

Paper

Understanding the Diving Tourism Industry in Tulamben Using the Scuba Diving Tourism System Framework

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Abstract: As one of the most-known wreck dive destinations in the world, diving tourism at the USAT Liberty site in Tulamben, Bali, has been developing for more than forty years. However, this niche island tourism is facing other problems besides the deteriorating condition of the shipwreck. Some examples include emerging conflicts of interest between stakeholders and the local community's economic dependency on diving tourism. Using the scuba diving tourism system framework, this article aims to understand wreck-diving tourism management in Tulamben, focusing on involved key stakeholders by examining their positions, roles, and contributions to socio-cultural, socio-economic, and environmental sustainability. This study uses social network analysis to examine the dynamics of actor relations in depth. Data were collected through field observation, interviews, and questionnaire surveys in 2019, 2020, and 2022. The results show that involved stakeholders in the management of wreck diving at the USAT Liberty site consist of local people, the traditional village, local government bodies, business owners (both native Balinese and outsiders), and divers, who were predominately foreigners. The study also revealed the high dependency of locals on diving tourism, causing them to experience economic difficulties when wreck diving stopped due to the COVID-19 pandemic. In addition to that, the lack of transparency regarding the number of tourists and the profits from ticket sales made it difficult to develop facilities and attractions. This study argues that community-based tourism management needs to be maintained to ensure that the local community remains the main actor. However, this practice needs to be continuously evaluated internally and externally to overcome various problems that currently exist.

Keywords: wreck-diving management, stakeholders, sustainable tourism, heritage tourism

DOI: <https://doi.org/10.24564/0002020196>

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Introduction

Scuba diving tourism has been growing as one of the most popular marine activities in recent years and has become a flourishing industry. The growth in the number of tourists participating in diving tourism can be estimated from the rise in the number of people who take diving certificates. Although the exact number or statistics on certified divers around the world are quite hard to get, a rough estimation still can be made. According to Dimmock and Musa (2015), in 1988 there were 2.5 million certified divers around the globe. Two decades later, this number had multiplied seven times by 2008 up to 17.8 million divers. In 2021, the Professional Association of Dive Instructors (PADI) reported that they have more than 128,000 professional members and operate in 186 countries and territories with 6,600 dive centers and resorts worldwide (PADI 2021)¹. As a result, diving tourism is an important niche sector in coastal areas and islands that want to extend their tourism base from traditional sun, sea, and sand tourism to attract high-spending visitors (Jeyacheya and Hampton 2016).

Along with the high number of enthusiasts in diving tourism, diving activities are even more diverse. In addition to seeing the aquatic landscape, coral reefs, and fishes, divers also explore underwater historical remains such as shipwrecks, aircraft, old-time settlements, and other man-made structures. This activity of exploring wreckage is known as wreck-diving tourism (Edney 2006; Torres-Delgado and Saarinen 2014). This diversity of diving activities can help to address the risks of rapid saturation and reliance on a restricted number of tourism activities, two of the distinct challenges of island tourist destinations (Graci and Maher 2018).

One of the popular wreck-diving sites in the world is the USAT Liberty site in Tulamben, Bali (PADI). This 135-meter-long US freighter sank on the north coast of Bali Island after being torpedoed by a Japanese submarine in World War II (1942). Based on several previous studies, wreck-diving tourism at this site has had a big impact on local economies (Lukman 2020; Ridwan, Husrin, and Kusumah 2013). With an average of 250 divers per day, it is estimated that the turnover of money in Tulamben reaches 250 million IDR (around 15,959 USD²) per day or over 91 billion IDR (5.809 million USD) per year. The economic impact is felt by not only local people but also diving operators from major cities in Bali offering diving packages to Tulamben (De Brauwer et al. 2017). More importantly, the Tulamben community is considered one group of key stakeholders who have successfully managed wreck-diving tourism based on local wisdom (Lukman 2020; Noerwidi 2007; Ridwan, Husrin, and Kusumah 2013).

However, previous studies on wreck-diving tourism in Tulamben were mostly carried out from the point of view of cultural heritage management, in which the discussions were still focused on the condition of the wreck and the role of the community (Lukman 2017; Noerwidi 2007; Ridwan, Husrin, and Kusumah 2013; Tahir 2012). Meanwhile, studies based on a tourism perspective are still limited. In fact, as one of the most popular diving destinations in the world, it is important to understand Tulamben's management system deeply, including current issues and challenges from a tourism perspective.

¹ PADI is one of the biggest diving organizations, providing training and certification at both beginner and professional levels. Besides PADI, there are several other large organizations engaging in the same field, such as Scuba Schools International (SSI), CMAS (Confédération Mondiale des Activités Subaquatiques), BSAC (British Sub-Aqua Club, Best British Contingent), and SDI (Scuba Diving International). Hence, the number of active divers in the world is probably much higher than stated in the data provided by PADI.

² Approximate number with exchange rate of 0.0000638367 USD per 1 IDR (Source: Xe Currency Converter accessed through <https://www.xe.com/currencyconverter/> updated on Feb 27, 2024, 21:52 UTC).

Lukman (2017) identified a conflict of interest between the traditional village³ and the local government regarding the management of diving tourism. In 2017, a ticket officer was arrested by the police and the local government for embezzling entry ticket sales. Two years on from the case, based on the author's preliminary survey in September 2019, local people still have trust issues with traditional village staff regarding the use of money from ticket sales. Apart from that, local people also mentioned that problems sometimes occur between divers and porters (local people who work as helpers), and friction occurs between local and foreign dive guides in Tulamben. These issues have hardly been discussed in previous studies, including those that focused on discussing the management of wreck-diving tourism based on the local community. Another issue is, as mentioned by Ridwan, Husrin, and Kusumah (2013), that the increasing damage to the shipwreck is not only due to natural factors such as landslides, corrosion, and sea waves but also because of the activities of divers. However, an in-depth study of the profile and behavior of divers at USAT Liberty is still very limited. In their research on the impact of diver spending on the local economy in 2016, Suardana and Ariani mentioned that one of their case studies was Tulamben. However, there was no specific information in their paper regarding the description of the divers' profile in Tulamben and how many samples they used.

As a world-famous diving destination that stimulates a million-dollar diving tourism industry, it is not surprising that there are many indications of problems in Tulamben. Previous studies noted that the diving tourism industry creates various issues such as accidents to divers, conflicts of interest between stakeholders, and damage to the coastal environment, including underwater cultural heritage (Dimmock and Musa 2015; Edney, Dimmock, and Boyd 2021b; Giglio, Luiz, and Ferreira 2020; Wongthong and Harvey 2014). Some of these issues have an impact not only locally and regionally but also on the national and even global levels (Dimmock and Musa 2015.)

Based on these critical issues, Dimmock and Musa (2015) concluded that to unravel the complexity of the problems in the diving tourism industry, a systematic approach is needed. Key stakeholders involved must be placed in a system where they work together, influence each other, and have an impact on cultural, social, and environmental aspects. In that way, problem-solving could be done in an integrated and systematic way (Dimmock and Musa 2015).

In line with this paradigm, the authors concluded that to unravel the complex issue of wreck-diving tourism in Tulamben, a systematic approach is important for uncovering the positions and roles of the stakeholders involved in the diving tourism industry. To this end, this study used the framework of the scuba diving tourism system (SDTS). As compiled by Dimmock and Musa (2015), the SDTS consists of (1) the host community, (2) the marine environment, (3) the scuba diving tourism industry, and (4) divers.

