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A QUANTITATIVE PERSPECTIVE OF DIVERS PERCEPTION OF TULAMBEN UNDERWATER AS THE DIVING SITE IN BALI, INDONESIA

Rahmadi Prasetijo
Doctoral Student in Tourism Program, Udayana University, Bali, Indonesia
rprasetyo.bcp@gmail.com

Made Antara
Doctoral Program in Tourism, Udayana University, Bali, Indonesia
Researcher at the Centre of Excellence in Tourism, Udayana University, Bali, Indonesia

I Wayan Arthana
Doctoral Program in Tourism, Udayana University, Bali, Indonesia
Researcher at the Centre of Excellence in Tourism, Udayana University, Bali, Indonesia

Agung S. Wiranatha
Doctoral Program in Tourism, Udayana University, Bali, Indonesia
Researcher at the Centre of Excellence in Tourism, Udayana University, Bali, Indonesia

Abstract

Bali marine tourism development increased significantly since 2009 after the second Bali bombing incident. However, the total numbers of the diving site destination in Bali are not comparable with number of divers, both of domestic and non-domestic. Recently, the total number of diving site in Bali are 16 sites whereas the numbers of dive operator are 330 companies. These phenomena cause heavy competition amongst businesses to survive as well as the careless attention of marine environment and the degrade of satisfaction in diving experiences. This paper aims to study the effects of site access, sea water condition, the marine beauty and the underwater diversity of Tulamben, the most famous dive site in Bali, toward

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divers' satisfaction as well their willingness to pay (WTP) for the entrance and dive fee. Covariance-based structural equation modeling (CB-SEM) was applied to analyse the causal relationship among variables with data were collected from 200 divers in the period January to March 2018. The CB-SEM showed, positioned as the exogenous variables, the sea water condition is the only factor that affects divers' satisfaction while the others demonstrated insignificant influences. In addition, divers' satisfaction, in turn, showed significantly effect to their WTP in paying the fees.

Keywords: Tourism management, Bali, Diving site, SEM, WTP

INTRODUCTION

Since the 1990s, tourism has been the main pillar of Bali's economic growth. Nearly 30 percent of Bali's regional gross domestic product comes from the tourism sector and the agricultural sector in a broad sense. The dominant role of tourism in Bali's economic growth has led to the development of various tourist attractions offered to tourists. One of them is diving attractions which are classified as attractions on marine tourism.

During this time, Bali is very famous as one of the favorite destinations for foreign tourists because the beauty of its culture as well the customs of its Hindu residents. Various types of Hindu religious rituals can be enjoyed by tourists during their visit in Bali. Unfortunately only a small portion of those who know the underwater world of Bali also offer a tour experience that is hard to forget. At present, Bali at least has five very attractive dive sites, namely Tulamben, Jemeluk, and Padangbai in Karangasem Regency; Nusa Penida Island area in Klungkung Regency; and Pemuteran in Buleleng Regency.

Judging from its popularity, Tulamben seems to outperform four other dive sites in Bali. This is inseparable from the existence of the ruins of USAT Liberty, United States warships that served in the Asia Pacific during World War II and sank at this location in January 1942, and dive sites that can be reached directly without divers must use a boat to reach it as they observed in the Nusa Penida Island Region where divers have to rent a fishing boat to the dive site. The Statistics Office of Bali (2016) noted that the number of tourists in Tulamben diving tourism in 2003 was 15,235 divers, in 2004 there were 22,825 divers, then jumped consecutively to 2012 reaching 71,802 divers, in 2013 there were 73,135 divers and in 2014 reached 77,842 divers, which means during the period from 2003 to 2014 or 11 years, the number of divers increased by about 5 times.

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Despite the economic benefits for local people, diving attraction at Tulamben underwater also raises some negative impacts. According to United Nations of Environment Program (2012), there are at least 5 negative impacts of tourism, namely the increase in greenhouse gas emissions due to the high utilization of transportation and accommodation, the consumption of clean water as a basic need, the amount of waste and damage to the environment of flora and fauna, conflicts with and/or within local communities due to issues of money and power, and the threat of cultural integration due to cultural differences, insights, perspectives and spirituality. All of these negative impacts are significant to the sustainability of tourism. For Tulamben, the negative impact of diving tourism was also observed, especially in the reduction the quality of coral reefs. It has long been known, damage to coral reefs is generally caused by two things, namely, first by natural factors such as rising sea temperatures, earthquakes, tsunamis and by storms, and the second factor is damage caused by human activities (Supriharyono, 2000).

