

Tourist Response as Water-based Seaplane Purposes for Island Tourism: A Literature Review

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Abstract. In a journal review, the conclusion of the statistical and mathematic model was presented to illustrate the impact of various factors on tourist preferences, facilities and infrastructure available as tourism support facilities. One of the most important sectors that drives the national economic is tourism sectors. This literature review covers a lot of research conducted on sustainable tourism, especially regarding transport facilities and other aspects. Other aspects of tourism, namely facilities, accommodation, social-culture, environment, and economy, are also considered. The main determinants of tourism are assessed using a scientific approach to evaluate the attractiveness of tourist sites by considering many aspects. Several results have indicated that natural resources, island culture, and access infrastructure are important determinants of tourism demand in various countries. This discussion may be useful for the authorities involved in tourism development and sustainability in the future. The study primarily focused on accessibility, tourism attraction, environment, etc. With these results, important tourist sites can be prioritized for enhanced accessibility and promoted as major tourist destination in the country. Research mapping to establish the basic model can be based on simulation approach and statistical analysis, such as a system dynamic model and other relevant analysis.

1. Introduction

The covid-19 pandemic, an unprecedented non-natural disaster, has affected almost every country. The pandemic which started in December 2019, has resulted in a health crisis and financial difficulties. Several sectors have been disrupted, necessitating restrictions on societal activities. Various sector, including health, education, and social activities, have been severely impacted by the pandemic, along with the accompanying economic consequences [1]. The restrictions have been particularly harmful to the service sector, especially travel activities, tourism, and hospitality. For example, the closure of many international routes has negatively impacted the air transportation sector in US [2]. However, after going through these challenges, there are new opportunities for sector businesses to develop [3]. In low-income countries, the pandemic has also impacted education and human capital, with potential long-term effects on labor productivity and economic recovery. Rebuilding human capital and ensuring sustained external financing will be crucial for a successful post-COVID recovery [4]. Thus, after the pandemic, the repair economy can increase income, which also effect the repair of infrastructure tourism. Return sector tourists after the pandemic subsided not only the repair economy course, but also the reform and improvement of the existing industry. Activity tourism post-pandemic needs involve academics and makers policy order activities that tourist can keep growing and rising [5].

One method for raising the activity of tourism is by making decisions while considering the intended destination with research on the location's objectives, even if it involves entering a dangerous and vulnerable zone [6]. Additionally, improving infrastructure for tourists can attract more travelers. The government can expedite tourism recovery by providing transportation option to tourist destinations and developing infrastructure throughout the tourist area, which can increase the number of visitors. For development infrastructure can add value to all aspects of local and international tourism. When ensuring the sustainability of socio-cultural life, economy, and reducing risk to attract more tourist.

Transportation in remote areas can play a crucial role in sustainable and comprehensive development. Implementing policies to connect regions through various mode transportation, particularly in island areas, can lead to increased development and connectivity. One effective way to support this development is by introducing seaplanes for transporting passenger in a short amount of time, which can minimize journey costs [7]. The transportation choice

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mode for traveler should be made appropriately, taking into consideration the location, geographical region, connectivity means, security and convenience issues [8]. By ensuring a well-integrated and well-constructed transportation system, remote areas can become more developed and accessible, providing economic and social benefits to region and its inhabitants.

Moderate tourism growing, with one of the popular activities being tour fishing. Generally, sea transportation is used, involving ships to facilitate tourism in the Sanriku region of Japan. The proximity of attractive tourist spot to the harbour enhances accessibility, making the Sanriku region a potential hub for travel and tourism development [9]. Ghana is one example countries that adopting tourism as a driving force for the economy in the sub-region. It offers a variety of tourism tours such as beach trips, exploring natural rainforests, participating in festivals, and visiting mountains, among others. Land transportation is the common mode of travel in Ghana, particularly for passengers. Trains and waterways, particularly Lake Volta, are in moderate stage of development. Approximately 15% of tourists private cars, while 85% depend on public transportation [10].

The attraction derived from nature and culture, local economic development and demographic characteristics can influence it [11]. Attraction of an area for culture and nature as well as their satisfaction offer can influence humans and nature will be destination vacation. The concept of accessibility in tourism, as defined by Ghose and Johann (2018) [12], referring to the convenience of accessing goods, services, activities, and desired goals through availability, affordability, and convenience of transportation facility and information distribution, as well as the geographical distribution of activities and goals.