The research questions of this study are (1) How is wreck diving managed in Tulamben, and who are the stakeholders based on the SDTS framework?; and (2) What are the positive and negative impacts of Tulamben's wreck-diving management system on the socio-economic, cultural, and environmental aspects?

To support the evaluation of the sustainability of wreck-diving tourism management in Tulamben, this study aims to explore the pattern of relationships between the stakeholders involved and clarify various issues of wreck-diving tourism in Tulamben. In other words, this research aims to understand in detail who the stakeholders are and how they work together,

³ Balinese people lived within an indigenous community called a *desa pakraman* (traditional village). It is governed by the teachings of Hinduism as the main belief of the Balinese people.

influence each other, and have an impact on socio-economic, socio-cultural, and environmental aspects.

1. Literature Review

The management of wreck-diving tourism will be considered a sustainable practice if it is not only able to ensure the host community roles but also the best diving experience for the tourists and the sustainability of both the marine environment and underwater cultural heritage. Preserving the environment and heritage while maintaining and even improving tourist satisfaction and the community's economy is indeed a complicated task. To evaluate and realize the management of sustainable wreck-diving tourism, we also need to fully understand the actors involved as well as their respective roles and impacts in practice. The literature review will identify issues of sustainability in wreck-diving tourism, summarize existing case studies on the USAT Liberty in Tulamben to identify the research gap, and introduce the scuba diving tourism system (SDTS) as a tool for analysis. In addition, this study uses social network analysis to gain a deeper understanding of stakeholder structure and the dynamics of each actor's relationships.

1.1 Wreck-Diving Tourism

Wreck diving has grown as one of the most popular underwater tourism activities within the last decade. This may be due to different challenges and sensations offered for divers than in an ordinary diving spot (Edney 2006). Besides seeing fish and coral reefs or other marine life, divers can also have the experience of diving within the space of a ship, aircraft, or ancient buildings, exploring the history and knowledge behind the wreckages. In other words, wreck diving stimulates adrenaline and triggers the curiosity of divers.

Some archipelagic countries relying on their marine resources see the growing trend of wreck diving as a huge potential in developing their tourism industry that needs to be taken seriously. Dozens of wreck sites in their waters are no longer only seen as historical remains but also as tourist attractions with economic value. Therefore, they keep developing various underwater diving sites through continuous promotion, improving supporting facilities, and creating regulations. Some examples are Vanuatu, the Marshall Islands, Micronesia, Indonesia, Malaysia, and the Philippines (Akyzbekov et al. 2022; Edney 2016). Especially for the Chuuk Lagoon region in Micronesia, wreck diving is the most important attraction of the tourism industry (Edney and Howard 2013).

In general, diving tourism generates higher expenditures, which could encourage economic growth through job creation and business development. Therefore, this niche tourism makes an important contribution to local economies, particularly in the Pacific Island and Southeast Asian nations such as the Federated States of Micronesia, Palau, Vanuatu, and Thailand (Dearden, Bennet, and Rillins 2006; Edney 2006, 2012; Musa and Dimmock 2012; Vianna et al. 2012). According to De Brauwer et al. (2017) and Pascoe et al. (2014), the estimated economic value of diving tourism in Southeast Asia reaches 4.5 billion USD per year.

Up to this day, studies specifically discussing wreck diving within the perspective of sustainable tourism are still limited. Research by Edney (2006) is one such study, analyzing the impact of diving tourism on shipwrecks in Australia and the Pacific. In 2012 and 2017, she conducted studies about the characteristics, motivations, and attitudes of divers in Chuuk Lagoon, Micronesia, and Australia. Edney and Howard (2013) also wrote a review on wreck diving in the book *Scuba Diving Tourism*, edited by Musa and Dimmock (2013). In these four studies, she found that scuba divers are generally satisfied with diving activities on the shipwreck because it is more

challenging yet, at the same time, offers a different atmosphere as well as important values and knowledge. However, she also mentioned that the activities of scuba divers could bring harm to Underwater Cultural Heritage (commonly abbreviated as UCH), such as taking or moving parts of the wreckage, both intentionally and accidentally. Scuba divers' air bubbles trapped inside a ship can also accelerate corrosion and cause further damage to it. Therefore, Edney emphasized that understanding the characteristics, attitudes, behaviors, motivations, and preferences of divers is very important for managers of underwater archaeological sites in managing diving tourism to ensure that it is safe for divers and guides as well as the sites (Edney 2017).

In another study she conducted, Edney (2016) offered solutions to minimize the impact of scuba divers' activities on shipwrecks. First, regulatory approaches are needed, including strict rules for people accessing or dropping anchor at the dive site. Within this approach, it is also necessary to create a marine protected area (MAP) and a provision requiring each diver to be accompanied by a licensed dive guide who understands the environment of the site. Second, a non-regulatory approach covering basic knowledge about the importance of environmental and cultural-historical preservation is equally as important as the first approach. These two provisions can be carried out in the form of varying programs such as diver training, engagement, and partnership among the dive communities about safe and responsible diving, as well as education about maritime archaeology in general. The non-regulatory approaches also encompass the benefits of artificial reef wrecks to reduce the impact of divers on shipwrecks (Edney and Spennemann 2015).

1.2. Wreck-Diving Tourism in Tulamben

Based on the literature review, previous studies on wreck diving in Tulamben covered several topics related to the heritage aspect (existence and preservation of the shipwreck) (Adhityatama 2015; Pratama 2018; Setiawan 2018), the surrounding marine environment, and the impact of natural disasters (Putri and Adikampana 2019; Ridwan, Husrin, and Kusumah 2013), the condition of underwater biota, the carrying capacity (Arifin, Yulianda, and Imran 2019; Marchel, Zahida, and Yuda 2021; Rizaldy and Suryawan 2019), and the community's perspective and local wisdom (Lukman 2017, 2020; Noerwidi 2007; Tahir 2012). On the other hand, discussion about the perspectives of tourists, including divers, in wreck diving in Tulamben was rather limited. Although their activities based on their knowledge and experience may have huge impacts on the economic, socio-cultural, and environmental aspects of tourism itself (Doiron and Weissenberger 2014; Wongthong and Harvey 2014), they are rarely discussed in academic papers.

As mentioned above in the sustainable tourism concept, it is important to discuss the needs and satisfaction of tourists or, in this case, the scuba divers (Dimmock and Musa 2015; Lucrezi et al. 2017). So far, only one study discussed the contribution of tourist satisfaction to the relationship between motivation and product loyalty at development centers for diving in Bali. Suardana and Ariani in 2016 used several locations as their case study, including the Sanur and Benoa, Pemuteran, Nusa Penida, Tulamben, and Candidasa areas (Suardana and Ariani 2016). However, there was no specific information in the paper regarding the description of the divers' profile in Tulamben.

Besides tourists, another element that contributes to realizing sustainable tourism in Tulamben is the scuba diving tourism industry (SDTI). However, research covering this topic in Tulamben was rather insufficient. The subject matter can be related to the level of security and comfort provided by SDTI to tourists, from the quality of diving equipment to lodging and insurance (Hall 2013). This industry also takes a substantial role in educating and controlling the

manners of divers (Lucrezi and Saayman 2017) and preventing further damage to the USAT Liberty shipwreck and its surrounding environment caused by tourists. In addition to that, the SDTI can determine the extent of the economic impact received by the community by providing employment opportunities for residents, decent wages, and worker welfare levels.