The number of tourists who enjoy diving tourism in Tulamben, may not be the main factor that directly contributes to the destruction of coral reefs or shipwreck attractions, but the number that continues to increase can be a distinctive pressure for the conservation of underwater biota in Tulamben. According to Bengen (2001), the uncontrolled or under-controlled tourism industry is a major cause of damage to coral reefs. Some of the activities that cause it include pollution of hotel and restaurant waste that can cause eutrophication, physical damage to corals by boat anchors, damage to corals by divers and collections and diversity of coral biota as their souvenirs. Related to the rapid development of diving visits to Tulamben accompanied by competition between dive operators who tend to pay less attention to the underwater carrying capacity, this paper is aimed at:

1. Knowing the level of satisfaction of diving tourists in Tulamben caused by four exogenous variables, namely(a) access to the dive sites;(b) the beauty of underwater panoramas;(c) water conditions; and (d) underwater diversity;
2. Find out the effect of the satisfaction of diving tourists in Tulamben on their willingness to pay (WTP) the entrance fee to the dive site.

LITERATURE REVIEW

Related to tourist activity during diving, Barker and Roberts (2004) published their research that 73.9 per cent of divers at least touched the reef once in each dive activity at a diving destination in Saint Lucia, Venezuela, in the Caribbean Sea. At this location, contact divers are equipped cameras on corals were higher than those without cameras (on average 0.4 compared to 0.1 contacts per minute). In addition, the contact of divers on the reef with flat topography is higher than the slope topography as well as 97.9 per cent of divers who start diving from shore are

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more often in contact with divers who use ship to the dive site (on average 0.5 compared to 0.2 contacts per minute). Night dive is more likely to damage than day dive (1 compared to 0.4 contacts per minute). If there are instructions or supervision from the dive master, the damage can be reduced from 0.3 to 0.1 contacts per minute.

Related to the contact that occurred between diving tourists and corals, Worochanananat et al. (2008) stated about 97 per cent of divers in Thailand made contact in the first 10 minutes. Two-thirds of them have been proven damaged corals with their fin. Furthermore, Worochanananat et al. (2008) also revealed that professional divers with photographic expertise are less damaging than the amateur photographers as well as male divers are less damaging the corals than female. Another research conducted by Ong and Musa (2012) stated that divers who lack mastery of buoyancy techniques also has the potential to damage the corals.

The characteristics of marine tourists, especially diving, in Bali show that diving activities attract as much as 90.8 per cent of the market for divers with beginner qualifications (picnikers). Tourists in this group are categorized to young divers, have limited diving experiences between 1-5 years, and are educated. In addition, they can be classified as repeater tourists with a length of stay in Bali as much as 4-5 days and their time spent for diving on average for 1-2 hours per day (Suardana, 2015). He also stated that the background of divers with relatively very limited diving experience has a great potential to the damage of coral reefs when diving. Other triggering factors are the ocean currents at the dive sites that are impossible to avoid as well as the possibility of repeated dives in a day that leads divers to experience fatigue and use corals as a medium to protect him/herself against currents and to maintain his buoyancy.

Wiranatha et al (2016) who examined the relationship between the level of satisfaction and loyalty of diving tourists found a very significant relationship between the satisfaction of diving tourists with their loyalty to return to enjoy diving activities in Bali. In addition, the results of their research also found a very strong correlation between intrinsic and extrinsic motivation of marine tourists, especially diving. Referring to the results of this study, it can be hoped that if divers to be involved in coral reef management activities, they will be enthusiast.

Meanwhile, willingness to pay (WTP) is defined as the amount a consumer could pay to obtain an item or service (Nababan, 2008). Simonson & Drolet (2003) also mentioned that WTP are nothing but prices at the consumer level that reflect the value of goods or services and efforts to obtain them. In addition, some literatures shows WTP will be determined by the interest and experience in consuming goods and/or services that is reflected in the level of customer satisfaction.