In tourism sector development, the utilization of simulation, particularly using the methodology of system dynamics modeling, become crucial in making informed decisions and formulating appropriate policies for mapping and enhancing the existing attraction [13]. The approach system dynamic offers a powerful tools to analyze feedback loops, identify causal relationships, and understand the consequences of various statements and linkages, thereby facilitating an increase in the number of travelers. This approach can foster competitiveness and cooperation in investment, including infrastructure in transportation and other aspects. The enhancement of transportation infrastructure can notably contribute to the improved accessibility of tourist sites, reducing travel time and enabling visitors to explore multiple place [14].

Moreover, some of literature review did not discuss about tourism accessibility simultaneously. There is a notable gap in discussing tourism accessibility comprehensively along with other essential aspects such as economy, risk for new transportation, and environmental considerations [15]. The interconnection between these aspect within the system dynamics modelling can have mutually positive or negative effects. The utilization of the *Causal Loop Diagram (CLD)* can aid in understanding these relationships and determining suitable policies based on the existing situation and conditions. Models developed through this approach can be presented in various formats, such as diagrams, pictures, and matrix tables, to visualize the complex dynamics involved [16]. By adopting this research methodology, valuable findings can be obtained, contributing to the mapping and identification of various tourism aspects.

2. Method

The methodology by reviewing this journal uses a qualitative and quantitative approach based on existing journal references. The journal used is the background of the tourism conditions that occur. Identification of problems and data collection is done by recording variables that influence the attractiveness of tourism locations and problems that exist in tourism. Studies obtained from credible sources, such as reputable journals or papers available on platform like Google Scholar, Scopus and various other well-known online publishers. Irrelevant aspects can be excluded. In sorting, summarizing and studying journals and research that builds basic ideas related to topics that are then compiled in this review.

This approach study provides an overview of the economic sector, infrastructure development, tourism, development of tourist areas to increase tourist visits and problems caused by several aspects of tourism. Furthermore, it is hoped that the review of problems and aspects of development in tourism will also affect the tourism sector by increasing tourist visits.

3. Review

The primary focus of this research was to conduct a literature review on tourist development. Based on the research methodology, previous studies were analyzed using qualitative and quantitative approached. This review encompassed previous studies published between 2000 and 2022, totalling over 20 publications. The research methodology used of qualitative approaches to analyze the previous studies. The quantitative approach output is mathematical, simulation model, and statistical analyses. Additionally, the analysis of previous research was also categorized based on the location of the studies. One key point of interest in attracting tourists is the location of the tourism destination.

Therefore, the studies were classified based on research location, which included China, Iran, Spain, Italy, Indonesia, Makka, Ghana, Taiwan, Amsterdam, Japan and General.

3.1 Tourist Attraction

Indonesia Has Lots Of Potential Islands For Development In The Tourism Sectors. Many Small Island In Indonesia have experienced remarkable growth in the tourism sector and have become well-known global tourist destination, such as Trawangan Island (Lombok), Nusa Lembongan Island (Bali), Seribu Islands (Jakarta), Karimunjawa (Central Java), Bunaken Island (Manado), Waigeo Island (Raja Ampat), Banda Island (Maluku), and among others [17]. For example, in the Nusa Penida district, which is located on the southeastern coast of Bali, is objective tourists. The region is part of Regency Klungkung and consists of islands (Nusa Penida Island, Nusa Lembongan Island, and Nusa Ceningan Island). There are numerous access points to reach the island of Nusa Penida and a ferry port. Interesting sites make the island its own source of power sea quality and serve service tour nautical for diving, travel coral, and fishing [18][19]. Transportation between islands in the region still relies on traditional motorboats, and some islands may face challenges in terms of accessibility. However, efforts are underway to improve infrastructure and develop tourist facilities on these island, making them more accessible and attractive to visitors. Such development has also been witnessed in the neighboring country of Malaysia, specifically on Tioman island, which faces similar access location challenges for tourism puposes [20].

