The effect of infrastructure development on the development of tourism area and living environment of Carocok Beach, Painan

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Abstract. Carocok beach tourism destination is one of the integrated tourism development areas in Pesisir Selatan district, West Sumatra province which already has a Master Plan. The purpose of the study was to investigate the effect of infrastructure development on the development of tourism and the environment in the Carocok beach tourism area. This study is a causal method survey research involving 180 respondents, stakeholders of the Carocok beach tourism area including the Government, private parties, non-governmental organizations, tourists, and local residents. The sample selection is done in a convenient purposive sampling manner. Data analysis used path analysis which was preceded by test data requirements: normality, multicollinearity, autocorrelation, and heteroscedasticity. The research error rate was set at 5%. The results of the study show that infrastructure development has a significant direct effect on the development of tourism and the environment. Tourism development also has a significant direct effect on the environment.

1. Introduction
Tourism is an important component of the global economy. Tourism creates billions of dollars of income and millions of jobs worldwide. Tourism is considered by most people, especially in developing countries as the only means of development, and is the only opportunity to improve the quality of life. But at the same time, tourism is starting to show the downside. The activities of investors and tourists have a negative impact on socio-cultural values and natural environmental wealth of people around the world.

Carocok Beach tourist destination is one of the integrated tourism development areas of South Pesisir Regency which already has a Master Plan. Carocok beach is located west of Painan city, approximately 2 km from Painan Market. This beach is very famous in West Sumatra and Indonesia, according to some people, Carocok Beach is not inferior to the Kra Peninsula Beach in Malaysia or Sanur Beach in Bali.

Basically, Ndulu explained the development infrastructure can be divided into: (1) economic infrastructure namely physical infrastructure that is used both in the production process and used by the community, covering all public infrastructure such as electricity, telecommunications, transportation, irrigation, clean water and sanitation and waste disposal (2) social infrastructure, namely social infrastructure such as health and education. Infrastructure is the driving force of economic growth. Insufficient infrastructure is one of the key obstacles to faster economic growth [1].
Investment in infrastructure investment in tourist areas will not only have a positive influence on economic growth, and employment, but can also have a negative influence from a socio-cultural and environmental point of view. Economic, socio-cultural and environmental impacts of tourism activities are important considerations in the planning and economic development of a country, regional region and for the community. Therefore, the community needs to understand the relative importance of the tourism industry to their region, including its contribution to the development of economic, socio-cultural and physical environment of the tourist area.

The aim of the study was to investigate the effect of independent variables on infrastructure development on the dependent variable of tourism and environmental development in the tourist destinations of Carocok Beach West Sumatra.

2. Literature review

2.1. Living environment
Holden [2] states that to discuss more accurately the relationship of tourism with the environment, it is necessary to see actors who play a role in tourism activities such as central and regional government authorities, the private sector (investors, contractors), non-governmental organizations that care about tourism, local residents, as well as tourists. In general, actors who play a role in the development of the tourism area mentioned above are human. So if you want to discuss the relationship between tourism and the environment, you need to discuss human relations with the natural environment itself; how humans respect their natural environment, cultural stereotypes about nature, and human ethical relationships with nature.

In the case of tourist areas in this study, what is meant by environmental impacts is the perception of local residents regarding changes in the physical environment that occur due to tourism activities.

2.2. Tourism development
WCED explained the sustainable development is development that meets the needs of the present without neglecting the ability of the next generation to meet their needs [3]. And Weaver explained, sustainable tourism is defined as the application of sustainable development in the tourism sector, or the development of tourism that uses wisely and conserves natural resources for long-term tourism feasibility [4].

2.3. Infrastructure development
Adebayo explained, tourist infrastructure is defined as a physical element that is designed and built for the needs of tourists. A theoretical strong relationship between tourism development and infrastructure development has been put forward by various researchers [5]. Tourism infrastructure includes the main facilities and equipment, equipment, systems, processes and resources needed for the functioning of tourist destinations. Mainly includes roads, railways, airports, ports and others that can facilitate access to tourist destinations. As an addition, infrastructure also includes health care systems, public services and services. Seetanah et al [6] in his research found that tourists are very sensitive to infrastructure or in other words infrastructure provides a positive contribution to the arrival of tourists, mainly from Europe / America and Asia.

Jovanović [7] in his research concluded that there is a strong relationship between infrastructure development and tourism development. Ghulam Rabbany et al [8] in his research described the impact of tourism on natural resources, environmental pollution on a global scale, and its contribution to environmental conservation. INTOSAI [9] revealed that infrastructure development can significantly impact the local environment and community and more widely and use a lot of natural raw materials in its development.
3. Methodology
The research design used is a survey with a causal design. Study respondents totalling 180 stakeholders Carocok beach tourism destinations include local government authorities, investors and tourism entrepreneurs, local residents, tourism observers and non-governmental organizations. Data was collected using a questionnaire instrument designed as a closed question with five choices of Likert scale answers. The infrastructure development questionnaire totalled 22 items, the tourism development questionnaire numbered 13 items and 9 environmental questionnaires. Data analysis used path analysis which was preceded by test data requirements: normality, multicollinearity, autocorrelation, and heteroscedasticity. The research error rate was set at 5%.