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Wielgus et al. (2009) mention divers in conservation areas around the world are willing to pay additional fees as conservation costs as long as their money is solely intended to preserve the area. Furthermore they justified that a decentralized payment system in an area had a positive effect on willingness to pay. Airin and Kramer (2002) in their research in the Philippines also said divers were willing to pay more to be able to enjoy the beauty of corals and reef fish in a watershed area where reef fishing is prohibited in the area. In estimating the factors that affect the WTPs, Papilaya (2018) found the age, education, income, and occupation factors to be very influential on the value of the WTP paid, while the sex factor was not proven to influence it. The range values of WTP that divers are willing to pay after seeing the coral damage due to bleeching in South Trang Province in Thailand varies from 7 to 15 $ USD (Samsuvan and Yeemin, 2012).

Related to the development plan of sustainable marine tourism in the Nusa Penida region, located at the southern of Klungkung regency in Bali, Wiranatha et al. (2010) explained although the rules and/or ethics in diving at this area has not been well socialized as well as the level of coral damage is not yet known by the divers, but as many as 45 per cent of them expressed willingness to pay additional costs as conservation fee with a range of Rp. 5,000 - Rp. 150,000 per person per visit (average IDR 20,000 or approximately $ 1.5 USD), and 67 per cent said they were willing to pay conservation fees in the range of USD $ 5 - $ 15 per person per one visit (an average of US $ 7.5). Previously, Tania et al. (2011) in their research at Nusa Penidaand Nusa Lembongan (small island on the west of Nusa Penida), stated that 83 per cent of diving tourists have a willingness to pay ranging Rp. 53,000 – Rp 95,000 per arrival (4 USD – 7.5 $).

RESEARCH METHOD

This research was designed using a quantitative approach. A set of questionnaire was designed at the beginning of the research and was tested before data collection conducted through guided surveys. After the questionnaire was proven to be suitable as a research instrument, primary data was collected by distributing it to tourists as soon as they completed their diving activities at the research location located in Tulamben Village, Kubu District of Karangasemregency, Bali. This marine tourism area has been designated as a natural tourist attraction with an area of 26 km^2. Data is collected from June to August 2018 by distributing questionnaires to 200 dive tourists, randomly selected from the divers at Tulamben at chosen period.

Before being used as a data collection instrument, the questionnaire designed in this study was tested on 40 dive tourists at the site in March 2018. The trial was intended to

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determine the validity of each indicator and the reliability of each latent variable in the model. According to Dwipayana et al. (2018), an item or reflective indicator is considered valid if the correlation value of items with all items on the same latent variable ≥ 0.30, and a concept represented as a latent variable on the model is considered reliable if the Cronbach's α coefficient value is at least 0.60 (Hair et al., 1995; Kencanaand Manutami, 2017).To elaborate the causal relationship between the determinants of the level of satisfaction of dive tourists with their WTP, a covariance-based structural equation model (covariance-based SEM) is developed with an operational model is shown on Fig. 1 with the operational variables is listed on Table 1. The data is analyzed using AMOS (Arbuckle, 2010).