3.2 Accessibility

Accessibility in a manner wide is defined as convenient access to objective purposes. Researchers and analysts have argue from evaluation-based mobility to evaluation-based accessibility for many years [21]. Accessibility in this context considers four main components: transportation, land use, temporal, and individual components [22]. However, the temporal and individual components are frequently disregarded due to challenges in methodology. This has led to various failures in planning, procurement, construction, and operation of extensive transportation project, where the priority is often placed on sustainability without comprimising the accountability of the decision-making proses [23]. Accessibility for tourism is also investigated through competition airport side. Espessially, a lot of contribution literature prove that accessibility of land is one determinant main choice airport for air travelers[17]–[19]. Research conducted in the San Francisco Bay Area concluded that business travelers prioritize time value more than leisure travelers do. The Study also found that leisure travelers exhibit greater sensitivity to changes in access cost, while business travelers are more responsive to variations in access time when selecting their preferred mode of transportation [17]. One implication is that, given the high time value, large investments in airport access time may be justified [20]. In addition to this, data accessibility related to information on ordering seaplane flights [21] is also important in the sustainability of this transportation.

Accessibility is broadly defined as the ease of access to a destination. Over the years, there has been an ongoing debate among of researchers and analysts regarding the shift from mobility-based to accessibility-based evaluation [21]. In evaluating accessibility, four main components need to be considered: the Transport component, the land use component, the temporal component and the individual components. However, the temporal and individual components are often omitted due to methodological complexity, especially in research programs [22]. This exclusion has resulted in significant failures in the planning, procurement, construction and operation of large transportation projects. These failures are not due to natural law or lack of accountability in the decision-making processes but rather a lack of integration of all aspects of sustainability, which should be given higher priority [23].

3.3 Seaplane Versus Other Transportation Means

The seaplane has unique combination of both the ship and the aircraft characteristics. Its structural design encompasses two primary categories: functions pertaining to aircraft operation, and functions linked to ship operations. Aircraft-related funtions encompass componenes such as wings, fuselage, landing gear, etc, mainly makes seaplane take-off/land on the water surfaces. During these phases, the seaplane significantly interacts with maritime elements, potentially effecting nearby routes during ingress and egress. When comparing seaplane terminals to passenger terminals, both share the capacity to handle passengers and offer onshore facilities. However, the risk associated with seaplane take-off and landing on water surfaces tends to rise in proximity to hydraulic structures like terminal, fairways, anchorages, and bridges. Furthermore, the presence of seaplanes can elevate the possibility of collisions in areas with intricate water traffic patterns or unpredictable water activities. The proposition involves establishing a transportation network utilizing seaplanes. This approach would enable quicker and more efficient travel between coastal regions. The advantages of avoidings extensive infrastructure development, such as airport conventional, as existing fishing ports could be repurposed at a relatively lower cost. Furthermore, introducing seaplanes is anticipated to positive effect on tourism, such as employing seaplanes as a mode of transportation for tourists or implementing specialised tourist flights to the seaplanes operation in Hiroshima [9]. With a research [8] for introduction of passenger

services utilizing seaplane has the potential to stimulate growth for small operators and the tourism industry. As the result, this study could serve as a foundational framework for authorities to strategize the development of a regional network comprising small general aviation airfield and seadromes situated around the lakes or in close proximity to port, particularly near major tourist destinations. This approach aims to facilitate the establishment of cohesive regional commuting traffic system involving both seaplanes.

3.4 Destination Management Approach

However, [24] said that five sets of factors that contribute to a destination's competitiveness and sustainability:

- a. Core resources and attractors: these are the factors that motivate tourism to visit that destination. That destination includes natural attraction, cultural heritage, historical sites, coastal sites, iconic landmarks and many more.
- b. Supporting factors and resources: These factor and resources support of development for tourist industry in the destination. They reliable transportation, a range of accomodation option, entertainment facilities, and easy accessibility for tourists.
- c. Destinantion management: These factors refer to activities carried out to support and maximize outcomes for the four other factors of the model.
- d. Destination policy, planning, and development: Creating an environment for sustainable tourism to flourish involves aligning economic, social, and environmental goals. By adopting such an approach, destinations can foster long-term sustainabel growth in their tourism industry while preserving for future generation.
- e. Qualifying and ampifying determinants: These factors define the potential competitive capacity, but they are beyond the direct control of the tourism sector.

Accessible tourism fundamentally replicates the core resources and attractors of a destination. The successful incorporation of the principles of independence, equity, and dignity within destination management approaches for the remaining four factors will significantly influence the realization of accessible destination experiences.