Based on the description of relevant research and research concepts, the research framework can be identified as follows:

![Research Framework](image)

**Figure 1. Research Framework**

Hypothesis
H1 Infrastructure development (X1) directly affects tourism development (X2)
H2 Infrastructure development (X1) directly affects the environment (Y)
H3 Tourism development (X2) directly affects the environment (Y)

4. Result

4.1. Instrument validity and reliability test
Test the validity and reliability of the instrument carried out on 30 respondents with a summary of the results of the instrument validity and reliability testing as follows:

| Variable | r-count | r-table | Conclusion | Alpha Cronbach | Conclusion |
|----------|---------|---------|------------|----------------|------------|
| P1 (X1)  | 0.878-0.925 | 0.361   | Valid      | 0.990          | Reliable   |
| PP (X2)  | 0.839-0.928 | 0.361   | Valid      | 0.980          | Reliable   |
| LH (Y)   | 0.783-0.889 | 0.361   | Valid      | 0.966          | Reliable   |

The summary of the results of the validity and reliability of the instrument above shows that all research instruments are valid and reliable so that they can be disseminated to collect data.
4.2 Descriptive statistics
The results of research data collection if described statistically are as follows:

|       | N  | Range | Minimum | Maximum  | Sum    | Mean | Std. Deviation | Variance |
|-------|----|-------|---------|----------|--------|------|----------------|----------|
| PI    | 180| 72    | 38      | 110      | 13320  | 74.00| 13.404         | 179.665  |
| PP    | 180| 45    | 20      | 65       | 7650   | 42.50| 8.465          | 71.648   |
| LH    | 180| 32    | 13      | 45       | 5220   | 29.00| 6.028          | 36.335   |

Valid N (listwise)

4.3 Test data requirements
Data collected successfully before being used to test the research hypothesis needs to be tested for data requirements including normality, multicollinearity, autocorrelation, and heteroscedasticity. The data requirements test results show:
- All research variable data are normally distributed
- The research model has no conclusions about autocorrelation
- The research model is free from the symptoms of multicollinearity and heteroscedasticity

4.4 Hypothesis testing
The results of hypothesis testing are as follows:

4.4.1. Substructure LH = f (PI, PP)

| Model | R   | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-----|----------|-------------------|---------------------------|
| 1     | .911* | .830     | .829              | 2.496                     |

a. Predictors: (Constant), PP, PI

| Model | Unstandardized Coefficients | Standardized Coefficients |
|-------|-----------------------------|---------------------------|
|       | B             | Std. Errors | Beta | t    | Sig. |
| 1     | (Constant)    | -.653       | 1.049| -.622| .543 |
| PI    | .180          | .029        | .399 | 6.203| .000 |
| PP    | .385          | .046        | .541 | 8.398| .000 |

4.4.2. Substructure PP = f (PI)

| Model | R   | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-----|----------|-------------------|---------------------------|
| 1     | .877* | .769     | .768              | 4.081                     |
a. Predictors: (Constant), PI

| Model       | Unstandardized Coefficients | Standardized Coefficients | t    | Sig. |
|-------------|-----------------------------|---------------------------|------|------|
| 1 (Constant)| 1.524                       | 1.711                     | .891 | .374 |
| PI          | .554                        | .023                      | .877 | 24.334 | .000 |

a. Dependent Variable: PP

Summary of hypothesis test results are as follows:

| Relation | Path Coefficient | p-value | p-critical | Significant | Determination |
|----------|------------------|---------|------------|-------------|---------------|
| PI → LH  | 0.399            | 0.000   | 0.05       | Significant | 0.830 (83%)   |
| PP → LH  | 0.541            | 0.000   | 0.05       | Significant |               |
| PI → PP  | 0.877            | 0.000   | 0.05       | Significant | 0.769 (76.9%) |
| PI → PP → LH | 0.877 x 0.541 = |         |            |             | 0.475         |

a. Infrastructure development (X1 = PI) has a significant direct effect on tourism development (X2 = PP)

b. Infrastructure development (X1 = PI) has a significant direct effect on the environment (Y = LH)

c. Tourism development (X2 = PP) directly affects the environment (Y = LH)

5. Discussion

The results of the above analysis are in line with the research of Seetanah et al. [6] and Jovanović [6] which states that tourists are very sensitive to infrastructure or in other words infrastructure makes a positive contribution to the arrival of tourists; and there is a strong relationship between infrastructure development and tourism development.

The results of the analysis are also in line with the research of Ghulam Rabbany et al [8] which describes the impact of tourism on natural resources, environmental pollution on a global scale, and its contribution to environmental conservation, and in line with INTOSAI [9] which states that infrastructure development can significantly impact the environment and the local community and more broadly and use a lot of natural raw materials in its development.

Jovanovic explained, for the development of successful tourism, the need for more intensive investment in infrastructure modernization is increasingly emerging as a necessary condition. Higher levels of tourism infrastructure development can contribute to increasing production efficiency and distribution of tourism services, and, in some cases, such as remote destinations, increase the supply of tourism services. For the presence in the tourism market, which is becoming more dynamic and demanding, the question of increasing competitiveness is very important. In this case, investment in developing tourism infrastructure is an important component of tourism competitiveness [7].

The construction of new infrastructure can bring significant benefits, including opportunities to build priorities to meet the challenges posed by change and to improve sustainability. However, it can also use significant costs for the environment, both in construction and in its use. Some costs can be
overcome and discussed through the planning and design process and opportunities needed to obtain direct and indirect benefits.

Tourism creates disaster situations throughout the world and this condition of destruction can quell regional collaboration and communication. Everyone must be aware of the negative impacts of tourism and take appropriate steps to reduce the problems, especially of each state government and international authority in the tourism industry.

6. Conclusion

Infrastructure development has a significant direct effect on tourism development and the environment. Tourism development also has a significant direct effect on the environment. For this reason, it is recommended that the development of tourist areas need a concept of infrastructure development that is measurable and takes into account environmental sustainability.

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