

Variable	Indicator	Weight	Score	Results
Infrastructure	Access road	4	4.20	16.80
Clean water	Access to clean water	4	4.40	17.60
Medical Facility	Encouraging to be actively involved in village development	4	4.45	17.80
Communication	Internet network access	4	3.88	15.52
Education facility	Increase the sense of family and cooperation	4	4.29	17.16
Total				**84.88**

Source: Data processed, 2021

The village's development of facilities and infrastructure relied on its Village Original Income (PADes) (Salmiah et al., 2020). The growing contributions from BUM Desa to this income played a significant role in advancing the village's development efforts (Amanda & Kawedar, 2023). For example, the creation of a BUM Desa to supply clean water to households marked a significant step forward in ensuring equitable access to clean water, breaking the previous practice of limiting control to specific groups. By managing the water supply for everyone, a greater sense of fairness was established within the village community. The operational costs for this clean water initiative were subsidized by the BUM Desa, supporting the tourism business unit of D'las.

The primary road leading to and from the tourist attractions in Serang Village is a provincial road (Table 6). The section between Hamlet I and Hamlet II was riddled with potholes, largely due to frequent heavy traffic, including tourist buses. Unfortunately, repairs for this road fall under the jurisdiction of the central government. The roads in the village were primarily compacted, though they had not been paved with asphalt. This was due to the hilly terrain and frequent rainfall, which made it challenging to apply and

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maintain asphalt. Instead, paving blocks were used as a suitable alternative for the local conditions. Despite the improvements in road quality, public transportation remained scarce in Serang Village. As a result, most residents relied on private vehicles, particularly motorcycles, for their transportation needs.

In Serang Village, the availability of educational facilities and qualified staff was generally deemed sufficient. However, respondents expressed concerns about the lack of supportive infrastructure, particularly a reliable internet connection, especially in the Mount Malang hamlet. This issue became especially critical as the education system began to incorporate digital learning methods, which were essential during the pandemic when online education was necessary. Additionally, internet access has been reliable in areas outside of Mount Malang (V) and hamlets I through IV, particularly for Telkomsel and Indosat providers. Network issues were mainly confined to Mount Malang. The village's facilities have also seen significant improvements, including a well-equipped health center with an emergency unit, ambulance services, and qualified medical staff. During the COVID-19 pandemic, the Primary Health Care center offered swab and PCR testing services to help residents safeguard themselves against the virus.

Natural Capital

Natural capital encompasses all of nature's resources that support human livelihoods (Gai et al., 2020; Scoones, 2015). In Serang Village, nature serves as the primary asset for tourism development. The fertile volcanic soil offers excellent opportunities for cultivating high-yield crops. Unlike other tourist villages where traditional culture plays a dominant role, Serang Village's daily life has largely blended with modern influences, even though the community retains many characteristics of a subsistence rural lifestyle. Consequently, the village's natural resources are the community's main asset, supporting both agriculture and tourism.

Table 7. Scoring Value of Natural Capital

Variable	Indicator	Weight	Score	Result
Agriculture	Rate of conversion of agricultural land	4	3.79	15.16
Garbage	Waste management	4	3.96	15.84
Forest Ecology	Forest sustainability	4	4.31	17.24
Pollution	Air pollution	4	4.24	16.96
Disaster	Potential disaster	4	4.44	17.76
Total				**82.96**

Source: Data processed, 2021

Serang Tourism Village's greatest natural asset is its agricultural landscape. The introduction of tourism in the village has led to some agricultural land being repurposed for commercial use to support tourism activities. While this shift has occurred in Serang, it has been on a very limited scale and hasn't significantly impacted the overall agricultural land use (Table 7). The tourism projects managed by BUM Desa primarily utilized village treasury land, which helped minimize the conversion of agricultural land in Serang Tourism Village. However, the rising demand for land near tourist attractions has led to concerns over land ownership. If left unchecked, this trend could marginalize the local population and alter the intended future use of the land. To address this, the Village Government has initiated consultations to establish regulations for village land use and ensure proper control.

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Garbage pollution is a frequent challenge that arises with the development of tourism (Nugroho, 2020). To address this issue, a more focused waste management strategy has been planned since 2021. The plan includes establishing a Village-owned Enterprise business unit dedicated to managing waste in the village, with a particular emphasis on waste generated by tourism activities. The implementation of liquid smoke-based waste processing technology has been introduced in Serang Village to reduce pollution and promote environmental sustainability. As for noise pollution, most respondents reported minimal disturbance, as tourist sites are generally located far from residential areas. Additionally, the community has begun to explore forest conservation as a valuable initiative. Perhutani's lands have been leased for tourism purposes, such as the Mini Village Ecotourism project in Hamlet II (Probahan), which aims to educate the public on the critical role forests play in preserving water resources.

Tourism in Serang Village has introduced a new source of income for the local community, supplementing their traditional reliance on agriculture. What was once a predominantly farming-based livelihood has now expanded, with residents diversifying their income strategies to include tourism-related opportunities. This shift allows the community to better address shortages and meet their daily needs.

Business diversification takes many forms, but in Serang Village, the rise of tourism has led to a significant portion of the community (26%) focusing their diversification efforts on tourism-related ventures. These include activities such as selling souvenirs, operating grocery stores near tourist spots, and running food businesses at tourist locations.

The development of tourism has also encouraged the return of about 5% of villagers who had previously moved away. They found that by participating in the tourism industry in Serang Village, they could earn an income comparable to what they were making in the city.

> *I used to work as an insurance marketing admin in Jakarta, but after saving up enough money, I decided to return to Serang Village. It so happened that they needed a head of security here, and I was asked to take on the role. Although the salary isn't as high as what I earned in the city, the cost of living here is much lower. (A, personal communication, 2024)*

Tourism Village Resilience Strategy During the Covid-19 Pandemic

Vulnerability essentially refers to situations that are susceptible to sudden changes, which can significantly impact society at any moment (Chang et al., 2024; Putri et al., 2019). The COVID-19 pandemic was a disruptive force in people's lives overall (Akkermans et al., 2020), affecting rural communities as well. The inability to cope with such an unprecedented situation leads to vulnerability, as unforeseen challenges emerge from both social and economic perspectives, threatening the stability of people's livelihoods.

In Serang Village, the community was generally lax or neglectful in adhering to health protocols and preventing the spread of viral infections during the pandemic. However, in terms of policy and enforcement, Serang Village continued to follow the Central Government's guidelines for implementing PPKM (Restrictions on Community Activities), including rules for online schooling and health protocols at tourist sites. The transition to a new normal, requiring reduced physical activity and social distancing, created several challenges for residents in generating their economic resources.

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According to survey results, the majority of respondents (85.3%) reported a decline in their income due to the pandemic, while a smaller portion (14.7%) indicated that their income remained unaffected. Those who did not experience a decrease were typically employed in positions with a fixed salary structure. Nearly half (43%) of respondents reported that they did not face significant challenges during the pandemic, while the majority (57%) acknowledged that the pandemic made it harder to make ends meet.

In follow-up interviews with several respondents, it was revealed that the pandemic-induced vulnerability has primarily strained the financial aspects of their lives. The slowdown in market access, due to the closure of markets in several areas, has led to a lack of buyers for agricultural products, leaving many unable to sell their harvests and incurring losses. Similarly, in the tourism sector, the decrease in visitors has resulted in reduced income for those employed in the industry.

For some individuals, the pandemic hasn't posed significant challenges. Despite the difficulty in selling agricultural products, their subsistence lifestyle allows them to be content with what they produce. In fact, food scarcity hasn't been an issue due to the ample availability of resources.

For those employed in tourism, the drop in visitor numbers has affected their income; however, many have not experienced a severe impact because they still have family-managed agricultural land or livestock as a form of savings, allowing them to meet basic needs like food. Others have adapted by assisting with farm work or taking on roles as agricultural laborers. The pandemic's challenges or vulnerabilities have not led to a severe crisis in Serang Village, as the two primary sectors—agriculture and tourism—play a crucial role in bolstering the local economy.

The agricultural sector, which typically takes longer to yield profits, complements the tourism sector, which can generate income more quickly. Therefore, it is crucial to integrate agriculture with tourism (Kusuma et al., 2022). In times of crisis, these sectors can support one another without one diminishing the other, demonstrating how sustainable livelihood practices and sustainable tourism can coexist. The experience in Serang Village exemplifies the concept of sustainable tourism as described by Weaver (2013), where tourism is developed to satisfy current needs without compromising the ability of future generations to meet their own.

CONCLUSION

The key strategy for ensuring the successful operation of village tourism, as identified through a balanced scorecard analysis, involves establishing a village-owned enterprise known as BUM Village. This approach can enhance success by boosting income and increasing the village's real revenue (PAD), even amidst the challenges of the pandemic. Additionally, it contributes to the broader distribution of tourist attractions, which have become a new economic center in Serang Village. When examining the impact of the Tourism Village on community livelihoods, it is evaluated across five key capitals: financial, social, human resources, physical, and natural. These elements form a pentagon of assets, each with significant to very significant value in supporting the livelihoods of residents in Serang Tourism Village.

The community has responded to the emergence of tourist villages by expanding their sources of income. Engaging in trade that supports tourism has become a common

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strategy for many residents in Serang Village as they adjust to the growing tourism industry. This approach does not replace their primary livelihood in agriculture but serves as an additional means of support for households. During the pandemic, 43% of residents saw a drop in household income. However, the role of tourism in supplementing household income has played a crucial part in helping the community endure and fulfill their needs during the challenging times of the COVID-19 pandemic.

Tourism has the potential to reduce negative effects while enhancing positive ones. This implies that introducing tourism into rural areas can contribute to sustainable development that works in harmony with the existing livelihoods of village residents, such as agriculture, rather than displacing them. Local authorities need to recognize this dynamic and ensure that both sectors—tourism and agriculture—are integrated in a way that they reinforce each other, thereby improving the overall well-being of households in and around the tourist village.

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SUSTAINABLE STRATEGY TOWARD COMMUNITY LIFE SATISFACTION IN HERITAGE TOURISM

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Abstract

This research aims to form a model strategy for community life satisfaction by developing sustainable tourism in cultural heritage sites. This research used mixed method: qualitative method by in-depth interviews with four respondents from local communities, MSMEs, *Kawasan Cagar Budaya Nasional* (*KCBN*) *Muaro Jambi*, government involved in heritage site tourism activities and analyzed using QDA Miner. The quantitative method was by distributing questionnaires using purposive sampling to 200 respondents, and data were processed using SmartPLS to build a holistic model of community life satisfaction in heritage sites. The results of this research are: firstly, social culture and urban landscapes contribute to community satisfaction; secondly, social culture and urban landscape have a significant positive influence on sustainable tourism; thirdly, through sustainable tourism, community life satisfaction will be formed. This research has relevant implications for providing a deeper understanding of the impact of sustainable tourism in improving community life satisfaction in heritage sites by integrating natural values and urban landscape and empowering the local community.

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INTRODUCTION

The World Tourism Organization and the European Travel Commission (ETC) (2020) report that demographic and tourism changes emphasize changes in modern society that create new challenges and opportunities for tourism development. The National Tourism Sector in 2022 contributed 3.26% of GDP; in 2020-2021, it decreased to 2.24% and 2.4% due to the Covid-19 pandemic. Previously, in 2018-2019, it was 4.5% and 4.8%. It means that this sector has quite an impact on national GDP. National income from the foreign exchange side of the tourism sector in 2018 was USD 16.43 Billion; in 2019, it increased to USD 17.76 Billion. A significant decrease occurred in 2020 to USD 3.38 Billion. The following year, there was also a decrease, namely USD 0.49 Billion. In 2022, foreign exchange earnings from the tourism sector increased to USD 4.26 Billion. It was targeted that there would be an increase in 2023 because the impact of Covid-19 began to subside. Their impacts were positive impacts such as job creation, other sources of income, and encouragement of social and spiritual; negative impacts in the form of economic vulnerability, income leakage, spatial polarization, seasonal nature of work, and the allocation of economic resources as well as on the physical environment (Chenavaz et al., 2022; Kowalczyk-Anioł, 2023; S. Liu et al., 2021).

Based on data from the Jambi Provincial Statistics Agency in 2022, Regional Original Income (PAD) in 2018 amounted to IDR 4.2 Trillion. In 2019, it amounted to IDR 1.6 Trillion, a significant decrease from the previous year. In 2020, Jambi Province's PAD amounted to IDR 1.55 Trillion, PAD in 2021 amounted to IDR 1.56 Trillion, and in 2022 amounted to IDR 1.78 Trillion. Based on the data obtained, when compared to the year before Covid-19, Jambi Province's PAD has not returned to normal. The following Table 1 shows that the number of domestic tourist trips in 2021 to Jambi Province still needs to be higher.

Table 1. Number of Trips by Indonesian Tourists to Jambi Province in Million

No	Province	Number of Indonesian Tourist Trips					Average	Rating
		2017	2018	2019	2020	2021		
1	Aceh	4.41	6.52	25.52	4.74	5.47	9.33	4
2	North Sumatra	9.36	10.35	63.58	13.44	16.40	22.63	1
3	West Sumatra	5.48	6.40	19.41	7.19	8.29	9.36	3
4	Riau	5.15	5.55	23.13	5.44	6.19	9.09	5
5	**Jambi**	**1.91**	**2.24**	**10.72**	**2.40**	**2.97**	**4.05**	**7**
6	South Sumatra	5.95	6.14	19.38	5.63	6.35	8.69	6
7	Bengkulu	1.95	2.02	6.10	1.46	1.60	2.63	10
8	Lampung	6.00	6.88	17.96	7.87	8.66	9.47	2
9	Kep. Bangka Belitung	3.83	5.20	4.54	0.86	0.98	3.08	8
10	Kep. Riau	3.81	4.61	5.12	0.44	0.49	2.89	9

Source: Central Bureau of Statistics, 2022

Jambi Province is in seventh place or the four lowest provinces, with an average visit of 4.05 million on Sumatra Island. Nationally, Jambi province is in 19th place with an average number of visits of 4.05 million. According to the latest data in 2021, Jambi Province was visited by 2,973,777 visits, compared nationally with 603,020,000 visits. Jambi Province only contributed 0.49% of tourist visits nationally. The Jambi Province heritage site was still the leading destination in the Covid-19 pandemic era until the

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transition period and post-Covid-19. During tourism activities, tourists only focus on tourist objects (temples), and their stay is relatively short. Thus, this tourism activity does not have an impact on the local community. When there is a closure of the area, tourists are reluctant to come and visit supporting destinations in buffer villages around the Jambi Province heritage site area because the visitors still focus on heritage sites, not on culture, the environment, the ecosystem, and natural tourism in buffer villages. Therefore, this tourism does not have an impact on the environment, local communities, and MSMEs.

Sustainable tourism must consider environmental and societal impact (Ghobakhloo et al., 2022; Wibowo & Hariadi, 2022). One approach to achieving sustainable tourism is through transforming the urban landscape and incorporating natural values and resources to improve the performance of micro, small, and medium enterprises (MSMEs) in tourist areas. The urban landscape is the result of actions, reactions, and interactions between humans and the environment, with three components that influence each other: society, culture, and economy (Keshtkaran, 2019). Wibowo and Hariadi (2022) showed that integrating creative industries and tourism can produce sustainable tourism destinations. This research found that community and stakeholder participation can improve sustainable tourism. Dahmiri et al. (2023) stated the natural wealth of culinary, local culture, and supporting ecosystems still needs to be exploited because the community is still not optimal in getting income and benefits from tourism, and few tourists visit the supporting villages as a tourism environment and ecosystem. A lot of tourism potential can be developed, such as agro-tourism of duku plants, which have a distinctive taste that surpasses other types of duku. X. Zhang et al. (2022) found that tourism should provide benefits to local communities. Therefore, it can be concluded that tourism opens up opportunities for local communities to earn additional income from tourist visits.

The sustainable tourism model emphasizes the importance of tourism development that is non-threatening to local communities' environment, economy, and socio-culture (Goeldner & Ricthie, 2011). This concept emphasizes the importance of integrated and sustainable tourism development in the long term. Sustainable tourism is a process of meeting current needs without reducing the ability of future generations to meet future needs. According to GSTC (2023), four pillars of sustainable tourism development are sustainable management, socio-economic impacts, cultural and environmental impacts (including resource consumption, pollution reduction, and biodiversity and landscape conservation). Meanwhile, according to Regulation of Minister of Tourism and Creative Economy No. 9 of 2021 (2021), the scope of sustainable tourism destination guidelines includes sustainable management, social and economic sustainability, cultural sustainability, and environmental sustainability.

This research aims to develop a holistic model of community life satisfaction through sustainable tourism in the Jambi heritage site. Community life satisfaction can be reflected through progress in education, health services, social insurance, and public infrastructure (Boakye et al., 2021; Huang et al., 2022; Kanwal et al., 2020; Yin et al., 2023). According to Yin et al. (2023) and L. Zhang et al. (2022), community life satisfaction includes three dimensions education, health and insurance, and public infrastructure. Community life satisfaction is also seen from the income index, the quality of community security, and the quality of the environment (Urtasun & Gutiérrez, 2006).

Previous research conducted by Ashraf et al. (2020), Ivars-Baidal et al. (2023), and Streimikiene et al. (2021) related to the implementation of sustainable tourism in various

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destinations but do not consider the elements of community satisfaction, especially the life satisfaction of local communities. The local community at tourist attractions is an essential element (Kim et al., 2021; Richards, 2020). Community life satisfaction in tourism development is often ignored even though it contributes to sustainable tourism. Additionally, this research also analyzes the concept of urban landscape in improving community life satisfaction and sustainable tourism. The urban landscape in sustainable tourism in heritage sites is also rarely found, especially in its relationship to community satisfaction.

METHODOLOGY

This research used sequential mixed methods. This method was carried out by in-depth interviews to obtain qualitative data, followed by quantitative data using a survey (Creswell & Creswell, 2017). This research focused on the National Tourism Strategy Heritage Site (KSPN) area of Jambi Province as a buffer village namely; Desa Muaro Jambi, Desa Danau Lamo, Desa Kemingking Luar, Desa Kemingking Dalam, Desa Baru, Desa Olak Kemang and Desa Lambur. The research stage is shown in Figure 1.

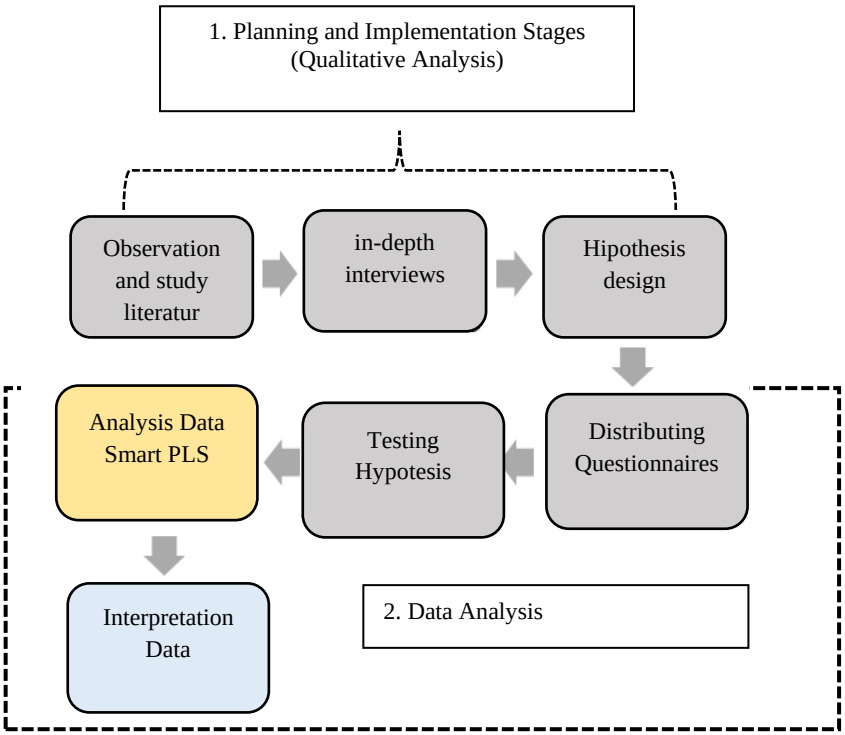

Figure 1. Research Stage
Source: Author's analysis, 2023

Planning and Implementation Stages

Observation

Observation through preliminary studies, analysis based on the latest relevant topics, and reviewing topics and research gaps that will provide research novelty.

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In-depth Interviews

The initial step was to conduct in-depth interviews with local communities, MSMEs, Kawasan Cagar Budaya Nasional (KCBN) Muaro Jambi administrators, and the government. An in-depth interview was conducted to understand factors that may affect community life satisfaction at heritage tourism sites, with a particular emphasis on the Muaro Jambi National Cultural Heritage Area. In-depth interviews sought to establish the application of urban landscape and sustainable tourism in achieving community life satisfaction within heritage sites.

In-depth interviews with local communities would offer insight into their perceptions and experiences regarding the impact of heritage tourism on community life satisfaction and their needs and expectations regarding the development of heritage site tourism. In addition, understanding the percentage of the local community involved in these activities and forms of local community contribution is necessary. Interviews with MSMEs were conducted to assess the effect of tourism on their income and business growth. Information to collect includes the type of products or services offered, changes in demand along with tourism development, and challenges in exploiting economic opportunities from the tourism sector.

In this regard, heritage site management and conservation strategies were discussed during the interview, mainly about applying urban landscape and sustainable tourism concepts within KCBN Muaro Jambi. Information in the form of policies and programs already or to be executed, heritage area management challenges, and steps toward the involvement of local communities and MSMEs in tourism management and development were sought. The interviews with the government discussed policies and support for developing sustainable tourism and improving community life satisfaction around heritage sites. Therefore, the information solicited related to government programs, collaboration with other parties, and successes and challenges in implementing the urban landscape and sustainable tourism concepts.

Observation, documentation, and data were analyzed qualitatively using QDA Miner. QDA Miner is a qualitative research tool that organizes, annotates, codes, and analyzes documents and images (Cicea et al., 2021; Fornari & da Fonseca, 2023; Tani-Yildiz & Tam, 2023). QDA Miner helps researchers import documents, such as interview transcripts, books, legal documents, photos, and other visual materials (Frimpong et al., 2021; Kloess & Van der Bruggen, 2023). The intuitive interface enables efficient annotation and coding, helping quickly identify themes and patterns (Frimpong et al., 2021). The main advantage of QDA Miner is its integration with WordStat and SimStat, which provides flexibility in analyzing textual and numerical data (Das & Mishra, 2021). However, the tool's main drawback is that it lacks collaboration features, which can be an obstacle for teams that need regular project updates (Alsamarraie & Ghazali, 2023).

Hypothesis Design

Based on the results of in-depth interviews and analysis using QDA Miner, the factors that can help build community life satisfaction in cultural heritage tourism are urban landscape, empowerment of local community, integration of natural values, socio-cultural and sustainable tourism.

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Urban Landscape and Community Satisfaction

Urban landscape transformation results from actions and reactions between humans and the environment. Three components of interaction between humans and the environment influence each other, namely society, culture, and economy (Keshtkaran, 2019). It is a general concept or the same important component, namely what leads to the unification of the people of a region and its differences with other regions "perceived uniqueness of a place" (Arrage & Chamra, 2022; He et al., 2023; Huai et al., 2022). Egoz (2012) described the urban landscape as a "spatial character," which evaluates physical entities that can be analyzed according to established criteria. This concept shows lifestyle, interactions and activities, values and beliefs, city affiliation with geographical location, time, climate, economy, society, and community politics (Aminzadeh, 2015). Urban landscape describes all physical and social elements in the urban environment, including buildings, parks, roads, and public facilities (Rigolon, 2016). The urban landscape reflects the cultural characteristics, history, and economic growth of a city or urban area (Ziyaee, 2018). In the context of sustainable tourism, urban landscapes are crucial for creating interesting and meaningful tourism experiences for tourists and maintaining the quality of life of local communities (Lerario & Di Turi, 2018).

H1: Urban landscape had a positive impact on community life satisfaction

Integration of Natural Values and Community Satisfaction

Integration of natural values refers to efforts to consider the importance of the natural environment in tourism development (Ferretti & Comino, 2015). It includes preserving ecosystems, sustainable management of natural resources, and reducing negative impacts on the environment (Mondal & Palit, 2022). In the context of sustainable tourism development, the integration of natural values is the main focus to ensure that tourism provides economic benefits without disturbing the balance of the natural environment, which is a tourist attraction (Streimikiene et al., 2021). The integration of natural values in community life satisfaction at cultural heritage sites plays an essential role in creating a sustainable and harmonious environment (S. Zhang, Xiong, et al., 2023). Respecting and preserving natural resources around cultural heritage sites not only protects natural beauty but also improves the quality of life of the local community (Jang & Mennis, 2021). Maintaining the beauty of natural landscapes around heritage sites can provide recreational and educational spaces for the community to strengthen their connection with cultural and natural heritage (Maxim & Chasovschi, 2021).

H2: Integration of natural values had a positive impact on community satisfaction

Empowerment of Local Community and Community Satisfaction

Empowerment of the local community refers to the active participation and involvement of local communities in tourism development and management (Shafieisabet & Haratifard, 2020). Through collaboration with local communities, inclusive decision-making, and local economic empowerment, tourism can provide more sustainable benefits for local communities (Park & Kim, 2016). Empowerment of the local community at cultural heritage sites is essential to improve community life satisfaction (Purnomo et al., 2020). Through collaboration, community members can strengthen the local economy

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through sustainable tourism, creating authentic tourism products and services, and using revenue to improve public services and infrastructure (Rahman & Baddam, 2021).

H3: Empowerment of the local community had a positive impact on community satisfaction

Socio-Cultural and Community Satisfaction

Socio-cultural refers to social and cultural factors in a society, including norms, values, customs, and relationships between individuals and groups (Chirkov, 2020). In the context of sustainable tourism, the integration of cultural values and local wisdom plays a paramount role because it supports the authenticity of tourism experiences, encourages local community participation, and promotes respect for cultural diversity (Mathew & Sreejesh, 2017). Sustainable tourism development that considers socio-cultural aspects aims to preserve and enrich cultural heritage and respect the needs and desires of local communities (Oluwatuyi & Omotoba, 2016). Social culture is a key element that must be considered in tourism development (Malek & Costa, 2014). The rich cultural heritage and diversity of local community traditions demand a sensitive and inclusive approach (Udeaja et al., 2020).

H4: Socio-cultural had a positive impact on community satisfaction

Sustainable Tourism Mediates the Relationship between Community Satisfaction

Sustainable tourism mediates the relationship between community life satisfaction variables by ensuring that tourism development provides equitable and sustainable benefits for local communities (Khalid et al., 2019). Sustainable tourism aims to improve the quality of life and community life satisfaction of local communities. By paying attention to socio-cultural values, integration of natural values, and urban landscape management, sustainable tourism can be an effective intermediary in improving the socio-economic conditions of local communities and supporting sustainable development (Y. Zhang et al., 2018).

Sustainable tourism can positively impact the optimization of infrastructure, improve public services, and increase community life satisfaction (Kartsan, 2022). Sustainable tourism supports increased community life satisfaction that focuses on poverty alleviation is essential for reducing absolute poverty in China (K. Wang et al., 2020). Increasing community life satisfaction can encourage tourism development because community life satisfaction can increase community support for tourism development, thereby accelerating the progress of the tourism economy (Khan et al., 2020). Community life satisfaction can increase demand for tourism, which ultimately expands the local tourism market (Calero & Turner, 2019).

H5: Sustainable tourism had a positive impact on community satisfaction
H6: Sustainable tourism can mediate the relationship between urban landscape and community satisfaction
H7: Sustainable tourism can mediate the relationship between the integration of natural values and community satisfaction

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H8: Sustainable tourism can mediate the relationship between the empowerment of the local community and community satisfaction

H9: Sustainable tourism can mediate the relationship between socio-cultural and community satisfaction

Based on theory and previous research that has been explained at the hypothesis development stage, the relationship between variables in this research is in the following figure 2:

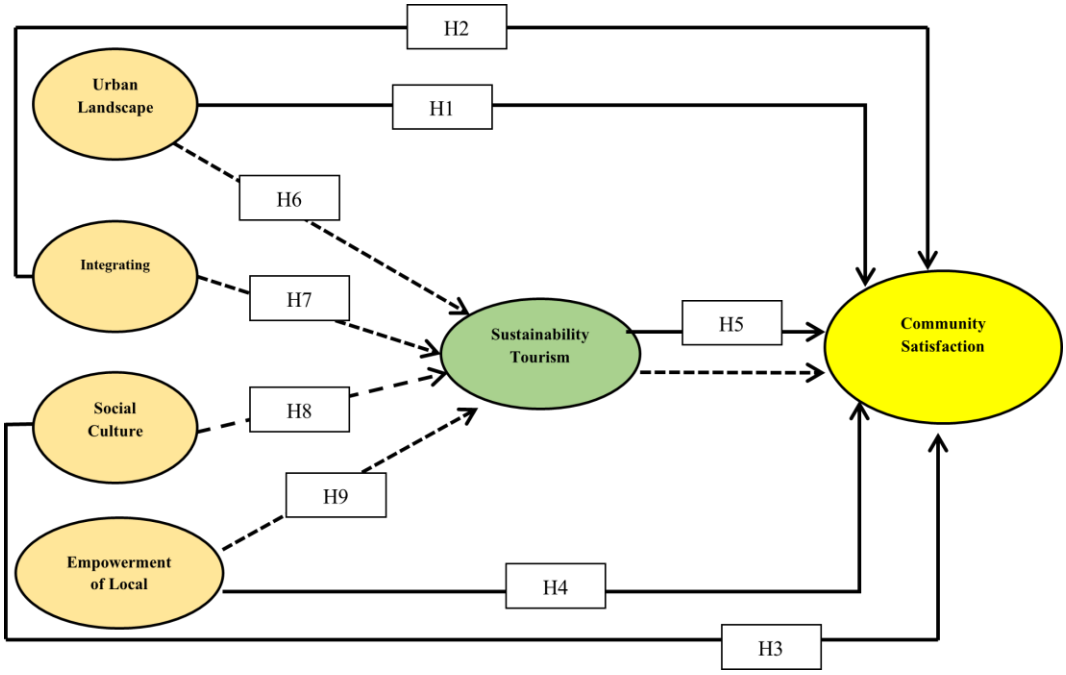

Figure 2. Hypothesis Development
Source: Author's analysis, 2023

Survey and Sample

The survey was used to obtain accurate and valid information and understanding about sustainable tourism, urban landscape, and community life satisfaction in Jambi Province. Hair et al. (2019) and Hoelter (1983) argued that a minimum sample of 200 or more is needed for accurate results. The process of selecting samples based on specific criteria, which in this research involved visitors to heritage sites in 2022 who were still living around heritage sites in KCBN Muaro Jambi. This approach ensured that the selected respondents have direct and recent experience with cultural heritage sites in Jambi Province. The specific sample selection is also related to limited resources and time available for research. By focusing on visitors still in the heritage site area, researchers can ensure that the data collected is relevant and reliable because respondents are directly involved with the research location. This approach also reduces bias and ensures that research results accurately depict the heritage site.

This research collected data from visitors to heritage sites in Jambi Province by distributing questionnaires directly. The researchers designed a questionnaire about visitor experiences and perceptions of community life satisfaction around cultural heritage site tourism. The questionnaire was designed in understandable language and consisted of

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questions using a 1-5 Likert scale. Data were collected at the Muaro Jambi heritage site for several days, especially on weekends and national holidays when the number of visitors increased. Each visitor was given a brief explanation of the research objectives and asked to participate by completing a questionnaire.

Visitors were given time to complete the questionnaire on-site, with an estimated completion time of 15-30 minutes. After visitors had finished filling out the questionnaire, they were asked to return it to the research team at the exit or collection point provided. Of the 250 questionnaires distributed, 200 were returned complete and ready for analysis, indicating a high response rate of 80%.

This research developed a questionnaire based on previous research concepts; the variable of sustainability tourism is measured by economic, social-cultural, and environmental aspects (Blancas & Lozano-Oyola, 2022; Lozano-Oyola et al., 2012; Yuedi et al., 2023). The urban landscape is measured through the dimensions of aesthetics, function, identity, and ecology (Keshtkaran, 2019). The natural value integration is measured by nature conservation, utilization of natural resources, environmental education, and awareness (Rawluk et al., 2017). Social and cultural measured by preserving local culture, maintaining culture, and awareness of the uniqueness of socio-culture (Maziliauske, 2024). Local community empowerment is measured through access to information and communication, involvement in decision-making, and participation in activities (Shafieisabet & Haratifard, 2020). The community life satisfaction variable is measured through income level, health and insurance, education, and public infrastructure (Kanwal et al., 2020; Urtasun & Gutiérrez, 2006; Yin et al., 2023).

This research used the Likert scale to carry out measurements. The Likert scale measures individuals' or groups' attitudes, opinions, and perceptions about social phenomena. With a Likert scale, the variables being measured are translated into variable indicators. These indicators then become the basis for preparing instrument items, which can be statements or questions. Each answer to the instrument item using a Likert scale ranges from negative to positive. Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly Agree (5).

Data Analysis

Data analysis consisted of average descriptive statistical analysis and Structural Equation Model (SEM) inferential statistics using SmartPLS software to formulate a sustainable tourism model through urban landscape transformation, integrated value, nature, and culture to increase community satisfaction based on the steps below:

Measurement Model Analysis (Outer Model)

The measurement model analysis (outer model) aims to evaluate the construct variables studied, the validity (accuracy), and the profitability (reliability) of a variable. Internal consistency analysis is a form of reliability used to assess the consistency of results across items on the same test. Internal consistency testing uses composite reliability values with the criteria that a variable is said to be reliable if the composite reliability value is >0.60. Assuming that (Hair et al., 2019):

1. If the Cronbach's Alpha value is >0.60, then the statement items in the questionnaire are reliable.
2. Composite reliability is used to measure the consistency of indicator blocks by

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looking at the composite reliability value, namely 0.7, so the measurement model in this research is reliable.

3. The AVE value must be equal to or greater than 0.5. The AVE value describes convergent validity, meaning that one latent variable can explain more than half of the variance of its indicators on average.

Structural Model Analysis (Inner Model)

The inner model analysis aims to test the research hypothesis. This research used the coefficient of determination test (R-Square) to evaluate the accuracy of a model's predictions. In other words, to evaluate how variations in the value of the dependent variable are influenced by variations in the value of the independent variable in a path model and hypothesis testing to see direct and indirect effects.

FINDINGS AND DISCUSSION

QDA Miner Analysis

Based on the results of in-depth interviews and the QDA Miner analysis carried out on the KCBN's response, the culture is an essential core of the restructuring of Muaro Jambi Temple (Figure 3). It is hoped that the preservation of cultural heritage will provide an economic impact, such as increasing employment opportunities; apart from that, the involvement of the local community must be able to maintain a sustainable nature which will ultimately improve community life satisfaction and the surrounding community (Figure 4).