3.5 Accessible Destination Experiences

According to [25], authenticity in tourism is a complex and multifaceted concept. To fully appreciate accessible destination experiences, one must recognize that the experience it self is also multifaceted, contingent on an individuals specific access considerations, such as mobility, vision, cognitive abilities, and other factors. According to [26] applied a comprehensive methodology to assess the competitiveness of 65 tourism destination in Brazil. The methodology was based on the analysis of five macro-variabel: tourism aspect (encompassing tourism infrastructure), Infrastructure (including access-related aspects), tourisym (attractions and destination promotion), economy, sustainability (environmental, social, cultural). Another research about accessible destination in the Red Sea. Over the past few decades, remarkable technological advancements and the rise in international travel have significantly increased the accessibility of marine environments, both in terms of phisical access and economic feasibility. Coastal and amrine tourism has emerged as a substantial sector, constituting a significant portion of the expanding global tourism of industry [27].

3.6 Transportation Sector

As highlighted by [28] and [29]the selection of a tourist destination is notably influence by the time and cost involved in travel, underscoring the significance of transport infrastructure in tourism destinations. Tourist continuously utilize various modes of transportation, leading to both direct an indirect impacts on traffics, potential delays, and the construction and maintenance of transport facilities. To evaluate the impact of transportation infrastructure on tourist choice behavior, competition and cooperation scenarios were used in anayzing the Xidi and Hongcung heritage sites. The simulation results show that both scenarios increase the attractiveness of the destination. Additionally, collaborative investment effort have the potential to bring the two locations together into one of attractive tourism destination[14].

3.7 System Dynamic

System dynamics is one of the methods in the decision-making system by looking at problem analysis where important factors provide an overview of understanding how a system is used in accordance with the objectives of system modeling [30]. System dynamics require understanding things change over time. The system dynamic method is used to solve a problem of a complex system, which allows us to see the dynamic interactions between the factors in the system. For example, in facilitating tourists and interconnecting between regions by considering the decision on the location of the facility and the capacity of the mode, it must be done with a multi-period decision or a dynamic decision on the location of the modal facility [31]. The decision to procure modes of support for tourism activities is a decision

that is influenced by relevant stakeholders. Decisions seen from multi-criteria are considered to be able to optimize the results of determining the location of the facility [32].

4. Discussion

The theme of tourism which is the focused of this research has indeed been studied by various parties from various perspective such as transportation, economic, risk aspect, and so on. However, these research studies have not discussed all these aspects in partial study and have not specifically discussed about what exact concern transportation aspect for tourist needs.

Table 1. Studies About SD and Other Methods in Tourism

Public Transportation	Study area (case)	Type Tour	Method	Variable												References	
				Population	Social Economy	Facilities	Accessibility	Attractive	Land Develop	risk	Travel Time	Travel Cost	Distance	Satisfaction	Technical Aspects		
Convention al Transportat ion	Iran	General tourism in Iran.	System Dynamics		v	v											[33]
Convention al Transportat ion	Xidi and Hongcun (China)	Cultural Heritage Tourism	Multinomial Logit and System Dynamics				v		v								[14]
Bus, Ferry, Tram and Train transport available for use by the general public including tourists to move around an area,	Ghana	Cultural Heritage Tourism	Three plays statistical tools (frequencies/ch arts, chi-square (χ^2) and multinomial logistic regression)	v			v	v			v	v			v		[10]
-	Mecca	The object of Islamic tourism	System Dynamics		v				v	v	v						[16]
-	Sicily, Italy	Island Tourism	System Dynamics				v		v		v						[40]
-	Bogor	Water Tourism	AHP				v	v			v	v					[37]
Boat and local transportati on	Venado Island, Costa Rica	Island Tourism	System Dynamics and SWOT	v		v				v	v						[41]
Boat	Galapagos Islands of Ecuador	Island Tourism	System Dynamics	v		v				v	v						[42]
-	Kaohsiung City in Taiwan	Coastal Tourism	Decision Support System by using System Dynamics	v	v		v				v						[38]

Regarding a tourism needs in Sanriku [9], this research focuses on selecting suitable fishing port for introduction of seaplane. The study analyzes about attractiveness of potential seaplane destinations based on factors such as tourist facilities, accessibility, and fishery products. The study also includes a survey of fishing cooperatives to gather opinions on seaplane operations and identify potential locations for seaplane use. The research uses a calculation method to determine the attractiveness of each fishing port for seaplane. The calculation of attractiveness includes the multiplication and addition of coefficients for tourist attractiveness, fishery product, and maritime access advantage. The study also considers the topography and characteristic of each fishing port to identify potential seaplane destination. However, this research not consider for travel time and travel cost for seaplane operation. In the future research, the are several aspect that could be expolred to further enhance the findings of this study such as feasibility of seaplane operation, user preferences, infrastructure development, environmental effect, and market analysis. There is survey result about purpose of using seaplane.