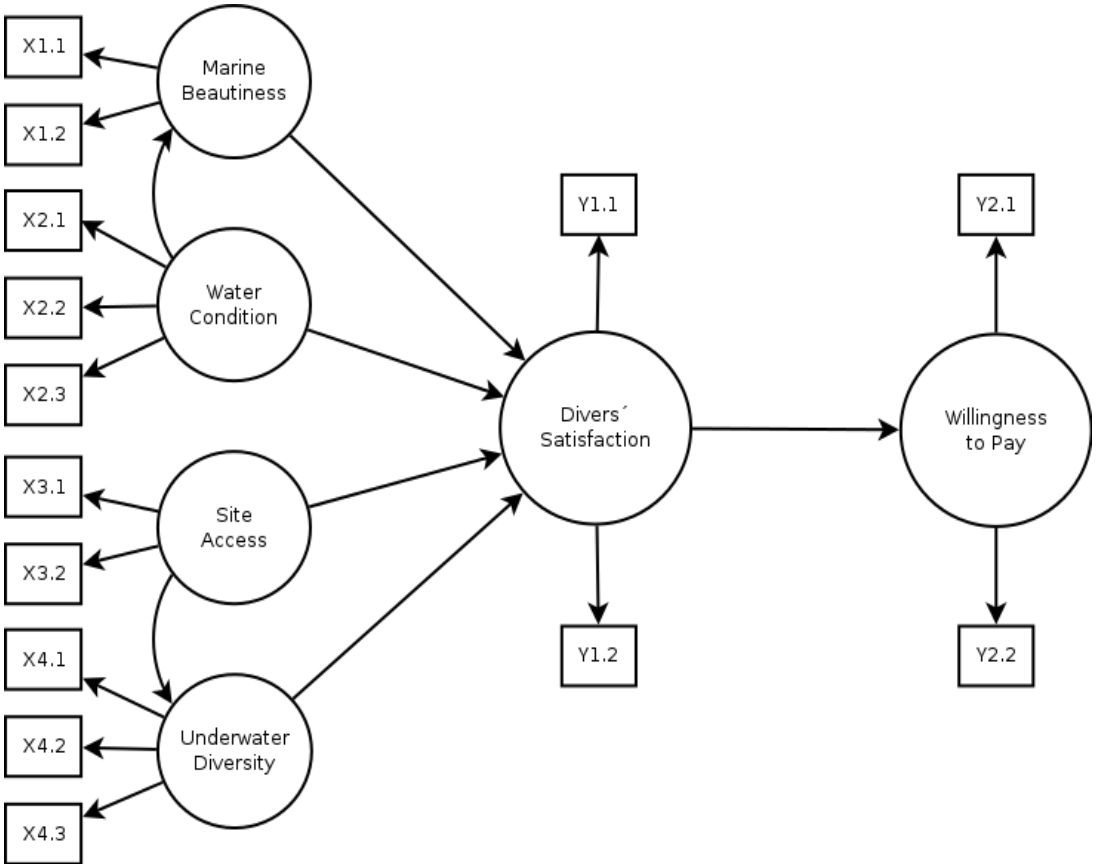

Figure 1. The Operational Model

RESULTS AND DISCUSSION

The Assessment of Research Instrument

To assess the quality of designed questionnaire, validity and reliability test is conducted using SPSS for Windows. The result is listed on Table 1. The analysis shows that all indicators in each construct have a correlation value above the lower limit required, so it can be concluded

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that the construct indicators are valid. The same finding goes for construct reliability. The six constructs are proven to have alpha values above 0.60 which are required. Noting the results of both tests, the questionnaire is concluded appropriate to be used as an instrument for collecting research data.

Table 1. Validity and Reliability Test

Construct	No. Item	Alpha Value	Note	Indicators		
				Code	Description	Correlation
Marine Beauty	2	0.838	Reliable	X1.1	Coral condition	0.891
				X1.2	Supporting objects	0.896
Water Condition	3	0.815	Reliable	X2.1	Water is relatively clear	0.818
				X2.2	Calm water	0.840
				X2.3	Water is not dangerous	0.814
Site Access	2	0.887	Reliable	X3.1	Direct access to site	0.896
				X3.2	Availability of transport	0.818
Underwater Diversity	3	0.846	Reliable	X4.1	Coral diversity	0.840
				X4.2	Fish diversity	0.814
				X4.3	Others diversity	0.896
Divers' Satisfaction	2	0.867	Reliable	Y1.1	Dive master services	0.818
				Y1.2	Comfort level of diving	0.840
Willingness to Pay (WTP)	2	0.862	Reliable	Y2.1	Divers' income	0.814
				Y2.2	Cost to pay for diving	0.814

Profiles of Respondents

Profiling the gender of dive tourists selected as respondents shows 134 men and 64 others women (67 percent vs. 33 percent). This fact is similar to the findings of gender divers in different places. Australians who love diving are dominated by men as much as 67 percent, and Salim et al. (2012) obtained 71 percent of divers on Perhentian Island, Malaysia, were male. These findings are consistent with data from the PADI diving organization which in its annual report states that of the 900,000 numbers of PADI certified divers, over the past 20 years, 62.8 per cent were male and 37.2 per cent female (PADI, 2017).