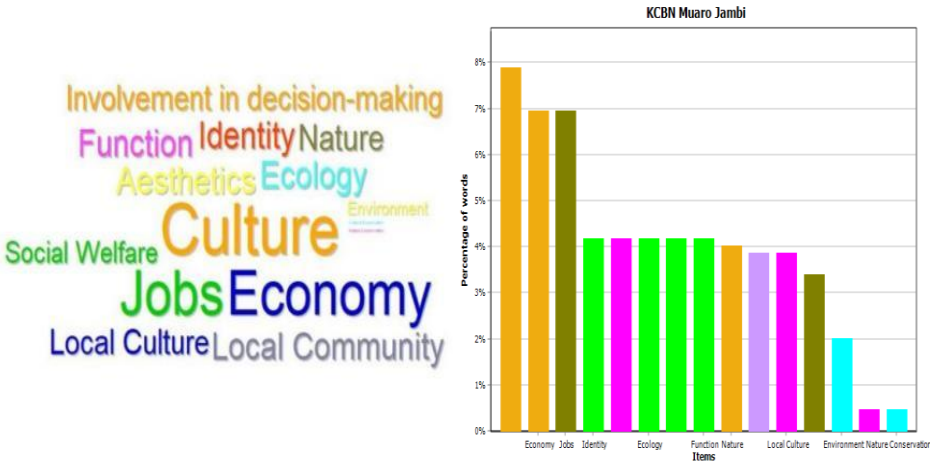

Figure 3. Result in in-depth Interviews with *KCBN Muaro Jambi*
Source: QDA Miner, processed data, 2023

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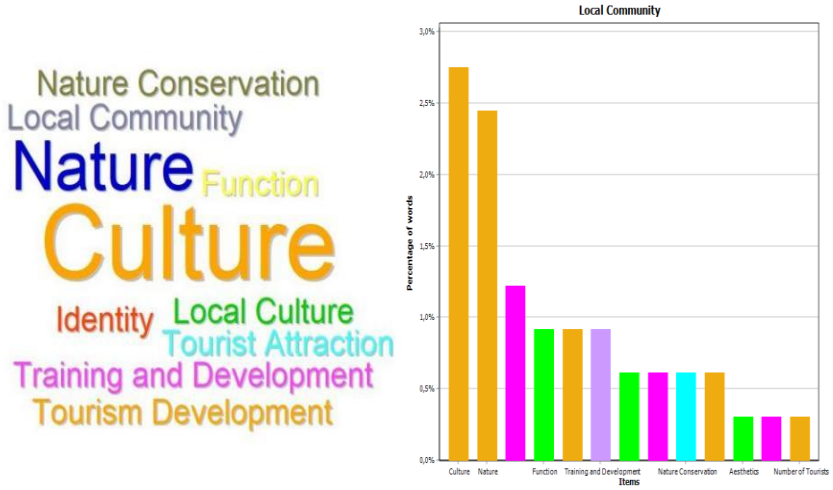

Figure 4. Result in in-depth Interviews with Local Community
Source: QDA Miner, processed data, 2023

The responses of MSME showed that local culture is an essential core of the restructuring of Muaro Jambi Temple (Figure 5). The arrangement with the urban landscape concept will help the growth of tourism by preserving the environment and culture. What is interesting about this interview is that the problems MSMEs face are product uniqueness, product marketing, innovativeness, and product quality, which still need to be improved.

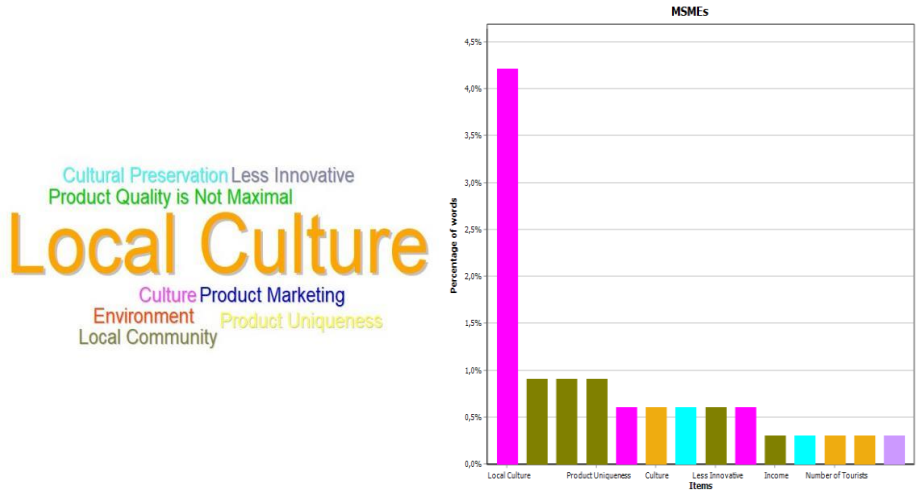

Figure 5. Result in in-depth Interviews with MSMEs
Source: QDA Miner, processed data, 2023

The government's response to the rearrangement of Muaro Jambi Temple is expected to have an impact on local communities and local products by preserving nature, culture, the environment, and culture so that it will create harmonious tourism, authenticity has an impact on tourist attraction, increasing tourists and income (Figure 6).

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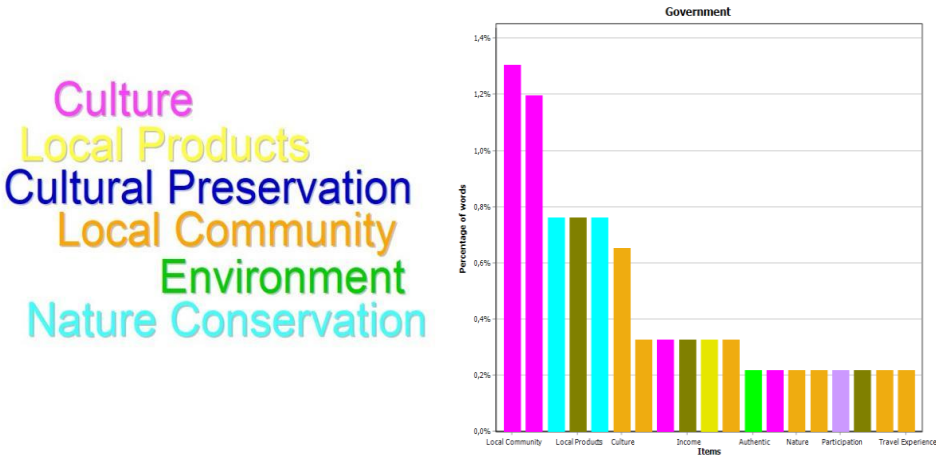

Figure 6. Result in in-depth Interviews with Government
Source: QDA Miner, processed data, 2023

Quantitative Analysis

Respondent Characteristics

The characteristics of the respondents showed that the majority were female (52.7%) and male (47.3%). The largest age group is in the 21-30 age range (53%), followed by 41-50 (26%). Most respondents work in the government sector (58%), with 18% in the private sector, 16% from the local community, and the rest in MSMEs and travelers. Regarding income, 55% earn 11-15 million, and most respondents have a master's degree (67%).

Table 2. Characteristics of Respondents

Characteristics	Criteria	Amount	Proportion (%)
Gender	Man	95	47.3
	Woman	105	52.7
	Total	200	100
Age	10-20 Years	22	11
	21-30 Years	106	53
	31 - 40 Years	20	10
	41-50 Years	52	26
	61 -70 Years	0	0
	71 - onwards	0	0
	Total	200	100
Work	Government	116	58
	Private	36	18
	MSMEs	8	4
	Local Community	32	16
	Traveler	8	4
	Total	200	100
Income	1-5 million	62	31
	6-10 million	28	14
	11-15 million	110	55
	Total	200	100
Education	Elementary School	2	1
	Junior High School	2	1
	Senior High School	26	13
	Bachelor	36	18

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Characteristics	Criteria	Amount	Proportion (%)
	Masters	114	67
	Total	200	100

Source: Respondent data, 2023

Measurement Model Analysis (Outer Model)

Internal Consistency Analysis

Table 3. Internal Consistency Analysis

Variable	Indicator	Loading Factor	Cronbach's Alpha	(rho_a)	Composite Reliability	Average Variance Extracted (AVE)
Sustainability Tourism	Economic Aspects	0.720	0.815	0.845	0.874	0.636
	Social and Cultural Aspects	0.730				
	Environmental Aspects	0.870				
Urban Landscape	Aesthetics	0.711	0.896	0.919	0.929	0.768
	Function	0.901				
	Identity	0.938				
	Ecology	0.935				
Natural Value Integration	Nature Conservation	0.755	0.812	0.825	0.890	0.731
	Utilization of Natural Resources	0.876				
	Environmental Education and Awareness	0.925				
Social and Cultural	Preserving Local Culture	0.849	0.822	0.829	0.893	0.736
	Maintaining Culture	0.863				
	Awareness of the uniqueness of socio-culture	0.861				
Community Satisfaction	Income Level	0.939	0.931	0.932	0.956	0.879
	Health and Insurance	0.935				
	Education and Public Infrastructure	0.939				
Empowerment of Local Community	Access to Information and Communication	0.923	0.884	0.898	0.928	0.812
	Involvement in Decision-Making	0.924				
	Participation in Activities	0.854				

Source: Processed data, 2023

Based on the internal consistency analysis data in Table 3, the results show that the variables integration of natural values, community satisfaction, empowerment of local community, social culture, sustainable tourism, and urban landscape have met the criteria so that the statement items and models in this research are valid and reliable.

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Structural Model Analysis (Inner Model)

Coefficient of Determination (R-Square)

The values of community satisfaction, empowerment of the local community, and social culture on the variables of sustainable tourism is 0.728. The R-squared value of 0.728 indicates variations in the variable values. Sustainable tourism can be explained by variations in the integration of natural values, community satisfaction, empowerment of the local community, and social culture 72.8%.

Table 4. Coefficient of Determination (R-Square)

	R-square	R-square Adjusted
Community Satisfaction	0.707	0.689
Sustainable Tourism	0.728	0.716

Source: Processed data, 2023

Based on Table 4, the results show the influence of the variables of integration of natural values, community satisfaction, empowerment of local community, and social culture on the variable of sustainable tourism of 0.728. The r-square value of 0.728 indicates variations in the variable values. Sustainable tourism can be explained by variations in the integration of natural values, community satisfaction, empowerment of the local community, and social culture 72.8%.

The influence of the integration of natural values, community satisfaction, empowerment of the local community, socio-culture, and sustainable tourism variables to public welfare of 0.707. The r-square value of 0.707 indicates that the variation in the value of the Y2 variable can be explained by the variation in the values of integration of natural values, community satisfaction, empowerment of local community, socio-culture, and sustainable tourism amounting to 70.7%.

Once the r-square value of each variable is known, as shown in the r-square table, the predictive-relevance value can be obtained using the following formulation and calculations:

$$Q\ 2 = 1 - (1 - R12)\ (1 - R22)$$
$$Q\ 2 = 1 - (1\text{-}0.7072)\ (1 - 0.7282)$$
$$Q\ 2 = 1 - (1 - 0.49)\ (1\text{-}0.53)$$
$$Q\ 2 = 1 - (0.51 * 0.47)$$
$$Q\ 2 = 1\text{-}\ 0.24$$
$$Q\ 2 = 0.76 \qquad \textit{...(1)}$$

The calculation results of the predictive-relevance value of 0.76 or 76% show that the diversity of data that the model can explain is 76%. The remaining 24% is explained by other variables yet to be contained in the model and errors. These results mean that this research model is feasible because it has relevant predictive value to be used for hypothesis testing.

1. Direct Influence

This research has carried out hypothesis testing with the help of SmartPLS to build a sustainable tourism research model in the heritage site area of Jambi Province.

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Table 5. Direct Effect

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-Statistics (|O/STDEV|)	*P Values*
Integration of Natural Values → Community Satisfaction	-0.149	-0.142	0.157	0.950	0.342
Integration of Natural Values → Sustainable Tourism	0.147	0.143	0.117	1,258	0.208
Empowerment of Local Community → Community Satisfaction	0.104	0.092	0.147	0.703	0.482
Empowerment of Local Community → Sustainable Tourism	0.091	0.088	0.109	0.839	0.402
Socio-Cultural → Community Satisfaction	0.300	0.298	0.096	3,132	0.002
Socio-Cultural → Sustainable Tourism	0.267	0.270	0.087	3,064	0.002
Sustainable Tourism → Community Satisfaction	0.704	0.716	0.118	5,948	0,000
Urban Landscape → Community Satisfaction	0.421	0.419	0.135	3,118	0.002
Urban Landscape → Sustainable Tourism	0.435	0.440	0.105	4,159	0,000

Source: Processed data, 2023

Based on the results of data processing (Table 5), the results obtained are:

a) Socio-cultural variables have a significant influence on community satisfaction; it can be seen from the coefficient value of 0.300 and the p-value below 0.05 with a value of 0.002.
b) Socio-cultural has a significant influence on sustainable tourism; it can be seen from the coefficient value of 0.267 and the p-value below 0.05 with a value of 0.002
c) Sustainable tourism has a significant influence on community satisfaction; it can be seen from the coefficient value of 0.764 and the p-value below 0.05 with a value of 0.000
d) Urban landscape has a significant influence on community satisfaction; it can be seen from the coefficient value of 0.421 and the p-value below 0.05 with a value of 0.002
e) Urban landscape has a significant influence on sustainable tourism; it can be seen from the coefficient value of 0.435 and the p-value below 0.05 with a value of 0.000.

2. Indirect Influence

An indirect influence test was carried out to test the sustainable tourism variable mediating between urban landscape, natural integration, empowerment of the local community, and socio-culture on community life satisfaction in the heritage site area in Jambi Province.

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Table 6. Output Indirect Effect

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-statistics (|O/STDEV|)	*P-values*
Integration of Natural Values → Community Satisfaction	0.104	0.105	0.090	1.151	0.250
Empowerment of Local Community → Community Satisfaction	0.064	0.061	0.079	0.811	0.417
Socio-cultural → Community Satisfaction	0.188	0.192	0.069	2.719	0.007
Urban Landscape → Community Satisfaction	0.307	0.314	0.091	3.372	0.001

Source: Processed data, 2023

Based on the indirect effect test results obtained (Table 6), the following results were obtained that:

a) Sustainable tourism variables can mediate the relationship between social-cultural and community satisfaction. It can be seen from the p-value, which is below 0.007.
b) The sustainable tourism variable can mediate the urban landscape and community life satisfaction relationship. It can be seen from the p-value, which is below 0.001.

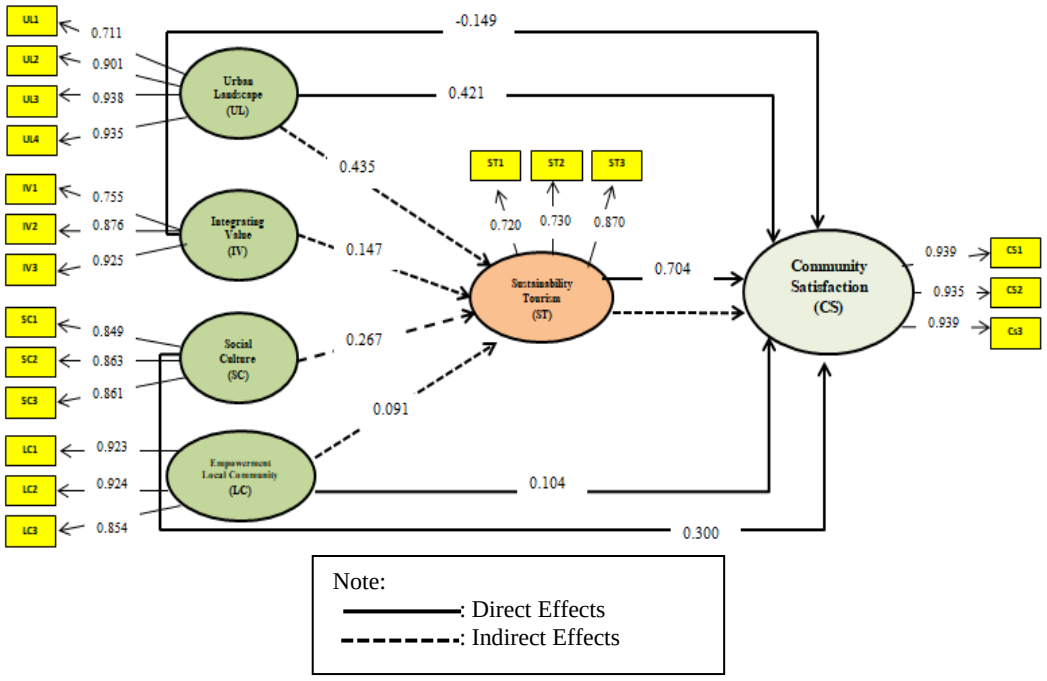

Figure 7. Holistic Model of Community Life Satisfaction in Heritage Site
Source: Processed data, 2023

Discussion

Urban Landscape towards Sustainable Tourism

This research found that urban landscape has a significant positive influence on sustainable tourism; it can be seen from the coefficient value of 0.435 and the p-value below

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0.05 with a value of 0.000. This research found that a sustainable urban landscape has a positive and significant impact on the concept of Sustainable Tourism in heritage site areas. The results of this research have important implications for sustainable tourism development, especially in historical areas.

This research found that sustainable urban landscapes in heritage site areas strategically support and promote sustainable tourism. The urban landscape includes various elements, including the arrangement of urban parks, preservation of green space in urban areas, use of buildings with environmental awareness, and public facilities that support the sustainable tourism paradigm (Keshtkaran, 2019). The findings of this research emphasize the need to integrate sustainability principles in the planning and development of urban areas. This effort includes developing and maintaining urban green spaces that uphold sustainability and steps to reduce negative impacts on the environment. Infrastructure development that aligns with Sustainable Tourism principles is also a paramount point.

Urban landscapes can create sustainable economic opportunities for local communities living in heritage site areas (He et al., 2023). With the growing interest of the world community in sustainable tourism destinations, local economies can grow through the tourism sector (Yarza Pérez & Verbakel, 2022). Urban landscapes can support sustainable tourism in creating a healthier and more comfortable environment for residents, with the consequence of increasing welfare (Dong, 2019). Urban landscape management that supports sustainable tourism is a determining factor in achieving harmony between tourism growth and environmental preservation in heritage site areas. The application of sustainable environmental ethical principles is critical in efforts to achieve this harmony.

Collaboration between government, the private sector, and local communities is essential in maintaining and developing a sustainable urban landscape (Apak & Gürbüz, 2023). The government has a central role in formulating policies that support the principles of sustainable tourism, while the private sector can contribute through investment in infrastructure that supports this concept. The active involvement of local communities in the planning and implementation process of projects that support sustainability is also a critical factor in this overall dynamic. The results of this research strengthen our understanding of the role of a sustainable urban landscape in supporting the principles of Sustainable Tourism in heritage site areas. Through wise preservation and urban landscape development efforts, heritage site areas can grow while maintaining environmental integrity and providing sustainable economic and social benefits for all parties involved.

Urban Landscape Towards Community Satisfaction

This research found that urban landscape has a significant favorable influence on community satisfaction; it can be seen from the coefficient value of 0.421 and the p-value below 0.05 with a value of 0.002. The heritage site area has unique architectural characteristics and cultural elements. Maintaining and designing an urban landscape that suits the character of the historic area, residents and visitors will feel more connected to the cultural heritage which can improve the quality of life of local people by providing a stronger sense of pride and identity.

Heritage site areas often become essential tourist attractions. In heritage site areas, the government and area managers can attract tourists (Wu & Xiao, 2016). Better tourism contributes to the local economy and can indirectly improve the welfare of local

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communities through increased employment and income (Alizadeh & Hitchmough, 2019). Applying an urban landscape that follows the character of the heritage site area can preserve the natural environment and cultural diversity, which are valuable assets that can provide long-term benefits for the community and promote understanding and respect for history and cultural heritage (Wu & Xiao, 2016).

Revitalization of the Muaro Jambi Temple National Cultural Heritage Area (KCBN) with harmonizing cultural heritage's authenticity with natural ecosystems. Harmonization of this ecosystem will create a balance between nature and culture. The biodiversity at KCBN Muaro Jambi has a historical value that is assumed to resemble a complex of parks, canals, and lakes. Biosecurity has economic value and is a source of community life, medicine, and traditional cooking.

Additionally, the area around the Muaro Jambi Temple is often used as a research object for various scientific disciplines, such as archaeology, history, and anthropology, as well as biodiversity. The revitalization of KCBN Muaro Jambi Temple is in line with national priorities following Law Number 15 of 2017 concerning the advancement of culture by carrying out reconstruction, revitalization, restructuring (urban landscape), preservation, and development.

Social Culture towards Community Satisfaction

This research found that social culture has a significant positive influence on community satisfaction; it can be seen from the coefficient value of 0.300 and the p-value below 0.05 with a value of 0.002. The heritage site reflects cultural and historical aspects inseparable from the daily lives of local people (Y. Liu et al., 2022). Maintaining and promoting cultural elements provides opportunities for communities to maintain cultural identity (Koufodontis & Gaki, 2022). Heritage site areas often become popular tourist destinations, so maintaining and maintaining the unique cultural and social elements in heritage site areas is paramount because it can attract more tourists and create local economic and employment opportunities (Hosseini et al., 2021). Economic growth indirectly improves the welfare of the people living in the surrounding area. Apart from economic benefits, the social and cultural elements preserved in heritage site areas often become a strong basis for forming solid communities (Islam, 2022). Social norms that respect cultural heritage and local culture are essential in creating an environment that supports community well-being (Z. Wang & Le, 2022).

There are several unique heritage sites in Jambi Province, such as the Muaro Jambi Temple, which is the largest enshrinement site in Southeast Asia at 3,981 hectares, the oldest campus, the center of Buddhist civilization, the study center for 5 (five) fields of science known as Panca Widya, is in the center in the middle of community settlements, plantations, mining. This is, of course, different from Prambanan Temple and Borobudur Temple, which are far from residential areas. Atisha Maha Guru once lived and studied here in the 7th century. Ancient boats were found in Lambur Village, East Muaro Sabak District, East Tanjung Jabung Regency, Jambi Province. The archaeologists in this discovery suspect that the ancient boat is around 700 years old and closely related to the Srivijaya Kingdom. The Batu House in Olak Kemang Village is the legacy of a propagator of Islam in Seberang City in the 18th century named Sayyid Idrus Hasan Al-Jufri, Nicknamed Prince Wiro Kusumo. The style and shape of this house is a combination of

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Chinese, Arabic, Malay, and European. These three objects have been designated as cultural heritage

Heritage site areas can improve welfare through social involvement (Anra & Sadzali, 2017). Social and cultural activities, such as cultural festivals, community gatherings, and arts activities, provide a sense of purpose, excitement, and social interaction. The presence of cultural elements in the heritage site area provides better educational opportunities and cultural awareness for local communities to better understand history, art, and cultural values, which can increase their sense of identity and well-being (Wicaksono et al., 2021). The involvement of local communities in cultural activities in heritage site areas can improve social and emotional aspects of well-being, strengthen social relationships, and provide joy through participation in cultural and social events.

Socio-Cultural towards Sustainable Tourism

This research found that the influence of social-cultural has a positive and significant influence on sustainable tourism; it can be seen from the coefficient value of 0.267 and the p-value below 0.05 with a value of 0.002. The findings of this research have significant implications in the context of sustainable tourism development. The research results show that social and cultural elements are crucial in achieving sustainability in the tourism industry (Tariq & Hassan, 2023). There is a strong emphasis on considering and preserving cultural values, historical heritage, and social interactions as integral elements in planning and implementing sustainable tourism strategies.

Tourism destinations are often home to priceless cultural heritage, such as historic buildings, traditional artistic practices, and cultural celebrations. Therefore, to achieve sustainable tourism, it is essential to implement strong protective measures, including preserving traditions, restoring historic buildings, and promoting arts and culture (Mbilima, 2021). This preservation is not only about preserving the destination's identity but also generates positive economic impacts and creates job opportunities related to cultural preservation.

The findings of this research also underline the need to respect and maintain social and cultural values in sustainable tourism development. As tourism grows, it is essential to strike the right balance between economic growth and cultural and social life protection. This development must include social and cultural dimensions in addition to environmental aspects. Through this approach, tourism can become a motor for economic development, cultural preservation, and forming a sustainable society. With a forward-looking approach, tourism can become a tool for preserving and promoting local communities' cultural richness and community satisfaction.

Sustainable Tourism towards Community Satisfaction

This research found that the influence of sustainable tourism has a significant positive influence on community satisfaction, it can be seen from the coefficient value of 0.764 and the p-value below 0.05 with a value of 0.000. The research results confirm that a sustainable tourism approach significantly impacts the community's welfare in the heritage site area. Sustainable tourism encourages protecting and preserving the natural environment and cultural heritage as core elements in tourism development.

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The existence of tourism should provide prosperity for the people around it. However, this does not necessarily happen, for example in the Muaro Jambi Temple area, the community needs to utilize it optimally so that inequality is still found. and monthly income is below the prosperous standard of living, ranging from Rp. 300,000-Rp. 900,000 per head of family/month; in the villages of Lambur and Olak Kemang. It is also the case that there is very minimal impact, and tourism activities contribute to improving community satisfaction, so the research team concluded that this phenomenon is interesting to study. With the concept of a sustainable strategy model, it is hoped that tourists will not only focus on visiting the heritage site areas of Jambi Province but also on areas around the buffer that have very interesting culinary, cultural, and natural potential. Suppose this tourism can be developed with a sustainable model. In that case, this will also mean that tourists will stay longer in Jambi Province because many exciting destinations can be visited in one travel period.

Environmental protection and cultural heritage to achieve tourism sustainability, emphasis is often placed on protecting the natural environment and preserving cultural heritage (H. Wang et al., 2022). Wise management of tourist areas, strict environmental protection policies, and maintenance of historic buildings are essential elements to preserve cultural heritage and the natural environment, creating a healthy environment for local communities (Chenavaz et al., 2022).

The principles of sustainable tourism also positively impact sustainable economic opportunities for local communities by creating stable employment opportunities in the tourism sector, the growth of local businesses, and increasing income within the community (Li et al., 2021). This positive economic contribution is essential in improving community life satisfaction in heritage site areas. Respecting local culture and involving local communities in tourism decision-making are essential because they can listen to community aspirations, maintain cultural authenticity, and empower communities to actively participate in industrial tourism (Blancas & Lozano-Oyola, 2022).

The Mediating Role of Sustainable Tourism between Social Culture and Urban Landscape on Community Satisfaction

Sustainable tourism appears as a mediating element that combines interactions between socio-cultural aspects and the urban landscape and their impact on community life satisfaction variables in heritage site areas. Sustainable tourism principles and practices act as intermediaries that facilitate harmonization between urban landscape and culture, forming a complex interweaving with significant implications for the level of well-being of local communities (Chenavaz et al., 2022).

Sustainable tourism promotes the protection and preservation of socio-cultural elements that have significant value in heritage site areas, including preserving traditions, arts, and cultural heritage (Sugiama, 2019). The sustainable tourism paradigm seeks to preserve the integrity of local culture and avoid excessive commercialization, leading to the cultivation of a strong sense of identity (Li et al., 2021). Sustainable tourism also encourages sustainable urban landscape development, such as wise urban planning, urban green space maintenance, and infrastructure supporting a healthy environment (He et al., 2023).

The strong relationship between sustainable tourism, socio-cultural aspects, and urban landscape positively impacts community life satisfaction variables. This paradigm

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generates local economic opportunities through the tourism sector, creates stable employment opportunities, improves the quality of life, and strengthens a strong sense of identity among residents. Socio-cultural aspects and urban landscape - interact in a holistic work series that creates a supportive and sustainable environment for the heritage site area (Szromek, 2022). The mediator role played by sustainable tourism on urban landscape and culture can holistically increase the level of community life satisfaction and maintain environmental integrity and cultural heritage in heritage site areas (Rabelo & Bernus, 2015).

Sustainable tourism promotes sustainability principles to minimize negative impacts on the natural environment in heritage site areas. Conserving biodiversity, wise use of resources, and implementation of environmental practices that support long-term ecological sustainability. Sustainable tourism provides empowerment opportunities for local communities, enabling local communities to be actively involved in tourism activities. It includes training, business opportunities, and cultural heritage preservation (Dorobantu & Nistoreanu, 2012). Sustainable tourism provides residents with greater access to economic benefits and development opportunities.

Sustainable tourism also contributes to increased cultural awareness among local communities, potentially resulting in a deeper understanding of history, art, and cultural values, ultimately enriching experiences and improving individual well-being (Elvina & Zebua, 2019). Sustainable tourism provides sustainable economic benefits and welfare for local communities, including increased income, expanded access to services and infrastructure, and sustainable job creation (Wicaksono et al., 2021). The role of sustainable tourism in connecting these elements creates a broad and beneficial environment, which includes the environmental, social, and economic sectors, not only improving the welfare of people in heritage site areas but also supporting the preservation of the natural environment and cultural sustainability, creating a sustainable positive impact for all communities and destinations.

The urban landscape has a paramount role in supporting sustainable tourism in the Muaro Jambi Temple area, especially in the context of harmonization between cultural and natural heritage. By involving design elements such as parks, pedestrian paths, and open space arrangements, the urban landscape helps maintain the natural beauty around the temple while strengthening the authenticity and beauty of culture in the KCBN Muaro Jambi area. Thoughtful arrangements can create the right balance between natural and cultural aspects so that tourists can enjoy an authentic and memorable experience. Additionally, urban landscapes also have a paramount role in maintaining biodiversity by paying attention to local ecosystems, and natural habitats and promoting environmental sustainability. In addition, because the KCBN Muaro Jambi area has many crowded zones, the urban landscape helps regulate the flow of visitors, manage tourist density, and maintain a balance between visitors and the surrounding environment. Thus, the urban landscape not only functions as an aesthetic element but also strengthens tourism attractiveness protects cultural and natural heritage, and improves the overall quality of the tourist experience.

The urban landscape has a significant impact on the community life satisfaction of local communities in the KCBN Muaro Jambi. Sustainable urban landscape development creates new economic opportunities for local communities, such as jobs in the tourism sector, environmental care services, and creative industries related to tourism. This increases the income and standard of living of local people, as well as providing

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opportunities for skills development and general welfare improvement. Additionally, a good urban landscape also creates friendly and safe public spaces for residents, improving the quality of life of local communities. With good recreational facilities, gathering places, and transportation facilities, local communities can better enjoy the benefits of tourism and strengthen social ties between them. Therefore, urban landscape development not only contributes to sustainable tourism development but also has a positive impact on the community life satisfaction of local communities, ultimately creating a more inclusive and sustainable environment. Urban landscapes facilitate immersive and educational tourist experiences, helping to increase understanding and appreciation of cultural heritage. Urban landscape creates conservation zones and protects historic sites by assisting in the physical preservation of cultural heritage. A balanced urban landscape between modern development and cultural heritage preservation creates harmony between the past and the present, maintaining the relevance and life of cultural heritage in the urban context that continues to develop at KCBN Muaro Jambi.

The concept of developing sustainable tourism at heritage sites involves efforts to preserve, restore, and develop cultural heritage as an integral part of sustainable tourism practices (Kim et al., 2021). This concept focuses on empowering local communities and ensuring the sustainability of a tourist destination, especially those related to historical sites (Labadi et al., 2021). The key to the concept of developing sustainable tourism at heritage sites is that policymakers must integrate cultural heritage management into tourism planning and development so that they can protect and strengthen the unique attraction of the heritage site (Loulanski & Loulanski, 2011; Nocca, 2017).

The findings of this research align with those found by Dans and González (2019) that social and cultural values positively influence sustainable tourism in Altamira, Spain. This research also found the same research results as Urtasun and Gutiérrez (2006), and Yin et al. (2023) that a sustainable tourism approach can improve the quality of life of communities in heritage site areas as a whole, where local communities can enjoy a maintained environment, stable economic benefits, and a solid cultural identity. This research confirms that sustainable tourism preserves natural and cultural heritage and creates tangible benefits for local communities living in heritage site areas. This research supports previous findings (Yarza Pérez & Verbakel, 2022; S. Zhang, Lin, et al., 2023) that urban landscapes in cultural heritage site areas preserve cultural heritage and improve community satisfaction. This research reveals that green spaces and parks designed with historic elements in mind can foster community pride and local identity, which in turn is positively related to community satisfaction.

CONCLUSION

The result of this research shows that socio-cultural and urban landscapes positively affect sustainable tourism and community satisfaction. Variables of sustainable tourism also mediate the complex relationship between socio-cultural and urban landscapes in community satisfaction. Mechanisms and practices relating to sustainable tourism mediate the positive influence of socio-cultural aspects on community life satisfaction and vice versa for the effect of urban landscapes on community satisfaction. In this respect, the relation that comes up as a primary determinant factor in improving community life satisfaction conditions refers to socio-culture, the urban landscape, and sustainable tourism.

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This demands an approach that is holistic and integrated in the promotion of sustainable development within the framework of sustainable tourism.

Promoting sustainable tourism can be enhanced by cooperation between the government, local communities, and other relevant parties by emphasizing socio-cultural and urban landscape aspects affecting community satisfaction. Building a destination image concerning local culture and the environment might attract more tourists who support sustainable development. It is within the capacity of governments and stakeholders to make their investment in the preservation of cultural heritage and urban landscapes through the maintenance of historic sites, development of urban parks, and improvement in infrastructure and urban planning that sustains cultural character. Moreover, community life satisfaction can be enhanced by providing cultural and environmental training and education to the local communities to help people understand that their local culture needs to be preserved and that living principles support sustainable tourism. By doing this, they can contribute affirmatively towards developing environmentally friendly tourism with good impacts on the local communities.

A sustainable area for tourism requires an approach that will easily integrate the local culture with the cityscape. This has been done by demarcating areas for tourism, developing environmentally friendly infrastructure, and initiating training programs to make residents actively participate in tourism. Such integration makes the area attractive to tourists and friendly to the locals, as it ensures the safeguarding of local identity and the least possible harm to the natural environment. Besides, including local communities in decision-making for sustainable tourism is very important. It engages people in processes through decision-making levels, gives chances for economic gains, and makes them willing to participate. Those are very anchor strategies for areas of sustainable tourism with cultural integration, community empowerment, and environmental responsibility at their core. While the holistic model of social and cultural heritage tourism emphasizes the urban landscape as the fundamental basis, it must be revised.

Cultural sites imply massive investments. This approach speaks, besides the tourists' experience at cultural sites, about the greatness of local customs, typical culinary delicacies, natural beauty, and attractions of surrounding villages, as well as evening attractions and programs organized by locals. Urban landscapes enable tourists to understand and enjoy destinations by supporting diversity and meeting various needs. If this model proves to be successful, with a focus on cityscapes, it will create affluent communities while sustaining cultural sites.

This research has relevant implications for developing sustainable tourism in cultural heritage areas. Provide a deeper understanding of the impact of tourism on community satisfaction. A holistic model integrating natural values, urban landscape, and empowerment of the local community in accepting sustainable tourism. The empowerment of local communities could enhance community life satisfaction and provide added value to local communities while providing a positive experience for tourists, strengthening tourism destination attractiveness, thus positively impacting the community in aspects of economic growth and sustainable development.