There were two recent broad studies conducted by Wiyanto (2021) and Wiyanto et al. (2020) on this topic. They discussed the sustainability of diving tourism in Tulamben using several variables such as water conditions and coral coverage, underwater biota, and carrying capacity. Those studies also explained the sustainability of diving tourism in Tulamben in three dimensions, namely ecological, economic, and socio-cultural. Unfortunately, the author could not find detailed and traceable information regarding the method and sample related to the economic and social-cultural dimensions on which the conclusions were based.

1.3. Sustainable Diving Tourism and the Scuba Diving Tourism System

According to the United Nations World Tourism Organization (UNWTO) (2005), sustainable tourism is “tourism that takes full accounts of its current and future economic, social, and environmental impacts, addressing the needs of visitors, the industry, the environment, and host communities” (10). Sustainable tourism should also (1) make optimal use of environmental resources, (2) respect the socio-cultural authenticity of host communities, and (3) ensure viable, long-term economic operations, providing fairly distributed socio-economic benefits to all stakeholders (United Nations Environment Programme (UNEP) 2005).

Related to the discussion of sustainable diving tourism in more detail, Dimmock and Musa (2015) explained there are four central elements in the scuba diving tourism system (SDTS). They are (a) the marine environment, (b) the scuba diver, (c) the scuba diving tourism industry (SDTI), and (d) the host community. These four elements are the essential keys to evaluating the extent of the sustainability of diving tourism. Among the four central elements in the SDTS, three of them consist of the stakeholders involved in wreck-diving management. They are the host community, the scuba diving tourism industry, and the divers.

The STDS can be used as a framework to assess the management of wreck-diving tourism as it can describe the role of each party and explain their relationship within the social, cultural, and economic contexts. For every site, the STDS of wreck-diving tourism can be different, and hence, various stakeholders of each of these sites need to be addressed as a unified system including in Tulamben (Hall, 2013). They are related to each other as one’s behavior and actions may influence another’s attitudes and reactions. Not only that, the social, cultural, economic, and environmental aspects are also affecting and being impacted by those stakeholders. After knowing how they work as a system, an appropriate and case-specific strategy can be drawn up to improve the management of wreck-diving tourism at their site. Therefore, this framework will be used for the analysis of wreck-diving tourism in Tulamben.

1.4. Stakeholders Theory and Social Network Analysis

Stakeholders are the most important aspect of the diving tourism industry. Dimmock and Musa (2015) define stakeholders in diving tourism as individuals and groups who affect and are affected by tourism activities in the generating region, transit region, and destination region. The sustainability of diving tourism will be determined by the relationship and form of cooperation among stakeholders. However, various studies also concluded that creating good cooperation among stakeholders has many challenges. In many cases, cooperation is difficult to fully achieve, especially in the management of natural resources for the tourism industry. Some of the challenges

are unfair competition, mutual distrust, control of natural resources by a certain group, conflicts of interest, and the marginalization of other groups based on religion, gender, and culture (Dimitrovski et al. 2021; Nguyen et al. 2019; Prell, Hubacek, and Reed 2009; Wondirad, Tolkach, and King 2020).

To address the above issues, Nguyen et al., (2019) and Prell, Hubacek, and Reed (2009) suggested the first steps that need to be taken are to identify the actors involved and explain their roles using stakeholder theory. However, in the case of large-scale tourism management involving many actors, the stakeholder theory needs to be supported by social network analysis (SNA). This is based on the consideration that stakeholder theory focuses more on explaining which actors are involved and what their roles are but has limitations in analyzing the relationships and interactions between them. Therefore, previous studies proposed that SNA can be used to describe complex patterns of social relations between actors in stakeholder networks (Nguyen et al. 2019).

Prell, Hubacek, and Reed (2009) explained that in SNA, there are two types of stakeholder ties, namely strong and weak ties. In the strong tie, actors tend to share similar perspectives and give one other emotional support and help in an emergency situation. Through the strong tie, the actors will create a homophily relationship. That is a situation where several similar actors build interactions with each other and tend to communicate intensely. These social networks usually have a strong mutual understanding between fellow actors. However, in this pattern, the actors lack diverse views and knowledge because they have similar characters. Meanwhile, in weak ties, actors tend to create a centralized relationship pattern, a situation in which one person or group controls most of the ties with others in the network. This network concept is ideal for an initial step in forming an organization and building support for collective action but unsuitable for managing natural resources in the long term (Prell, Hubacek, and Reed 2009). [Click or tap here to enter text.](#)

Specifically, Prell, Hubacek, and Reed (2009) divided the centralized relationship pattern into two patterns, namely degree centrality and betweenness centrality. Degree centrality is a condition where one or a few actors are connected directly to all networks with a centralized system. In that way, they can disseminate information and communicate directly with all the actors. However, they tend to be weak because of the many ties with other parties. On the other hand, this pattern does not guarantee that all network segments can be unified. Betweenness centrality is a situation where actors are connected separately to several network groups. In this way, they can also mobilize and disseminate information on a larger scale within the group. However, divided into several groups with weak ties, each group is prone to splitting into two or more groups; therefore, this relationship pattern is not suitable for long-term management. In this study, the relationship patterns described by Prell, Hubacek, and Reed (2009) were applied to examine and analyze the dynamics of the relationship among stakeholder actors in Tulamben.

1.5 Research Gap

Based on the literature review above, previously conducted studies seemed to miss out on further analysing the relationships between the diverse stakeholders involved in wreck-diving tourism management and their respective roles and influences in realizing sustainable tourism. This topic needs to be addressed to provide a more comprehensive discussion about sustainable wreck-diving tourism since each party contributes differently to the cultural, economic, and environmental aspects. Therefore, this paper aims to fill in the gap in the research on sustainable wreck-diving tourism by providing an analysis of each stakeholder that participated and collaborated in its management with a case study at the USAT Liberty in Tulamben, Bali, Indonesia.

2. Research Method

Primary data were collected through observation, interviews, and a questionnaire survey. The field observation was carried out twice, on 6-13 September 2019 and 2-10 March 2020 in Tulamben Village at several places, from the beaches, entry ticket counters, and dive centers to restaurants, cafes, streets, hotels, homestays, and gift shops. The author also conducted semi-structured interviews with several local people working as ticketing staff, traditional village representatives, dive guides, tourist guides, hotel staff, and policies. The interview begins with some general questions, followed by other questions that have been prepared by the author related to the research topic. In addition, the author also asked more detailed questions related to the information conveyed by the informants.

In general, the interviewees were divided into three stakeholder groups, (a) the host communities, (b) scuba divers, and (c) members of the scuba diving tourism industry. Interviews with Indonesians were conducted in Indonesian while interviews with foreigners were conducted in English. This interview was conducted to learn who the stakeholders in wreck-diving tourism in Tulamben are and what their roles are. Specifically, in this interview, the author tried to find out the positive and negative impacts and challenges or problems faced by each stakeholder in the context of sustainable diving tourism.

The questionnaire survey of tourists was carried out in English and covered the sociodemographic characteristics of divers, their experiences, and level of satisfaction. From 3-7 March 2020, we were able to collect 72 questionnaire results: 70 of them were conducted face to face and the rest online. However, since seven of them were not filled out thoroughly, only 66 could be processed for further analysis. The questionnaire consisted of 30 questions composed of two parts. The first part was about their basic demographic profile, nationality, age, job, education level, diving certification level, and diving experience. The second part was about their experiences while traveling in Tulamben, where they stayed, and the locations that were explored.