In terms of origin, tourists who dive in Tulamben are dominated by divers from European countries such as France (19.7 per cent), Germany (10.4 per cent), United Kingdom (5.7 per cent), and the Netherlands (5.2 per cent). Other countries that also contributed significantly were Australia (7.3 per cent), China (4.7 per cent), as well Indonesian domestic divers (9.4 per cent). Generally, the diving tourist market from

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European countries is quite dominant in the Tulamben as much as 65 per cent, Asia 24.6 per cent, America 2.6 per cent and Australia and New Zealand 7.8% per cent. According to Pabel and Coghland (2011), the European market is indeed very potential for diving tourists as is the case in Australia's Great Barrier Reef destination, which ranks first in the category of foreign tourists.

In the perspective of the age category, diving tourists aged 21-25 years reached 25 per cent, aged 26-30 years reached 24.48 per cent, aged 31-35 years reached 17.71 per cent, and aged 36-40 years reached 10.94 per cent. The age range is dominated by the 21-40 years age which reaches 78.18 per cent. In addition, divers have at least a high school education to a master level with a percentage of around 88.1 per cent, even the percentage of divers who have a master education level of 33.9 per cent, which shows the qualifications of diving tourists are already very adequate to master various theories about diving, as well as an understanding of conservation is excellent.

Related to the diving tourist profession that enjoys the underwater of Tulamben, some prominent professions are as professionals or managers as much as 27.6 per cent, while other professions that are equitable are private sector workers (16.7 per cent), business people (16.7 per cent), and other sectors. These figures show that the market for diving activities is young people who are educated and successful in their careers.

SEM Result

Briefly, SEM is a statistical method commonly utilised in social as well tourism research to study the causal relationship among constructs. According to Bollen (2002) and Tenenhaus et al. (2005), SEM is ultimate method to study the causal relationship among latent variables or constructs, variables that can not be measured directly and is mostly measured by their indicators or manifests. Basically, SEM is composed of 2 sub-models, namely the outer and inner models.

The outer model is intended to check the quality of construct measurements through its indicators, and the inner model is used to check the causality formed between constructs. Before the influence of exogenous constructs on endogenous ones is examined in the inner model, an outer model analysis must be carried out (Bollen, 2002; Tenenhaus, 2005; Kencana, 2019). Table 2 showed the outer or measurement model of all construct in this study.

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Table 2. The Outer Model Test

Construct and Its Indicators			Loading Estimate	Standard Error	Critical Ratio	P-Value
Marine Beauty	⇒	X1.1	0.839	0.215	6.291	0.000
	⇒	X1.2	0.628	–	–	–
Water Condition	⇒	X2.1	0.795	0.103	9.693	0.000
	⇒	X2.2	0.840	0.098	10.337	0.000
	⇒	X2.3	0.808	–	–	–
Site Access	⇒	X3.1	0.806	0.073	11.126	0.000
	⇒	X3.2	0.918	–	–	–
Underwater Diversity	⇒	X4.1	0.968	–	–	–
	⇒	X4.2	0.908	0.047	19.033	0.000
	⇒	X4.3	0.536	0.080	6.763	0.000
Divers' Satisfaction	⇒	Y1.1	0.859	–	–	–
	⇒	Y1.2	0.888	0.074	14.617	0.000
Willingness to Pay (WTP)	⇒	Y2.1	0.860	–	–	–
	⇒	Y2.2	0.826	0.118	7.594	0.000

Table 2 shows except for X4.3, all of indicators have a loading estimate greater than 0.60 as suggested. In addition, the critical ratio also greater than 1.65 as the lowest threshold to claim the indicator is a valid measure for its respective construct. From this finding, we eliminate the X4.3 as an indicator of underwater diversity construct.

The inner model after X4.3 is eliminated, known as the full model, is conducted by applying AMOS software from Arbuckle (2010). The result showed some of the goodness of fit (GoF) criteria did not demonstrate the full model is good to make inferences. Noting this situation, we follow Arbuckle's suggestion to look at the modification index (MI) of the model. This index suggests which indicator must be kept in the model as well as to add or eliminate one or more path diagram among indicators in the model. After three iteration, we found the accepted model for our study is making a correlation line between some error components. The GoF of final model and the regression weight between the exogenous and the endogenous constructs is listed on Table 3.