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SUSTAINABILITY STUDY AND MANAGEMENT SCENARIOS OF RAMMANG-RAMMANG GEOPARK, MAROS REGENCY, SOUTH SULAWESI PROVINCE

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Abstract

Rammang-Rammang Geopark has become one of the growing tourist destinations. The need for research aims to understand the sustainability status and implement sustainable tourism management strategies and scenarios in the area. The method used in this research is a descriptive method with a quantitative approach. Rapfish and MICMAC were used as analysis tools. The results of Rapfish analysis show that the environmental sustainability and institutional status are relatively positive and well-maintained, but improvements need to be made in the social and economic dimensions of the community. MICMAC analysis showed that variables such as protection and rehabilitation of local flora, community participation, and integration of management programs significantly influenced the management system. Therefore, the combination of the two analytical tools formulates a management scenario to increase community participation, sustainable tourism education, coordination between management agencies and environmental management, and economic diversification through promotion, marketing, and digital campaigns on environmentally oriented tourism in a more serious geopark area to ensure the sustainability of ecotourism aspects.

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INTRODUCTION

In the 2030 Agenda, policies and promotion of sustainable tourism can create employment opportunities and promote local culture and products to boost the economy (Bauer & Ap, 2004; Regulation of Ministry of Tourism and Creative Economy No. 9 of 2021, 2021). In Indonesia, and even in the world, tourism has become one of the most developed sectors and is used to improve a country's economy (Parmawati & Hardyansah, 2020). It can even shift the manufacturing industry sector (Wahono et al., 2019). Therefore, the development of tourism destinations must be carried out in an integrated, sustainable, and responsible manner to provide long-term benefits (Gale & Hill, 2009) by measuring how social and economic systems develop toward sustainability and require humans to live within certain limits and ensure the sustainability of natural resources for the next generation (Graymore, 2005). The case in the Rammang-Rammang Geopark tourist area is a growing destination, with the growth of tourists that continues to increase. So, with all the beauty shown, tourism in the Rammang-Rammang area becomes a potential for welfare because the high number of tourist visits can increase regional income, as in Figure 1 (Asro, 2023).

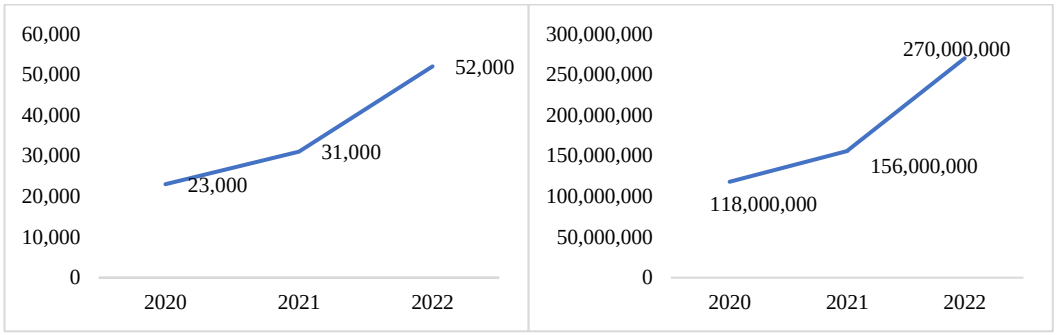

Figure 1. Visitor Data and Economic Income: (a) Visitor Data; (b) Tourism Turnover
Source: Kolom Desa, reprocessed from Asro, 2023

However, the increasing number of tourists will bring bad possibilities if not considered aspects of sustainability properly, such as the widespread number of buildings, loss of land cover, degradation, waste generation, and environmental pollution, which results in less aesthetics (Dwikorawati, 2012; Nunna & Banerjee, 2022). In addition, negative changes will occur if tourism development and management are solely economically oriented (Harahab et al., 2021). Therefore, it is essential to develop the Rammang-Rammang Geopark into sustainable tourism (Nurhayati et al., 2021) with a management system that considers environmental aspects because the ecosystem that is a natural tourist attraction has certain limitations. If these limits happen, it can damage and disrupt the ecosystem. According to residents and the researcher's observations, the development of tourists contributes to the increase of waste, the construction of villas around the riverbanks, the number of stalls that do not pay attention to environmental sustainability such as waste, and the potential for conflict between residents, stakeholders, and tourists.

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The urgency of this research lies in efforts to overcome the potential threats posed by tourism development, including environmental degradation and possible conflicts between interests, resulting in a decrease in the attractiveness and sustainability of geoparks as tourist destinations. Therefore, the research was to ensure the value of sustainability and long-term sustainability.

Thus, sustainable tourism becomes a significant part of planning and development because unplanned management results in big environmental problems (Raj Sharma & Bisht, 2019) so it needs to be done in an integrated, sustainable, responsible, and long-term oriented manner (Purwaningsih et al., 2021). There are two disadvantages if natural tourism is exploited without regard to sustainability aspects. First, tourist visits decrease due to the destruction of nature. Second is environmental degradation and reduced biodiversity (Adinugroho, 2021). Therefore, management scenarios are established to deal with the trade-off between economic progress and environmental damage (Wahono et al., 2019). Based on this background, the author formulated the purpose of this study to assess the sustainability status and formulate strategies and scenarios for sustainable tourism management in the Rammang-Rammang Geopark area.

METHODOLOGY

This research was a mixed method involving qualitative and quantitative approaches. Qualitative research explores existing facts using observation methods to inventory of environmental, social, economic, and institutional conditions (Creswell & Creswell, 2018). Quantitative analysis used the Rapfish Rap-Tourism method with Multidimensional Scaling (MDS) to assess the status and sustainability index of tourism management (Pitcher et al., 2013), and to determine sustainable tourism management scenarios with MICMAC analysis (Godet, 2006).

Location and Time of Research

Rammang-Rammang is in Salanrang village, Bontoa District, Maros Regency, South Sulawesi Province. It is approximately 32 km or 1 hour by land from Sultan Hasanuddin Airport, or a 5-minute drive from Makassar rail station. The research site map is in Figure 2. The study was conducted from August to November 2023.

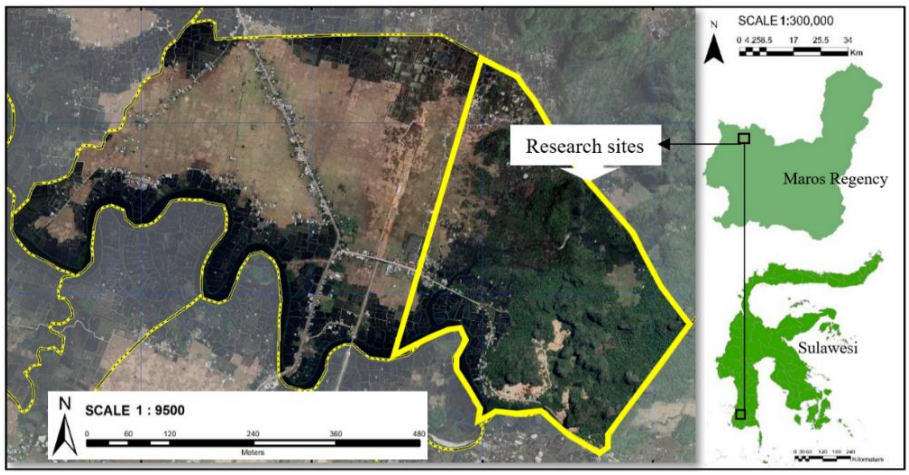

Figure 2. Research Location in Rammang-Rammang Geopark, Salenrang Village
Source: Author's primary data, 2023

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Data Collection Techniques

Data collection in this study used a combination of two methodologies, namely qualitative and quantitative. The first step was qualitative data collection using direct observation of environmental conditions, community involvement, and tourism administration in the Rammang-Rammang Geopark area. This observation was to get an authentic picture of the research location. In addition, secondary data was from previous research findings, reports, and information from relevant government agencies related to sustainable tourism management in Rammang-Rammang Geopark.

The second step is quantitative data collection through surveys using questionnaires administered to 49 respondents who are local residents actively involved in tourism management. The selection of respondents used a simple random sampling technique. The purpose of the questionnaire was to collect quantitative data regarding community involvement, perceptions, and judgements towards sustainable tourism management (Mappasomba & Haidir, 2024). In addition, secondary data were from previous research findings, reports, and information from relevant government agencies related to sustainable tourism management in Rammang-Rammang Geopark. Subsequent data collection for the Rapfish and MICMAC matrices involved seven expert respondents selected by purposive sampling. These experts represent academics, tourism industry professionals, local government officials, and community leaders, aiming to gain comprehensive insights and viewpoints from experts regarding sustainable tourism supervision.

Data Analysis Techniques

Rapfish was a multi-disciplinary assessment technique used to evaluate sustainability (Pitcher & Preikshot, 2001), which evolved into rap-tourism and was employed to ensure the sustainability of natural resource management (Purwaningsih et al., 2020). The data analysis involved the Multidimensional Scaling (MDS) method, executed through two sequential stages (Santoso et al., 2023). Firstly, leverage analysis was employed to generate stress and the coefficient of determination (R2) values, providing insights into sensitive attributes or potential interventions that could enhance the sustainability status of the region. Secondly, Monte Carlo analysis estimates the impact of errors in the analysis process at a 95% confidence interval. The calculation method used in the MDS-RAPFISH analysis method was as follows (Hermawan et al., 2019; Yunus et al., 2023).

Standardize attribute scores to ensure consistent weighting and measurement scale alignment with the formula:

$$Xiksd = \frac{Xik - Xk}{Sk} \quad \text{...(1)}$$

Where:

Xiksd : the standard score value of the i-th region on each k-th attribute
Xik : the initial score value of the region to i on each k-th attribute
Xk : the mid-value of the score on each k-th attribute
Sk : the standard deviation of the score on each k-th attribute

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Compute the nearest distance based on the Euclidean distance using the given equation:

$$d12 = \sqrt{(x1 - x2)^2 + (y1 - y2)^2} \quad \text{...(2)}$$

Convert the Euclidean distance between two points (d12) into a two-dimensional Euclidean distance (D12) using the error value (e) in the equation:

$$d12 = a + bD12 + e \quad \text{...(3)}$$

Generate the minimal error value using Rapfish to derive the equation:

$$d12 = bD12 + e \quad \text{...(4)}$$

Compute stress values using the specified formula:

$$[Stress = \frac{1}{m}\sum_{k-1}^{m} \frac{\sum_i + \sum_j (D_{ijk} - d_{ijk})^2}{\sum_i \sum_j d_{ijk}^2}] \quad \text{...(5)}$$

Raptourism analyzed data to assess sustainability aspects across four dimensions: environmental, economic, socio-cultural, and institutional, conducted through several stages:

1. Determination of the sustainability dimension was based on field observations, library studies, and consultation with various stakeholders.
2. Each attribute within the dimensions was scaled based on scientific assessments by the researcher, ranging from 0 to 2, reflecting conditions from worst (0) to best (2).
3. The scores for each attribute were then analyzed multidimensionally using the Rapfish program to determine sustainability conditions, categorized as follows: Unsustainable (0.00-25.00), Less Sustainable (25.01-50.00), Sustainable (50.01-75.00), and Good or Very Sustainable (75.01-100.00) (Pitcher et al., 2013).

Variables and research data sources used for analyzing sustainability using the Raphtourism technique are in Table 1.

Table 1. Variables Data Raptourism

No.	Dimension	Attribute
1.	Environmental Dimension	Water safety and quality management.
		Prohibition of flora destruction.
		Protection and rehabilitation of local flora.
		Waste management program.
		Deterioration of surrounding ecosystem resources.
		Environmental management and protection.
2.	Economic Dimension	CSR fund support.
		Accessibility of tourist areas.
		Government budget for tourism management.
		The average income of the community.
		Community welfare level.
		Community involvement in local businesses.

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No.	Dimension	Attribute
3.	Social Dimension	Researcher's attention to the tourist area.
		Level of community education.
		Level of conflict between community members.
		Damage to tourism resources by the community.
		Community participation in tourism management.
		Community knowledge about sustainable tourism.
4.	Institutional Dimension	Integration of management programs.
		Level of community compliance.
		Availability of formal regulations.
		Involvement of community institutions.
		Local government commitment to conservation.
		Area legality.

Source: Authors' analysis, 2023

In the MICMAC analysis, the technical stages consisted of several significant steps. First, eleven key variables relevant to sustainable tourism management in the Rammang-Rammang Geopark were determined by identifying them in Table 2. Next, the level of influence and dependency between variables was assessed by assigning a score to each pair of variables based on the level of direct influence they had, using a rating scale from 0 to 4 (Ariyani et al., 2022; Wu et al., 2023).

The next step is to input the assessment data into the MICMAC software for further processing and analysis and a direct influence matrix analysis to determine the variables that fall into four quadrants. After that, a variable classification analysis is conducted based on the dependency and influence level to determine the most influential and dependent variables in the system (Fauzi, 2019). From the results of the analysis, the final step is to formulate appropriate management strategies and action scenarios to improve the sustainability of tourism management in the tourism area.

As indicated in Table 2, eleven variables are employed as leverage points for the sustainability analysis of the Rammang-Rammang Village Tourism area for the MICMAC analysis.

Table 2. Variables Data MICMAC

No.	Abbreviation	Variable
1.	PERLO	Protection of Local Flora Rehabilitation
2.	KSDE	Damage to Ecosystem Resources
3.	LPF	Prohibition of Destruction of Flora
4.	PM	Community Participation
5.	EDUMAS	Community Education Level
6.	TPMWB	Public Knowledge about Sustainable Tourism
7.	TKM	Community Compliance Rate
8.	TPM	People's Income Level
9.	APPK	Area Management Government Budget
10.	AKW	Tourist Area Accessibility
11.	LK	Area Legality

Source: Authors' analysis, 2023

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FINDINGS AND DISCUSSION

Characteristics of Respondent

Based on the analysis of questionnaires, interviews, and various supporting sources used in this study, we observed the respondents' gender as one of the relevant aspects. The data indicated that out of the total 49 respondents involved in this study, 78% were male, while female respondents accounted for 22%. This data served as the first step in understanding the characteristics of respondents and could be the basis for further exploration in the context of other research variables.

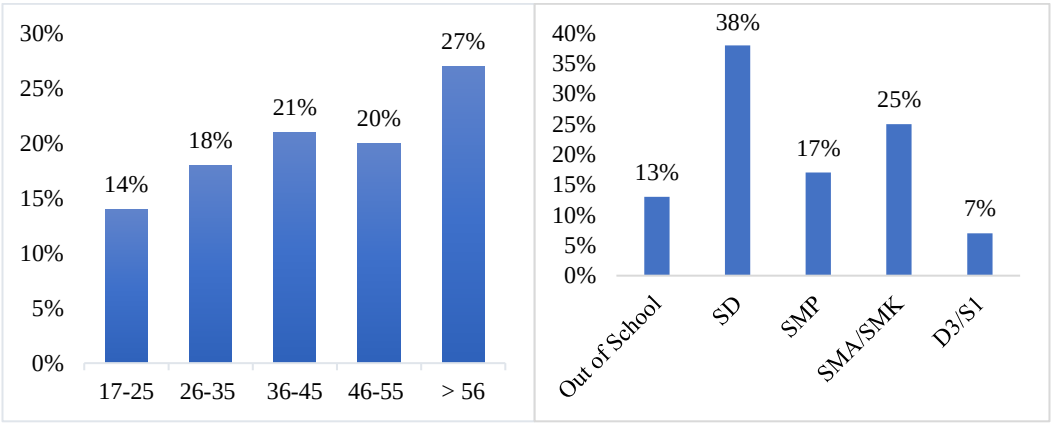

Figure 3. Characteristics of Respondents: (a) Characteristics of Respondents by Age; (b) Characteristics of Respondents based on Education
Source: Processed from primary data, 2023

Characteristics based on age groups involved in managing tourism activities showed that individuals aged 56 years and over had the highest level of engagement, comprising approximately 27% of the total sample (Figure 3). However, overall, respondents showed equal involvement on average. This analysis revealed diversity in age distribution within the study sample. It indicates that age variation was not dominated by a specific age group but involved productive ages. Regarding education, the dominance of lower levels of education among community members was noted, with some individuals having no formal education. It highlights a significant concern for developing the quality of community resources, particularly in education related to tourism management, environmental conservation, and the creative economy, as part of efforts to enhance living standards and welfare.

Rapfish Analysis for Environmental Dimensions

The data in Figure 4 showed that the attribute which had the most influence on the overall change in status in environmental management was the protection and rehabilitation of local flora, followed by general environmental management and protection and prevention of damage to neighboring ecosystems. Focusing on these attributes greatly supported the success of environmental management and conservation. Other attributes, such as water safety and quality and waste management, had less influence but were still important to manage effectively. The data showed that protection and restoration initiatives

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aimed at the local flora promote environmental sustainability within the Rammang-Rammang Geopark. Various native flora was a fundamental aspect of the karst environment and enhanced the attractiveness of ecotourism in the area. Furthermore, the importance of prohibiting damage inflicted on the flora underscored the need for strict regulations and law enforcement to mitigate the adverse effects of human activities on plant life.

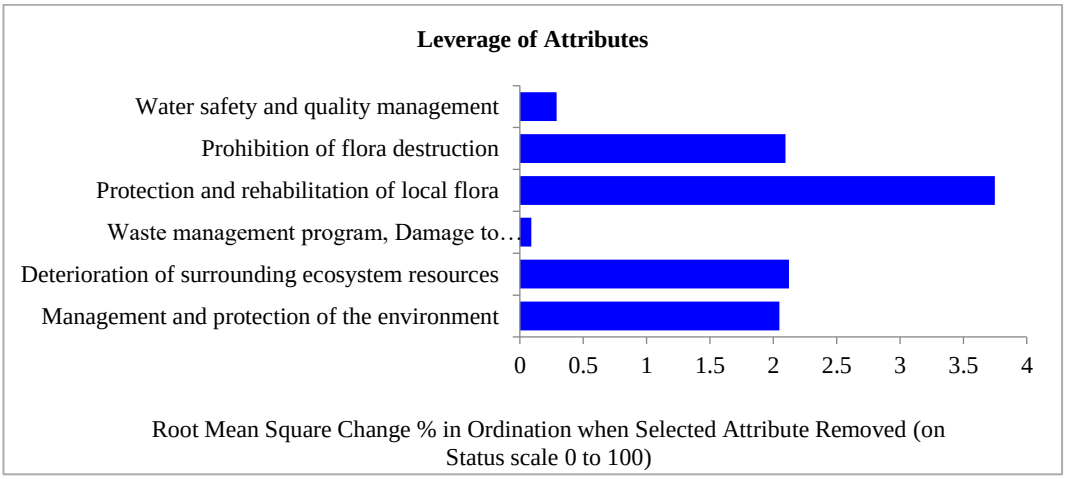

Figure 4. Environment Dimension State
Source: Processed from primary data, 2023

According to Iwan Dento, one of the environmental activists who campaigned for environmental sustainability in Rammang-Rammang began his social action, which includes efforts to preserve land, restore endangered ecosystems, or reduce air and water pollution. In addition, good waste management is also highly considered to maintain ecological balance by minimizing the generation of hazardous waste and encouraging waste recycling.

It was important to remember that environmental protection was a shared responsibility, and collaborating with external parties, such as environmental groups or local governments, was crucial to achieving environmental sustainability. Therefore, local communities were involved in environmental management, creating awareness about the importance of environmental protection.

Rapfish Analysis for Economic Dimensions

The data in Figure 5 showed that the most influential attribute on the overall status change in tourism management and community welfare was the average income followed by the government budget for tourism management. CSR fund support, accessibility of tourist areas, and the level of community welfare were also influential but on a smaller scale. Therefore, focusing on improving the economic welfare of the community and adequate government budget allocation supported the success of tourism management and the improvement of local community welfare.

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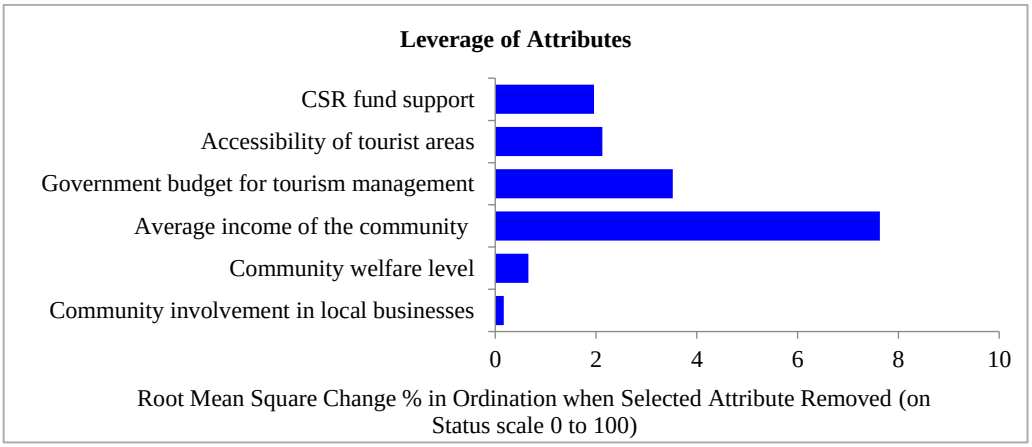

Figure 5. Status of the Economic Dimension
Source: Processed from primary data, 2023

These efforts are a step towards ensuring the long-term economic sustainability of local communities that depend on tourism activities. Therefore, the involvement of donor organizations, government agencies is needed to assist communities in various programs that foster their creativity, investment in business capital and marketing strategies.

Overall, this leverage analysis emphasized the importance of increasing community income, adequate government budget allocation, good accessibility to tourist areas, and support from CSR funds in maintaining the economic sustainability of tourism management. Therefore, long-term economic sustainability had to be prioritized by considering creative efforts to create marketable products and services offered to tourists. These efforts were a step towards ensuring the long-term economic sustainability of local communities that depended on tourism activities. Therefore, communities need donor organizations and government agencies to assist in various programs that foster their creativity, investment in business capital, and marketing strategies.

Rapfish Analysis for Social Dimension

The data in Figure 6 showed that the attributes that influence on the overall status change in tourism management and conservation were the level of community education and participation in tourism management. Local communities' knowledge of sustainable tourism also influences on sustainability. Factors such as the attention of researchers, the level of conflict within the community, and the damage to resources caused by tourism activities, as perceived by the community, had a small influence but were still important to consider. In addition, improving community education and participation supported the success of sustainable tourism management and conservation activities.

In general, the interpretation of these data suggested that the development and improvement of community education, encouraging the active involvement of communities in overseeing tourism activities, and efforts to reduce potential conflicts within communities were essential elements to uphold the social sustainability of tourism management.

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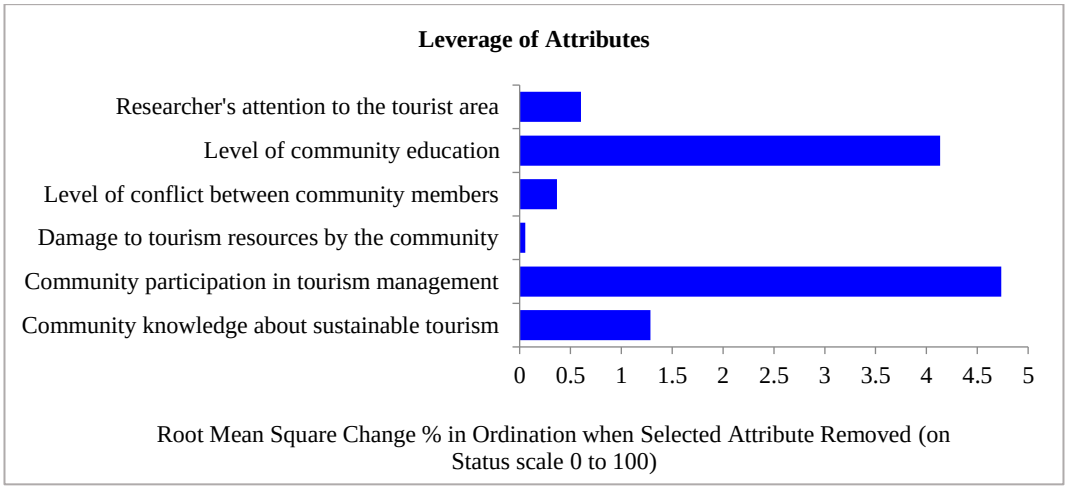

Figure 6. Social Dimension Status
Source: Processed from primary data, 2023

The empowerment process involves granting autonomy rights to communities or social organizations to participate actively in decision-making processes (Kumar et al., 2022). In addition, social sustainability relied on the issue of equality without discrimination and ensuring that every citizen had an equal opportunity to be involved in management (Gianfate et al., 2020). By placing a community empowerment orientation based on the principles of justice and social welfare, it was expected that local communities could contribute to tourism development.

Social sustainability depended on equality without discrimination and ensuring every citizen had an equal opportunity to be involved in tourism management. By placing the orientation of community empowerment based on the principles of justice and social welfare, it was hoped that local communities could contribute to more friendly-sustainable tourism development.

Rapfish Analysis for Institutional Dimensions

Overall, the data in Figure 7 emphasized the importance of area legality, community compliance, integration of management programs, and local government commitment in tourism and conservation management. Formal regulations and government commitment integrated with tourism activity programs ruled and impacted the overall status. It meant that legal certainty related to the tourism area greatly influenced the success of tourism management and conservation efforts, leading to positive impacts on environmental sustainability and local community empowerment, especially tourism businesses. The community's institutional system had functioned well, as indicated by the establishment of a management organization structure, direct involvement, and effective policies. This stability was supported by an institutional management system oriented towards tourism village management, based on the level of participation and awareness of the importance and benefits of tourism villages for employment, economic improvement, and welfare.

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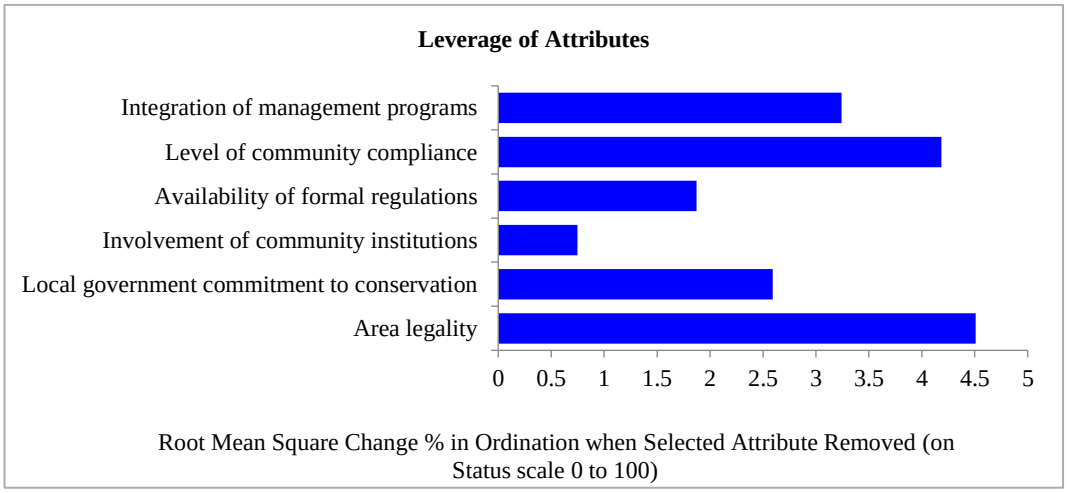

Figure 7. Status of Institutional Dimension
Source: Processed from primary data, 2023

By maintaining openness, accountability, and good governance, communities were better equipped to deal with potential changes and challenges that could impact community institutions. Therefore, it was critical to maintain the integrity of each individual and community group. Transparent management and community engagement were valuable components in maintaining the sustainability of tourism villages, ensuring that all parties with an interest in policy and resource management could access information transparently, thereby building trust and fostering cooperation between communities to identify potential solutions and problems (Rukmiyati et al., 2023).

Accountability was thus a key component of organizational/institutional sustainability. By maintaining openness, accountability, and good governance, communities could keep the sustainability index score on the institutional dimension high and be better prepared to deal with changes and challenges that could affect community institutions. Hence, it was necessary to maintain the integrity of each individual and community group. Overall, the raptourism data analysis indicates sustainable outcomes, consistent with the data analysis presented in Figure 8.

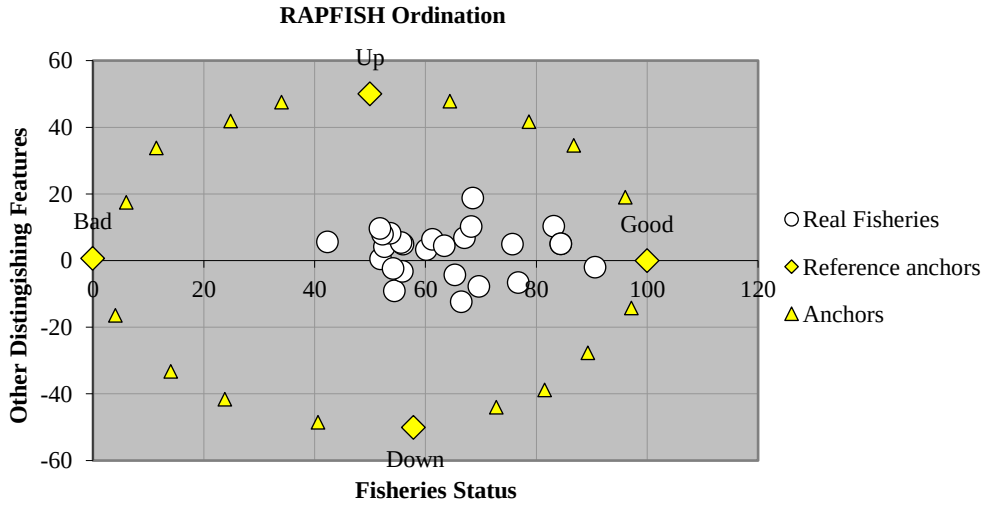

Figure 8. General Status of Sustainability
Source: Processed from primary data, 2023

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The Raptourism chart illustrated the integrated sustainability status across dimensions, where proximity to the zero point indicated a lower level of sustainability, and conversely, greater distance from the zero point signified a higher level of sustainability (Fauzi, 2019). Based on the chart analysis across all dimensions, it was evident that the social dimension had the lowest sustainability level among the four analyzed dimensions. Therefore, special attention was needed to manage the Rammang-Rammang Geopark tourism area, particularly in addressing the social dimension to enhance its sustainability, as presented in Table 3 and Figure 9.

Table 3. MDS Validation and Accuracy

Dimensions	Sustainability Indeks Value %				
	Rapfish	Stress	RSQ	Montecarlo	Difference
Environment	66.20	0.16	0.94	67.09	0.89
Economic	55.78	0.15	0.94	56.21	0.43
Social	49.97	0.15	0.94	50.15	0.18
Institutional	81.40	0.14	0.95	80.00	1.40

Source: Processed from primary data, 2023

Figure 9. Radar Chart
Source: Processed from primary data, 2023

From this analysis, the environmental dimension scored 66.20%, the institutional dimension scored 81.40%, and the economic dimension scored 55.78%, indicating a fairly sustainable status. However, the social dimension scored 49.97%, signifying a less sustainable status. Considering this situation, effective management of sensitive attributes was needed to prevent or mitigate the decline in sustainability status and to promote an improvement in the sustainability status of other dimensions.

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MICMAC Analysis

The direct influence graph presented in Figure 10 showed the relationships and interrelationships between various variables that affected the sustainability of ecotourism management in Rammang-Rammang Geopark. This graph provided a clear visualization of variables that had a strong, moderate, or weak influence on others in the system. The figure showed that several variables had a strong influence (depicted by a red line) on other variables, such as:

1. PERLO (Protection and Rehabilitation of Local Flora) had a strong influence on the variables KSDE (Damage to Ecosystem Resources) and LPF (Prohibition of Flora Destruction).
2. KSDE (Damage to Ecosystem Resources) had a strong influence on the variables PERLO, LPF, PM (Community Participation), and TKM (Community Compliance Level).
3. TKM (Level of Community Compliance) had a strong influence on the variables KSDE, EDUMAS (Level of Community Education), and TPMWB (Community Knowledge of Sustainable Tourism).

It showed that efforts to protect and rehabilitate local flora, prevent damage to ecosystem resources, and maintain the level of compliance and community participation had a very strong influence in sustaining the management of ecotourism in Rammang-Rammang Geopark.

On the other hand, some variables had a weaker influence (depicted by blue or green lines) on others, such as TPM (Community Income Level), APPK (Government Budget for Area Management), AKW (Tourist Area Accessibility), and LK (Area Legality).

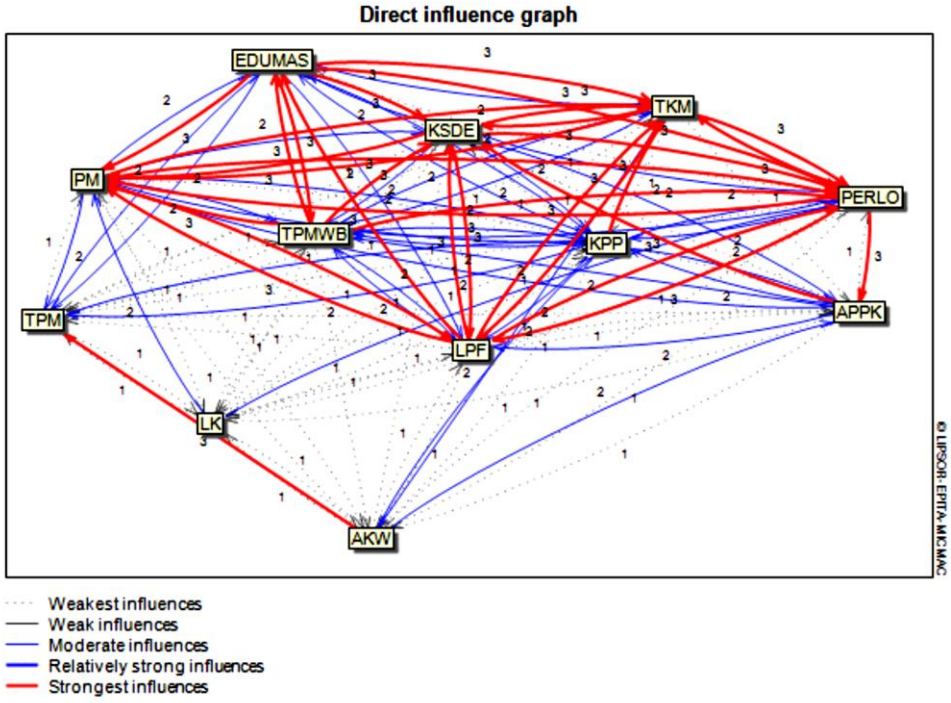

Figure 10. Direct Influence Graph
Source: Processed from primary data, 2023

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The interpretation of the graph showed that environmental factors such as protecting flora, preventing ecosystem damage, and encouraging community involvement and compliance strongly impact on the sustainability of tourism management. Therefore, the management strategy approach prioritized these variables. However, other factors such as community income levels, government assistance, ease of access, and the legal status of the area also played a noteworthy role in this framework. Although their influence was relatively weaker, these factors still required careful monitoring and addressing to uphold the overall sustainability of ecotourism management.

From the analysis results presented in Figure 11, the image showed a direct influence/dependence map, a visual representation of the relationships and dependencies between various factors in a given system or analysis. Here's an interpretation of the information presented in the image.