3. Results and Discussion

3.1. Overview of Tulamben Village and USAT Liberty Site

3.1.1. Tulamben Village

As one of the relatively smaller islands in Indonesia, Bali and its people rely heavily on the tourism industry. According to the Laporan Perekonomian Provinsi Bali Agustus 2023 (in English Bali Province Economic Report for August 2023) compiled by Kristian et al. (2023) industries that highly supported or are closely related to the tourism sector absorbed at least twenty percent of the working population in the province⁴. One of the tourism sectors on the island that generates a lot of money is diving tourism. Referring to PADI, there are at least fifty-six already known dive sites around Bali, ranging from reef dives to wall and drift dives⁵. Most of these diving spots are located along the coastline on the eastern part of the island. Several factors that have made diving tourism develop rapidly in Bali are the diversity of coral reefs, clear sea water, and an advanced tourism

⁴ Referring to the statistics of February 2023, from a working population of around 2.62 million in Bali, 951,000 people are working in tourism related industries: 320,000 in the accommodation or food and beverage industries; 536,000 in the transportation industry, and 95,000 in the trade industry. If we assume around sixty percent of workers in these industries are directly or closely related to the tourism sector, including in industries such as manufacturing and services (providing souvenirs, crafts, and tour operator services), we get at least twenty percent as the result (Kristian, Rahman, Prayitno, and Dewi 2023).

⁵ "Top Dive Sites Around Bali," retrieved from <https://www.padi.com/dive-sites/bali/>, accessed on November 10, 2023.

industry. One of the villages that has developed diving tourism is Tulamben Village, with the main attraction being the USAT Liberty site.

Tulamben Village is located in the Kubu District, Karangasem Regency, in the northeastern part of Bali Island. This small village is quite far from Nusa Dua, the center of the tourism industry in Bali, which is around 100 km away. Tulamben Village has an area of around 29.16 sq km, with a population of 11,228 people. A total of 11,210 Tulamben residents are predominantly Hindu, and the rest are Muslim, Christian, Catholic, and Buddhist. Most of the residents work in the tourism sector, a small number work as sand and rock miners, and others are civil servants (Statistics of Karangasem Regency 2019).

Before the Republic of Indonesia was formally established in 1945, the indigenous people in the archipelago lived in a traditional system. In some areas, the traditional system is in the form of a kingdom, whereas in other regions, it can be in the form of an indigenous community group that has its own leadership structure. In the past, Balinese people lived within the concept of an indigenous community called *desa pakraman* (traditional village). It is governed by the teachings of Hinduism as the main belief of the Balinese people. To govern the community, the leader of the traditional village, called *kelian adat* or *bendesa*, made a rule called the *awig-awig*. This traditional law originated from the concept called *tri hita karana*, the harmonization of the relationship between humans and God, humans with nature, and between one another.

Throughout history, the Tulamben people have experienced changes in their status: under the reign of the Karangasem Kingdom, the authority of the Dutch East Indies Government, later the Japanese Army occupation, and now being a part of the Republic of Indonesia. However, the traditional village continues to exist as a traditional system of the local people's life. Up to this day, this system is still recognized and implemented even though formally in Indonesia, there is a local government called *desa* (official village) as the fourth level of administrative division. In Bali, it is called *desa dinas* (service village) and has the authority to regulate community life, particularly as related to the administrative function. On the other hand, the traditional village has more roles related to cultural and religious aspects. Bali Province Regulation Number 4 of 2019 mentioned that the *desa adat* (traditional village) also has the authority to manage tourism destinations or attractions in their area. Thus, since the very beginning, the management of wreck-diving tourism in Tulamben was predominantly done by the traditional village instead of the official village.

3.1.2. The USAT Liberty Site

According to Ridwan, Husrin, and Kusumah (2013) and Pratama (2018), the USAT Liberty was a US freighter that sank in 1942 after being torpedoed by the Japanese submarine I-166. Based on official documents cited in Ridwan, Husrin, and Kusumah (2013), this ship has a dimension of 135.43 x 17 meters. Initially, the USAT Liberty sank close to the seashore of Tulamben; however, the eruption of Mount Agung in 1963 generated a lava overflow and stimulated an earthquake that dragged the vessel into the deep sea. It also caused damage to the ship's structure, and it split into parts (Noerwidi 2007, Ridwan, Husrin, and Kusumah 2013; Pratama 2018).

The latest study indicates that USAT Liberty is now resting at a depth of about 7-30 meters below sea level and is located about 30 meters from the coast (Adhityatama 2015; Lukman 2017). After being under water for a long time, it also became an environment for various fish and corals to live, such as sea fans, barrel sponges, brain coral, massive coral, and table coral (Pratama, 2018). With such conditions, USAT Liberty became one of the easiest and calmest wreck-dive sites to be

accessed. This site is one of the most popular spots for divers not only among sites in Bali Island but also in Indonesia (Dicker 2015).

3.2 The Management and Stakeholders of Diving Tourism in Tulamben

This part explains several parties involved in managing diving tourism in Tulamben along with their respective roles and contributions as well as some existing issues between them. As explained by Dimmock and Musa (2015), there are three stakeholders in SDTS: the host community, the scuba diving tourism industry, and scuba divers. Lukman (2017) already covered the topic of the stakeholders involved in Tulamben. However, his discussion was more focused on the ones (host community) playing the role in preserving shipwrecks as underwater cultural heritage. From a broader perspective, the management of USAT Liberty as a tourism attraction involves other parties having various impacts on the wreckage's conservation and management. Two of them are tourists (divers) and the scuba diving tourism industry. In this chapter, the roles and impacts of each stakeholder are thoroughly explained. The various challenges and problems that exist between them in the context of diving tourism management are also deeply discussed.

In Tulamben, the involved stakeholders are (1) the Karangasem Regency government, (2) the official village of Tulamben, (3) the police, (4) the traditional village of Tulamben, (5) the scuba diving tourism industry, (6) scuba divers, and (7) related institutions such as universities and research institutions. Traditional villages are divided into several groups, such as porters, entry ticket staff, dive guides, *pecalang* (traditional security officers of administrative villages, found mainly in Bali), and employees in hotels and restaurants. The details will be explained as follows (see fig. 1. Scheme of stakeholders of shipwreck management in Tulamben).