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Table 3. The Inner Model and Its GoF Criteria

Construct			Regression Weight	Standard Error	Critical Ratio	P-Value	Note
Exogenous		Endogenous					
Marine Beauty	⇒	Divers' Satisfaction	0.062	0.237	0.261	0.794	Not Significant
Water Condition	⇒	Divers' Satisfaction	0.475	0.233	2.039	0.041	Significant
Water Condition	⇒	Marine Beauty	0.651	0.103	6,312	0.000	Very Significant
Site Access	⇒	Divers' Satisfaction	0.290	0.185	1.567	0.117	Not Significant
Site Access	⇒	Underwater Diversity	0.821	0.073	11.250	0.000	Very Significant
Underwater Diversity	⇒	Divers' Satisfaction	0.072	0.102	0.706	0.480	Not Significant
Divers' Satisfaction	⇒	Willingness to Pay (WTP)	0.893	0.137	6.536	0.000	Very Significant

GoF Criteria	Cut-off	Result	Note	GoF Criteria	Cut-off	Result	Note
χ^2	Small	69.892	Good	CMIN/df	≤ 2.00	1.271	Good
p-Value	> 0.05	0.085	Good	TLI	≥ 0.90	0.983	Good
RMSEA	< 0.08	0.135	Moderate	CFI	≥ 0.90	0.988	Good
GFI	≥ 0.90	0.948	Good	NFI	≥ 0.90	0.948	Good
AGFI	≥ 0.90	0.948	Good				

Discussion

Considering the criteria commonly used in CB-SEM, it can be decided that the model is worth interpreting. In addition, of the seven causal relationships in the model, three of them have a regression coefficient that is not significant at the 5 percent test-level. These three insignificant relationships were observed in the determinants of the level of diving satisfaction, i.e. marine beautiness, site access, and underwater diversity. The only factor that is proven to have a significant effect on the satisfaction of divers is a calm and harmless water condition.

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The results of the study that found the water condition as the single most important determinant factor for the level of satisfaction of divers in Tulamben proves that diving tourists in this destination are novice divers. Safe and comfortable diving activities in Tulambencan not be separated from the coastal landscape due to the eruption of Mount Agung in 1963, so that the beach is filled with coarse sand and rocky. This rocky substrate is one of the causes of good water clarity, and the contours of the bathymetry of the coast increasingly sharper make the circulation of water masses relatively maintained, even though the wind and big waves. The clarity of the waters and the depth of these waters which can be reached only a few tens of meters from the beach, making this location an excellent place for beginner divers tourists to practice and do activities.

Related to the significant influence of the level of diving tourists' satisfaction with the PAPs, they considered Tulamben as a dive tourism destination should be managed and improved in quality, so that if they had to pay, the divers were willing as long as they had the opportunity to enjoy the beauty of Tulamben's underwater panorama. Satisfaction is a real cause in determining the willingness of tourists to pay. Specifically, the new findings obtained by this research using SEM are that diversity influences the willingness to pay by mediating endogenous variables of satisfaction.

CONCLUSION

Research on perceptions, satisfaction levels, and willingness to pay from diving tourists in Tulamben, Karangasem Regency concluded:

1. About two-thirds of dive tourists in Tulamben are male tourists. In addition, the divers on this beach are beginner divers belonging to the young and educated age group;
2. As a beginner diver, safety and comfort become important causes in determining the level of satisfaction. Access to dive sites, diversity of underwater panoramas, and beautiful beaches are not the dominant determining factors;
3. Tourists who are satisfied with their diving activities do not mind contributing to coral and fish protection efforts in Tulamben. Their satisfaction has a significant effect on the WTP.

Suggestions

Noting that dive tourists in Tulamben are novice divers, to reduce damage to coral reefs caused by the experience and understanding of divers, it is recommended:

1. To limit the number of dive tourist visits, especially novice divers;
2. Manage some of the diving costs collected and the WTPs paid by tourists to improve the quality and quantity of coral reefs in Tulamben.

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Suggestion for further Research

Noting this study was conducted without differentiating the citizenship of divers as well their diving experiences, future research should be carried out to find perception and WTP's differences may exist because of demographic and/or motivation factor of divers.

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