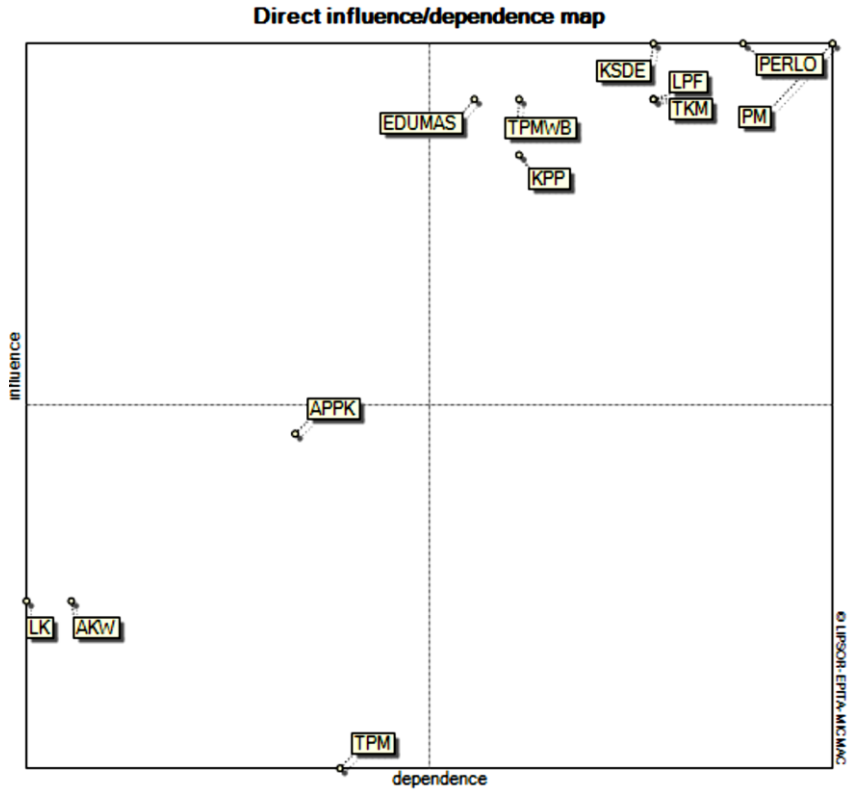

Figure 11. Direct Influence and Dependence Map
Source: Processed from primary data, 2023

The map has four quadrants, each representing a different category of factors based on their level of dependence and influence on other factors. Quadrant II (Relay Variables): This quadrant contained factors that had a high level of dependence on others while also significantly influencing on other factors. The factors in this quadrant were crucial and interconnected within the system. Some of the factors in this quadrant included:

1. PERLO (Protection and Rehabilitation of Local Flora): This factor had a high dependence on various other factors in the analysis, showing that the protection and rehabilitation of local flora was one of the essential factors in the Rammang-Rammang Geopark management.

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2. KSDE (Damage to Ecosystem Resources): This factor also had a high dependence on other factors and had a significant impact. It shows that efforts to reduce damage to ecosystem resources impact the sustainability of the region.
3. LPF (Prohibition of Flora Destruction): The prohibition of the destruction of flora impacts various other factors, but it also depends on certain factors. It emphasizes the importance of policies and rules related to the protection of flora within the Geopark area.
4. PM (Community Participation): Community participation was a key factor influencing many aspects of area management. This factor had a significant impact on various other factors in the analysis.
5. EDUMAS (Community Education Level): The education level of the community influences the system and has high dependencies on other factors. Community education plays an important role in the management of tourist areas.
6. TPMWB (Public Knowledge about Sustainable Tourism): Public knowledge about sustainable tourism in Quadrant II, with significant impact and dependence on other factors. It shows the importance of public knowledge related to sustainable tourism in the context of Geoparks.
7. TKM (Community Compliance Rate): Community compliance with rules and regulations influenced various other factors in the analysis. This factor had a significant impact and high dependence on others.

These factors were highly dependent on other factors in the system, but at the same time, they significantly impact other factors. They were considered key variables that needed to be carefully managed and addressed, as changes in these factors could have ripple effects throughout the system.

Quadrant IV (Autonomous Variables): This quadrant contains factors that have a low level of dependence on other factors but significantly influence others. These factors are relatively independent but still play an important role in the system. The factors are:

1. TPM (Community Income Level): Community income levels impact factors in the system, although they are less dependent on other factors. It shows the importance of the community economy in the context of tourism area management.
2. APPK (Government Budget for Area Management): The government budget for area management significantly impacts area management, although it does not depend heavily on other factors.
3. AKW (Tourist Area Accessibility): Tourist area accessibility affected various other factors in the system but does not have a high degree of dependence on other factors.
4. LK (Area Legality): Area legality is an important factor in tourism area management and significantly impacts other factors in the analysis.

While these factors are less dependent on other factors in the system, they can still substantially impact the overall dynamics. They might require focused attention and management, as they could influence other factors despite their relative independence.

The interpretation of this direct influence/dependence map highlighted the complex relationships and interdependencies among various factors within the system being analyzed. It helped identify the key variables that needed to be prioritized and managed

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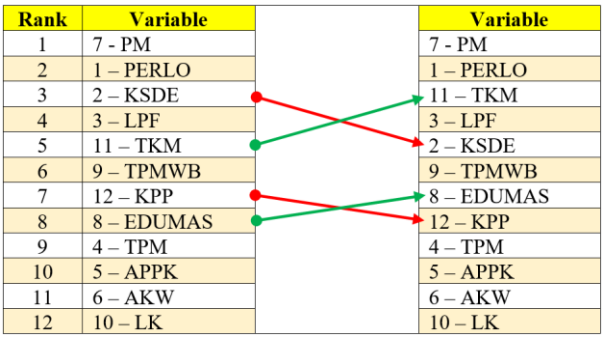
carefully and the relatively independent factors that could still have significantly impact the overall system.

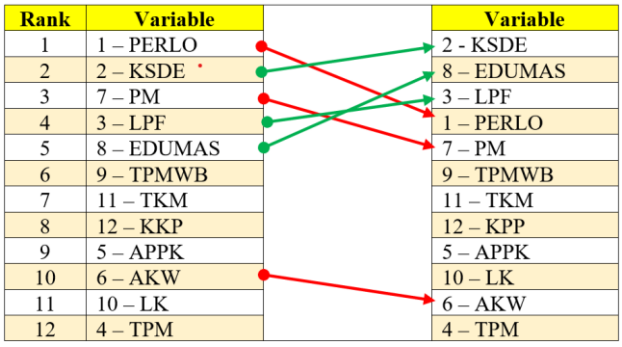
Classement par dépendance shown in Figure 12 is an analysis that classified variables based on dependence and influence in the system. In the results of this classification, variables were ranked based on the degree of dependence and their influence on other variables in the system.



Rank	Variable	Variable
1	7 - PM	7 - PM
2	1 – PERLO	1 – PERLO
3	2 – KSDE	11 – TKM
4	3 – LPF	3 – LPF
5	11 – TKM	2 – KSDE
6	9 – TPMWB	9 – TPMWB
7	12 – KPP	8 – EDUMAS
8	8 – EDUMAS	12 – KPP
9	4 – TPM	4 – TPM
10	5 – APPK	5 – APPK
11	6 – AKW	6 – AKW
12	10 – LK	10 – LK

Figure 12. Classification of Variables by Dependencies and Influences in the System
Source: Processed from primary data, 2023

Classifying variables according to their influence in this classification indicated that variables were classified based on their level of influence in the system (Figure 13). Variables that had more influence were ranked higher. The variables that were ranked higher on this list were those that had a greater impact in the system (Godet, 2006). The management of the Rammang-Rammang Geopark area had to pay close attention to the influencing variables, while the affected variables could be the focus of actions needed for better and more sustainable management efforts.



Rank	Variable	Variable
1	1 – PERLO	2 - KSDE
2	2 – KSDE	8 – EDUMAS
3	7 – PM	3 – LPF
4	3 – LPF	1 – PERLO
5	8 – EDUMAS	7 – PM
6	9 – TPMWB	9 – TPMWB
7	11 – TKM	11 – TKM
8	12 – KKP	12 – KPP
9	5 – APPK	5 – APPK
10	6 – AKW	10 – LK
11	10 – LK	6 – AKW
12	4 – TPM	4 – TPM

Figure 13. Classification by Degree of Influence in the System
Source: Processed from primary data, 2023

Based on the analysis using Direct Influence measurements, Classement par dépendance, and Classify Variables According to The Influence, a management strategy for the Rammang-Rammang Geopark area was formulated in Table 4.

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Table 4. Management Strategy

No.	Management Strategy	Empowered Variables (Influential Variables - Red)	Affected Variables (Dependent Variables - Green)
1.	Strengthen the Protection of Local Flora	(Damage to Ecosystem Resources)	-
2.	Overcoming Damage to Ecosystem Resources	(Protection of Rehabilitation of Local Flora), (Prohibition of Destruction of Flora)	-
3.	Increase Community Participation	(Protection of Rehabilitation of Local Flora), (Damage to Ecosystem Resources), (Prohibition of Destruction of Flora)	-
4.	Improving Education and Knowledge	(Protection of Rehabilitation of Local Flora), (Prohibition of Destruction of Flora)	-
5.	Drive Compliance	(Damage to Ecosystem Resources)	-
6.	Budget Management Funds	(Accessibility of Tourist Areas), (Area Legality)	-
7.	Improve Accessibility	-	(Protection of Rehabilitation of Local Flora), (Damage to Ecosystem Resources)
8.	Strengthening the Legal Framework	-	(Protection of Rehabilitation of Local Flora), (Prohibition of Destruction of Flora)
9.	Management Program Integration	-	-
10.	Monitoring and Evaluation	-	-

Source: Authors' analysis, 2023

The next step is to combine the analysis of Rapfish and Micmac, then formulate a scenario model of the management action of the Rammang-Rammang Geopark area in Table 5.

Table 5. Action Scenarios

No.	Management Scenarios	Action
1.	Strengthening Local Flora Protection	Form a special team for the protection of local flora. Monitoring and replanting of local flora.
2.	Handling Damage to Ecosystem Resources	Identify areas with severe ecosystem damage. Implementation of a targeted and sustainable recovery program.
3.	Active Community Participation	Training and education programs for local communities. Encourage active participation in management and monitoring decisions.
4.	Education and Community Knowledge.	Continuing education programs in local schools. Workshops and training programs to increase knowledge about sustainable tourism.
5.	Monitoring and Enforcement	Increased enforcement of rules and regulations that protect the region. Patrol and routine monitoring.
6.	Adequate Budget Allocation	Ensure adequate budget allocation for area management. Use of budget for facility maintenance, environmental restoration, and awareness campaigns.

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No.	Management Scenarios	Action
7.	Improve Accessibility	Improve accessibility to the Geopark area with sustainability in mind. Improved road infrastructure and public transport accessibility.
8.	Strengthening the Legal Framework	Strengthen the legal framework that protects the region and regulates activities that damage the environment.
9.	Management Program Integration	Ensure that all management programs are well integrated and coordinate with stakeholders.
10.	Continuous Monitoring and Evaluation	Implement an ongoing monitoring and evaluation system to ensure that management scenarios are on track.

Source: Authors' analysis, 2023

Table 5 summarizes actions to be taken in each management scenario to maintain the sustainability of the Rammang-Rammang Geopark area. In its implementation, it was important to involve all relevant parties and continuously monitor the impact of these actions.

Ramang-Ramang Geopark Development Strategy

A comprehensive development strategy is needed to facilitate international recognition of the Ramang-Ramang Geopark by UNESCO to encompass conservation initiatives, advancement of public education and awareness programs, empowerment of local communities, sustainable infrastructure development, and the fortification of legal and institutional frameworks. All of which had to be implemented consistently and sustainably. This comprehensive approach was necessary for Ramang-Ramang to fulfil the global criteria set by UNESCO, thereby achieving recognition as a geopark of international status. The strategic steps required to secure UNESCO international recognition for Ramang-Rammang Geopark are in Table 6.

Table 6. Rammang-Rammang Geopark Sustainability Development Strategy based on UNESCO Standards

Strategy	Strategic Steps	Program Realization
Improved Environmental Conservation and Management	- Zoning of tourist areas	- Conservation Zoning was implemented in the form of restrictions on protected areas from tourist activities that had the potential to damage biodiversity and geology. - Tourism Zoning was established to restrict tourist travel activities in certain areas that were vulnerable to natural damage.
Enhanced Environmental Monitoring	- Drones and sensors were used to monitor environmental changes. - Communities engage in monitoring through training programs.	
Strengthening Education and Public Awareness	- Geopark Education Centre	- Facilities for geological education and conservation. - An integrated education program was created with a curriculum related to the protection and conservation of the geopark area in schools included in the Maros-Pangkep geopark zoning.

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Strategy	Strategic Steps	Program Realization
Awareness Raising through Educational Tourism Activities	- A tour community was created that offered geological and conservation knowledge. - Visitors were educated so that before the tour, they were educated for about 5 minutes about the tourist and protected zoning areas.	
Local Community Empowerment and Engagement	- Local Economic Empowerment	- Local wisdom-based micro-enterprises were developed businesses derived from handicrafts and guide services from the surrounding community. - Capacity building through training and mentoring on entrepreneurship and environmentally friendly technology.
Community Involvement in Geopark Management	- The community was involved in geopark management decision-making. - A conservation volunteer program was initiated to invite the community to participate in nature protection and conservation programs.	
Eco-friendly Infrastructure Development	- Environmentally Friendly Infrastructure Development	- Green Transport was developed, such as local vehicles like dokars or bicycles. - Hotels, bungalows, or lodges were built using natural materials.
Waste and Waste Management	- A 3R program (Reduce, Reuse, Recycle) was implemented for waste management. - Waste management facilities were built at certain points to treat solid and liquid waste and also served as educational tools.	
Strengthening Legal and Institutional Aspects	- Legal Recognition and Protection	- Protection Status: Immediate legal sanctions were implemented in the form of laws or regional regulations to protect geoparks from exploitation by collaborating to obtain regulatory support.

Source: Authors' analysis, 2023

The Importance of Promotion and Marketing to Support Tourism Sustainability

Promotion and advertising were considered very important in driving the progress of sustainable tourism, especially in relation to achieving the goals of the 2030 Agenda. They were highly beneficial in increasing the influx of tourists, resulting in beneficial effects on the local economy and employment opportunities, as they facilitated market diversification, thereby attracting diverse segments of tourists.

In addition, the support and strengthening of local culture and products through digital promotion make local products such as handicrafts, traditional cuisine, and cultural artworks more recognizable and attractive to visitors. It increased demand for local products and aided in the preservation of cultural heritage, thereby increasing appreciation

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from tourists and locals alike, which encouraged the preservation of the traditions and cultural practices that characterized Rammang-Rammang.

Furthermore, promotional initiatives that conveyed educational messages about environmental conservation and local culture motivated travelers to engage in more responsible tourism activities. The application of digital platforms, including social media, websites, and mobile apps, are an efficient strategy to disseminate information on sustainable practices adopted in tourist destinations, promoting increased public awareness and participation in sustainable tourism. They are listed in Table 7 below.

Table 7. Promotion Strategy

Strategy	Key Initiatives	Implementation
Identity Development and Branding	Developing a Distinctive Image (Branding)	- Identified the uniqueness of Ramang-Ramang Geopark, such as its distinctive karst formations. - Determined key messages such as 'Sustainable Nature Tourism Destination.' - Designed a logo and slogan that reflected sustainability values.
Use of Digital Technology for Promotion	Optimization of Promotion and Marketing on Social Media Interactive Website	- Created educational content about conservation and sustainability. - Encouraged influencers to promote the geopark.
	Interactive Website	- Created a website with detailed and complete information about the geopark area. - Facilitated online booking of tour packages and travel guides.
	Utilizing Mobile Applications as a Means of Digital Education	- Developed a mobile application as an interactive tourist guide. - Created a loyalty program for tourists with sustainability-related incentives.
Strategic Partnerships for Promotion	Cooperation with Travel Agent	- Collaborated with travel agencies to create tour packages that included visits to Ramang-Ramang Geopark and other tourist destinations. - Promoted tourist accommodation that was consistent with the principles of environmental sustainability.
	Cooperation with International Tourism Networks and International Medians that Focus on the Development of Geopark Natural Destinations	- Collaborated with international media and civil society organizations to promote conservation efforts in Ramang-Ramang. - Collaborated with geopark tourist destinations around the world for cross-promotion and experience sharing
Education and Community Engagement	Promotion Training for Local Communities	- Trained locals to become tour guides and promote conservation values. - Engaged local residents as agents to promote geopark tourism
	Educational Programs for Visitors	- Organized workshops on sustainable tourism. - Provided on-the-spot learning experiences for travelers.

Source: Authors' analysis, 2023

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This study provides an understanding of the characteristics of the community involved in tourism management. Demographic data indicates that most respondents are male, with a dominance in the age group of 56 years and above. It reflects gender inequality in tourism management, despite the positive impact of women's involvement in tourism management, offering diverse perspectives and creating broader social impacts (Alarcón & Cole, 2019). Therefore, increasing women's participation in management activities is essential to achieve holistic sustainability in the context of the Rammang-Rammang Geopark.

The development of this tourist area requires a systematic methodology to gain international recognition, especially from UNESCO. An important component is the coupling of conservation initiatives with tourism management, which requires the protection of the biodiversity and geological features of the area. Strict enforcement of zoning regulations and rehabilitation of disturbed ecosystems are fundamental early actions. In addition, increased environmental education and awareness initiatives are essential to increase the knowledge and involvement of local communities and tourists in conservation efforts.

Rapfish Analysis observes comprehensive attention to environmental issues in tourism management in Rammang-Rammang Geopark. It is in line with the global emphasis on environmental sustainability in the tourism industry, emphasizing the importance of sustainable ecotourism management to protect natural heritage and biodiversity (Boley & Green, 2016). Forest protection efforts, waste management, and campaigns by environmental activists in Rammang-Rammang reflect positive steps. Nonetheless, cooperation with external parties, such as environmental groups or local governments, was identified as an important factor in achieving optimal environmental sustainability. In the economic dimension, Rapfish's results show increased income through tourism management. However, the study provides a warning that reliance on tourism as a source of income can be a long-term risk. Increased economic value through diversification of tourism products and services must be realized to reduce the risk of over-reliance (Solarin et al., 2023). Empirical studies and creative approaches are needed to create memorable travel experiences and compelling products, so that destinations remain attractive to tourists (Lončarić et al., 2021).

Rapfish's analysis shows that, despite the considerable focus on environmental issues in tourism management, collaboration with external entities, including environmental organizations and local governments, requires optimization to realise maximum environmental sustainability. In addition, increased community engagement and institutional optimizations are essential to ensure that geopark management is implemented in a transparent and inclusive manner. Diversification of the tourism economy should also be considered to mitigate the risks associated with long-term dependence on a single source of revenue focused solely on the tourism sector.

The social dimension shows that community participation is still suboptimal. Community empowerment and improvement of skills and resources are needed to increase participation in tourism management. The concept of equality without discrimination being essential to achieve sustainability was identified as a key element in achieving tourism sustainability (Okazaki, 2008). Community empowerment through improving skills and resources can help create a sense of belonging and responsibility towards tourism management (Patadjenu et al., 2023). Better accountability through increased participation

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and transparency can improve institutional effectiveness (Widhianthini, 2017). Therefore, suggestions to strengthen the structure and increase the involvement of all parties can contribute positively to institutional sustainability in the Rammang-Rammang Geopark.

The Montecarlo Analysis states that the sustainability index is classified as sustainable overall. However, environmental, economic, and social dimensions need further attention. The analysis results reveal an evaluation of four main dimensions to explore effectiveness and sustainability with management scenario analysis that focuses on 12 main interrelated aspects (Godet, 2006). The MICMAC analysis provides the foundation for more targeted management strategies, including strengthening the protection of local flora, addressing damage to ecosystem resources, and increasing community participation. The integration of Rapfish and MICMAC results in action scenarios that include strengthening local flora protection, addressing damage to ecosystem resources, increasing community participation, and increasing community education and knowledge. This scenario provides a concrete foundation to improve the sustainability of the Rammang-Rammang Geopark. Although the overall sustainability index is categorized as sustainable, the social and institutional dimensions require high attention. The level of community participation in tourism management remains suboptimal, indicating an urgent need to enhance community empowerment initiatives and improve available skills and resources.

In addition, the MICMAC analysis maps out a strategic basis for more targeted management, which includes measures to enhance protection of local flora, address degradation of ecosystem resources, and strengthen community participation. These initiatives will foster a sense of ownership and accountability towards tourism management that ultimately contributes to sustainability in all aspects. In effect, strong institutional governance and active involvement of all stakeholders can enhance institutional privilege in the sustainable management of this geopark.

Based on the research findings, strengthened policy implications include increasing women's participation in tourism management to achieve comprehensive sustainability. Additionally, optimizing external collaboration with environmental groups or local governments needs enhancement to attain optimal environmental sustainability. Encouraging tourism economic diversification is essential to reduce long-term dependency risks while enhancing community empowerment and skills is necessary for their increased involvement in tourism management. Furthermore, the improvement of institutional structures and engagement of all stakeholders is needed to enhance institutional sustainability.

In-depth impact and dependency analyses on environmental, economic, and social dimensions need to be conducted for a more comprehensive understanding. Further studies on the influence of community empowerment on participation in tourism management can also be a focus of future research, while the development of more specific management scenarios is required to support the sustainability of the Geopark Rammang-Rammang tourism area.

Then, proceed with promotion and marketing through the implementation of digital promotion strategies so that geopark tourism attraction can increase domestic and international tourists. The goal is not just an increase in tourist numbers but includes branding that resonates with sustainability principles, such as prioritizing environmental management and sustainability. In this context, promotion and marketing are not only a

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mechanism to attract tourist numbers but also an instrument to enlighten visitors on the importance of environmental protection and local cultural heritage. In addition, promotional efforts should support the diversification of tourism advantages, including the utilization of local handicrafts, promotion of traditional cooking, and cultural art performances, all of which can strengthen the local economy and protect cultural heritage.

CONCLUSION

The development of tourism villages in Rammang-Rammang Geopark has great potential in supporting environmental conservation and improve the welfare of local communities. This study shows that village tourism can be an effective instrument for conserving natural and cultural resources through active involvement of local communities and sustainable management.

In this analysis, the rate of the environmental and institutional dimensions is strong, while the Social and Economic dimensions need to be improved. In addition, sustainability and protection of local flora needs to be addressed proactively to ensure its sustainability due to their close relationship with ecological aspects. Important variables such as the protection and rehabilitation of local flora, community participation, and integration of management programs strongly influence on the tourism management system based on the MICMAC analysis. Therefore, to achieve sustainability in tourism management, management scenarios that focus on increasing community participation, sustainable tourism education, coordination between management agencies, and environmental management need to be strengthened because the sustainability of tourism management is not only seen from one aspect but includes various interconnected dimensions.

Because the sustainability of tourism management is not only seen from one aspect but includes various interconnected dimensions. Therefore, by identifying the four dimensions, this research demonstrates a holistic approach to evaluating the sustainability of tourism management in the area. The development of the management plan includes the identification of vulnerable areas as well as zoning mapping that separates open areas from others that need to be protected. Eco-friendly infrastructure planning, such as pedestrian paths and local transport, such as dokar and supporting facilities, is the key to minimizing negative impacts on the environment. In addition, awareness-raising and education through environmental campaigns and training for local communities on tourism management are strengthened, as local communities are the most potential tour guides.

Thus, a multidimensional approach to evaluating sustainability using four key dimensions serves as an important basic analytical framework for formulating appropriate management recommendations. The gist of this study is that a multidimensional approach to evaluating and achieving sustainability in tourism management is needed to enrich perspectives. In this study, important variables such as the protection and rehabilitation of local flora, community participation, and integration of management programs are very influential on tourism management. In addition, the promotion and marketing aspects are very influential on increasing the number of tourist visits which ultimately have an impact on community welfare provided that local communities are assisted in the manufacture of local products, providing support to small and medium enterprises related to ecotourism, such as homestays, handicrafts, and traditional cuisine. Thus, the proposed management scenario should focus on increasing community participation, ecotourism education,

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coordination between management agencies and environmental management, and collaboration between Geopark managers throughout Indonesia and local and international entrepreneurs to ensure that the economic benefits of tourism can ensure the sustainability of tourism in the area.

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THE KEY SUCCESS FACTOR FOR SUSTAINABLE RURAL TOURISM DEVELOPMENT IN MADURA USING INTEGRATION OF THE IPA-KANO MODEL

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Abstract

The momentum for the rise of global tourism after the COVID-19 pandemic has become an opportunity for developing local tourism and Indonesia's creative economy. One of the promising tourism regions in Indonesia is Madura. The tourism potentials on the island of Madura are historical, religious, natural, and cultural. Unfortunately, Madura's tourism potential has not been fully utilized, and as a result, the benefits have not emerged to strengthen the Madurese community's economy. In addition, tourism development directions are also partial without looking at environmental sustainability, community welfare, and other social aspects. Therefore, this research was conducted to determine the key success factors of sustainable tourism by integrating the Important-Performance Analysis method with the Kano model. This study was conducted in Sampang, Madura, specifically in a tourist village called Bira Tengah. The result of the study is that the tourist village should adopt key success factors such as leading to maintaining the destination environment, improving the contribution of tourists and local communities in area conservation, increasing the competitiveness of tourist destinations, conducting more intensive tourism promotions, creating fun tourism activities, increasing participation of the community and stakeholders of tourist villages, using local and environmentally friendly materials, improving the cleanliness of destinations, disseminating local cultural information and increasing employment opportunities. The cultural factors are a highlight in improving sustainable tourism performance. In addition, to enhance tourism performance, it needs to benchmark with developed and autonomous tourist villages that have demonstrated success in sustainable tourism.

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INTRODUCTION

Tourism is an alternative sector favored to boost the Indonesian economy amidst the sluggish industrial and trade sectors. Tourism is expected to increase its contribution to the Gross Domestic Product (GDP). During COVID-19, there has been a significant decrease in tourist visits by 87.8% (year on year) (Kemenparekraf, 2022). However, the Indonesian tourism sector is experiencing a gradual resurgence after the COVID-19 outbreak. The increase in tourist visits began at the beginning of 2022, with the number of foreign tourist trips to Indonesia increasing by 152% compared to January 2021 (Hutauruk, 2023). Meanwhile, the number of local tourist trips represents a 19.82% increase compared to the preceding year. Therefore, the Ministry of Tourism and Creative Economy of Indonesia is optimistic that the national tourism development programs are expected to attract 8.5 million foreign tourists, increase the movement of domestic tourists to reach 1.2–1.4 billion trips, and increase tourism foreign exchange by USD 10 Billion by 2023 (Kemenparekraf, 2022).

One of the promising tourism regions in Indonesia is Madura. Administratively, Madura is known as a region in the East Java province. It is separated from Java Island by the narrow Madura Strait. The government constructed the 5,438-kilometer Suramadu Bridge in 2009 as an accessibility gateway connecting the islands of Java (in Surabaya) and Madura (in Bangkalan). The tourism potentials of the isle of Madura are historical, religious, natural, and cultural, spread across the four regencies of Bangkalan, Sampang, Pamekasan, and Sumenep (Hanifah & Fitriyah, 2021). In addition, some famous tourist destinations are Karapan Sapi, Sape Sono, traditional dances, religious tourism, beach, and limestone hill views (Utomo, 2019). Madura is also famous for its culinary tourism, specifically satay and fried duck dishes.

Unfortunately, Madura's tourism potential has not been fully utilized, and as a result, the benefits have not emerged to strengthen the Madurese community's economy (Diskominfo East Java Province, 2015). Among the regencies in East Java province, the four regencies in Madura reveal high poverty rates. Notably, the regency of Sampang stands out, with the most significant proportion of impoverished people reaching 25.06%. The prevalence of poverty can be attributed to several factors, including low per capita income, limited access to education, a poor Human Development Index (HDI), and a lack of work opportunities (N. K. Sari et al., 2020).

Moreover, I. P. Sari et al. (2019) stated that the East Java province shows an average annual economic growth rate of 5.58%. In contrast, the regency of Sampang reports a modest economic growth rate of 3.26%. The HDI measurement indicates that Madura's overall development level is medium. However, it should be highlighted that the HDI for Sampang Regency is in the "low" category (58.54) (N. K. Sari et al., 2020). The HDI serves as a metric for assessing the influence of regional development performance, particularly economic growth. Therefore, it is essential for stakeholders, particularly the government, academics, and society, to engage in collaborative efforts aimed at developing the tourism sector for the welfare of the Madurese.

Unknowingly, all activities in the tourism industry can impact the environment and ecosystem (Pan et al., 2018). For instance, (1) CO2 emissions from global tourist travel reached around 1,302 million tons (Mt) of CO2, (2) the tourism industry has resulted in deforestation and endangered species, (3) minimal wastewater treatment, and (4) a lack of

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orientation towards the welfare of past and future communities (Astawa et al., 2018). As a result, sustainable tourism needs to be implemented to fulfill the needs of tourists and local communities while protecting their opportunities in the future through the development of the tourism sector.

According to the United Nations World Tourism Organization (UNWTO, 2016), sustainable tourism comprehensively considers the present and future economic, social, and environmental consequences. While also addressing stakeholders' requirements, such as tourists, the tourism industry, the natural surroundings, and the local community. Much literature has addressed sustainability issues extensively, typically about the growth of ecotourism, geo-tourism, sustainable tourism, and rural tourism (Shekhar, 2023). However, there needs to be more scholarly literature about sustainable tourist development in recent years, particularly concerning Indonesia (Kawuryan et al., 2022). In this way, tourism sustainability research in Indonesia still has excellent opportunities due to its strategic implications for the country.

Due to its considerable potential, developing Indonesia's sustainable tourism industry is essential. According to UNWTO guidelines, sustainable tourism development uses the Community-Based Tourism (CBT) pattern, local wisdom tourism development, tourist village development, and the partnership approach (Musaddad et al., 2019). The CBT approach has been widely promoted as a fundamental component of sustainable tourism development. CBT can be employed to evaluate the community's involvement and propose further actions (Zielinski et al., 2020).

The Bira Tengah tourist village in Sokobanah District is one of Sampang's most popular tourist destinations. The main attractiveness of the tourism industry in Indonesia lies in the pleasing appearance of its natural environment, including Lon Malang Beach. Lon Malang Beach is well-known for its clean white sand and shady pine trees along the coastline. In addition, the presence of tourist attractions such as cultural, culinary, and educational tourism enriches Bira Tengah as a tourist village. A tourist village traditionally integrates tourist attractions, supporting facilities, and accommodation (Hanifah & Fitriyah, 2021). Tourist villages are distinct rural areas with specific attributes that make them suitable for attracting tourists. Rural tourism is promising because of the ease with which visitors can access rural areas. There exist endeavors focused on enhancing rural development while concurrently prioritizing the principles of nature conservation. Strategies to sustain the rural economy are fostering investment, creating employment opportunities, and facilitating the establishment of new enterprises in rural areas. Finally, rural tourism possesses distinct characteristics and unique selling points, necessitating a heightened focus on preserving the rural area. Therefore, incorporating sustainable components into rural tourism is a significant movement to develop tourism (Polukhina et al., 2021).

Even though the Bira Tengah tourist village has become one of the most popular destinations, it has not been developed with sustainability in mind, as evidenced by the absence of integrated waste processing, inadequate sanitation, an issue in the quality of human resources in the tourism services sector, and limited community involvement in the planning and development of tourism sector. Additionally, increasing waste production, escalating water and energy consumption, and tourist behavior frequently adversely affect the physical environment and local culture (Sulistyadi et al., 2017). Nevertheless, rural tourism remains among the few economically feasible alternatives for rural areas.

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The consideration of Key Success Factors (KSFs) is crucial in implementing sustainable tourism, as these elements facilitate effective and efficient policy development and implementation by tourism industries, specifically in the context of Bira Tengah village. KSFs refer to the specific attributes, circumstances, or variables that, when effectively upheld, preserved, or controlled, can substantially influence the achievement of a company engaged in competition within a specific industry (Leidecker & Bruno, 1984). Understanding tourist consumer behavior and travel characteristics is key to successful marketing (Juvan et al., 2017). This understanding enables a tourist destination to effectively and efficiently present tourism products and promotions by providing comprehensive information on consumer behavior. In addition, a study by Lun et al. (2016) stated that product and service characteristics, participatory approach, networking, visionary thinking, communication, and organization are key success factors identified in the development of rural mountain tourism.

In this research, we propose that the IPA-Kano model addresses the shortcomings of the Kano model by acknowledging the significance of attribute performance (IPA) and effectively mitigating its weaknesses. The Kano model has successfully integrated with other methodologies in several domains (Lizarelli et al., 2021). Therefore, this study integrates the Kano model into an IPA methodology to prioritize attributes. The attributes are called KSFs in a tourist village. Moreover, Wu et al. (2010) argued that integrating IPA and KANO successfully identified KSF in an enterprise to formulate appropriate strategies.

This paper is organized as follows: Section 2 presents a comprehensive research method employed in the study, including the design of the research instrument. Section 3 presents the findings and subsequent discussion, while Section 4 delves into the conclusions drawn from the study and their implications for managerial practices.

METHODOLOGY

This study employs a comprehensive methodology integrating Importance-Performance Analysis (IPA) and Kano's model to assess, define, and categorize the primary strengths and weaknesses of the vital success variables of the Bira Tengah tourist village. According to Martilla and James (1977), IPA is characterized by its easily understood, inexpensive, and ability to assist management in comprehending data and utilizing it for strategic decision-making. IPA produces the most crucial attribute of responsiveness. IPA enables the identification of attributes' strengths and weaknesses from the customers' perspective. IPA is achieved through the simultaneous evaluation of importance and performance. In addition, the Kano model was initially employed to enhance the quality of product development in the manufacturing sector, but it has subsequently found extensive application across diverse service industries (Lippitt et al., 2023). The KANO model is designed to enhance comprehension of consumer preferences, assess and comprehend quality characteristics, and prioritize traits that customers see as more significant to improve them (Kermanshachi et al., 2022).

The questionnaire was used to collect data from 100 tourists visiting the destination. The customer perspective is used to understand sustainable rural tourism because customer loyalty is essential for sustainability (An & Alarcón, 2020). The questionnaire comprehensively addressed all the sustainable tourism indicators and topic areas, consisting of 44 questions. Then, the data is processed through validity and reliability

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tests to ensure the instrument is accurate and consistent. Taherdoost (2016) suggested correlation analysis and Cronbach's correlation techniques to accomplish the instrument's validity and reliability tests. The data was subjected to statistical analysis to derive measures of frequency, percentage, mean, and standard deviation. The findings were displayed and accompanied by detailed explanations elucidating the content of the figures and tables.

According to Azzopardi and Nash (2013), the IPA possesses the capability to distinguish the key attributes that hold the greatest significance for customers, hence exerting the most substantial influence on their satisfaction. Additionally, IPA can effectively identify the characteristics that exhibit unsatisfactory performance and necessitate quick improvement. The IPA analysis uses a two-dimensional matrix, representing importance on the X-axis and performance on the Y-axis. This arrangement results in the formation of four quadrants.