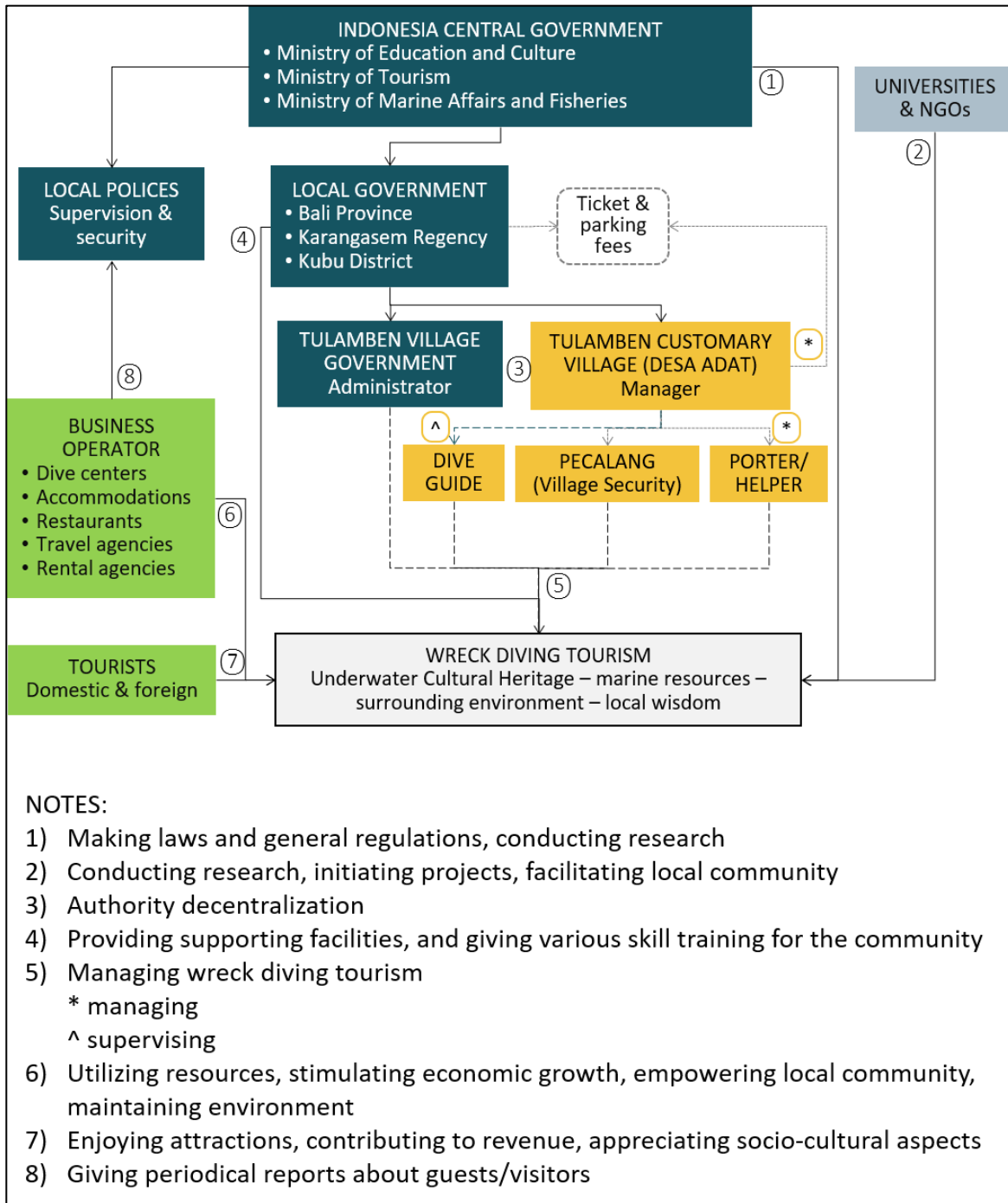


FIGURE 1. Stakeholders in wreck-diving tourism in Tulamben with their respective roles. Compiled by Author 2020.

3.2.1. Host Community

A. Government of Karangasem Regency and Official Village of Tulamben

The Karangasem Regency, a regional-level government, is one of the parties playing a direct role in the management of diving tourism at USAT Liberty in Tulamben. They made regulations specifically related to the entrance fee of all tourist destinations in the region, including Tulamben Village (Karangasem Regional Regulation No. 16/2016). According to the staff at the

official village office, all administration-related management of diving tourism is under their authority as an “official village.” Meanwhile, the traditional village in Tulamben, through their leader called *kelian adat*, will be performing all the technical works. The official village has made several regulations and carried out various programs related to the preservation of the coastal area in Tulamben. As an example, Village Regulation No. 07, Management of Coastal Zoning and Tulamben Coastal Waters, explains the rights and obligations of villagers in managing coastal areas, outlining prohibited matters and specifying sanctions for violators. This regulation is similar to a traditional law created by the traditional village of Tulamben called the “*awig-awig*.”

Besides making regulations, the Karangasem Regency government is also budgeting funds to manage the USAT Liberty shipwreck. As time goes by, the USAT Liberty is continuously in danger of further damage due to the overcapacity issue⁶. Realizing that the increasing number of divers at USAT Liberty may have some negative impacts on the shipwreck, the official village government allocated 42,306,512 IDR (approximately 2,680 USD) in 2019 to create artificial reefs. Made with hexadomes, the man-made objects offer another alternative site for tourists while minimizing the potential threats to the USAT Liberty shipwreck. By making artificial reefs that attract a diversity of marine life, diver activities will no longer be concentrated only on the wreck and surrounding environment.

Two years prior, a garbage bank as waste management to support environmental conservation had been initiated. However, the program in conjunction with Conservation International Indonesia (a non-profit organization) did not seem to be going well⁷. The village government also has a routine agenda every Sunday, inviting school students to clean the village by collecting plastic trash. This weekly chore aspires to create a garbage-free environment while at the same time educating children to be aware of and care for their surrounding environment⁸.

Although the Karangasem Regency and official village government had carried out various programs and made regulations related to the preservation of the coastal area, some people from the *desa adat* (traditional village) claimed that attention from the Karangasem Regency government for the management of diving tourism was still lacking. As mentioned by staff at the entry ticket counter, the Karangasem Regency government did not provide adequate public facilities. People often complained about the lack of street lighting around tourist sites. It even caused several accidents involving tourists due to dark roads at night (Lukman 2017). Several roads heading to the beach were also in poor condition. At the time of the field survey in 2022, they remained neglected by the government. According to a hotel staff member, the covenant with the traditional village agreed that the provision of public facilities, such as roads, lighting, toilets, parking, and others, became the responsibility of the Karangasem Regency government. He also expressed the opinion that the local government only focuses on economic benefits from the entrance fee but had not done its best at providing supporting facilities.

⁶ “Tulamben Village Allocated Budget for Conservation.” Published on 31 July 2019, retrieved from <https://nyegaragung.net/en/anggaran-desa-tulamben-untuk-konservasi/>, accessed on 22 June 2020 at 1.24 p.m.

⁷ (Bahasa Indonesia) “Bank Sampah, Apa Kabar?” Published on 23 March 2020, retrieved from <http://nyegaragung.net/en/bank-sampah-apa-kabar/>, accessed on 2 July 2020 at 11.08 a.m.

⁸ (Bahasa Indonesia) “Wujudkan Gerakan Sadar Lingkungan Sejak Dini, Kawil Tulamben Ajak Anak-anak Rare Segara Pungut Sampah Plastik.” Published on 9 September 2019, retrieved from <http://nyegaragung.net/en/wujudkan-gerakan-pungut-sampah-sejak-dini-kawil-tulamben-ajak-anak-anak-rare-segara-pungut-sampah-plastik/>, accessed on June 22, 1.10 p.m.

On the other hand, based on information from the Karangasem Regency government, the addition of streetlights has not become a priority because tourists rarely do activities at night. This decision was made based on a report on the number of entrance tickets sold by the traditional village. The report stated that there are around 3,000 to 4,000 tourists per month. Thus, the district government considered the number of streetlights and other supporting facilities in Tulamben to still be sufficient. The contradictory statements given by the district government and the traditional village show friction within host communities. In 2017, the district government and the police arrested a member of the traditional village working collecting entrance fees. He was proven to have illegally charged the tourists by not giving them official tickets issued by the government.

B. *Desa Adat (Traditional Village)*

The traditional village directly administers three main parties in diving management: the entry ticket staff, *pecalang* (traditional security officers), and porters or helpers. There is also a local dive guide group, although they are not directly under the control of the traditional village but still under its supervision.

a. Entry ticket staff

As told by a ticketing worker, four people work as entry ticket staff, two women and two men, including him. The two females are in charge at the main counter building during two shifts, the morning shift from 6 a.m. to 12 p.m. and the afternoon shift from 12 p.m. to 5 p.m. Meanwhile, the male staff is responsible for collecting money from the sale of entry tickets from the two counters mentioned and reporting the number of tourists and tickets sold to the Karangasem government once every month. There are three types of tickets and one coupon sold by the entry ticket staff as described in table 1.