Question 1: What purpose do you want to use the seaplane

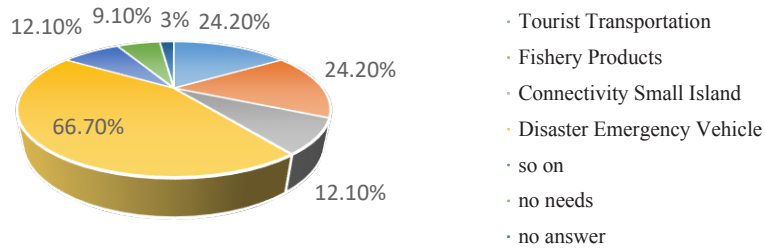


Figure 1. Survey Result of Market Section in Sanriku [9]

Table 1. Studies About SD and Other Methods in Tourism (continue)

Public Transportation	Study area (case)	Type Tour	method	Population	Social Economy	Facilities	Accessibility	Attractive	Land Develop	risk	Travel Time	Travel Cost	Distance	Satisfaction	Technical Aspects	References
(Service Quality)	Surakarta	Cultural Heritage Tourism	System Dynamics			v	v	v						v		[39]
-	Tunisia, Africa	Cultural Heritage Tourism and Island Tourism	System Dynamics	v		v		v	v	v						[43]
Car	Chiang Mai City, Thailand	Cultural Heritage Tourism	System Dynamics	v				v	v	v						[45]
-	Dalian City, China	Coastal Tourism	System Dynamics	v	v						v			v		[46]
-	Kenting Coastal zone, Taiwan	Coastal Tourism	Decision Support System by using System Dynamics	v					v	v						[47]
-	Amsterdam, Netherlands	Cultural Heritage Tourism	Decision Support System by using System Dynamics	v	v						v					[48]
-	Malaysia	General tourism in Malaysia	System Dynamics	v		v		v								[44]

Another research about potential seaplane operation in Tokyo, [1] explaining about potential changes in transportation behavior by introducing seaplane as a mode of transportation. The paper also discusses the historical background of seaplane, its decline due to land-based airport, and the challenges to its widespread adoption, such as regulatory issues, safety issues, and environmental effect. The study using a transportation mode choice model to analyze the behavior changes of user in response. The parameter are estimated using a non-aggregate logistic model, and for sensitivity analysis is conducted by varying the number of round trips and total cost. The study finds that the total travel time and cost significantly influence the choice of transportation mode. The probability result is 32% choose for using train and 68% for using seaplane. The study also highlights the potential benefits of establishing a waterbased seaplane network

to improve accessibility to remote areas. In further advance this research it should expansion of analysis for several areas, this would provide a more comprehensive understanding of the potential impact of seaplane services and demand characteristic.

This research paper for general tourism in Iran and this research paper focuses on the development of sustainable tourism destinations. The [33] propose a system dynamics approach to understand the complex interactions and behaviors within the system. They develop a dynamic model to simulate the development of smart tourism destinations and predict the consequences of different policy options. The study emphasizes the significance of effective policies and strategic decision-making in achieving sustainable tourism. The research methodology involves the use of system dynamics modeling and simulation. This research using vensim software to create cause-effect and state-flow diagrams for each subsystem of the smart tourism destination system. The framework in this research including the environment, economy, social, political, and technical aspects. Real data is used to validate the model, and sensitivity analysis is conducted to examine the effects of parameter variations. The design and evaluation of policies in this research involves using the models developed to suggest policies and strategies that can be implemented in the real world to improve the state of the smart tourism destination system. The goal is to design policies that promote sustainable development and improve the performance of smart travel destinations. By addressing these research needs, further investigation into the potential accessibility, economic, environment of developing tourism management in different region and countries.