The steps of Importance-Performance Analysis are as follows (Martilla & James, 1977):

1. Identifying the attributes to be measured. Attributes were determined based on the literature review, consisting of four variables with nineteen items shown in Table 1.
2. Distinguishing between the importance measure and the performance measure. Performance measurement on each item is conducted using a Likert-type scale of five numbers.
3. Placing the vertical and horizontal axes on the grid.
4. Calculating the median value, which serves as a measure of central tendency, is required.
5. Examining the important-performance grid:
    a. Quadrant 1 (maintain performance) is an area that shows high levels of expectations and performance.
    b. Quadrant 2 (exaggeration) is an area that shows a low level of expectations but a high level of performance.
    c. Quadrant 3 (low priority) is an area that shows low levels of expectations and performance.
    d. Quadrant 4 (top priority) is an area that shows a high level of expectations from indicators but a low level of performance.
6. The disparities observed in customer ratings have significant consequences for strategic decision-making.

Based on a literature review, Table 1 shows some variables and indicators contributing to sustainable tourism development.

Table 1. Variable and Indicators of Sustainable Tourism Development

Variable	Indicators
Environment (Pan et al., 2018)	Maintaining the destination environment (Astawa et al., 2018)
	Safe and healthy environment (Choi & Sirakaya, 2006)
	Availability of clean water sources (Hasanah, 2022)
	Waste management (Choi & Sirakaya, 2006)
	Tourist attractions are made from local and environmentally friendly materials (Van Magdalena, 2022)

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Variable	Indicators
	Destination cleanliness (Hasanah, 2022)
	Contribution of tourists and local communities in area conservation (Sulistyadi et al., 2017)
Culture (Pan et al., 2018)	Local cultural information (Choi & Sirakaya, 2006)
	Access traditional culture (Choi & Sirakaya, 2006)
	Protection of cultural heritage (Nižić & Drpić, 2013)
Economic (Pan et al., 2018)	A competitive destination (Khan et al., 2021)
	Tourism contribution to the local economy (Choi & Sirakaya, 2006)
	Employment opportunities (Astawa et al., 2018)
	Tourism promotion (Nižić & Drpić, 2013)
Social (Pan et al., 2018)	Tourist activities (Khan et al., 2021)
	Local community activities (Astawa et al., 2018)
	Society participation (Astawa et al., 2018)
	Stakeholder role (Khan et al., 2021)
	Tourist village (Sulistyadi et al., 2017)

Source: author's analysis, 2023

The Kano model refers to an evaluation tool on tourists' responses for each indicator, utilizing both functional and dysfunctional questions (Lippitt et al., 2023). The classification of indicators into six distinct categories: Must-be (M), One-dimensional (O), Attractive (A), Indifferent (I), Reverse (R), or Questionable (Q) is illustrated in Table 2.

Table 2. Evaluation of KANO

Customer Requirement		Dysfunctional				
		Like (5)	**Must-be (4)**	**Neutral (3)**	**Like with (2)**	**Dislike (1)**
Functional	Like (5)	Questionable	Attractive	Attractive	Attractive	One-Dimensional
	Must be (4)	Reverse	Indifferent	Indifferent	Indifferent	Must-be
	Neutral (3)	Reverse	Indifferent	Indifferent	Indifferent	Must-be
	Like with (2)	Reverse	Indifferent	Indifferent	Indifferent	Must-be
	Dislike (1)	Reverse	Reverse	Reverse	Reverse	Questionable

Source: Lippitt et al., 2023

The integration model provides a prioritized strategy by combining the results of the IPA matrix and the KANO model classification. The results can ascertain indicators that need to be maintained and improved.

FINDINGS AND DISCUSSION

Bira Tengah tourist village is one of the developing villages in the Sokobanah sub-district of Sampang, located on the north coast of Madura Island. The relevant village borders the Java Sea to the north. It shares a boundary with Pangerreman village in the west and Bira Timur village in the south and east (Jadesta Kemenparekraf, n.d.). Figure 1 illustrates a map of Madura Island and the specific locations of tourist villages.

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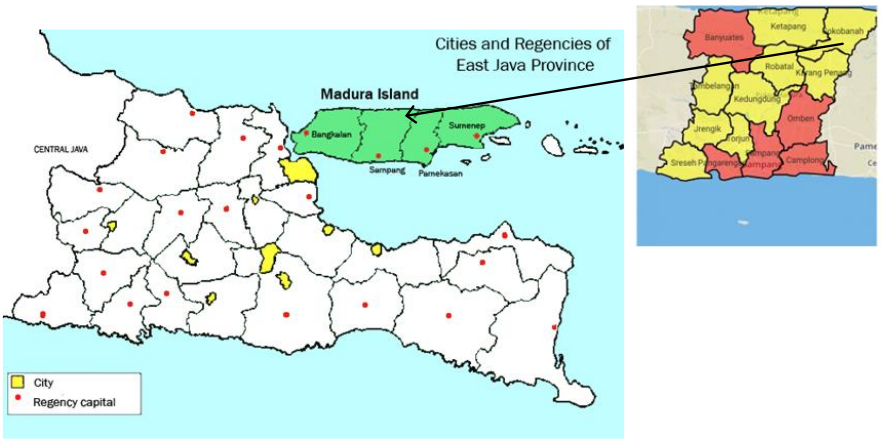

Figure 1. Map of Madura Island and the East Java Province
Source: modified from Arifhidayat, 2007

The survey was carried out in 2023 at Lon Malang Beach. A total of one hundred valid questionnaires were collected, resulting in a valid return rate of 96.15%. The measurement instrument's reliability is assessed using Cronbach's α, which considers four aspects: performance, importance, functional, and dysfunctional. It has been proposed that α exhibits a threshold or cut-off whereby a level of ≥ 0.7 is considered acceptable, sufficient, or satisfactory (Cortina, 1993). A correlation analysis was used to evaluate the construct validity of each item. The r-coefficient value of each indicator is compared to a cut value of 0.349.

Table 3 presents the demographic information collected in the survey, including age, gender, marital status, family size, educational background, and occupation. Tourists visiting Lon Malang Beach are predominantly women, single, aged 17-24, and high school students.

Table 3. Respondents Demographic Profile

Profile	Criteria	Sum
Age	17-24 years	55
	25-44 years	41
	45-54 years	4
Gender	Male	38
	Female	62
Marital Status	Married	41
	Single	59
Family size	2	11
	3	33
	4	43
	≥5	13
Education Background	High school	80
	Diploma	6
	Undergraduate	14
Occupation	Student	45
	Civil servant	4
	Private employee	5
	Entrepreneur	16
	Other	30

Source: primary data analysis, 2023

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Based on Figure 2, among these attributes, indicator number 6 has the highest importance (4.78), while indicator number 4 has the lowest perceived performance (4.43). The mean value for all indicators of importance is 4.58, while the mean perceived performance of all indicators is 4.54, indicating that it falls within the range of being satisfied and very satisfied. This finding suggests that tourist village management must improve their performance in tourism sustainability to get higher tourist satisfaction. At the same time, the gap between the level of importance and performance is not substantial.

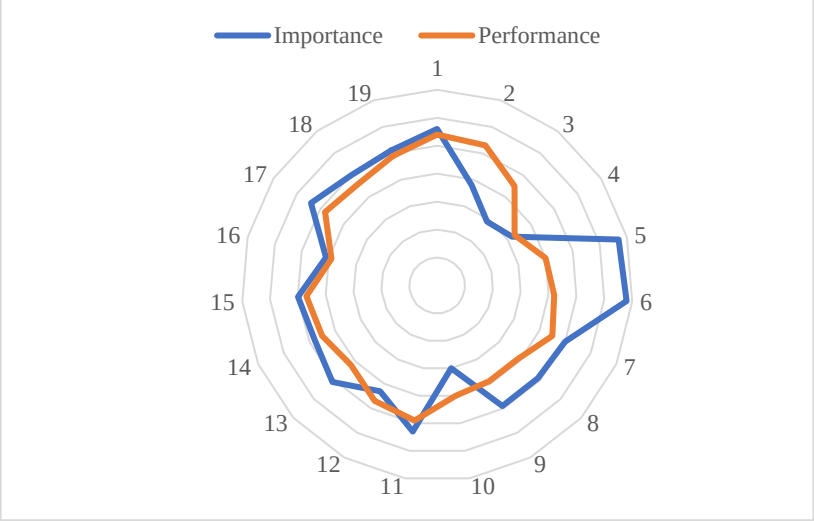

Figure 2. Diagram of the Average Level of Importance and Performance of Each Sustainable Tourism Development Indicator
Source: Primary data analysis, 2023

Figure 3 illustrates the primary strengths and weaknesses of the Bira Tengah tourist village in terms of key success factors. Sustainable tourism performance can be evaluated by stakeholders and destination managers (Agustina et al., 2024). The strengths of the eight important success factors are located in quadrant 1 (maintain performance), precisely indicators 1, 7, 11, 14, 15, 17, 18, and 19. These eight key successes are the main strength of the Bira Tengah tourism village. These include maintaining the destination environment, contributing to tourists and local communities in area conservation, creating a competitive destination, promoting tourism, promoting tourist activities, participating in society, having stakeholder roles, and creating a tourist village. On the other hand, it is observed that items 2, 3, and 12 are positioned inside quadrant 4 (top priority), indicating a low performance of the Bira Tengah tourist village from the perspective of tourists. These items include a safe and healthy environment, availability of clean water sources, and tourism contribution to the local economy sector. The Bira Tengah tourist village should prioritize addressing three identified weak indicators.

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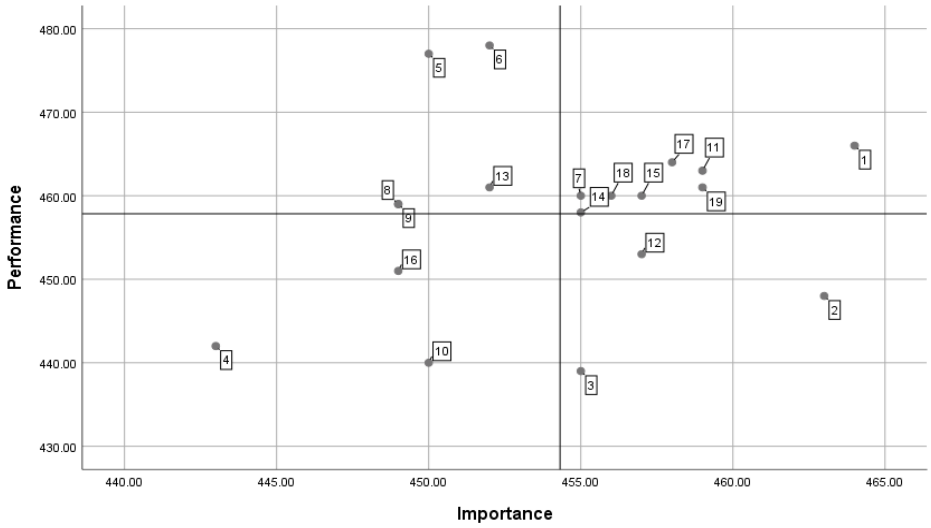

Figure 3. IPA Diagram Based on Sustainable Tourism Development Indicators in Four Quadrants
Source: Primary data analysis, 2023

Survey data is tabulated based on the categories attractive, must be, one dimensional, indifferent, questionable, and reserved. Afterward, a recapitulation was carried out to determine the Kano category for each indicator, as shown in Table 4. To categorize indicators, it is necessary to employ a formula that involves comparing the sum of the categories M, O, and A with the sum of the categories I, R, and Q. If (O + A + M) > (I + R + Q) then the grade is obtained from the maximum of (O, A, M). Conversely, if (O + A + M) < (I + R + Q), then the grade is obtained from the maximum of (I, R, Q) (Violante & Vezzetti, 2017). The result indicates that most of the indicators (12 indicators) fall into the category One Dimensional, then Attractive (5 indicators), and Indifferent (2 indicators), respectively.

Table 4. Sustainable Tourism Development Indicator Categories Based on the KANO Model

No	Indicator	A	M	O	I	R	Q	O+A+M	I+R+Q	Total	Category
1	Maintaining the destination environment	11	9	62	18	-	-	82	18	100	O
2	Safe and healthy environment	30	5	59	6	-	-	94	6	100	O
3	Availability of clean water sources	31	8	47	14	-	-	86	14	100	O
4	Waste management	36	6	39	19	-	-	81	19	100	O
5	Tourist attractions are made from local and environmentally friendly materials	19	13	34	34	-	-	66	34	100	O
6	Destination cleanliness	30	19	41	10	-	-	90	10	100	O

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No	Indicator	A	M	O	I	R	Q	O+A+M	I+R+Q	Total	Category
7	Contribution of tourists and local communities in area conservation	17	6	29	48	-	-	52	48	100	O
14	Tourism promotion	27	8	45	20	-	-	80	20	100	O
15	Tourist activities	14	6	63	17	-	-	83	17	100	O
16	Local community activities	22	14	47	17	-	-	83	17	100	O
17	Society participation	15	23	45	17	-	-	83	17	100	O
18	Stakeholder role	26	19	29	26	-	-	74	26	100	O
8	Local cultural information	34	6	15	45	-	-	55	45	100	A
11	A competitive destination	37	15	14	34	-	-	66	34	100	A
12	Tourism contribution to local economy	20	15	19	46	-	-	54	46	100	A
13	Employment opportunities	45	23	20	12	-	-	88	12	100	A
19	Tourist village	36	7	34	23	-	-	77	23	100	A
9	Access traditional culture	21	12	10	57	-	-	43	57	100	I
10	Protection of cultural heritage	15	10	11	64	-	-	36	64	100	I

Source: Primary data analysis, 2023

Table 5 categorizes each indicator of sustainable tourism development according to the frameworks of IPA, Kano, and integrated IPA-Kano models. Based on the integrated IPA-Kano model, it can be observed that six indicators are in the significant weapon category (1, 7, 14, 15, 17, and 18). Indicators 11 and 19 are placed in the precious treasure category, indicators 5 and 6 are placed in the supportive weapon category, indicators 8 and 13 are placed in the beginning jewelry category, indicators 4 and 16 are placed in the defenseless zone category, indicators 2 and 3 are placed in the defenseless strategy point category, and indicators 12 is placed in the dusty diamond category. Kuo et al. (2012) explained that the categories and strategies resulting from the integration of IPA and KANO are as follows:

1. Major weapon: The primary instrument the tourist village employs to deter competitors. Management must consistently exert efforts to uphold superior performance that challenges rivals. This particular category represents an indicator that necessitates continuous maintenance of its performance.
2. Precious treasure: The indicators in this category are attractive to tourists and thus become a valuable asset for the tourist village.
3. Supportive weapon: Indicators in this category have characteristics similar to "major weapons" but are still below them and less influential. Therefore, the indicators in this category can be called supporting weapons in terms of competing with competitors.

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4. Beginning jewelry: Indicators in this category are characterized by relatively low attractiveness and high performance and can be seen as the beginning of gems. This category has strategic priorities to maintain.
5. Defenseless zone: This category includes indicators that are not very important but remain a weak point. As a result, improvements are still needed.
6. Defenseless strategy point: Indicators in this category become weak points if attacked; it can have fatal consequences in tourist dissatisfaction. Indicators in this category must be subject to improvement. The more indicators in this category can be improved, the more tourist dissatisfaction can be eliminated.
7. Dusty diamond: The indicators of this category are like closed diamonds and need to be opened (fixed) to be able to see them. Indicators in this category are very important and improve performance effectively and can attract tourists.

Table 5. Integrated of the IPA-KANO in Sustainable Tourism Development

No	Indicator	IPA Quadrant	KANO Category	IPA-KANO	Decision
1	Maintaining the destination environment	1	O	Major weapon	Maintained
7	Contribution of tourists and local communities in area conservation	1	O	Major weapon	Maintained
11	A competitive destination	1	A	Precious treasure	Maintained
14	Tourism promotion	1	O	Major weapon	Maintained
15	Tourist activities	1	O	Major weapon	Maintained
17	Society participation	1	O	Major weapon	Maintained
18	Stakeholder role	1	O	Major weapon	Maintained
19	Tourist village	1	A	Precious treasure	Maintained
5	Tourist attractions are made from local and environmentally friendly materials	2	O	Supportive weapon	Maintained
6	Destination cleanliness	2	O	Supportive weapon	Maintained
8	Local cultural information	2	A	Beginning jewelry	Maintained
9	Access traditional culture	2	I	-	-
13	Employment opportunities	2	A	Beginning jewelry	Maintained
4	Waste management	3	O	Defenseless zone	Repaired
10	Protection of cultural heritage	3	I	-	-
16	Local community activities	3	O	Defenseless zone	Repaired
2	Safe and healthy environment	4	O	Defenseless strategy point	Repaired
3	Availability of clean water sources	4	O	Defenseless strategy point	Repaired
12	Tourism contribution to local economy	4	A	Dusty diamond	Repaired

Source: primary data analysis, 2023

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According to Purnomo et al. (2020), effective leadership, innovation, collaboration, and good governance are all necessary to achieve sustainable tourism in tourist villages. Sustainable tourism development entails more than preserving natural resources; it also increases tourist consumption. It also has significant consequences for fulfilling economic, environmental, and social aspects (Nižić & Drpić, 2013). Wilson et al. (2001) argued that the factors that contribute to successful rural tourism development include (1) the provision of a complete tourism package, (2) effective community leadership, (3) the endorsement and involvement of local government, (4) adequate financial resources for tourism development, (5) the implementation of strategic planning, (6) coordination and collaboration between business individuals and local leaders, (7) cooperation among rural tourism entrepreneurs, (8) access to information and technical support for tourism development and promotion, (9) the presence of well-functioning convention and visitors bureaus, and (10) widespread community support for tourism initiatives.

Complementing the results of previous research findings, the following are the key success factors for sustainable tourism development in developing tourist villages as follows: (1) Maintaining the destination environment (environment), (2) Contribution of tourists and local communities in area conservation (environment), (3) A competitive destination (economic), (4) Tourism promotion (economic), (5) Tourist activities (social), (6) Society participation (social), (7) Stakeholder role (social), (8) Tourist village (social), (9) Tourist attractions are made from local and environmentally friendly materials (environment), (10) Destination cleanliness (environment), (11) Local cultural information (culture), and (12) Employment opportunities (economic).

The KSFs have managerial implications for the sustainable management of tourist villages, encompassing environmental, social, economic, and cultural variables. The findings indicate that twelve indicators demonstrate strengths that should be maintained, while seven necessitate improvement. The Bira Tengah tourist village has been acknowledged at the national level for its institutional management and principles of CHSE (Cleanliness, Health, Safety, and Environment Sustainability) by the Indonesian Ministry of Tourism and Creative Industry. The management of tourist villages must continuously improve their sustainability performance, especially regarding cultural variables. For sustainable tourism activities, the local community's perspectives and active participation in the decision-making and execution of programs are crucial (Akinci & Öksüz, 2022). He et al. (2018) stated that the government's role in increasing the sustainability of rural tourism is to provide environmentally friendly incentives. Therefore, this achievement can be extrapolated to a broader context, encompassing many categories and types of tourist destinations beyond the scope of Bira Tengah village. This guidance can be utilized by any village embarking on developing tourist villages, such as start-up, growing, developed, and self-sufficient (Akbar & Safira, 2023).

However, future research is needed to assess the impact of resource allocation so that it can provide information to tourism village managers about the current status of optimizing resource allocation to the right areas. In addition, considering that human perception is fuzzy, an approach is needed to reduce uncertainty and eliminate bias from managers.

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CONCLUSION

The importance of sustainable development in solving the problems of developing rural tourism systems is increasing globally. Integrating the IPA-KANO model has led to the establishment of a set of key success indicators that can be outlined as a managerial tool for sustainable tourism development. Four factors are involved in sustainable rural tourism: social, cultural, economic, and environmental. The result shows that although 12 indicators show strengths that should be retained, seven must be improved. The study of sustainable tourist village development in Indonesia demonstrated how to find out what is being focused on with maintaining the destination environment, how tourists and locals help protect the area, making the destination more attractive to tourists, promoting tourism, tourist activities, community involvement, stakeholder roles, tourist village, tourist attractions from the local region and environmentally friendly materials, destination cleanliness, local cultural information, and employment opportunities.

The cultural factors are a highlight in improving sustainable tourism performance. Access to traditional culture and protection of cultural heritage are two indicators that must be prioritized for improvement. Using information technology extensively to access traditional culture significantly impacts how the younger generation views the significance of local culture as the nation's identity. This effort also protects cultural heritage against the wave of globalization through cultural experience and knowledge.

Moreover, to enhance tourism performance, it needs to benchmark with developed and autonomous tourist villages that have demonstrated success in sustainable tourism. The best practice insights will enable developing tourist villages to identify and adopt the most effective strategies for improving their tourism performance. However, future research is needed to assess the impact of resource allocation on tourist villages. Efficient resource allocation is crucial due to their limited availability while implementing tourism improvement programs. Furthermore, given that human perception is fuzzy, a strategy is required to lessen uncertainty and bias among managers of tourist villages while assessing the impacts.

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BIG DATA ANALYTICS FOR FORECASTING TOURISM RECOVERY IN BALI ISLAND USING MULTIVARIATE TIME SERIES

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Abstract

Bali is a famous tourist area and can significantly contribute to the Indonesian tourism sector. The COVID-19 pandemic has made Indonesian tourism, including Bali tourism, experience a decline. In March 2022, COVID-19 cases decreased, and the government began to relax some policies. The tourism sector is vital in economic recovery efforts after the COVID-19 pandemic. Therefore, it is necessary to identify tourism recovery to determine strategies and policies related to Indonesian tourism, especially in Bali. Multivariate time series forecasting of tourism demand can be used to identify tourism recovery using several significant data sources. The methods used are Vector Autoregressive (VAR), Support Vector Regression (SVR), Long Short-Term Memory (LSTM), and Gated Recurrent Unit (GRU). The data used are the monthly official number of tourists, room occupancy rate, Google Trends, number of booking.com user reviews, and nighttime light intensity in Bali Province from January 2019 to December 2022. The results show that the best forecasting method is VAR, and modeling with multivariate time series forecasting can improve the performance of forecasting results. In addition, big data can be used as a source of supporting data that can provide better forecasting results, and the size of the dataset affects the selection of the best model. Furthermore, the descriptive and forecasting analysis results show that Bali tourism has experienced post-pandemic tourism recovery. The strategies and policies of the Bali government to restore Bali tourism faster are good enough.

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INTRODUCTION

The tourism sector is one of the service-based sectors that plays a vital role in the Indonesian economy. It can be shown in 2021 when the tourism sector contributes to the national GDP by 4.2 percent (Yanwardhana, 2021). The tourism sector is also one of the sources of foreign exchange earnings. Based on data from BPS-Statistics Indonesia (2018) the tourism sector contributed USD 16.426 Billion (4.5% of GDP) to Indonesia's foreign exchange in 2018. Indonesian tourism has been recognized by tourists from various countries, especially Bali tourism. Tourism on the island of Bali is one of the tourism in Indonesia that can significantly contribute to Indonesia. Based on 2017-2021 data from BPS-Statistics of Bali Province (2021), most foreign tourists visiting Indonesia visit Bali. Bali Island is not only a destination for foreign tourists, but it is also a destination for domestic tourists. Indirectly, Bali Island already has its magnet to attract tourists to visit Bali Island through natural tourism, cultural tourism, and religious tourism.

The existence of the COVID-19 pandemic that entered Indonesia in early 2020 made Indonesia's tourism activities, including Bali Tourism, experience a decline (Pramana et al., 2022). The number of tourists, both foreign tourists and domestic tourists, has decreased significantly. Based on BPS data in 2020 and 2021, the growth of domestic tourist visits to Bali was negative. The COVID-19 pandemic has also caused the Gross Domestic Product (GDP) for the tourism sector and foreign exchange to decline.

Starting in March 2022, the number of COVID-19 cases has declined. The government began to relax some health protocol policies and people began to resume normal activities. The prolonged pandemic has encouraged tourists to travel. It can be an indication of the recovery of the tourism sector. The tourism sector has an essential role in recovering the economy after the COVID-19 pandemic, so tourism recovery needs to be identified. Tourism recovery can be identified by using tourism demand forecasting. Tourism demand is one measure of tourism based on goods and services used in a country as measured by the number of tourists (Friscintia & Alamsyah, 2019). Accurate forecasting can provide good results for the medium term and build tourism strategies, pricing policies, investment plans and strategies, and allocation of existing resources.

Nowadays, tourism demand forecasting cannot only rely on statistical data published by the government. The use of big data can be one of the data sources for forecasting tourism demand (Li et al., 2020). In addition, remote sensing data can be linked to tourism activities (Chang et al., 2022). The use of multisource data can strengthen the process of identifying tourism recovery (Bi et al., 2020; Liu et al., 2018; Zhang & Tian, 2022). Multivariate time series forecasting can be a solution for identifying tourism recovery in Indonesia. Research on tourism demand forecasting using multivariate time series and big data has been conducted in many other countries, but the Indonesian locus is still rare (Frechtling, 2001; Li et al., 2020; Song et al., 2019). These studies have also utilized deep learning technology, which still needs to be applied in research related to tourism demand forecasting in Indonesia. The utilization of deep learning technology in the field of tourism has been widely done to develop new and better models that can recommend the most suitable tourist activities/attractions (Cepeda-Pacheco & Domingo, 2022; Essien & Chukwukelu, 2022).

Research conducted by (Zhang & Tian, 2022) entitled "Forecast daily tourist volumes during the epidemic period using COVID-19 data, search engine data, and weather

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data". This study forecasts the volume of tourists during the COVID-19 pandemic using a hybrid model of Variational Mode Decomposition and Gated Recurrent Unit Networks (VMD-GRU) and then compares it with other methods. Other forecasting methods used in this study are Simple Random Walk, ARIMAX, Support Vector Regression (SVR), Artificial Neural Network (ANN), Long Short-Term Memory Networks (LSTM), Gated Recurrent Unit Networks (GRU), hybrid model Empirical Mode Decomposition and Gated Recurrent Unit Networks (EMD-GRU), hybrid model Ensemble Empirical Mode Decomposition and Gated Recurrent Unit Networks (EEMD-GRU), and hybrid model Variational Mode Decomposition and Long Short-Term Memory Networks (VMD-LSTM). The data used are the number of COVID-19 cases, search engine data, and weather data. The result of this study is that VMD is very suitable for predicting non-stationary traveler volumes and can significantly improve forecasting performance. In addition, the GRU network has the best performance in forecasting the volume of tourists and the use of multisource big data can improve the quality of forecasting results (Zhang & Tian, 2022).

Furthermore, a previous research study entitled "Daily Tourism Volume Forecasting for Tourist Attractions" was conducted by (Bi et al., 2020). This research analyses the daily tourism volume in the Jiuzhaigou and Huangshan mountain areas using the Long Short-Term Memory (LSTM) method. Other methods compared are the naïve method, ARIMAX, ANN, and SVR. In addition, this study was also conducted using several combinations of variables. The data used in this research are historical, search engines, and weather. The result of this research is that the LSTM method can be used for forecasting using historical, search engine, and weather data to produce solid data and forecast tourism volume. This research has shortcomings, among others, in forecasting using only three variables even though in real life, some other factors or predictors may have an influence on tourism volume (Bi et al., 2020).

(Liu et al., 2018) conducted research titled "Big Data Analytics for Forecasting Tourism Destination Arrivals with the Applied Vector Autoregression Model". This study analyses the correlation of weather, temperature, weekends, and holidays with tourist destination arrivals and web search requests and then performs forecasting analysis. The method used is Vector Autoregression (VAR) and the data use daily ticket data, weather, temperature, calendar information, weekends and public holidays), and web search queries. This study found that weather does not correlate with the actual arrival of the cultural tourism destinations studied or with web search queries (Liu et al., 2018).

Research on Indonesian tourism using big data has been conducted. (Pramana et al., 2022) conducted one of the studies titled "Impact of COVID-19 pandemic on tourism in Indonesia". This research investigates the different impacts of the COVID-19 pandemic on the tourism industry. The method used is clustering. The data used in this study are room occupancy rate data published by BPS, Google mobility index data, the number of flights from the flight status website, the number of reviews from TripAdvisor, the number of reviews from Booking.com, and data from Google Trends. This study provides results that show that the COVID-19 pandemic impacts the tourism industry and each province has a different impact. The utilization of big data helps the government and industry to provide knowledge about tourism plans and needs, real-time visitors, rates, and recommendations for activities and tourist attractions (Pramana et al., 2022).

Meanwhile, tourism demand forecasting in Indonesian tourism has also been carried out. Research conducted by (Friscintia & Alamsyah, 2019) titled "Forecasting

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Tourism Demand in Indonesian Tourism with the Artificial Neural Network Backpropagation Method" created a model to forecast tourism demand in Indonesia accurately. The data used in this study are historical data on Gross Domestic Product (GDP), Customer Price Index (CPI), and exchange rates of visitor countries, which are used as variables that affect the number of foreign tourist arrivals. This study shows that the government can use ANN forecasting to anticipate the availability of tourism infrastructure and services. This research has limitations in only using three variables to forecast tourism demand. In forecasting tourism demand using ANN, the proper configuration process is needed to choose architecture, parameters, and delays to ensure the model can work optimally (Friscintia & Alamsyah, 2019).

Recovering tourism is not far from the influence of a strategic leadership perspective, where leaders are required to prepare strategies to develop technical capabilities (Fenitra et al., 2022). The leader in this context is the government, which must also provide financial support and always strive to improve the international image (Yang et al., 2024). Taking a promising approach to the tourism industry's micro, small, and medium enterprises can also accelerate the recovery process (Fenitra et al., 2022). Another strategic approach that can be taken is a strategic approach with public-private partnerships and collaboration to develop local tourism (Alcoriza & Policarpio, 2023). In the tourism recovery process, focusing on product development, marketing, and destination coordination is critical (Faeni et al., 2023).

The government needs to identify Indonesia's tourism recovery immediately to determine strategies and policies related to Indonesian tourism. Tourism recovery is an urgent process in every country that aims to boost the economy and revive the lives of its people (Lin et al., 2023). Therefore, this study identifies tourism recovery through tourism demand forecasting using multivariate time series data consisting of big data and available tourism-related secondary data. The use of multivariate time series data can provide more accurate forecasting. The locus of this research is Bali Province because Bali is the icon of tourism in Indonesia.

METHODOLOGY

The time series data used in the study is from January 2019 to December 2022, with a monthly period. Based on related research and the availability of existing data, five variables will be used for forecasting. The following is an explanation of the data used.

Number of tourists visits

This study uses data on the number of monthly foreign tourists from Ngurah Rai Airport and Benoa Port and the number of domestic tourists who go to Bali. Foreign tourists were obtained from the Directorate General of Immigration, while domestic tourists were obtained from the survey results of the Bali Provincial Tourism Office. This data has been published by BPS Bali Province. In this study, the data on the number of tourists visits is denoted by "H".

Room Occupancy Rate (ROR)

Room Occupancy Rate (ROR) is the ratio between the number of room nights used and the number of room nights available. This study uses ROR for all classes of star hotels.

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ROR data is obtained from the results of the Monthly Hotel Survey (VHTS), BPS Bali Province. In this study, ROR data is denoted by "T".

Google Trends

Google Trends is an index that shows the volume of keywords entered by users in a region. In this research, several keywords related to Bali tourism will be taken and then made into a composite index using the first principal component analysis by considering the weight of each keyword. The category used is travel and the keywords used are Bali, tourist Bali, Bali tourism, hotel Bali, travel in Bali, holiday in Bali, Bali tourist place, and Bali Indonesia.

The keywords are made into one time series or commonly called a composite index using Principal Component Analysis (PCA) weighting. After obtaining the first principal component, the PCA weight calculation will be carried out. First, calculate the weight value for each keyword in the first component.

$$B = \frac{LF}{RLF} \times RSSL \quad \text{...(1)}$$

Where:
LF = loading factor
RLF = average loading factor in 1 component
RSSL = proportion of variance.

The second step is to calculate the contribution of each keyword.

$$b = \frac{B}{JB} \quad \text{...(2)}$$

Where:
B = weight,
JB = sum of weights.

The third step is to calculate the composite index as follows:

$$Composite\ Index = \sum b_i K_i \quad \text{...(3)}$$

Where:
b_i = contribution weight value,
K_i = keyword search index value (Pramana et al., 2022).

In this research, the composite index data from Google Trends is denoted by "S".

Number of Booking.com user reviews

Booking.com is one of the world's leading digital travel companies, available in 43 languages and offers over 28 million accommodation listings, including more than 6.6 million houses, apartments, and other unique places to stay (Booking.com, n.d.). Data collection using web scraping is used to collect the number of reviews from Booking.com

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from each hotel in Bali. In this study, only count the number of reviews in the column of the date of stay at the hotel. The steps taken to collect data on the number of reviews from Booking.com are as follows.

1. Scraping the accommodation data list. The data obtained from scraping this accommodation data list consists of hotel name, URL, aid, and province.
2. Scraping reviews. After getting the list of accommodations, the next step is scraping to extract the review information, as presented in Figure 2. The data collected consists of province, hotel name, reviewer name, reviewer origin, room type, review date, hotel stay date, review score, review reaction, good comments, and bad comments.
3. Data cleaning. The raw data obtained from the previous step is cleaned from duplicate data before being analyzed.

In this study, the data on the number of Booking.com user reviews is denoted by "B".

Intensity Night Time Light (NTL)

Night-Time Light Intensity data is obtained through cloud-free composite data from VIIRS Day/Night Band (DNB), which is then aggregated with regional boundaries using the zonal statistics feature. Areas that have high NTL intensity values can be identified as urbanized areas and maintain more tourism infrastructure and services (Chang et al., 2022; Devkota et al., 2019). NTL is currently also used for different purposes, such as poverty mapping, as it can be used as an approach to economic activity in an area (S. R. Putri et al., 2023; Ramadhan et al., 2023; Utami et al., 2023).

In this study, NTL intensity data is denoted by "N". The processed satellite images were then aggregated with the boundaries of the area. In this research, aggregation was done using the zonal statistics function available in QGIS.

Multivariate Time Series Forecasting

This research uses multivariate time series forecasting, one type of forecasting with more than one variable that changes over time, where the results can be more accurate than using univariate time series. Data analysis in this study was carried out with the help of RStudio software and Python. The research flow used is based on the research of Li et al. (2020) and Zhang and Tian (2022). The flow of this research is illustrated in Figure 1.