TABLE 1. Tickets sold at Tulamben.

Type of Ticket	Price in IDR	Price in USD	Note
Karangasem Regency government	30,000/diver/day	2.10	Revenue for the government of Karangasem Regency. It will be used to provide various public facilities.
Desa adat Tulamben (traditional village)	20,000/diver/day	1.50	Revenue for traditional village. It will be used to support cultural and religious activities in Tulamben.
Parking fee	5,000/car/day	0.35	

Source: Interview with the entry ticket staff, 2020.

b. Porters

In 2020, there were twenty-nine permanent groups of porters coming from twenty-nine households. The porters provide a service transporting all diving equipment such as air tanks, buoyancy compensator devices (BCD), and fins from the counter to the dive site. Divers pay for the service based on the number of tanks transported (10,000 IDR or 0.60 USD per tank). Besides the adult porters who work from morning to evening, there are also younger porters taking the evening shift until 8:00 or 9:00 p.m. This group is not managed by the *desa adat* and has no permanent members, yet they still have a senior porter as the head of the group. The leader is in charge of coordinating and recording the work of the young porters each day. He is also responsible

for collecting the service fee from travel agencies or tourists. Instead of directly distributing it to its members, the money earned by the younger porter group is saved by the leader as a deposit. The rule is that each member can take their deposit out once every six months or each semester. The money is usually used to buy various school supplies such as bags, school uniforms, shoes, and books. One member of this group said that he works as a porter to get an independent income.

c. Tulamben Dive Guide Organization

The official name of this group is *Organisasi Pemandu Selam Tulamben* (English: Tulamben Dive Guide Organization). However, to make it easier for the public to remember, it is also called the “Tulamben Guardians.” Lukman (2017) in his thesis stated that the Tulamben Guardians had up to 600 members in 2016. However, based on our interviews with the leader and a member of Tulamben Guardians in 2019 and 2022, there were only 108 registered members. Among this number, only about fifty to sixty members are still active now. As told by an inactive member,⁹ there are two types of Tulamben Guardian members. The first one is those working in a dive center in Tulamben. They are bound by a contract and get a monthly salary. The second group is people working as freelance guides who only take the job when the dive centers need their help or when tourists directly contact them.

Based on an interview with the leader of the Tulamben Guardians, the organization has several concerns regarding the management of wreck diving. The first one is about the preservation of the shipwreck and underwater biota. He realized that the shipwreck, coral, and fish are important elements in the sustainability of wreck diving in Tulamben. Therefore, he and his group mates routinely carry out several programs aiming to conserve the shipwreck and the marine environment. Some examples are monitoring the condition of the shipwreck and underwater marine life, making artificial coral reefs, and cleaning up garbage along the beach. Besides the preservation of the shipwreck and the marine environment, the dive guides also have another concern. The increasing number of foreign guides employed by dive centers and resorts in Tulamben is affecting the local guides. It makes the competition between local and foreign guides more intense as they need to share working hours and visitors.

d. The Pecalang and Siskamling (Traditional Security)

Pecalang are the traditional police in Bali, whose duty is to maintain the security of the village and enforce the traditional law called *awig-awig*. This group consists of four members, each of them working on a different day. Technically, they patrol around the beach and other locations crowded with tourists. The *pecalang* routinely supervise tourists’ activities and check out their belongings on the beach.

3.2.2. Scuba Diving Tourism Industry

According to data from the official village, in 2017 there were thirty-seven large businesses related to diving tourism in Tulamben. A year later, it became thirty-eight businesses, consisting of dive centers, restaurants, and hotels. Based on observation in September 2019 and March 2020, the number of businesses in Tulamben related to diving tourism had increased to fifty- six. The Tulamben Village government only counted the dive centers as one single business when in fact most of them also own hotels and restaurants.

⁹ The man has been working as a scuba diving guide for around thirty years. After being inactive within the organization, he currently works as a freelance guide while running a food stall by the beach with his family.

Most of the businesses in Tulamben are owned by local people, the Balinese themselves. Although there is no detailed data regarding this information, we can identify it by looking at the names of the business owners in Tulamben. Out of thirty-eight businesses, twenty-eight of the owners are locals as they have typical Balinese names. This study also found that there are quite a lot of foreigners who work as dive guides, especially in dive centers owned by foreigners. They can be Europeans, Americans, East Asians, Middle Eastern Asians, and Australians. Foreigners who work as dive guides can be divided into two types. First, those who are purely working for money and thus must possess a work visa issued by the government of Indonesia, and second, those who take internships to get higher diving certificates such as instructors.

Dozens of business owners mentioned above have contributed to the physical and non-physical development in Tulamben. As explained by the leader of the *banjar adat*, a smaller part of the traditional village, they used to support local community activities and religious rituals by donating money and providing facilities. On the non-physical aspect, they contributed to providing diverse skill training to the local community, whether as dive guides, hotel staff, or restaurant workers. During a field trip in June 2022, we interviewed some students who were doing internships at a hotel and a restaurant. They said that the experience working at those two businesses can be beneficial for their future career. Even though they did not get paid and had to bring their food from home, it was still an enjoyable experience as their cooking, hospitality, and English skills improved.

One point of interest related to the scuba diving tourism industry in Tulamben is the existence of an unwritten rule about employment. It says that businesses such as dive centers, hotels, and restaurants should be hiring local residents totaling at least fifty percent of their employees. The leader of the *banjar adat* told of his experience in applying the rule when he served as the *kelian banjar adat*¹⁰ from 1996 to 2017. As the leader of the smallest community, he was in charge of checking the administrative documentation submitted by investors for business establishments. Due to his strong bargaining position, he often asked investors to verbally promise that they would hire local people as their employees.

3.2.3. Scuba Divers

As of now, there are no detailed data on the number of tourists in Tulamben each year. In this study, data were collected from three different sources: information from entry ticket staff, data from the official village, and data from the Karangasem Regency government. After comparing the three data sets, a significant difference in the number of tourists was found even though all these parties are hierarchically related to each other in the management of diving tourism in Tulamben. According to ticketing staff, the average number of tourists per month is around 3,000-4,000, or 36,000-48,000 each year. The data collected were always reported to the Karangasem government monthly. However, the latest data available on the tourist numbers from the Karangasem Regency government in 2013, 2014, and 2015 show a different amount from what the staff reported. It was almost twice the number, and in 2015, we can see it rose significantly. Contrary to that, data from the official village collected by Lukman (2017), showed the complete opposite as the tourist numbers in 2015 dropped drastically (see table 2). The authors did not get a sufficiently detailed explanation regarding the difference in the number of tourists from the three sources above, but it is quite easy to understand why this happened. This is related to the lack of

¹⁰ *Kelian banjar adat* is the title for the leader of several community groups belonging to a smaller part of the traditional village (*desa adat*). Its position within the customary bureaucracy is under the *kelian desa adat* (leader of the customary village).

transparency in the amount of profit from ticket sales, both from the traditional village government and the Karangasem Regency government.

TABLE 2. Number of divers

Year	Data from entry ticket staff	Data from Tulamben village government(Source: Lukman 2017)	Data from Karangasem Regency government
2013	36,000-48,000	73,135	64,559
2014	36,000-48,000	77,842	63,204
2015	36,000-48,000	35,983	72,354

Source: Karangasem Regency Government; Lukman (2017); and information of ticket staff (2020).