Table 1. Studies About SD and Other Methods in Tourism (continue)

High Speed Rail and Private Vehicles	Spanish	General tourism	Binomial Logit	v				v	v	v	[49]		
Private Cars share and Public Transport share	Lativa	General tourism	AHP and System Dynamics		v	v		v	v		v	[15]	
Seaplanes	Greece	Island Tourism	PROMET HEE Method	v				v	v	v		v	[35]
Seaplanes	Aegean Sea	Island Tourism	Used an integrated approach to assess the suitability of the Aegean Sea									v	[34]
Seaplanes and cruise ship	Sanriku Coastal	Fishing tours	AHP		v	v	v		v	v		v	[9]
Seaplane	Miyako City, Tokyo Metropolitan Area	General Mobility	Binomial Logit					v	v				[1] Miyako

Another research in tourism facilities about road infrastructure of Xidi and Hongchun. [14] it analyzes the impacts of transportation infrastructure on tourism development and presents tourism development strategies for the two villages based on scenario analysis. The paper examines the growth rate of tourist numbers for Xidi, which was lower than that of Hongcun but still higher than the growth rate of Mt. Huang. It emphasizes the potential benefits of opening the Xi-Hong Road, a development that could effectively reduce the travel distance between Xidi and Hongcun. The research findings indicate that competition and cooperation on road infrastructure investment can attract more tourist destinations. The study suggests that tourism destinations should focus on building road infrastructure to shorten the distance to major markets and connect with adjacent destinations. It emphasizes the potential for a win-win situation and potential merger of the two destinations through competition for road infrastructure investment. The study employs a quantitative method that combines system dynamics with a multinomial logit model. The system dynamics method is utilized to analyze the dynamic interaction between road investment, tourist choice behavior, and destination

land management. The multinomial logit model is used to simulate the impacts of road infrastructure on tourism development in the selected destinations. The MNL choice model is proposed to calculate the market share of tourism products, and the possibility of tourists choosing a product is determined by the utility of the product, which is affected by three major factors: trip cost, the number of destinations they can visit, and the level of crowdedness. However, Further investigation into the specific factors that influence tourist choice behavior and destination preferences and the methodology section lacks detailed information about the data collection process and the specific models used for analysis. This limits the ability to replicate the study or assess the validity of the findings.

Reviewed journals [9], [10], [19]–[23], [30]–[32], [34], [11]–[18] discuss about tourist perspectives and technical matters in the tourism aspect. The selection of journals is centered on publications over the last 10 years, showing a tendency for research on the quality of tourism support. The aspects that are reviewed as the basis of attractiveness in each tourist area also vary. For example, the marine tourism journal discusses three different countries, namely Indonesia, which considers the safety aspect as seen from bad wave and weather conditions affecting policies in coastal tourism and modal planning according to tourism conditions [34]–[36]. Another aspect, namely accessibility, is important as the attractiveness of the tourist area, for example in several journals that discuss this as an entity that can influence tourist attraction to choose tourist sites [10][9], [14], [15], [37]–[39]

One of the entities discussed to see the attractiveness of tourist areas is the facilities and accommodation available in tourist areas [9], [21], [37], [39]–[44]. Journals that discuss various entities that are used to see how tourism conditions are in parts of the world, allow suggestions about the relative importance of the various aspects discussed. The research gap is more developed especially for coastal marine tourism, marine tourism and island tourism to provide easier access and shorten travel time without building expensive physical facilities. Studies that can be reviewed further and need further elaboration to see the overall aspects of accessibility, facilities, land availability, convenience, and other aspects to increase the number of foreign and foreign tourists.

5. Conclusion

Based on the main findings the following conclusions. When checking the preferences of local and international tourists with the various available modes, if the tourist locations are on different islands, the transportation tourism commonly used is public transportation. Apart from factors in transportation, there is a strong relationship between the socio-demographic characteristics of tourists and their modal preferences. The aim to explore aspects affecting tourism is as a primary preference for increasing tourism figures by developing alternative and innovative transportation systems to utilize the vast coastline and islands for tourism revival. Technical issues such as routes and alternative modes of allocation are important aspects that need to be reviewed in evaluating the possibility of alternative transportation links between the island and the mainland. The priority scale in connecting between regions is the development of infrastructure in the form of accessibility and mobility. So that it is hoped that after being developed it can improve the community's economy and revive other sectors. indirectly infrastructure development also has an impact on the development of tourism activities. Enhanced infrastructure conditions significantly contribute to increasing tourist mobility towards their intended destinations. Moreover, increasing number of tourist is closely associated with the revitalization of the local economy. This development must also be accompanied by appropriate policy making so that tourism activities can continue.

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