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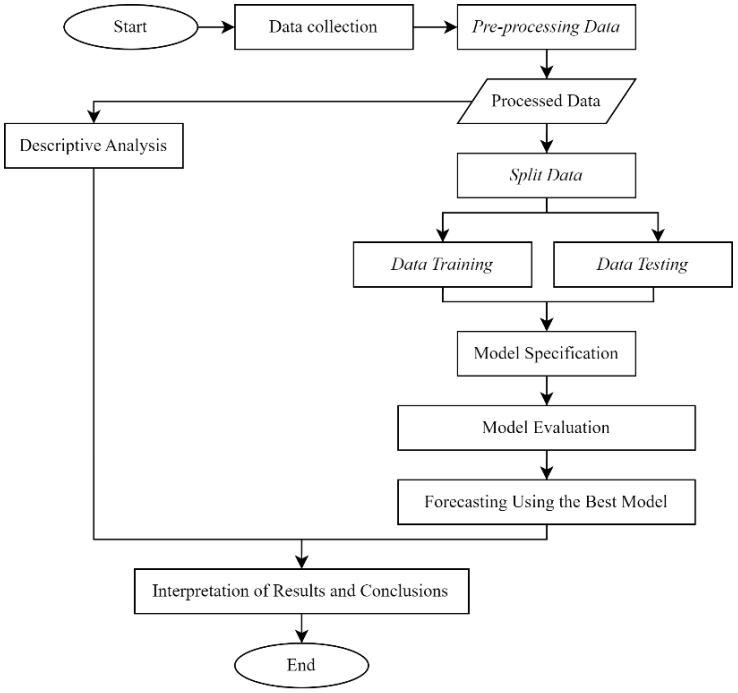

Figure 1. Research flow chart
Source: Li et al., 2020; Zhang & Tian, 2022

Step 1: Data Preprocessing

This research uses multivariate time series data to convert each variable into time series data with a monthly period. In the Booking.com user review data, data validation has previously been carried out, including data checking and data updating. Then, the number of reviews data will be aggregated to calculate the number of reviews per month. The Google Trends composite index data needs to be aggregated from per week to per month. After all variables are in the form of time series data, all variables are made into one file and then ready for further analysis.

Step 2: Descriptive Analysis

In this study, descriptive analysis was carried out to see the condition of Bali tourism on each variable in three periods, namely the period before the COVID-19 pandemic, the period during the COVID-19 pandemic, and the transition period to the endemic (Table 1).

Table 1. Date categories according to the chronology of events

Time Period	Event Name	Event Date
I	The period before the COVID-19 Pandemic	January 2019 – February 2020
II	During the COVID-19 pandemic	March 2020 – March 2022
III	Transitional period toward endemic	April 2022 – December 2022

Source: Biro Komunikasi dan Informasi Publik, 2022; Nuraini, 2020

Step 3: Forecasting Model Analysis

Previous research is the basis for choosing the method to be used. The method used in modeling to predict tourism demand using multivariate time series data is as follows.

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Vector Autoregressive (VAR)

The VAR model is a method for forecasting time series data of more than one variable that assumes all variables in the model are endogenous variables (Widarjono, 2013). The VAR model can be used to explain simultaneous variables that have an influence on each other. In other words, this VAR is two-way influencing each other.

Long Short Term Memory (LSTM)

LSTM is a Recurrent Neural Network (RNN) capable of learning short-term and long-term dependencies (Zhao et al., 2017). LSTM has three gates: forget gates, which decide what information to remove from the cell; input gates, which decide what new information to store in the cell; and output gates, which decide what to produce.

Gated Recurrent Units (GRU)

GRU can be a variation of LSTM, but its internal structure is simpler because GRU has fewer calculations required to update the hidden states, making training time faster (Gulli & Pal, 2017). GRU has two gates, which are update gates and reset gates.

Support Vector Regression (SVR)

Support Vector Regression (SVR) is the application of a Support Vector Machine (SVM) to solve regression cases (Jändel, 2010). The output of SVR is both real and continuous. SVR is able to overcome overfitting. Another advantage compared to other regression methods is that SVR can handle nonlinear regression problems efficiently.

Step 4: Identify Tourism Recovery

After model evaluation, the best model will be used for further forecasting analysis to identify whether there is a recovery in tourism. The data used is the overall data from January 2019 to December 2022.

FINDINGS AND DISCUSSION

Number of tourists visits

Figure 2 shows that before the COVID-19 pandemic, the number of tourists coming to Bali, both domestic and foreign, increased during June-August and December-January. This is because these months are high seasons in Bali. During the COVID-19 pandemic, the number of tourists coming to Bali, both domestic and foreign tourists, experienced a very significant decline. Even for foreign tourists from June 2021 to January 2022, only a few foreign tourists were visiting Bali. This is because the number of COVID-19 cases increased that month, so the international entrance to Bali was closed (Paludi, 2022). The number of tourists decreased by 74.07 percent compared to the period before the pandemic. During the transition period to the COVID-19 endemic, the number of tourists coming to Bali gradually increased. This can be an indication of tourism recovery in Bali.

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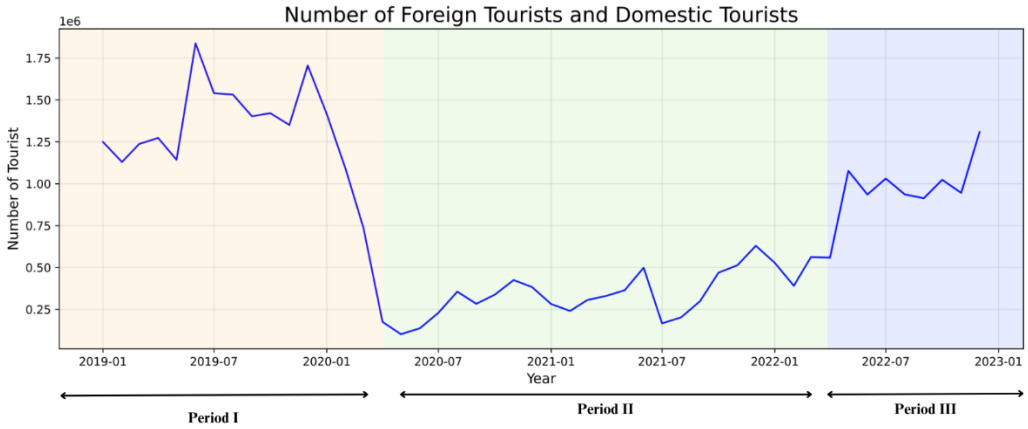

Figure 2. The number of foreign tourists and domestic tourists (in millions) visiting Bali, 2019-2022
Source: Author's analysis, 2023

Room Occupancy Rate (ROR)

The Bali Hotel Room Occupancy Rate (ROR) for all hotel classes began to experience a significant decline in March 2020, as shown in Figure 3. Compared to March 2019, which reached 55.43 percent, the room occupancy rate in March 2020 decreased by 45.84 percent. Even during the COVID-19 pandemic, the ROR reached its lowest point in May and June 2020 when the hotel ROR value in Bali for all classes was only 2.07 percent. The ROR value decreased by 79.81 percent compared to the pre-pandemic period and can be categorized as a low ROR value (small). A small ROR value can mean that accommodation in the area is less attractive to visitors and vice versa. A high ROR value can mean that visitors consider accommodation in the area desirable. However, during the COVID-19 pandemic, a small ROR value does not mean that the area is in less demand by visitors; somewhat, the number of tourists visiting Bali has decreased. Bali is one of the provinces that experienced the most significant decline in Room Occupancy Rate (ROR) values (Pramana et al., 2022). During the transition period to the COVID-19 endemic, starting in March 2022, the ROR value increased again.

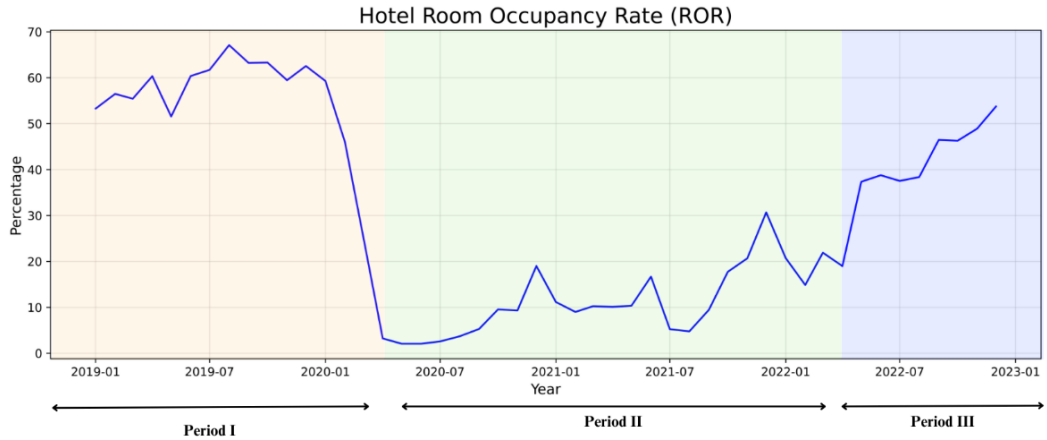

Figure 3. Room Occupancy Rate (ROR) of hotels in Bali, 2019-2022
Source: Author's analysis, 2023

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Google Trends

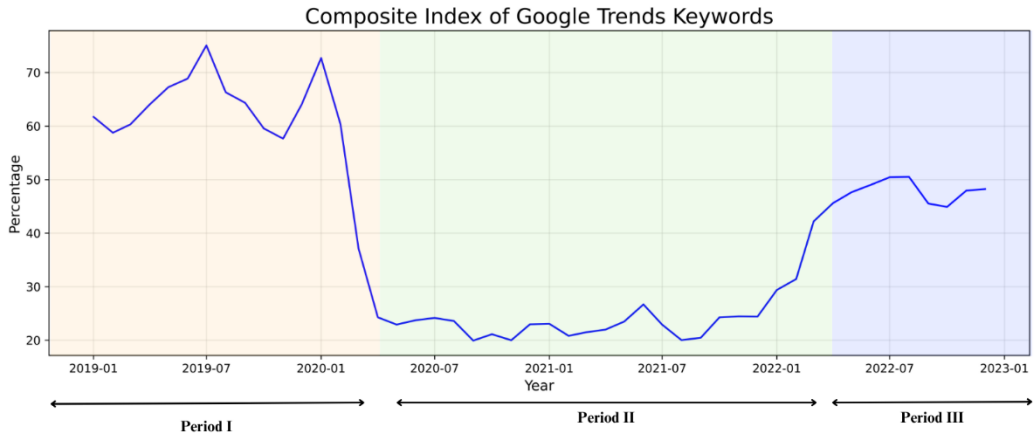

Figure 4. Composite index of multiple keywords on Google Trends, 2019-2022
Source: Author's analysis, 2023

In the pre-pandemic period, the value of the Google Trends composite index (presented in Figure 4) increased in the vacation months of June-August and the end of the year in December-January. Then, March 2020 experienced a significant decline, and during the transition period towards the endemic, it showed a gradual increase. When viewed from the monthly average during the COVID-19 pandemic, there was a decrease of 61.67 percent compared to the period before the COVID-19 pandemic. The decline in Google searches for keywords related to Bali tourism is due to restrictions on community activities and mobility, which allow people to do all their activities from home. It has an impact on reducing the intensity of people's search for things related to activities outside the home, such as vacations. During the transition period to the COVID-19 endemic, this composite index experienced a gradual increase. The prolonged pandemic has encouraged tourists to travel to Bali, so Google search for keywords related to Bali tourism has increased again.

Number of reviews from Booking.com

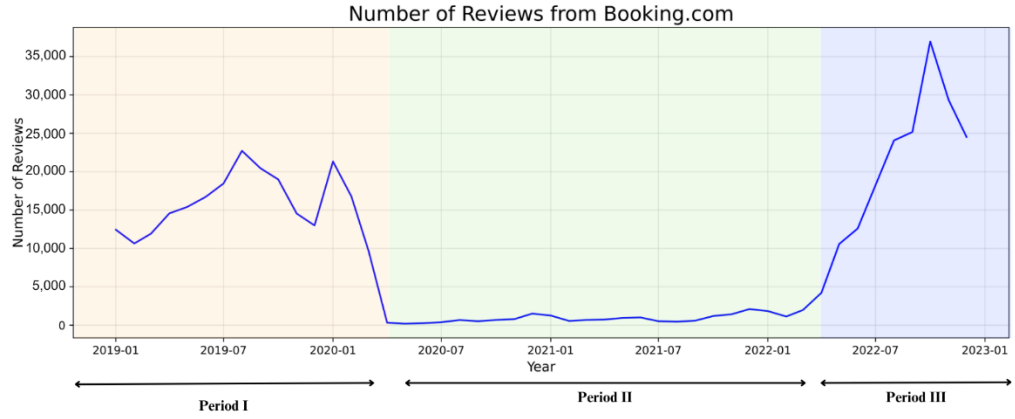

Figure 5. Number of user reviews of Booking.com hotels in Bali, 2019-2022
Source: Author's analysis, 2023

When compared to other provinces in Indonesia, Bali Province has a larger number of hotel accommodations. This number of Booking.com user reviews, as shown in Figure

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5, includes both international and domestic reviews. Most reviewers come from Australia, domestic tourists, France, and Germany. This is in line with the results of BPS publications regarding the number of foreign tourists visiting Bali. Australian tourists dominate foreign tourists who come to Bali (BPS, 2022). In the pre-pandemic period, there was an increase in the number of Booking.com user reviews in July-August and at the end of the year (December-January).

In March 2020, there was a very significant decline. Compared to the period before the COVID-19 pandemic, the average number of reviews per month during the COVID-19 pandemic decreased by 92.3 percent. The lowest value for the number of Booking.com user reviews occurred in May 2020, with only 192 reviews. During the COVID-19 pandemic, the number of reviews per month of visitors from Indonesia has mostly stayed the same when compared to the number of reviews per month of visitors from abroad. In February 2022, the number of Booking.com user reviews started to increase gradually. This gradual increase in the number of reviews can be interpreted as a recovery in Bali tourism.

Night Time Lights Intensity

Of the five variables shown previously, only the Night Time-Light Intensity variable has a different pattern (see Figure 6). The graph shows that the COVID-19 pandemic does not influence the NTL intensity value. NTL intensity values tend to provide a similar pattern from year to year or what is commonly referred to as a seasonal pattern. At the beginning of the COVID-19 pandemic, almost all districts or cities in Bali Province experienced a decrease in community activity. However, after the implementation of PPKM in early 2021, some areas in Bali Province experienced an increase in activity (Putro, 2022).

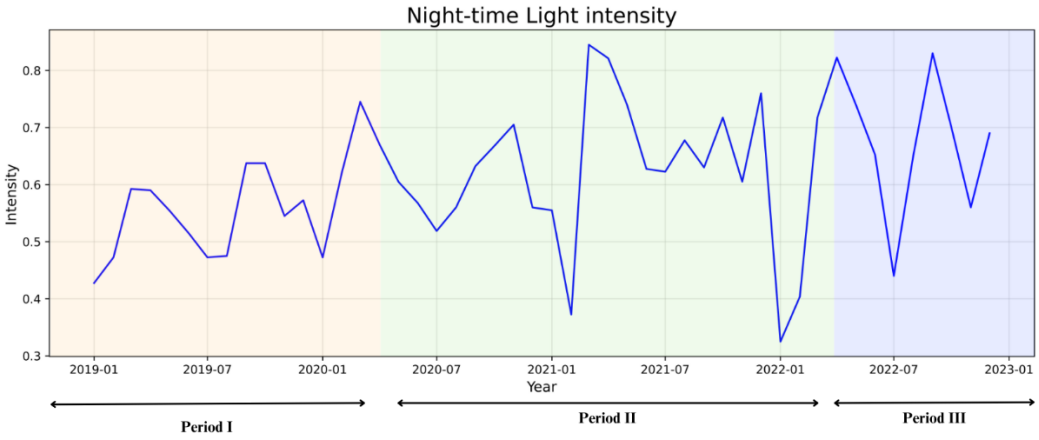

Figure 6. Night Time-Light (NTL) Intensity Bali Province, 2019-2022
Source: Author's analysis, 2023

Best Forecasting Model Analysis

Modeling using VAR starts with a stationarity test of the data and the determination of the optimal lag. Then, modeling will be done based on the best lag. Forecasting using SVR is done with Radial Basic Function (RBF) kernel; gamma 0.5; C 10; and epsilon 0.05. Epoch 250 and batch size 32 were used for forecasting with deep learning model specifications. Researchers determine the best model by comparing the model evaluation of each method and the combination of variables used. The result is presented in Figure 7.

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By doing this comparative analysis, we can find out how multisource data improves the performance of forecasting results.

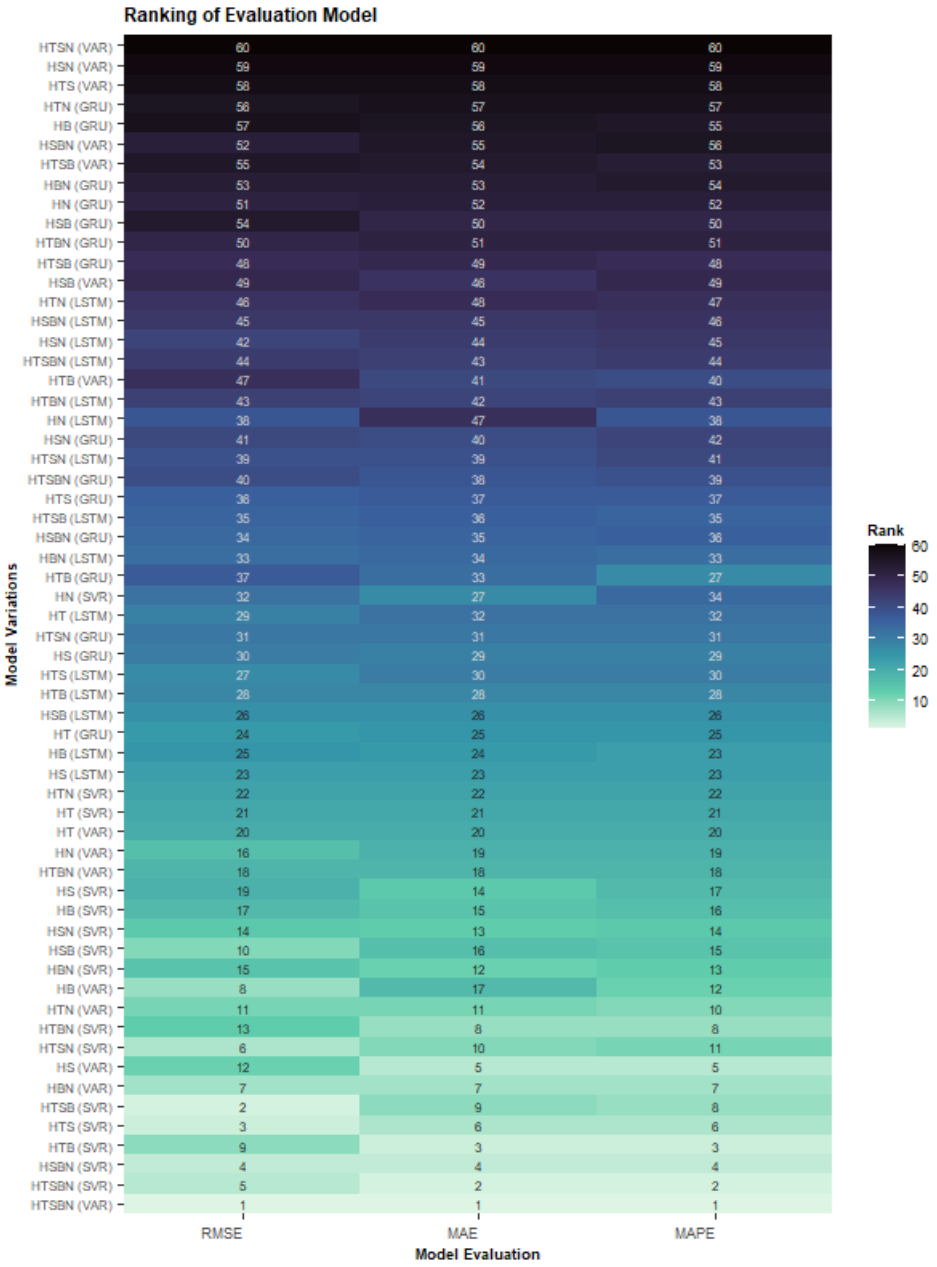

Figure 7. Ranking of Evaluation Model
Source: Author's analysis, 2023

The results of the three model evaluations above show that the best forecasting model is a model with a combination of HTSBN variables using the Vector Autoregressive (VAR) method. The HTSBN model with the VAR method has a model evaluation value of RMSE 283,699.9; MAE 220,987.4; and MAPE 0.219 (this forecasting model can be categorized as good enough or feasible to use). Visualization of the ranking results of the model evaluation can be seen in Figure 7.

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Forecasting tourism demand using multivariate time series where the data used consists of a combination of BPS data with data sourced from big data has been able to improve the performance of forecasting results. Previous research shows that integrating various data sources has the advantage of improving the results of tourism demand forecasting (Li et al., 2020). The selection of appropriate variables for multivariate time series forecasting is also able to improve the performance of forecasting results. In addition, the size of the dataset used in this study also plays a vital role in determining the best model. The size of the dataset used in this study can be categorized as small because there are only 48 data points in this study. The use of machine learning can provide better performance if the dataset used is large (Cerqueira et al., 2019). For small datasets, classical methods show better performance. However, as the dataset size increases, the machine learning method can outperform the classical method. This is in line with the results of this study, which show that the best model is the one using the VAR method.

The model uses a combination of big data variables and BPS data. Big data can already be used as an alternative data source for forecasting tourism demand. Big data has been used as a supporting data source for official statistics produced by BPS Statistics Indonesia, which is integrated with survey or administrative data available at BPS (Faris & Pramana, 2021).

Identify Tourism Recovery

Based on the model evaluation, the best model obtained is a model with a combination of HTSBN variables using the VAR method. Forecasting is carried out using all data to identify tourism recovery (January 2019-December 2022) using the best method and variable combination.

Before forecasting modeling, a stationary test is conducted using the Augmented Dickey-Fuller (ADF) test. Based on the ADF test results, at the level α=0.05, only the NTL intensity variable is stationary, while the other variables are not stationary. Then, the data is standardized and differenced. After standardizing and differencing, all variables are stationary. Because the data is stationary, the next step can be continued, namely testing the lag length.

The optimum lag is the lag that has the smallest AIC, BIC, FPE, and HQIC values. Based on optimum lag test results, the criteria that indicate the optimum lag is at lag 6 because it has the smallest AIC, FPE, and HQIC values. By using lag 6, VAR modeling will be done for forecasting.

Then, to check whether the model is sufficiently able to explain the variance and pattern in the time series, the residual serial correlation test is used using the Durbin Watson test. Based on the Durbin Watson test results, the serial correlation looks quite good because the resulting value of each variable is close to 2, so it can be concluded that there is no significant serial correlation. The VAR model equation obtained from this study for the number of tourists is as follows.

$$H_t = 0{,}67T_{t-1} - 0{,}66B_{t-1} - 0{,}289N_{t-4} \quad \text{...(4)}$$

The number of tourists with ROR has a positive one-way relationship. ROR is influential at lag 1 because it has a probability value that is smaller thanα (0.05). In addition, the number of tourists has a negative one-way relationship with the number of

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Booking.com user reviews and NTL intensity. The number of Booking.com user reviews was affected at lag 1 and NTL intensity was affected at lag 4.

After analyzing the VAR model, VAR model forecasting will be carried out. Forecasting is done for the next 12 months. The results of this forecasting are used to identify the progress of Bali's tourism recovery.

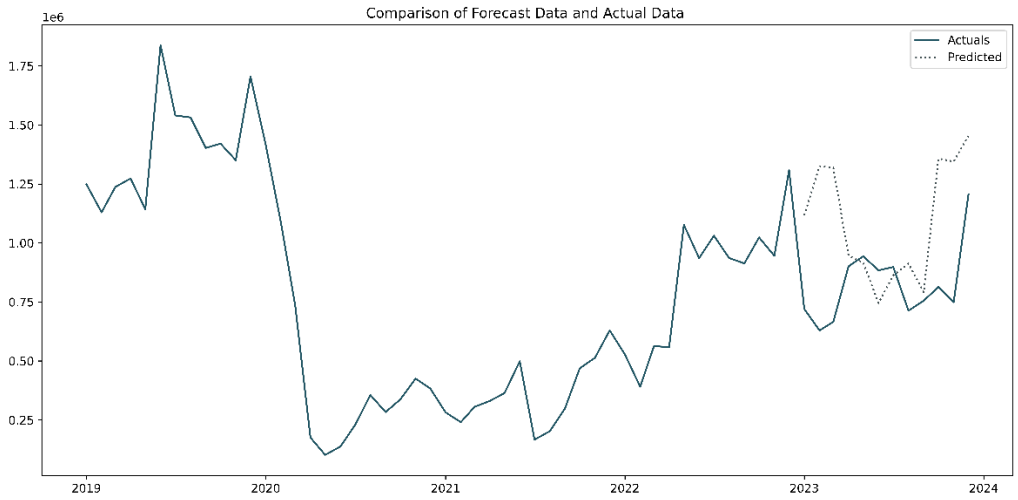

Figure 8. Tourism demand forecasting results and the actual data
Source: Author's analysis, 2023

Based on Figure 8, Bali tourism's condition has generally experienced recovery. However, Bali tourism cannot be said to have recovered one hundred percent like the conditions before the COVID-19 pandemic. Based on previous research, Bali Province is a province whose tourism has yet to be able to bounce back quickly when compared to other provinces. In other words, Bali's tourism recovery still needs to catch up to other provinces (Pramana et al., 2022). Therefore, the government has made many policies and strategies to overcome this. Rather than refining the existing model, systematic change is needed to cope with another extraordinary event and build a stronger tourism system (Gössling & Higham, 2021; Rosenbloom et al., 2020). Although not fully recovered, the hard work of the government and the Balinese people to restore Bali's tourism conditions after the COVID-19 pandemic has produced quite good results. The most essential component of tourism recovery is the tourists, who must be willing to go on holiday and recreate during the COVID-19 pandemic (Gössling & Schweiggart, 2022).

The forecasting results graph shows that in January 2023, the number of tourists decreased. Then, in February and March 2023, the number of tourists visiting Bali began to increase again. The Bali Tourism Office has compiled tourist, cultural, MICE (Meeting, Incentive, Convention, and Exhibition), and sports events spread across the districts or cities of Bali Province. This is one form of strategy carried out by the government to restore Bali tourism. One of the MICE events held in February 2023 was the ASEAN+3 meeting (ASEAN countries together with Japan, Korea, and China) held at the Bali Nusa Dua Convention Center (BNDCC). The increase in the number of tourists coming to Bali in March 2023 is due to the long Nyepi holiday (K. Putri, 2023). Nyepi Day falls on Wednesday, so employees can apply for leave for Monday and Tuesday so that employees get five days off starting from Saturday.

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For the forecasting results for April to June 2023, the number of tourists has decreased again. Many problems exist regarding foreign tourists visiting Bali when associated with the current field conditions. Many foreign tourists have violated both the law and cultural ethics in Bali, so from January to May 2023, there have been 123 foreign tourists deported from Bali (Winata, 2023). The easy access to Bali and the lack of strict regulations make the list of violations committed by foreign tourists more and more. Therefore, the Balinese government needs to evaluate and tighten tourism regulations in Bali so that tourists who come on vacation to Bali can feel comfortable and safe. Tightened tourism regulations and entry access can lead to a decrease in the number of tourists coming to Bali.

In the tourism demand forecasting graph, the number of tourists rose again in July 2023. This is because July is the vacation season for school children in Indonesia. In addition, Australia, as a country that dominates foreign tourist visits to Bali, is also on winter vacation. This increase in the number of tourists lasts until August 2023. However, in September 2023, there was a slight decrease in tourists. In October 2023, the forecasting results of the number of tourists visiting Bali increased again until the peak at the end of 2023. Based on the forecasting results, in December 2023, the number of tourists visiting Bali will be more than that in December 2022. The increase in the number of tourists visiting Bali in December is because there are long holidays in this month (Christmas, New Year, and school holidays). In addition, countries such as the United States, South Korea, Japan, countries in Europe, and surrounding countries are on winter vacation and Australia is on summer vacation.

However, after being compared with the actual data on the number of foreign and domestic tourists in 2023, for the months of January to April 2023, the amount remained the same. Based on forecast data, for January-April 2023, there was an increase. However, in reality, there was a decrease. Based on data from BPS, domestic tourists still dominate. The number of foreign tourists from January to April is half that of domestic tourists. So, tourism recovery is slower from January to April. This is because there are still COVID-19 regulations from outside regarding going abroad, especially for holidays. In May 2023, WHO stated that the pandemic had ended (WHO, 2023). The emergence of this statement was followed by an increase in the number of tourists in Bali. Tourism recovery in Bali is starting to improve.

The Bali government's strategy and policy in restoring Bali tourism faster is appropriate for now. The Bali government still has to improve Bali's image in the international arena. There is a need for a review of tourism regulations in Bali by the Balinese government and regulations on access to Bali to realize quality, safe, and comfortable Bali tourism. Anticipatory planning and management are essential and can contribute to tourism recovery (Gössling & Schweiggart, 2022). Not only the government but also market players, technology innovators, and the workforce working in the tourism industry are participating in the tourism recovery program (Sharma et al., 2021).

CONCLUSION

Before the COVID-19 pandemic, the variables of the number of tourists, Room Occupancy Rate (ROR), a composite index of several Google Trends keywords, and the number of Booking.com user reviews increased in June-August and December-January.

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During the COVID-19 pandemic, these four variables experienced a significant decline. Meanwhile, during the transition to the COVID-19 endemic, it has shown a gradual increase. This can mean that Bali tourism has been recovering little by little. The Night Time Light (NTL) intensity variable has a value that is not much different from the three periods (before the pandemic, during the pandemic, and during the transition to the COVID-19 endemic).

The best model for forecasting tourism demand is a model with a combination of variables of the number of tourists, ROR, Google Trends, number of reviews, and NTL intensity (HTSBN) using the Vector Autoregressive (VAR) method. This best model is influenced by the size of the dataset used. Since the dataset used is small, the classical method shows better performance. Modeling using variables that are only sourced from big data has been able to create a forecasting model that is as good as a forecasting model that uses variables only from BPS data. However, the model evaluation value will be even better if the forecasting model uses variables from big data and BPS data. Therefore, big data can already be used as a supporting data source for forecasting tourism demand.

The forecasting results of tourism demand show an increase, so it can be concluded that Bali has experienced a tourism recovery. However, Bali's tourism recovery cannot be said to have recovered to its pre-pandemic condition. For now, the strategies and policies of the Bali government to restore Bali tourism faster are good enough. In the future, the government can organize international events that invite international tourists to Bali. In addition, the government needs to support all businesses in the tourism sector, such as UMKM. The government needs to make improvements, maintenance, and renewal regarding infrastructure and tourism facilities.

This research has shown that the best forecasting method, namely the model using the VAR method and modeling with multivariate time series forecasting, has improved the performance of forecasting results. In addition, this research also shows that big data can be used as a source of supporting data that can provide better forecasting results.

This study has limitations, namely the limited data available so that only five variables are used (number of tourists, Room Occupancy Rate (ROR), Google Trends, number of Booking.com user reviews, and NTL), so the results are still not optimal. Therefore, future research can add other variables related to tourism demand, such as the number of holidays, weather, GDP, consumption price index, rupiah exchange rate, and the number of reviews from other travel sites such as TripAdvisor. Adding data periods used for forecasting according to data availability can also be a recommendation for future research. In terms of methods, future research can use XGBoost, Decision Tree Regression, or variations of methods using a combination of deep learning and VAR to improve forecasting accuracy. Increased forecasting accuracy can provide accurate forecasting results so that the government can precisely determine strategies and policies. The Bali government's strategy and policy in restoring Bali tourism faster is appropriate for now. The Bali government still has to improve Bali's image in the international arena. There is a need for a review of tourism regulations in Bali by the Balinese government and regulations on access to Bali to realize quality, safe, and comfortable Bali tourism.

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SUSTAINABLE LIVELIHOOD IN POST-DISASTER TOURISM: LESSON LEARNED FROM MERAPI TOURISM SITE

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Abstract

This research aims to explore the practice of the Sustainable Livelihood Tourism Framework (SLTF) in post-disaster management in the Mount Merapi area, Sleman, Yogyakarta. The focus of SLTF achievement in this study encompasses ecological, economic, sociocultural, and institutional dimensions. Research on the SLTF has indeed become a significant focus in tourism studies. However, most of these studies are confined to a single research methodology, resulting in limited scope and a lack of comprehensive discussion. This study used a mixed-method approach with an explanatory sequential design. The study found that tourism positively impacts the increase of economic activities in the community. However, on the ecological side, tourism presence degrades environmental quality due to issues such as carbon emissions, industrial waste, climate change, the greenhouse effect, illegal logging, and illegal mining. Furthermore, other policies were identified, such as mineral water mining permits that degrade the environment and the establishment of landfill sites in the Kaliurang area, which spoils the natural beauty. Tourism practices also have a negative impact on institutional aspects, as the community perceives government policies as too complex and not meeting their expectations. Lastly, in the socio-cultural aspect, tourism preserves traditional values, as tourists tend to respect them. This mixed-method approach underscores the need for balanced strategies that address environmental concerns while maximizing economic benefits, improving institutional involvement, and supporting socio-cultural enhancement.

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INTRODUCTION

This research is motivated by the debate on ensuring sustainable livelihoods for local communities, which have significantly shifted from agricultural sector to post-disaster tourism due to the eruption of Mount Merapi, Sleman Regency, Special Region of Yogyakarta (Antriyandarti et al., 2013). Volcanic disasters frequently occur in volcanic regions of Indonesia, with Java showing the highest number, accounting for 47% of the total eruptions with 23 active volcanoes (Harijoko et al., 2020). Mount Merapi is the most active mountain on Java Island (Gunawan, 2014; Nugraha et al., 2019). From 1672 to 2010, there have been more than 80 eruptions with an average interval of 4 years, with the 2010 eruption being the most devastating in the last 100 years (Akbar, 2019; Nugraha et al., 2019). Despite the many negative social and economic impacts, including the loss of livelihoods, people continue to return to the area due to strong social and economic ties, even with the high potential risk of disaster (Akbar, 2019; Antriyandarti et al., 2013; Gunawan, 2014).

Natural disasters cause socio-economic shocks (Bakkour et al., 2015), but the impacts and the recovery processes vary by region (Stanícǩová & Melecký, 2018). In terms of recovery and rehabilitation after Merapi eruption in 2010, the Sleman Regency Government has utilized the remnants of the Merapi eruption to create new tourist destinations (Putri & Damayanti, 2017). The goal is not only to rebuild the economy after the shock but also to share the historical values of the Merapi eruption that shaped the destination. This tourism is called post-disaster tourism, where an object becomes a tourist destination due to a disaster (Liu-Lastres et al., 2020). Examples include the Lava Tour, Kaliadem Bunker, and Merapi Museum, which emerged from the impact of the Merapi eruption, creating unique attractions (Muktaf, 2017). The development of post-disaster tourism in the Merapi area has multiplied, making the local economy dependent on this sector, even evolving into a local livelihood to recover from the negative impacts of the Merapi eruption (Kurniawan & Wasino, 2021). It means that the livelihood of the local community, which is run by agriculture (Antriyandarti et al., 2013), has shifted to rely on post-disaster tourism as a source of income.

The debate in this context revolves around the implementation of sustainable management concepts for the livelihoods of local communities in post-disaster tourism at Mount Merapi. The call to create sustainable tourism is further strengthened from a legal perspective, referring to the Regulation of the Minister of Tourism and Creative Economy/Head of the Tourism and Creative Economy Agency of the Republic of Indonesia Number 9 of 2021 on Guidelines for Sustainable Tourism Destinations. Therefore, the Sustainable Livelihoods Approach (SLA) is used to evaluate the sustainable livelihoods of the community to alleviate downturns (Stanícǩová & Melecký, 2018). SLA, combined with the tourism sector, checks the implementation of sustainable livelihood concepts known as the Sustainable Livelihood Tourism Framework (SLTF) (Figure 1).