A. Socio-Demographic Profile of Divers

The authors conducted interviews with some divers during the second survey as well as distributed printed and online questionnaires to determine the socio-demographic profile of divers based on their gender, educational background, age, job, and nationality (see table 3). There was a total of sixty-five respondents by the middle of May 2020. Among them, fifty-two percent were female and the rest were male. In terms of age, most of the divers were around twenty-five to thirty-four years old (thirty-eight percent). The youngest diver was an elementary school student under the age of ten, and the oldest was seventy-two years old. One-third of the divers had a bachelor’s degree (thirty-two percent), and one quarter had a master’s degree (twenty-eight percent).

TABLE 3. Socio-demographic profile

Attribute	Ratio (%)	Attribute	Ratio (%)
Gender		Level of Education	
Male	48	High School	23
Female	52	Diploma	1
Age		Bachelor’s Degree	32
<25	15	Master’s Degree	28
25 - 34	38	Doctoral Degree	5
35 - 44	21	Nationality	
45 – 54	11	American	9
55 - 64	7	Australian	9
>64	8	British	8
Occupation		Canadian	12
Student	18	Dutch	6

Teacher/Lecturer	5	Japanese	8
Manager/Businessman/woman	26	German	12
Engineer/Technician	11	French	8
Freelance	15	Indonesian	3
Other	25	Other	25

Source: Offline and online questionnaires (2020B) Divers' Experience

Based on the results of the questionnaire, fifty-two percent of the tourists who dived in Tulamben stayed outside Tulamben (see table 4). They came from other cities such as Denpasar, Kuta, Gianyar, and Candidasa. Most tourists stayed at Amed (38.9%), another diving destination located only 16 km away from Tulamben. That means that more than half of the tourists only took a one-day trip to Tulamben without spending a lot of money there, either to stay or eat. Moreover, most of these tourists also used dive center services from the region outside Tulamben. Based on interviews with several dive centers, tourists usually order their tour packages, which include diving equipment, guides, transportation, and even meals. As a result of such patterns, the estimated income gained by Tulamben Village mostly came from the fees of entrance tickets and porter service.

The most visited location by divers in Tulamben was the USAT Liberty Shipwreck, followed by the coral garden, monkey stronghold, and the drop-off. Based on the field observation, the most crowded time was in the morning around 8-11 a.m. and in the afternoon from 2-4 p.m. Other than that, some tourists also preferred to dive at night. From the interview with the dive centers, USAT Liberty was known as one of the favorite locations for tourists in Tulamben, or even in Bali, to perform the night dive.

TABLE 4. Dive experience

Attribute	Ratio (%)	Attribute	Ratio (%)
Level of Certification		Diver Accommodation Outside Tulamben	
Open Water	46	Denpasar	16.7
Advanced	31	Candidasa	8.3
Master	4	Amed	38.9
Divemaster	9	Sanur	5.6
Instructor	5	Other	30.5
Master Instructor	5	Stay Overnight (s) in Tulamben	
Location Visited		Yes	45
USAT Liberty	90.7	No	52
Other	9.3	N/A	3

Source: Offline and online questionnaires (2020)

3.3. The Sustainability of Diving Tourism in Tulamben

The management of diving tourism in Tulamben has been going well from the point of community involvement and based on the economic aspect. From the above explanations of the stakeholders scheme, it can be concluded that local communities have a considerable role and authority in the diving tourism industry. Local people working as porters, dive guides, and staff in the tourism service businesses (hotels, restaurants, etc.) are under the auspices of the traditional village, which leads the management of diving tourism based on local culture. They are also well organized, which can be seen by the formation of a porter association and several local dive guide groups. The porter association even obtained an official business permit from the government, indicating that they are trying to work more professionally. The strong participation of local people shows that one element of sustainable tourism, the participation of the local community, has been achieved.

The diving tourism industry has a big economic impact on the community. Initially, local inhabitants did not have stable jobs and were living very poorly; however, their lives started to change after the development of wreck-diving tourism, which created jobs. The economic impact achieved is due to a system of mutually beneficial cooperation between the local communities and diving industry operators. Local communities sell or lease their assets such as land to entrepreneurs to build hotels, restaurants, and dive centers. On the other hand, entrepreneurs employ local people in their companies, at least fifty percent of the total number of employees. Then these two key stakeholders, the local community and the diving tourism industry, provide tourism activities and services such as dive trips, accommodation, and food for divers, who are mostly foreigners. In the end, this way of working over several decades has not only stimulated billions of dollars in the Tulamben economy but also in other cities as transit places for divers from abroad to come to Bali and then to Tulamben.

Since the community fully acknowledges that their main source of livelihood is provided by nature, they always try to protect the marine environment as best as they can. That includes the application of traditional laws that must be obeyed by everyone involved in diving tourism, including business owners and tourists. Supported by local businesses, local communities also preserve marine areas by regularly checking the condition of the shipwreck and underwater habitats, constructing artificial coral reefs, and developing waste management centers.

The tourism industry also has had an indirect impact on the sociocultural aspects of Tulamben. For example, several hotel and dive center owners in Tulamben donated money to build temples (*pura*) for local people to pray. They also routinely support cultural and religious events held by the traditional village (Lukman 2017). Based on these examples, this research found that the management of the diving tourism industry in Tulamben upholds a reciprocal relationship between the local community and the businesses/tourism industry to realize sustainable tourism.

However, behind the positive aspects, there are several issues that have a negative impact on diving tourism in Tulamben. The most crucial issue is a conflict of interest between the traditional village and the official village government. This issue concerns the lack of a role for the official village government in managing diving tourism, including collecting income from ticket sales. The non-transparency of ticket sales money has also become a concern for the local community. There is a large amount of income from ticket sales, but the community does not see an increase in the number and quality of supporting facilities such as parking and roads leading to the beach. If these two main issues persist without any intervention, it will exacerbate conflict between the official village government, traditional village, and local communities. Consequently, some local people end up emphasizing the benefits for their group or even themselves.

With no proper evaluation and problem-solving efforts, this may cause the quality of diving tourism in Tulamben to decrease. This issue is also closely related to divers as one of the key stakeholders and one of the main elements in the SDTS framework. As consumers of services, divers have an important role in realizing sustainable diving tourism, especially the economic aspects. Although this study found that in general, tourists are satisfied with wreck diving in Tulamben, some of them are disappointed with the lack of decent public facilities. Those who have often dived in Tulamben also complain that the road conditions are getting worse over time and streetlights are not yet sufficiently available. Besides causing inconvenience, limited facilities also make the tourists feel unsafe.

The authors assume those might be reasons why many divers prefer staying in other areas outside Tulamben such as Amed, Candidasa, Pemuteran, and Denpasar. In the future, if divers come to Tulamben for only a one-day trip, where they only dive at the USAT Liberty site but stay outside the city, then it will have a significant impact on the local economy. The revenue from local industries such as accommodation services and diving equipment rental will decrease. In that situation, the industry will lay off some of the workforce, including local people, and consequently, they will lose jobs and income. In fact, the local economy is highly dependent on diving tourism. A decline in income from the diving tourism industry in the future could also be caused by an increasingly damaged USAT Liberty site, the main attraction, so not as many tourists come to Tulamben anymore.