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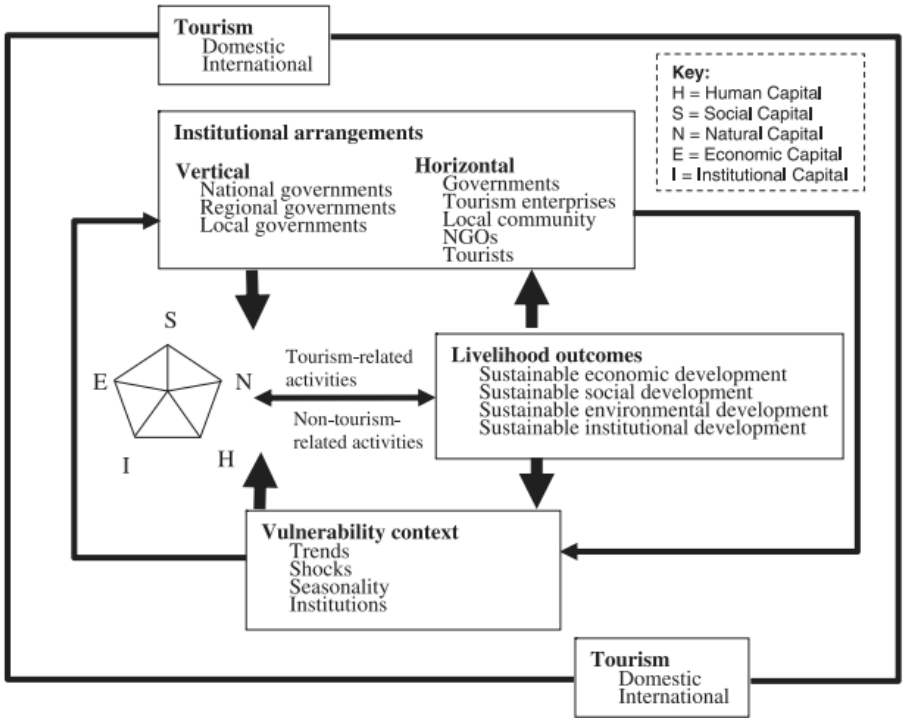

Figure 1. The Sustainable Livelihood Tourism Framework (SLTF)
Source: Shen et al., 2008

Studies related to SLTF in the tourism sector are limited to qualitative methodology, resulting in weak coverage of broader objects and generalization aspects of the framework. There are also studies limited to quantitative methodology, making comprehensive explanations of the framework challenging (Afandi et al., 2014). Discussions on SLTF in post-disaster tourism are not mainstream; if they exist, they are limited to one type of methodology. Furthermore, studies on SLTF in tourism fail to holistically explain the integration between variables within the framework (Singgalen et al., 2019). SLTF rebuilds village communities from downturns through tourism (Apriani et al., 2023; Sitorus et al., 2023). In post-disaster tourism, the promotion measurement for reviving local communities is limited to horizontal interactions between managing communities and consumers (Pottorff & Neal, 1994). In contrast, SLTF guides vertical and horizontal interactions while ensuring sustainable livelihoods through tourism (Su et al., 2019). Unlike mainstream tourism research that focuses on tourism product aspects, marketing, planning, and impacts, thus ignoring community livelihood sustainability from tourism (Ashley, 2000).

A dimension demands that all individuals have access to the resources and facilities they need to live healthy and dignified lives in the Social Dimension and implies a non-discriminatory social order, does not disrupt local norms and values, and supports local lifestyles through measures to reduce social exclusion and ensure minimum social standards and human rights. Last, the Economic Dimension focuses on meeting human needs for material well-being and involves an economy that supports employment and livelihoods within a competitive and stable macroeconomic framework. All dimensions of the prism of sustainability can be assessed by the perception of residents through the quality of dimensions as illustrated in the hypothesis (Figure 2) bellow:

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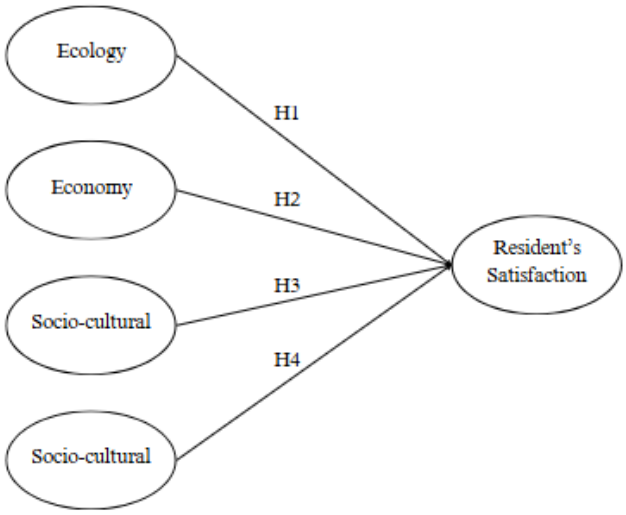

Figure 2. Resident's Perspective toward the Prism of Sustainability Implementation
Source: Results of processed data, 2024

By applying the Prism of Sustainability, this study aims to understand how tourism development at Mount Merapi can be managed to ensure environmental protection, institutional participation, social inclusivity, and economic stability through resident's perspective.

METHODOLOGY

The study utilized quantitative and qualitative methods with an explanatory sequential design (Creswell, 2013). It can be explained as seen in Figure 3 bellow:

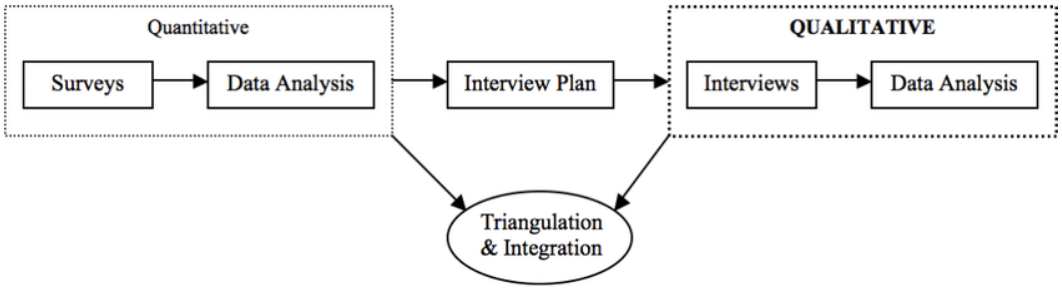

Figure 3. Explanatory Sequential Design
Source: Creswell, 2013

In the quantitative phase, the data collection uses several steps: questionnaire distribution, documentation, and observation. The initial stage of quantitative data collection involves the distribution of questionnaires. This process begins with designing and developing a structured questionnaire, ensuring the questions are clear, concise, and relevant to the research objectives. Once finalized, the questionnaire is distributed to the selected sample group. Distribution methods may vary depending on the target audience, including online platforms, email, or physical handouts. It is crucial to ensure that the distribution method aligns with the preferences and accessibility of the respondents to

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maximize response rates. This stage may also involve reminders or follow-ups to encourage participation and address respondents' issues.

Following the distribution of questionnaires, the next stage is documentation. It involves systematically organizing and recording the responses received. The collected data is compiled into a database or spreadsheet, which can be easily accessed and analyzed. During this phase, it is essential to verify the accuracy and completeness of the data to ensure that all responses are correctly recorded. Any inconsistencies or missing data should be addressed through data-cleaning techniques. Documentation also includes maintaining detailed records of the distribution process and any correspondence with respondents, which can be valuable for auditing and ensuring data reliability.

In conjunction with the questionnaire distribution and documentation, the observation phase provides a complementary data collection method. It involves systematically observing and recording specific behaviors, events, or conditions relevant to the research. Observations can be conducted in various settings, depending on the research focus, and may involve direct or participant observation techniques. The data gathered through observations are documented in field notes or observation logs, capturing details that the questionnaires may not fully address. This qualitative insight enriches the quantitative data, providing a more comprehensive understanding of the research topic.

This research first employs a quantitative method by utilizing a survey technique with respondents over a one-week survey in December 2023 in the Kaliurang district, Sleman Regency, Special Region of Yogyakarta. A hundred and twenty questionnaires were distributed to tourism stakeholders, achieving a 100% response rate. The questionnaires, administered by four researchers, included 29 items across four dimensions—ecological, economic, socio-cultural, and institutional-based on established research models (Gong et al., 2023; Hussain et al., 2015; Trišić, Nechita, Ristić, et al., 2023). The survey measured residents' satisfaction with sustainable tourism using a 5-point Likert scale, from "Strongly Disagree" to "Strongly Agree." Data analysis used Structural Equation Modeling (SEM) with Partial Least Squares (PLS) in SmartPLS 4.

After the phase of quantitative, the qualitative methods use some data collection with several steps: interviews, documentation, and observation. The first stage of qualitative data collection involves conducting interviews. This method is designed to gather in-depth insights and personal perspectives from participants. The process begins with developing an interview guide, which includes open-ended questions tailored to elicit detailed and meaningful responses. Once the guide is prepared, interviews with selected participants relevant to the research topic are scheduled. These interviews can be conducted in person, over the phone, or via video conferencing, depending on accessibility and convenience. Researchers aim to create a comfortable environment during the interviews to encourage open and honest communication. The interviews are usually recorded with participants' consent to ensure accurate capture of responses, which are transcribed for analysis later.

Following the interviews, the next stage is documentation. It involves systematically recording and organizing the qualitative data gathered. It includes transcribing recorded interviews into written text and organizing field notes or other relevant materials. Documentation also encompasses the maintenance of records related to the interview process, such as participant consent forms and interview schedules. Accurate and thorough documentation is crucial for ensuring the integrity and reliability of the data.

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Additionally, researchers often use qualitative data analysis software to assist in organizing and coding the data for further analysis.

Observation is a complementary method in qualitative data collection, providing direct insight into the context and behavior of subjects. In this stage, researchers observe and record relevant events, interactions, or settings related to the research focus. Depending on the research design, observations can be structured or unstructured and may involve direct participation or passive observation. The data collected through observations are meticulously documented in field notes, capturing detailed descriptions of the observed phenomena. These notes are then analyzed alongside interview transcripts to better understand the research topic and identify patterns and themes.

After obtaining quantitative data, the researcher then transitioned to qualitative methods by first developing interview forms based on the data collected from the survey to elucidate the phenomena identified. Interviews were with the Head of the Sleman Regency Tourism Office, the Chairman of the Tourism Village Communication Forum, and the Chairman of the Tourism Awareness Group. The interview results will be analyzed using NVIVO 12 Plus software to map the findings.

FINDINGS AND DISCUSSION

Upon recapitulating the data gathered from the survey conducted by the author, it is discerned that the demographic distribution based on gender among the 120 respondents can be delineated as seen in Table 1 as follows:

Table 1. Gender of Respondents

No	Gender	Number	Percentage (%)
1	Male	77	64.17
2	Female	43	35.83
	Grand Total	120	100

Source: Results of processed data, 2024

Based on the acquired data, 77 respondents, constituting 64.17% of the total, identified as male, and an equivalent number of respondents, also 43, accounting for 35.83%, identified as female. The findings derived from the data recapitulation concerning the age distribution of the respondents can be categorized as seen in Table 2 as follows:

Table 2. Age of Respondents

No	Age	Number	Percentage (%)
1	18-25	23	19.17
2	26-35	40	33.33
3	36-45	47	39.17
4	46-55	8	6.67
5	>55	2	1.66
	Grand Total	120	100

Source: Results of processed data, 2024

Based on the author's data recapitulation, several conclusions arise concerning the age distribution of the respondents. A total of 120 respondents falls within the 36-45 age range is represented by 47 respondents, accounting for 39.17% of the total, which is the

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most dominating age range. Regarding to the occupational distribution, it can be seen from the data in Table 3 bellow:

Table 3. Occupational Distribution of Respondents

No	Professions	Number	Percentage (%)
1	Hotel/Homestay Owners	13	10.83
2	Hotel/Homestay Employees	26	21.67
3	Jeep Rental Owners	10	8.33
4	Jeep Rental Employees	20	16.67
5	MSME (traders) Owners	18	15
6	MSME (traders) Employees	25	20.83
7	Civil Servants	8	6.67
	Grand Total	120	100

Source: Results of processed data, 2024

Disaggregating this count, Hotel/Homestay Employees are 26 individuals, constituting roughly 21.67% of the collective count, the most dominating population. This composite delineation underscores the multifaceted occupational landscape present within the cohort, illustrating the varied distribution of individuals across distinct spheres of economic engagement in the Merapi Tourism at Sleman Regency.

Item Description

Below is a table depicting each item developed from the Prism of Sustainability dimension, along with the data results on mean values:

Table 4. Items of the Prism of Sustainability Dimensions

No	Items		Mean
Institutional Dimension			**4.413**
1	I possess the authority to influence the decision-making process for policies issued by the government.	X1.1	4.463
2	I consider that this tourism plays a significant role in improving waste management practices within the Merapi region.	X1.2	4.300
3	I consider that effective communication exists among stakeholders involved in policy formulation and decision-making processes.	X1.3	4.362
4	I consider that local authorities (local government) actively promote and encourage participation among community members.	X1.4	4.475
5	I feel empowered to access the decision-making process to influence tourism development in the district.	X1.5	4.463
6	I consider that Long-term planning by regional authorities (local government) serves to mitigate the adverse effects of tourism.	X1.6	4.412
Ecological Dimension			**4.429**
1	I feel that tourists contribute to environmental pollution, affecting water, soil, and air quality.*	X2.1	4.438
2	I feel that the influx of visitors leads to disruptions in the habitats of plants and animals.*	X2.2	4.400
3	I feel that tourist activities have led to the escalating depletion of water and energy resources.*	X2.3	4.438
4	I consider that tourism does not result in the extinction of authentic species within the Merapi region.	X2.4	4.438
Economic Dimension			**4.348**
1	I admit that tourism generates additional income for residents.	X3.1	4.338
2	I admit that tourism stimulates the demand for local products.	X3.2	4.362

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No	Items		Mean
3	I consider that tourism fosters employment opportunities for the residents.	X3.3	4.388
4	I consider that tourism has led to the diversification of the local economy capability.	X3.4	4.362
5	I consider that the availability of products and services has generally improved since the development of tourism.	X3.5	4.325
6	I witnessed that the region has improved in the field of infrastructure, including roads, electricity, water, and public transport, attributed to tourism.	X3.6	4.338
7	Tourism development has provided me with increased educational opportunities, particularly vocational training.	X3.7	4.325
Socio-Cultural Dimension			**4.363**
1	I feel that the Merapi region experiences an overwhelming influx of tourists.*	X4.1	4.325
2	I feel that the development of tourism results in a shift in resident lifestyles and traditional customs.*	X4.2	4.338
3	I find tourists to be bothersome.*	X4.3	4.350
4	I feel that the tourists visiting Merapi tourism site contribute to excessive noise pollution.*	X4.4	4.350
5	I think that the alterations in resident lifestyles due to tourism are positive things.	X4.5	4.400
6	I feel that tourism has led to an increase in criminal activities, alcoholism, vandalism, etc.*	X4.6	4.438
7	I feel that tourism has a detrimental impact on the norms and values within our area.*	X4.7	4.350
8	I feel that the local traditions have diminished in significance due to the influence of tourism.*	X4.8	4.350

Note: Items are assessed using a 5-point Likert agreement scale.
*The items are decoded to align with the positive direction.
Dimensional scale means in bold.
Source: Results of processed data, 2024

Table 4 depicts the Cronbach alpha reliability scale and means (N=120) from each item developed from ecology, economy, institutional, and socio-cultural dimensions. Each item is represented by the indicator X, where X1 represented from X1.1 to X1.6 are items from the institutional dimension, X2 represented by X2.1 to X2.4 are items from the ecological dimension, X3 represented by X3.1 to X3.7 are items from the economic dimension, and X4 represented by X4.1 to X4.8 are items from the socio-cultural dimension.

Below is a table depicting each item developed from the satisfaction scale of residents in the Merapi tourism region, along with the data results on Cronbach alpha reliability and mean values:

Table 5. Items of Resident's Satisfaction

No	Items		Mean
Satisfaction of residents			**4.309**
1	I find satisfaction in the multitude of benefits that Merapi tourism in the protected area brings to me and my family.	Y1	4.438
2	My satisfaction stems from the enhancement of the attractiveness of this protected area due to Merapi tourism.	Y2	4.312
3	I consider that the presence of sustainable Merapi tourism in this protected area holds significance.	Y3	4.237
4	I am content with the condition of Merapi tourism in this protected area.	Y4	4.250

Note: Items are assessed using a 5-point Likert agreement scale.
Dimensional scale means in bold.
Source: Results of processed data, 2024

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Table 5 depicts the Cronbach alpha reliability scale and means (N=120) from each item developed from the Satisfaction of local residents. Each item is represented by the indicator Y1 until Y4.

Testing Model Measurement (Outer Model)

Convergent Validity

The author developed a structural model for SEM-PLS analysis utilizing the SmartPLS 4 software. Below is the structural model serving as the framework for the research analysis and the outcomes of the author's data examination presented through the outer loadings matrix (Table 6).

Table 6. Outer Loadings

No	Indicators	Ecology	Economy	Institutions	Resident's Satisfaction	Socio-Cultures
1	X1.1			0.898		
2	X1.2			0.796		
3	X1.3			0.866		
4	X1.4			0.887		
5	X1.5			0.855		
6	X1.6			0.872		
7	X2.1	0.910				
8	X2.2	0.933				
9	X2.3	0.934				
10	X2.4	0.917				
11	X3.1		0.961			
12	X3.2		0.945			
13	X3.3		0.939			
14	X3.4		0.927			
15	X3.5		0.896			
16	X3.6		0.965			
17	X3.7		0.955			
18	X4.1					0.879
19	X4.2					0.913
20	X4.3					0.932
21	X4.4					0.932
22	X4.5					0.877
23	X4.6					0.768
24	X4.7					0.890
25	X4.8					0.824
26	Y1				0.732	
27	Y2				0.841	
28	Y3				0.876	
29	Y4				0.899	

Source: Results of processed data, 2024

Based on the findings derived from the author's data analysis, ll indicators (X and Y) exhibit values exceeding 0.7, indicating their validity within this research context. Convergent validity means that a set of indicators represents a single latent variable and underlies that latent variable.

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Average Variance Extracted (AVE)

Upon processing the data, the author has computed the Average Variance Extracted (AVE). Presented herewith is a concise overview of the obtained data:

Table 7. Average Variance Extracted (AVE)

No	Variable	AVE	Explanation
1	Ecology	0.853	Valid
2	Economy	0.744	Valid
3	Institutions	0.886	Valid
4	Resident's Satisfaction	0.704	Valid
5	Socio-Cultures	0.771	Valid

Source: Results of processed data, 2024

Table 7 provided indicates that all variables, such as ecology, economy, institutions, socio-cultures, and resident's satisfaction, exhibit AVE values exceeding 0.5. As such, all constructs meet the validity standards outlined, as their respective AVE values surpass the threshold of 0.5. It implies the validity of the constructs and their ability to elucidate more variance in their indicators compared to measurement error.

Construct Reliability

The subsequent discussion revolves around construct reliability, which evaluates the reliability of latent variables employed in this study. An indispensable criterion for construct reliability is a value exceeding 0.70 (> 0.70). In this context, Cronbach's Alpha is a reference for assessing these values. Presented in Table 8 below are the outcomes of the author's data analysis:

Table 8. Construct Reliability

No	Variable	Cronbach's Alpha	RH0_a	Composite Reliability
1	Ecology	0.942	0.945	0.959
2	Economy	0.931	0.942	0.946
3	Institutions	0.978	0.980	0.982
4	Resident's Satisfaction	0.858	0.858	0.905
5	Socio-Cultures	0.957	0.959	0.964

Source: Results of processed data, 2024

According to the tabulated results, which summarize the findings of the author's data analysis, all examined constructs demonstrate Cronbach's Alpha values surpassing the threshold of 0.70 (> 0.70). Consequently, all constructs employed in this investigation are considered reliable. This observation implies that the measurement instruments utilized to assess these constructs exhibit substantial internal consistency, thereby ensuring the reliability of the constructs for further scrutiny and interpretation of the research outcomes.

Structural Model Analysis (Inner Model)

Structural Equivalent

In this scenario, the author aims to analyze the structural equation of the data by utilizing the structural model that has been made by the author. Consequently, in this context, the author follows to the result of Path Coefficients (Table 9):

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Table 9. Structural Equivalent

No	Variable	Original Sample (O)	T statistics (O/STDEV)	P values
1	Ecology → Resident's Satisfaction	-0.232	0.640	0.522
2	Economy → Resident's Satisfaction	0.195	2.537	0.011
3	Institutions → Resident's Satisfaction	-0.865	0.754	0.451
4	Socio-Cultures → Resident's Satisfaction	1.677	3.689	0.000

Source: Results of processed data, 2024

The Effect of Ecology Dimension toward Residents' Satisfaction

The direct effect coefficient of the Ecology dimension on Resident's Satisfaction, with an Original Sample (O) value of -0.232, indicates a negative association. A one-unit increase in the Ecology dimension of Tourism in the Merapi region corresponds to a 0.232 decrease in Resident's Satisfaction. However, this effect is not statistically significant. The T-statistic value is 0.640, below the critical threshold of 1.96, and the P-value is 0.522, above the conventional significance level of 0.05. Consequently, the observed effect is considered statistically insignificant. Therefore, while tourism implementation in the Merapi region may have negatively impacted the Ecology (environment) quality, this effect on Resident's Satisfaction is not statistically significant.

Based on the interview results from all parties, including the Head of the Tourism Office of Sleman Regency representing the government, the Chairman of the Village Tourism Communication Forum of Sleman Regency representing Non-Governmental Organizations, and the Chairman of the Tourism Awareness Group of Sleman Regency (Pokdarwis) representing the community, it was found that there are several negative environmental impacts resulting from the presence of tourism. These impacts include illegal deforestation, illegal sand mining, the greenhouse effect, climate change, excessive carbon emissions, industrial waste, and the greenhouse effect (Figure 4).

Figure 4. Calculated Interview Result of Ecology Dimension toward Residents' Satisfaction (Word Frequency)
Source: Results of processed data, 2024

This can be seen from the processed interview data using NVIVO 12 Plus software, with the word frequency feature indicating that environmental issues are an integral part of

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the problems arising from tourism activities, with waste management issues being particularly dominant.

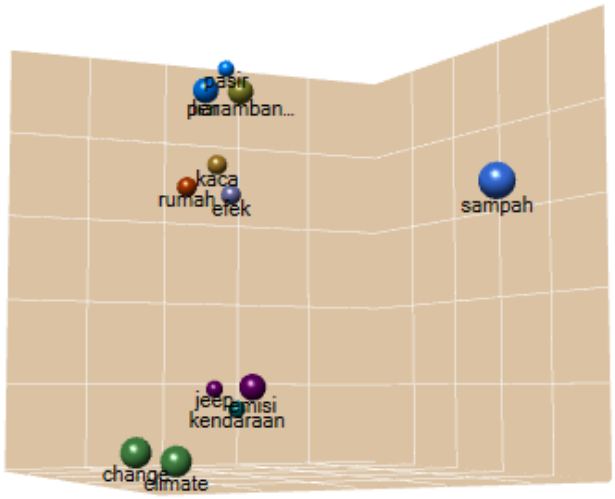

Figure 5. Calculated Interview Result of Ecology Dimension toward Residents' Satisfaction (Cluster Analysis)
Source: Results of processed data, 2024

The data further emphasizes, through the cluster analysis feature in NVIVO 12 Plus, that waste is the primary issue created by tourism operators and tourists (Figure 5). Additionally, climate change results from illegal deforestation and carbon emissions generated by tourism jeep fleets and tourist vehicles, ultimately contributing to the greenhouse effect. Environmental degradation is prevalent in the Mount Merapi National Park case study, particularly regarding deforestation and illegal water mining (Fandeli, 2008; Fauziyah & Putri, 2023).

This finding aligns with previous studies in the Prism of Sustainability dimensions field, such as those by (Huynh, 2018; Trišić, Nechita, Milojković, et al., 2023), which indicate that increased tourist activities and expanded tourism infrastructure often negatively impact natural environments. Mass tourism can degrade sensitive ecosystems, including mountain areas, and lead to excessive consumption of natural resources. Often, the expansion of tourism overlooks these adverse consequences. Therefore, it is essential to emphasize creating tailored tourist destinations that mitigate these adverse effects (Jeelani et al., 2023).

The Effect of Economy Dimension toward Residents' Satisfaction

The direct effect coefficient of the Economy dimension on Resident's Satisfaction, with an Original Sample (O) value of 0.195, indicates a positive association. A one-unit increase in the Economy dimension of Tourism in the Merapi region corresponds to a 0.195 increase in Resident's Satisfaction. This effect is statistically significant, with a T-Statistic value of 2.537, exceeding the critical threshold of 1.96, and a P-value of 0.011, below the conventional significance level of 0.05. In conclusion, the implementation of tourism in the Merapi region has led to an improvement in the economic quality, and resident satisfaction with it is statistically significant.

Based on the interview results from all parties, including the Head of the Tourism Office of Sleman Regency representing the government, the Chairman of the Village

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Tourism Communication Forum of Sleman Regency representing Non-Governmental Organizations, and the Chairman of the Tourism Awareness Group of Sleman Regency (Pokdarwis) representing the community, it can be seen from the data that calculated in NVIVO 12 trough Word Frequency feature:

Figure 6. Calculated Interview Result of Economy Dimension toward Residents' Satisfaction (Word Frequency)
Source: Results of processed data, 2024

The data processed from the above interviews indicates that there has been a significant economic change before and after the establishment of post-disaster management in the Merapi area (Figure 6). Economic growth is evident from the influx of tourists to the destinations provided by the Merapi area, such as jeep tours for lava activities, tourist villages, homestays, culinary vendors, souvenir vendors, and various other economic activities that have resulted in higher profits for tourism entrepreneurs, thereby enhancing their quality of life (specifically for MSME actors). On the other hand, economic development is also driven by the arrival of private investors aiming to develop more tourist destinations in the Merapi area, as it is considered to have substantial potential to become a major tourist destination. Consequently, this has led to increased economic activities in the Merapi tourism area. Simultaneously, support from the budget of the Special Region of Yogyakarta Provincial Government also acts as a catalyst for economic activities in the Merapi tourism area. The budget is utilized for Human Resource Development efforts to improve tourism management and infrastructure development in the Merapi area, aiming to attract more tourists.

In the case of Merapi tourism, the sector is a primary driver for the local community (Buol, 2016; Hartono, 2018). It aligns with the Sleman regency government's strategy of repurposing the remnants of the volcanic eruption into new tourist destinations to boost the economy (National Geographic Indonesia, 2010). Economic sustainability in tourism contributes to local community welfare through various avenues, including employment opportunities, revenue from ticket sales, local goods and services transactions, increased

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local involvement in tourism planning and management, and responsible resource utilization (Huayhuaca et al., 2010). Previous research also shows that economic development from the tourism industry benefits tourism stakeholders and residents (Trišić, Nechita, Milojković, et al., 2023).

The Effect of Institution Dimension toward Residents' Satisfaction

The direct effect coefficient of the Institution dimension on Resident's Satisfaction, with an Original Sample (O) value of -0.865, indicates a negative association. A one-unit increase in the Institution dimension of Tourism in the Merapi region corresponds to a 0.865 decrease in Resident's Satisfaction. However, this effect is not statistically significant, with a T-statistic value of 0.754 (below the critical threshold of 1.96) and a P-value of 0.451 (above the conventional significance level of 0.05). Thus, the observed effect is statistically insignificant. In conclusion, the community's limited access to influence public policies related to tourism implementation in the Merapi region results in dissatisfaction. The Institution dimension exhibits a negative and statistically insignificant effect on Resident's Satisfaction in implementing tourism practices in the Merapi region.

The Sleman Regency Tourism Office focuses on human resources development within the tourism sector, with policies designed to enhance existing human resources. Based on interview results, implementing tourism development policies from a human resource perspective is challenging. The causes can be identified from the interview data analysis using NVIVO 12 Plus with the word frequency feature as seen in Table 7 bellow:

Figure 7. Calculated Interview Result of Institution Dimension toward Residents' Satisfaction (Word Frequency)
Source: Results of processed data, 2024

It was found that tourism actors lack a service-oriented mindset, focusing instead on a money-oriented approach. Consequently, when the Sleman Regency Tourism Office implements specific policies for improving tourism services, these actors reject the policies, deeming them too complex and believing their current level of service is sufficient. It indicates that policy-making is not on mutual understanding between the tourism offices and actors. Tourism development policies are formulated solely by the government without involving the tourism actors. On the other hand, several instances of government policies not approved by the community have been documented in the tourism area of Mount Merapi. Significant issues include government permits for mineral water mining, leading

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to environmental damage (Fauziyah & Putri, 2023), and the construction of temporary waste disposal sites in the area (Trijoko, 2023).

The institutional dimension underscores the need for greater involvement of diverse stakeholders in strategic tourism planning. These stakeholders include governmental entities, indigenous enterprises, business entities, tourism bureaus, lodging establishments, and others (Trišić, Nechita, Milojković, et al., 2023). Previous research aligns with this finding, indicating a negative effect of the institutional dimension on resident satisfaction in tourism development. Prior research shows that lower values for the institutional dimension suggest insufficient support from local, national, and international institutions or limited resident access to decision-making processes (Obradović et al., 2021).

The Effect of Socio-Culture Dimension toward Residents' Satisfaction

The direct effect coefficient of the socio-culture dimension on resident's satisfaction, with an Original Sample (O) value of 1.677, indicates a positive association. A one-unit increase in the socio-culture dimension of Tourism in the Merapi region corresponds to a 1.677 increase in Resident's Satisfaction. This effect is statistically significant, with a T-statistic value of 3.689 (exceeding the critical threshold of 1.96) and a P-value of 0.000 (below the conventional significance level of 0.05). In conclusion, the implementation of tourism in the Merapi region has resulted in an improvement in the socio-cultural aspect, and resident satisfaction with it is statistically significant. The socio-culture dimension exhibits a positive and statistically significant effect on Resident's Satisfaction with the implementation of tourism practices in the Merapi region.

Based on the interview results from all parties, including the Head of the Tourism Office of Sleman Regency representing the government, the Chairman of the Village Tourism Communication Forum of Sleman Regency representing Non-Governmental Organizations, and the Chairman of the Tourism Awareness Group of Sleman Regency (Pokdarwis) representing the community, it can be seen from the data that calculated in NVIVO 12 through Word Frequency feature in Figure 8:

Figure 8. Calculated Interview Result of Socio-Culture Dimension toward Residents' Satisfaction (Word Frequency)
Source: Results of processed data, 2024

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The practice of upholding socio-cultural values in the Merapi area remains well-preserved and has even improved following the establishment of post-disaster management in the region. This improvement is attributed to the collaborative efforts of the Tourism Office, along with stakeholders such as local tourism awareness groups (Pokdarwis), the community, travel agents, museums, and various other parties. These collaborations work together to promote the cultural heritage of the Merapi area as a key attraction in schools and the broader public. Consequently, tourists are encouraged to respect the social and cultural conditions of the Merapi area during their visits.

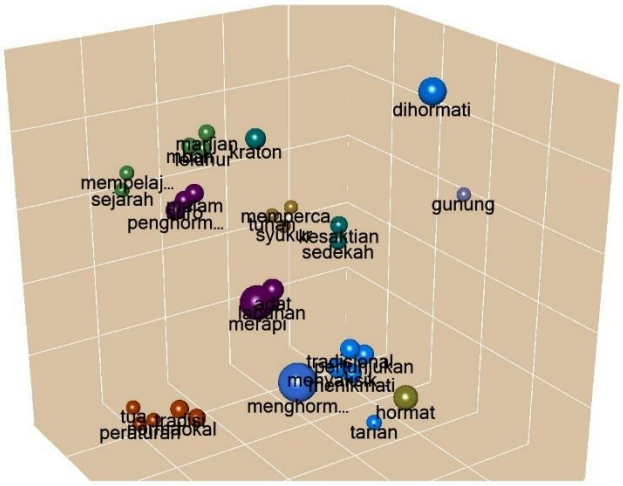

Figure 9. Calculated Interview Result of Socio-Culture Dimension toward Residents' Satisfaction (Cluster Analysis)
Source: Results of processed data, 2024

This can be observed from the results of the cluster analysis and word frequency, as shown in the Figure 9 above. The interview results indicate that tourists respect the traditions and customs of the Merapi area, including the belief in the sacredness of prominent figures such as Mbah Marijan. This respect extends to the tourists' trust in traditional practices in Merapi, such as the 'Adat Labuhan Merapi,' 'Sedekah Gunung,' and 'Tradisi pada Malam 1 Suro,' which are forms of gratitude to God, with tourists even participating in these traditional rituals. It is also noted that traditional dances in the Merapi area are an integral part of the attraction of many tourists due to the cultural significance. Additionally, the history and values upheld by the Merapi community are fully respected by tourists, including the pre-independence history and the volcanic eruptions of Mount Merapi, which have fostered greater sympathy and respect for the local community.

In this research context, tourism contributes to preserving the local culture of the Merapi community, making it an integral part of the tourism attraction. Additionally, the Merapi community exhibits greater openness to external influences due to tourism, resulting in positive impacts on their sociocultural conditions (Dinas Kebudayaan DIY, 2016; Sekretariat DPRD Yogyakarta, 2022). Sociocultural sustainability is achieved through the beneficial impacts of tourism development on the attitudes and satisfaction levels of the indigenous community (Bello et al., 2016; Khan et al., 2022). Previous research highlights the importance of socio-cultural aspects in tourism development and their positive impact on local residents. Studies (Asmelash & Kumar, 2019) have shown that the socio-cultural dimension is the highest positive predictor of resident satisfaction.

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The tourism sector is crucial in considering sociocultural aspects as it can alter the local culture positively or negatively.

CONCLUSION

The research highlights a mixed impact of tourism on community satisfaction in the Merapi region, illustrating both positive and negative dimensions. The ecological dimension reveals a negative influence, as tourism activities contribute to environmental degradation, which undermines local community satisfaction. Conversely, the economic dimension has a positive effect, demonstrating that tourism fosters economic growth and development, enhancing the community's financial well-being. The institutional dimension, however, negatively affects community satisfaction, suggesting that the lack of community involvement in tourism-related decision-making and local government policies hinders overall contentment. On the other hand, the socio-cultural dimension shows a positive effect, as tourism has played a role in enriching and promoting local culture, thereby contributing to the community's cultural pride and satisfaction. This mixed-method approach underscores the need for balanced strategies that address environmental concerns while maximizing economic benefits, improving institutional involvement, and supporting socio-cultural enhancement.

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EXAMINING THE NEXUS BETWEEN TOURISM INVESTMENTS, RENEWABLE ENERGY CONSUMPTION AND CO_2 EMISSIONS IN INDONESIA

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Abstract

The tourism industry undoubtedly contributes positively to economic growth. However, numerous studies show that tourism can have diverse impacts on environmental quality. This study focuses on exploring the correlation between investment in the tourism sector, the renewable energy consumption, and the contribution of tourism-related sectors to CO_2 emissions within the period 2000 – 2017 using a case study in Indonesia. By employing the distributed lag method with the Koyck approach, this study found that investment in the tourism sector in Indonesia has a statistically positive and significant correlation with CO_2 emissions. Conversely, renewable energy consumption, as the control variable, exhibits a significant negative correlation with CO_2 emissions. The findings suggest that the existing investment policies in Indonesia are not aligned with environmental sustainability, supporting the pollution haven hypothesis. To address this, the study underscores the need for stronger commitments to transitioning from fossil-based to renewable energy sources, ensuring that future tourism investments contribute to both economic growth and environmental preservation.

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INTRODUCTION

As the largest archipelagic country in the world, Indonesia has enormous potential to attract tourists due to its diverse natural and cultural heritage. In 2019, before the pandemic, this sector became one of Indonesia's primary economic drivers, contributing 4.97% to the national Gross Domestic Products (GDP) (BPS, 2023). This sector drew significant capital from both domestic and foreign investors. Families, companies, or affluent individuals were increasingly viewing hotels as valuable heritage assets as a means of diversifying their business (PwC, 2021).

However, the tourism industry's growth often comes at a high environmental cost, particularly with respect to CO_2 emissions and the consumption of fossil fuels (Danish & Wang, 2018; Gössling & Peeters, 2015; Katircioğlu, 2014; Scott et al., 2016). This trade-off poses a challenge for policymakers: how can Indonesia continue to profit on its tourism potential without jeopardizing the country's environmental objectives, particularly its commitment to reducing CO_2 emissions? Understanding the relationship between tourism investment, renewable energy consumption, and CO_2 emissions is essential for formulating policies that balance economic growth with environmental sustainability.

By exploring the nexus between these three factors, this paper provides insights into how Indonesia can manage its tourism growth in a way that not only maximizes economic benefits but also ensures environmental sustainability. Such a strategy is necessary for long-term national prosperity, as unrestricted CO_2 emissions could eventually harm the ecosystems and natural resources that attracted to Indonesia in the first place.

Existing literature on tourism economics generally discusses of how the tourism industry contributes to economic growth, with some studies exploring the impact on the environment. Several studies highlight the tourism industry as an important sector for economic development (Fauzel, 2021; Fauzel et al., 2017; Kumar et al., 2015; Rasool et al., 2021; Wu et al., 2022). A study by Liu et al. (2022) demonstrated that the tourism sector boosts economic activities that support long-term growth, with substantial evidence from countries like France, the United States, and China. This positive impact is often attributed to the multiplier effect, where increased tourism spending stimulates the economy in other areas, which results in overall economic growth.

Despite its contribution to economic growth, the tourism sector is also argued to contribute to environmental degradation due to its heavy reliance on fossil fuels, which disrupt the climate system through GHG emissions (Danish & Wang, 2018; Gössling & Peeters, 2015; Katircioğlu, 2014; Scott et al., 2016). Nosheen et al. (2021) observed that tourism, free trade, and urbanization deteriorated the environmental conditions in Asian economies, suggesting the need for sustainable tourism and renewable energy sources. Similarly, Sherafatian-Jahromi et al. (2017) argue that there is a long-term relationship between tourism and CO_2 emissions.

Given the environmental challenges associated with tourism, it is essential to explore how investment in this sector may exacerbate these issues. The Pollution Haven Hypothesis (PHH) is frequently used to observe the nexus between investment and carbon emissions. According to this theory, pollution levels rise when foreign direct investment (FDI) enters nations with more relaxed environmental regulations. Studies by Duan and Jiang (2021), Singhania and Saini (2021), and Nejati and Taleghani (2022) support this hypothesis. Additionally, Baek (2016) delved into the relationship between investment,

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income, energy, and the environment in 5 ASEAN countries and found that foreign investment increases CO_2 emissions, supporting the pollution haven hypothesis. While in the low-income countries, FDI will increase CO_2 emissions, in high-income countries, it will reduce them.

Some researchers have concluded different results. For instance, Hong et al. (2017) found that in addition to encouraging economic growth, government investment in the research and development sector and private investment in equipment can reduce CO_2 emissions. While new technology equipment could lower CO_2 emissions, the development of new technology may increase productivity and competitiveness, leading to higher output, which can indirectly raise CO_2 emissions. Lee and Brahmasrene (2013) research revealed FDI, CO_2 emissions, and tourism have a high and significant impact on economic growth. In the end, economic growth will show a significant positive impact on CO_2 emissions, even while FDI and the tourism sector have a negative impact.

Previous research has thoroughly examined the connection between tourism, economic growth, and CO_2 emissions across diverse regions. The research of Sherafatian-Jahromi et al. (2017), Nosheen et al. (2021), and Handoyo et al. (2022) provided insights into these relationships within Asia. Similarly, the studies by Lee and Brahmasrene (2013), Paramati et al. (2017), Cró and Martins (2020), and Sokhanvar and Jenkins (2022) explore the impact of tourism and CO_2 emissions on economic growth in Europe. However, there is limited research on the impact of tourism investment on CO_2 emissions in Indonesia. This study aims to fill this gap by examining the link between tourism investment and environmental degradation, while also examining various factors that affect CO_2 emissions in Indonesia, including income per capita, use of renewable energy, and contributions from tourism-related sectors (such as hotels, restaurants, and transportation).

As global tourism is projected to grow significantly by 2030, and sustainability becoming a priority (OECD, 2018), this study aims to provide insight into sustainable development policies that balance Indonesia's economic growth and environmental preservation. This study also contributes to the literature by using the distributed lag method with the Koyck approach, which effectively models the diminishing impact of past values on CO_2 emissions over time. Focusing on Indonesia, a country with both high tourism growth potential and significant climate challenges, this research offers insights for shaping sustainable development policies in developing countries.

METHODOLOGY

This research uses data and publications between the period of 2000 and 2017 from reputable sources. Table 1 on the List of Variables provides a detailed explanation of all the variables used in this study.

Table 1. List of Variables

Abb.	Remarks	Unit	Source
Dependent Variable			
CO_2	Emisi CO_2	Kiloton (kt)	https://databank.worldbank.org/source/world-development-indicators

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Abb.	Remarks	Unit	Source
Main Independent Variable			
TI	Investment in the tourism sector (total investment realization in the tourism sector)	Trillion IDR	Publication of the National Tourism Satellite Account/Nesparnas (BPS and Kemenparekraf), processed by the Ministry of Tourism and Creative Economy
Independent Control Variable			
PI	GDP per capita (constant 2015)	US$	https://databank.worldbank.org/source/world-development-indicators
REC	Renewable energy consumption as part of total energy consumption	%	https://databank.worldbank.org/source/world-development-indicators
HRT	Contribution of subsectors of hotels and restaurants, and transportation against national GDP (including oil and gas)	%	https://www.bps.go.id/

Source: Data processed by author

The dependent variable in this study is the amount of CO_2 emissions, which has been frequently used as a proxy for environmental quality in the previous studies (Danish & Wang, 2018; Katircioğlu, 2014; Lee & Brahmasrene, 2013; Paramati et al., 2017). The main independent variables are investment in the tourism sector, by adding renewable energy consumption, and the contribution of the tourism sector, which is represented by the contribution to national income from the transportation, hotel, and restaurant sectors as a control variable. Quantitative analysis is conducted to investigate the relationship between these variables using the distributed lag method with the Koyck approach. This method allows for the exploration of lagged effects over time.

Before estimating, the values for each of the CO_2 emissions (CO_2), per capita income (PI), and tourism investment (TI) variables were converted into natural logarithm form so that the CO_2 emission function specification is expressed through the following equation:

$$lCO_2 = f(lTI, lPI, REC, HRT) \quad \ldots(1)$$

This research model adopts the model specifications developed by (Ben Jebli et al., 2019; Katircioğlu, 2014; Khan et al., 2020), which links CO_2, tourism, investment, and renewable energy consumption. The use of renewable energy consumption as a control variable refers to the model developed by Pata et al. (2023) and Wang et al. (2022), who examined the relationship between investment, energy consumption and income. Meanwhile, considerations for including the contribution of the transportation sector, as well as hotels and restaurants as the control variable are based on the fact that emissions from the tourism sector result from transportation as much as 75%, accommodation 21%, and tourist attractions such as museums and amusement parks around 4% (UNWTO & International Transport Forum, 2019). Apart from that, several previous studies also used the hotel and restaurant sector as a proxy for the tourism sector (Cró & Martins, 2020; Endo, 2006).

To estimate this model, this research uses the Koyck approach, which is a type of technique used to analyze time series data. In a regression model that uses time series data,

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if the model not only uses present values but also delays past values of the independent variables, this model is defined as a distributed lag model (Gujarati, 2003). However, the weakness of using a distributed lag model is the problem of multicollinearity and degrees of freedom which decrease geometrically as the lag length increases (Dikmen, 2005; Erdal et al., 2009; Klein, 1958). To overcome this problem, the Koyck approach is used to estimate parameters in the distributed lag model. The form of the equation using the Koyck approach is denoted as follows:

$$y_t = \sum_{k=0}^{\infty} \beta_k \, x_{t-k} + u_t \quad \text{...(2)}$$

What often happens is that the dependent variable takes time to respond to the independent variable. In this case, CO_2 emissions respond to TI after some time. The time to respond is called the "lag period" (Dikmen, 2005; Erdal et al., 2009). The researcher who first used this approach was Irving Fisher (Erdal et al., 2009; Klein, 1958), the distributed lag model takes into account not only the variable values in the current year but also the variable values in the previous year. How far the lag is used to define the variable is not explained. Therefore, this approach is called the unlimited lag model (Klein, 1958), which is expressed in following equation (3).

$$lCO_{2_t} = \alpha + \beta_1 lTI_{t-1} + \beta_2 lTI_{t-2} + \cdots + u_t \quad \text{...(3)}$$

On the other hand, if the number of years back (t) is defined as (k), the model is called "finite distributed lag", as follows:

$$lCO_{2_t} = \alpha + \beta_1 lTI_{t-1} + \beta_2 lTI_{t-2} + \cdots + \beta_i lTI_{t-k} + u_t \quad \text{...(4)}$$

Furthermore, the unknown parameters (α, β0,.....βi) in this model can be estimated using the ordinary least squares (OLS) method (Gujarati, 2003). Based on the assumption that the lag in the independent variable influences the dependent variable to a certain extent and the weight of the lag decreases geometrically, the model is reduced, and a regression equation is estimated (Dikmen, 2005; Erdal et al., 2009). To obtain the reduced model, Koyck assumes that in an infinite distributed lag, all β have the same sign and decrease geometrically as shown below, where λ is the rate of decline of distributed lag and β_k is the lag coefficient.

$$\beta_k = \beta_0 \, \lambda^k \text{ where } k = 0,1, \ldots \quad \text{...(5)}$$

Assuming $0 < \lambda < 1$, the closer λ is to 1, the smaller the decrease in β_k and the closer λ is to zero, the greater the decrease in β_k (Gujarati, 2003). As lCO_2 goes back into the distant past, the lag effect on lCO2t becomes smaller. Geometrically, Koyck's scheme is described in Figure 1.

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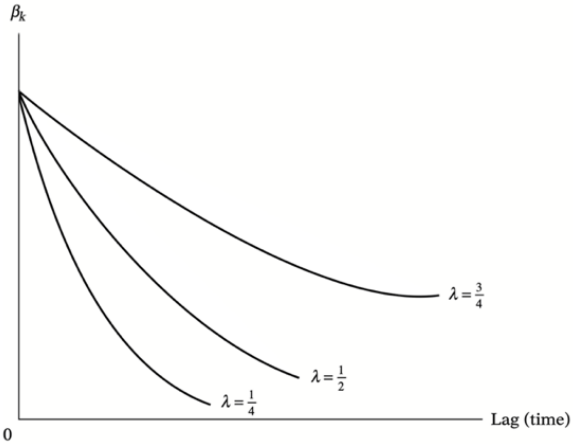

Figure 1. Koyck Scheme (Geometrically Distributed Lag)
Source: Gujarati, 2003

Assuming $0 < \lambda < 1$, Koyck gives lower weight to β in the distant past than to the present; and Koyck ensures that the sum of β, which gives the long run multiplier, is finite, then:

$$\sum_{k=0}^{\infty} \beta_k = \beta_0 + \frac{1}{(1-\lambda)} \quad \ldots(6)$$

Thus, the infinite lag model can be written as follows:

$$lCO_{2_t} = \alpha + \beta_0 lTI_t + \beta_0 \lambda lTI_{t-1} + \beta_0 \lambda^2 lTI_{t-2} + \cdots + u_t \quad \ldots(7)$$

However, the linear regression analysis method (in parameters) cannot be applied to the model in equation (7). Therefore, Koyck suggests adding the lag by one period to get the following equation:

$$lCO_{2_{t-1}} = \alpha + \beta_0 lTI_{t-1} + \beta_0 \lambda lTI_{t-2} + \beta_0 \lambda^2 lTI_{t-3} + \cdots + u_{t-1} \quad \ldots(8)$$

Next, by multiplying both sides by λ, we obtain the equation:

$$lCO_{2_{t-1}} = \lambda\alpha + \lambda\beta_0 lTI_{t-1} + \beta_0 \lambda^2 lTI_{t-2} + \beta_0 \lambda^3 lTI_{t-3} + \cdots + u_{t-1} \quad \ldots(9)$$

By subtracting equation (9) from equation (7), then:

$$lCO_{2_t} - \lambda lCO_{2_{t-1}} = \alpha(1-\lambda) + \beta_0 lTI_t + (u_t - \lambda u_{t-1}) \quad \ldots(10)$$

Which can be simplified as follows:

$$lCO_{2_t} = \alpha(1-\lambda) + \beta_0 lTI_t + \lambda lCO_{2_{t-1}} + v_t \quad \ldots(11)$$

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Whereas $v_t = (u_t - \lambda u_{t-1})$ is the moving average mean of u_t dan u_{t-1}. Therefore, using the ordinary least square (OLS) estimation method, the following regression equation is created:

$$lCO_{2_t} = \alpha + \beta_0 lTI_t + \lambda lCO_{2_{t-1}} + v_t \quad ...(12)$$

By adding control variables to the equation, then:

$$lCO_{2_t} = \alpha + \beta_0 lTI_t + \lambda lCO_{2_{t-1}} + \gamma X_t + v_t \quad ...(13)$$

Where CO_2 is CO_2 emissions, TI is the value of tourism investment, X is a control variable consisting of contribution or share of renewable energy consumption to total energy consumption (REC), and share of the tourism sector (in this is represented by the hotel and restaurant sector, as well transportation) to national GDP (HRT), α is the coefficient of TI, γ is the coefficient of each control variable, and ε is the error term.

FINDINGS AND DISCUSSION

To estimate the model, the author used Stata 16 software. First, the author carried out a data normality test and a classical assumption test, which aims to explore whether in the model there are problems with heteroscedasticity, autocorrelation or multicollinearity which will affect the validity of the regression results, as well as a stationarity test. To determine the existence of multicollinearity between the dependent variable (lCO_2) and the independent variables (lTI, lPI, REC, and HRT), estimation was carried out using Ordinary Least Square (OLS) and evaluating the variance inflation factor (VIF). VIF is the commonly used measure of multicollinearity of independent variables in regression models.

From the VIF Table shown in Table 2, the VIF values for all variables are much greater than the maximum tolerance of 10 except for the HRT variable. This shows the existence of multicollinearity between the independent variables. To ensure the accuracy of the regression model, overcome the influence of multicollinearity between variables on the regression results, and increase the stability and reliability of the regression coefficients, the author issued an lPI that had a VIF value far above the mean. The following are the results of the VIF test after lPI was removed from the model. With the VIF value of all variables less than 10, there is no longer any collinearity in the model. Table 3 presents the VIF results after removing the lPI variable from the model.

Table 2. VIF Result on Variable in the Model

Variable	VIF	1/VIF
lPI	47.32	0.021131
lTI	22.24	0.044960
REC	18.17	0.055039
HRT	2.41	0.415225
Mean VIF	22.54	

Source: Data processed by the author

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Table 3. VIF Result after Omitting the lPI Variable

Variable	VIF	1/VIF
lTI	9.56	0.104559
REC	8.75	0.114309
HRT	2.28	0.439199
Mean VIF	6.86	

Source: Data processed by the author

Because of the cointegration in the model, the estimation is carried out using the distributed lag method via the Koyck approach. The use of the distributed lag method is to determine the long-term balance relationship between investment in the tourism sector, as well as other control variables (renewable energy consumption, the share of GDP in the hotel and restaurant sector, and transportation) on CO_2 emissions. Regression results using the Koyck approach can be seen in Table 4.

Table 4. Regression Results with Koyck Approach

Variable	Coefficient	Standard Error
lCO_2 (-1)	-0.1506445	0.1756196
lTI	0.1070063***	0.0298493
REC	-0.0162411***	0.0033529
HRT	0.0442102	0.0660564
	0.9415	
T statistics: *p < 0.1; **p<0.05; ***p<0.01		
R-squared: 0.9844		

Source: Data processed by the author

From the application of the Koyck approach in the regression, the results show that statistically, tourism sector investment has a significant positive correlation with CO_2 emissions. This finding suggests that the higher the percentage increase in tourism investment, the higher the percentage increase in CO_2 emissions. If investment in the Indonesian tourism sector increased by 1% in the past year, then CO_2 emissions would also increase by 0.107% ceteris paribus. This relationship supports the pollution haven hypothesis, which posits that FDI in countries with more relaxed environmental regulations leads to increased pollution.

From 2000 to 2017, Indonesia experienced parallel upward trends in both tourism investment and CO2 emissions. Figure 2 illustrates that tourism investment and CO_2 emissions continued to increase from 2000 to 2012, fell slightly in 2013, and then slowly resumed an upward trajectory. Notably, from 2000 to 2012, tourism investments slightly surpassed CO_2 emissions, highlighting the potential environmental costs associated with the sector's growth. This pattern suggests that investment strategies might not sufficiently addressed environmental sustainability.

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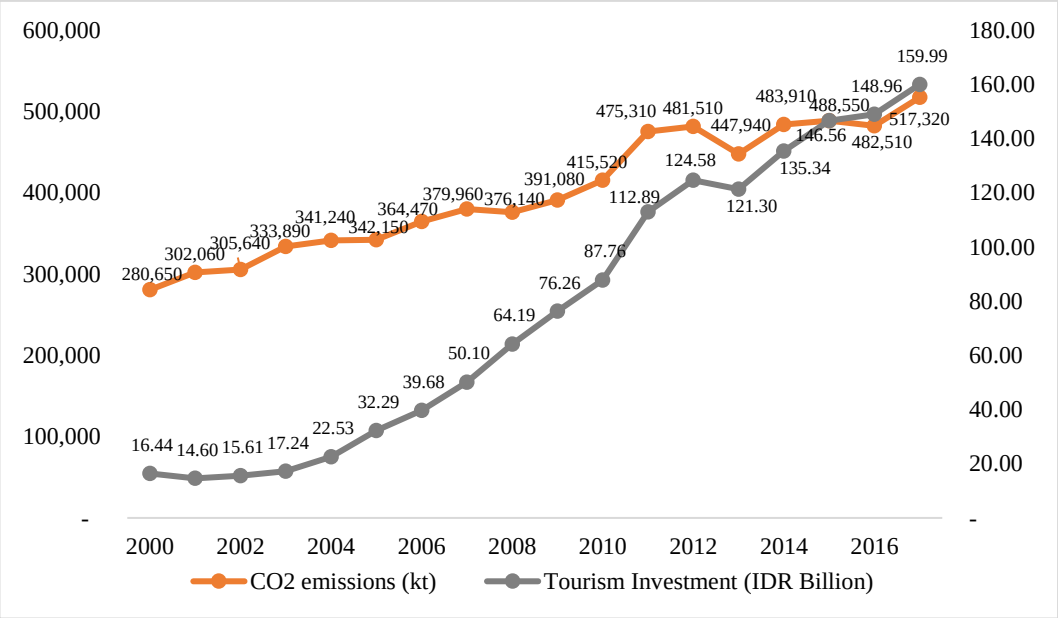

Figure 2. CO_2 Emissions and Tourism Investment in Indonesia (2000–2017)
Source: Data processed by the author

Tourism Investment and CO_2 Emissions

Indonesia has been an increasingly attractive travel destination for its diverse landscapes and ecosystems. This potential may be the reason why many investors are interested in investing in Indonesia in the tourism sector. When investment enters a country, the government of the country receiving the capital has the choice to implement stricter or more lenient policies regarding the use of that capital. Countries that implement strict policy requirements for investors to use environmentally friendly energy or technology tend to experience a pollution halo, where investments contribute to sustainability. On the other hand, countries that provide lenient environmental policies towards incoming investment tend to become pollution havens, where investments tend to exacerbate the environmental degradation.

The result of this study supports the Pollution Haven Hypothesis (PHH), which posits that foreign direct investment (FDI) in countries with less stringent environmental regulations leads to higher pollution levels. This hypothesis is supported by the observed correlation between tourism investment and CO_2 emissions in Indonesia. However, while the PHH provides a framework for understanding the environmental impact of FDI, it does not fully account for the specific dynamics of tourism-related investments and their effects on different sectors.

This study's results are in line with previous research (Baek, 2016; Bulus & Koc, 2021; Danish & Wang, 2018; Handoyo et al., 2022; Omri et al., 2014; Singhania & Saini, 2021; Tran et al., 2022), which suggested that investment (FDI) increases CO_2 emissions, ceteris paribus. However, the impact of tourism investment on CO_2 emissions varies by context. For instance, according to Baek's (2016) research, the income level, relationship between energy consumption and CO_2 emissions is always positive and highly significant. Tourism investment in Brazil, Russia, India, China, and South Africa (BRIC countries), which are regarded as major tourism destinations, was found to have a positive and significant impact on economic growth but lower CO_2 emissions (Danish & Wang, 2018).

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At the country-specific level, Mert and Caglar (2020) found that investment is a major factor that helps reduce the CO_2 emissions level in Turkey.

Differing from the results of this study, Abbasi et al. (2023) highlight that the impact of FDI on pollution varies depending on the country's economic development, environmental policies, and the types of industries attracting foreign investment. Countries with stronger environmental regulations tend to experience a more positive effect (pollution halo), while those with weaker regulations tend to attract polluting industries (pollution haven). A study of Mert and Caglar (2020) examines the impact of foreign direct investment (FDI) on Turkey's environmental quality, specifically testing the Pollution Haven Hypothesis (PHH) and Pollution Halo Hypothesis (PH). The results show partial support for pollution halo hypothesis. In case of Turkey, positive movements in FDI lead to long-run increases in emissions, but in the short run, FDI has a negative impact on emission growth. Additionally, negative changes in FDI also contribute to long-run increases in emissions, while short-term effects are the opposite (Mert & Caglar, 2020).

Renewable Energy Consumptions and CO_2 Emissions

From the regression result in Table 4, the coefficient for REC shows a negative sign and is significant, which indicates that increasing the use of renewable energy sources can reduce the environmental impact of tourism investments. The finding of this study is consistent with the broader literature, which advocates for a transition to renewable energy to achieve sustainable development. A study by Nosheen et al. (2021) further emphasizes the need for sustainable tourism practices and renewable energy sources to reduce environmental degradation in Asian economies. According to OECD (2020), fossil fuels continue to dominate electricity investment in Indonesia, where for every dollar invested in renewable electricity generation in 2019, three dollars was invested in coal power. The results of previous study of Ben Jebli et al. (2019) are also consistent with the idea that more renewable energy consumption reduces fossil energy consumption and the associated emissions. Their research revealed that using renewable resources greatly lowers CO_2 emissions. This could be because the level of pollution in these 22 countries within the Central and South American regions draws foreign investors to implement more projects using renewable energy.

This study also explored the relationship between renewable energy consumption and CO_2 emissions. Although the regression results indicate an inverse relationship between renewable energy usage and CO_2 emissions, the correlation was not statistically significant. This result suggests that Indonesia has not utilized renewable energy to its full potential. Figure 3 illustrates how renewable energy consumption in Indonesia has declined over time. The percentage of energy consumed from renewable sources was approximately 45% in 2000. After that, it declined gradually, reaching 40% in 2007. Simultaneously, CO_2 emissions from the energy sector are trending upward in line with rising energy needs, according to the Greenhouse Gas Inventory and Monitoring, Reporting, and Verification Report of the Ministry of Environment (2022). During the period 2000-2020, energy consumption in industry (including fuel in power and heat plants, oil refineries, and coal processes) contributed the most to CO_2 emissions in the energy sector.

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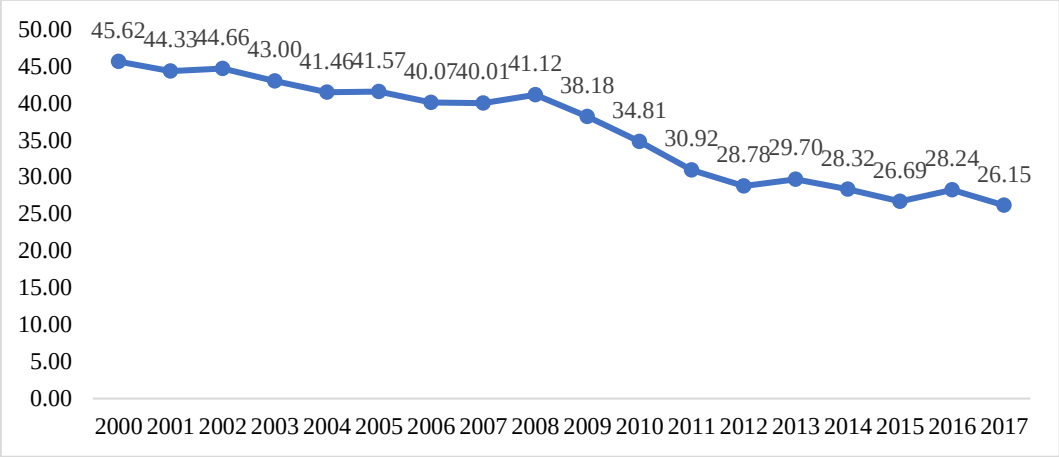

Figure 3. Share of Renewable Energy Consumption in Indonesia (% Total Energy Consumption), 2000–2017
Source: World Bank, 2022

Tourism-Related Sectors and CO_2 Emissions

The tourism industry is widely criticized for its contribution to greenhouse gas emissions, which leads to global warming (Banga et al., 2022). Tourism-related sectors, particularly hotels, restaurants, and transportation, contribute significantly to CO_2 emissions due to their heavy reliance on fossil fuels (Danish & Wang, 2018; Gössling & Peeters, 2015; Katircioğlu, 2014; Scott et al., 2016). The share of joint contributions between the hotel and restaurant sectors and transportation to national GDP shown in Figure 4 shows that the movement of share contributions between the two sectors does not form a regular pattern. However, from 2000 onward, the contribution increased until it decreased from 2006 to 2008 it decreased. Afterward, it gradually rose until 2017.

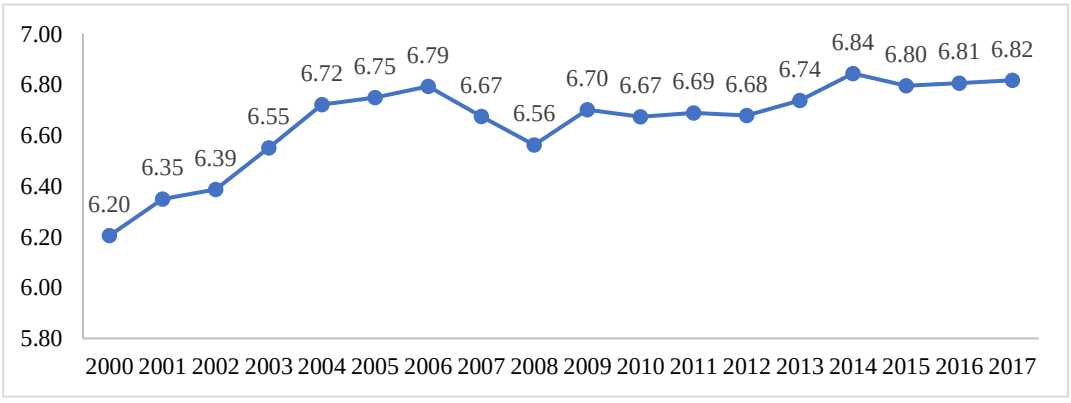

Figure 4. Share of Hotels and Restaurants Sector GDP, and Transportation, 2000 – 2017
Source: Calculations based on data from BPS, 2023

In 2016, global CO_2 emissions from transportation reached 7,230 million tons, accounting for 23% of all man-made emissions, with passenger transport accounting for 64% of the total (UNWTO & International Transport Forum, 2019). Despite improvements in fuel efficiency and greener transportation technologies, CO_2 emissions from passenger and freight transport are projected to increase by 21% by 2030, reaching 8,772 million tons, with two-thirds of passenger travel taking place in non-urban settings (UNWTO & International Transport Forum, 2019). A study by Lee and Brahmasrene (2013) revealed

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that tourism has a positive correlation with economic growth, thereby making it a substantial generator of GDP in EU countries. However, growth in tourism in EU countries is associated with increased CO_2 emissions, particularly from transportation and accommodation sectors.

Conversely, Handoyo et al. (2022) found that the interaction between FDI and imports reduces CO_2 emissions in high-income countries. This is because trade facilitates the transfer of environmentally friendly technology. Findings in lower-middle-income countries show that the lower-middle-income countries import goods and services from other countries, especially from high-income countries, the higher the level of CO_2 emissions will be.

Government Efforts to Reduce CO_2 Emissions

The Indonesian government has tried to reduce environmental impacts by promoting the use of new and renewable energy. One method taken was to implement a policy of converting kerosene into gas (liquified petroleum gas/LPG) with subsidies in 2007. The government then increased the energy sector subsidy budget in response to the growing demand for subsidies, which ultimately created a disincentive to renewable energy development because subsidized fossil fuel prices and electricity derived from fossil fuel-based make renewable energy sources less competitive, which in turn discourages people from using renewable energy.

In addition to the growth in the number of tourists and foreign exchange value, FDI in the tourism industry has become essential for the growth and development of the local tourism sector in various developing countries (Fauzel et al., 2017). Multinational companies in the tourism industry have the potential to contribute to building and strengthening the positive image of the chosen investment destination through foreign investment. For instance, establishing a foreign hotel chain in the host country might improve the reputation of the tourist destination among travelers. International tourism will also boost efficiency through competition between businesses in the country and other international tourist destinations (Fauzel et al., 2017).

Indonesia's policies have been aimed at boosting economic growth while tackling climate change and global economic challenges. Regulatory frameworks such as the 2009 Tourism Law and the 2011 National Tourism Development Master Plan (RIPK) emphasize sustainable tourism development. Since 2017, tourism has been a top priority, supported by initiatives like "Wonderful Indonesia" promoting the sector and the National Tourism Strategic Area Program (KSPN), whose indicators of success are not only assessed by physical development but also community empowerment, improving the quality of human resources, and the sustainability of development in the region (KemenkoPMK, 2020). The government has also prioritized 10 destinations for significant infrastructure development. The main goal is to replicate the model of international tourist destinations with high potential, such as Bali, throughout Indonesia. All the main tourist destination areas are spread across 10 of 34 provinces, of which four destinations are Mandalika, Tanjung Lesung, Tanjung Kelayan and have been designated as SEZs (Ollivaud & Haxton, 2019).

However, until now, the distribution of investment in Indonesia is generally still based on manufacturing, which is one of the sectors that consumes the largest energy (KLHK, 2022). According to BKPM data, around 44% of all foreign investment recorded

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by BKPM during 2009 – 2018 was in the manufacturing sector, 24% in the services sector, 20% in the primary sector, and 12% in the energy and construction sector (OECD, 2020).

CONCLUSION

FDI in the tourism industry plays an important role in the economic growth of emerging countries (Fauzel et al., 2017), including Indonesia. The country's diverse natural landscapes and cultural heritage attract both domestic and international tourists. With the growing number of tourist visits, this can attract investments. Multinational companies enhance the destination's image, for instance, by establishing hotel chains. Consequently, this encourages governments and businesses to strengthen the development of infrastructure in countries that heavily rely on tourism (Wu et al., 2022).

However, this study reveals a positive and significant correlation between investment in Indonesian tourism and CO_2 emissions. These findings suggest that Indonesia remains a pollution haven for investment. This could be the case given that the majority of capital invested in Indonesia is directed toward energy-intensive sectors, such as manufacturing, which accounted for 44% of all foreign investment from 2009 to 2018 (OECD, 2020). Moreover, the government licensing concessions aiming to attracting investments does not seem to be balanced by the enforcement of environmental conservation obligations, which is also one of the investment requirements mandated by the Investment Law. These findings highlight the need for targeted policies to address the environmental impact of tourism investments.

To address the positive correlation between investment and CO_2 emissions, policymakers should adopt a more strategic approach to tourism policy to effectively address this issue. As the regression results indicate a negative relationship between renewable energy consumption and CO_2 emissions, policymakers should enforce stricter environmental regulations by promoting renewable energy use, set higher energy efficiency standards, and provide incentives for environmental-friendly practices to acceleration the reduction of CO_2 emissions. Incentives such as tax breaks or grants can encourage businesses to adopt green practices or invest in sustainable infrastructure. Adversely, imposing higher taxes or reducing subsidies to businesses that continue to rely on fossil fuel energy sources could further drive the transition to sustainable energy sources. Additionally, implementing strong monitoring and reporting mechanisms are also crucial for tracking the environmental impact of tourism investments.

Given that the tourism-related sectors contribute significantly to greenhouse gas emissions given their heavy reliance on fossil fuels, businesses, particularly hotels, restaurants, and transportation services, should be encouraged to reduce its reliance to fossil fuel energy sources and shift to renewable energy sources. This could involve adopting solar panels, wind energy, electric vehicles, and sourcing locally to minimize ecological footprint. Eco-certification can also help businesses demonstrate their commitment to environmental responsibility, attract eco-conscious travelers, and correspond with global sustainability trends.

Investors should focus on projects that incorporate sustainability and renewable energy to mitigate the negative environmental impacts of tourism. This encourages eco-certified business and ensures that they adhere to environmental standards and sustainable practices. This approach includes supporting local businesses that provide sustainable

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products and services, such as locally sourced food, eco-friendly souvenirs, and low-impact recreational activities. Additionally, offering financial incentives for tourism businesses, such as low-interest loans, grants, or equity investments in green tourism projects can further encourage tourism businesses to adopt and maintain sustainable practices.

The current research was limited by the availability of data, covering only the period from 2000 to 2017, and focusing on the correlation between tourism investment and CO_2 emissions without considering other environmental factors, such as biodiversity loss and water pollution. To enhance the robustness, future studies might incorporate more recent data, extend the timeframe, and examine the specific types of tourism investments and their environmental impacts. Additionally, exploring the role of government policies, such as tax incentives for eco-friendly investments or carbon taxes, and investigating sustainable business practices like green certifications and carbon-neutral services, could provide valuable insights for aligning tourism development with sustainability goals.

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