In such conditions, ticket sales revenue needs to be used effectively and optimally to maintain the community's economic resilience. If the average number of divers is 5,000 per month/60,000 per year, then there would be revenue from ticket sales of around 1.5 billion IDR (95,757 USD) for the traditional village and 1.8 billion IDR (114,900 USD) for the Karangasem Regency government in one year. With that amount, the traditional village can invest part of it in the education sector for the younger generation, holding training programs to improve the local people's skills and developing small and medium enterprises. Supported by local government funds, some of the revenue can be used for the construction of facilities that support the optimization of current diving tourism.

The experience of the village government in Umbul Ponggok, Central Java Province, Indonesia, in managing revenue from swimming pool attractions should be a good model. With revenue of around one billion rupiah per year, in addition to physical construction, the village government provides scholarships for the younger generation to complete undergraduate education. Unfortunately, Tulamben traditional village has not been able to do this. The amount and utilization of revenue are not even clearly known, giving rise to the suspicion of various parties.

In the case of Tulamben, the community-based management principle (traditional village) initially gave substantial authority over management to the village community (Lukman 2017). However, this study also found that this created opportunities for the practice of corruption by the local community. This issue is inseparable from the lack of supervision of the traditional village in the management the funds, both by the local government and the community. Bali's feudal culture also had a major influence on that situation. Traditional village leaders are considered untouchable persons and cannot be criticized because they are leaders in religious and cultural rituals.

3.3.1. Impact of COVID-19

From March 2020, the spread of COVID-19 across the world had a significant impact on diving tourism in Tulamben. Staff at the ticket counters said that at that time, the number of tourists

decreased by fifty percent. The decline in the number of tourists staying at Tulamben was even more significant as it had reached seventy percent by the beginning of March 2020. As a result, some dive centers, including hotels and restaurants, closed and laid off their employees.

From that time until the end of 2021, regions in Indonesia that were heavily dependent on the tourism industry, including Bali, experienced an economic shock. Based on an interview with the people of Tulamben in June 2022, diving tourism had not been running for nearly two years. In other words, they did not have a stable income during that not-so-short period. Some resorts, hotels, and dive centers trying to keep their services open only employed a limited number of employees to maintain their assets. In addition, the employees did not receive their normal salary (pre-pandemic) but rather enough fees to cover their transportation costs, around 25,000–50,000 IDR or 1.59–3.19 USD per day.

According to a local selling food, such a condition was almost the same as the time when Mount Agung erupted in 2017. At that time, tourism in Tulamben was closed and the local people lost their source of income. Some of the inhabitants also fled to other cities to avoid a further disaster. During this difficult time, they heavily relied on donations from others to cover their living expenses.

3.3.2. Social Network Analysis among Stakeholders

Using the stakeholder theory, this study comprehensively examined the stakeholders of diving tourism in Tulamben. The first group is the host communities consisting of the traditional village, the official village of Tulamben, the Karangasem Regency government, the dive guide group, the ticket staff group, the *pecalang* group, the porter group, the souvenir seller group, and the police. Second, the diving tourism industry consists of small-scale actors such as food shops and laundry services while the large-scale actors include hotels, resorts, dive centers, and restaurants. By using the scuba diving tourism system framework, this study also placed divers as the third key stakeholder in the management of diving tourism in Tulamben. The authors concluded that divers have a significant influence on the development of diving tourism and the economic benefits obtained by the host community and the industry. Based on these results, this study enriched the information on dive tourism stakeholders in Tulamben that was previously discussed by Lukman whose main focus was only the host community.

This study also analyzed the social network of stakeholders in Tulamben to examine the relationship pattern among actors. It is known that the dynamics of the ties and relationship patterns between stakeholders in Tulamben have developed over the more than forty years since the beginning of diving tourism. Initially, there were only two major groups of actors, namely the host community (traditional village) and scuba diving operators. A homophily has developed between them in which they have worked well together to achieve a common goal of obtaining economic benefits from the diving tourism industry. They have also communicated extensively and helped each other in emergencies.

In its development, there has been a change in the structure and pattern of relationships within the stakeholder network. For example, among host community groups, their initial relationship was degree centrality (Prell, Hubacek, and Reed 2009), in which the traditional village directly controlled all tourism activities, such as making regulations, selling tickets, and directly assisting local people who worked as porters, guides, and sellers. However, their relationship changed, where in host community small groups appeared that had networks disconnected from each other, such as porter groups, guide groups, souvenir sales groups, and ticket staff groups. Weak ties (in business) mean they rarely communicate and tend to try to achieve their respective

economic goals. In this relationship, the traditional village no longer has the authority to regulate each group as before. Interestingly, though, they still have strong traditional ties, and the traditional village as a traditional organization in several aspects based on traditional rules still has the authority to control small groups. Therefore, the authors consider their relationship pattern to be semi-betweenness centrality.

The dynamic of the relationship between the authorities that regulate diving tourism is also increasingly complex, with the involvement of the official village of Tulamben and the Karangasem Regency government. In the past, the traditional village had full control over management, both in making rules and managing finances, but now they have to cooperate with the Karangasem Regency government, which manages Tulamben based on the law. Profits from ticket sales are also split roughly in half: around sixty percent is managed by the regency government and forty percent is managed by the traditional village. This study found that these two groups of authorities have a relationship that can be classified as betweenness centrality. The ties are weak, they don't trust each other, and they even compete to be more dominant in managing diving tourism. On the other hand, the diving industry services' relations with the traditional village as the traditional leader have also changed. Initially, they had a strong relationship, creating a homophily relationship, but lately, their bond has tended to get weaker, creating a feeling of mutual distrust. Consequently, there is a lack of business-owner support for socio-cultural activities in Tulamben.

4. Conclusion

The existence of USAT Liberty has proven to be the most dominant factor in driving the rapid development of diving tourism in Tulamben Village. Although the natural environmental conditions in Tulamben Village, including the beaches, are considered barren compared to other villages on the northern coast of Bali Island, the USAT Liberty wreck has become one of the main attractions for foreign divers. As a result, the people of Tulamben, who previously lived in poverty, working as fishermen and farmers, have experienced significant economic advancement after working as porters, dive guides, chefs, and employees in hotels, dive centers, and restaurants. Some of them have even been able to set up small and medium-size businesses such as laundries, food, and souvenir shops. From not only an economic perspective, over the past 40 years, wreck diving at USAT Liberty has had an impact on socio-cultural and religious aspects in Tulamben, where the local community has a different identity from other island community groups in Indonesia. It has thus contributed to the diversification of the tourism industry in Bali content wise as well as spatially, an important factor for a tourism-dependent island economy.

However, in a detailed discussion using the SDTS framework, this study uncovered various advantages and disadvantages in the management of diving tourism in Tulamben. These are the result of reciprocal relationships and cooperation between key stakeholders which are considered a system. They influence and depend on each other and then have an impact on economic, cultural, and environmental aspects. The following list describes the advantages and disadvantages:

Advantages:

- Diving Tourism is managed based on local wisdom.
- Significant involvement of local communities in several diving tourism-related activities.
- The government's attention to the preservation of the marine area by making regulations and providing funds.

- The commitment of diving tourism operators to employing and empowering local communities.
- NGO support in overcoming various environmental issues.
- Efforts to monitor and preserve underwater biota by local guide organizations and several dive centers.

Disadvantages:

- Conflicts of interest between the authorities, such as traditional villages and official villages, including the Karangasem Regency government.
- Friction among local communities.
- Lack of innovation and creativity of stakeholders in diversifying natural and cultural tourism.
- Lack of transparency on the number of tourists and ticket sales.
- Nonoptimal utilization of ticket sales profits for the development of diving tourism.
- The high dependence of the people of Tulamben on diving tourism.

Furthermore, this study examined the dynamic relationship among stakeholder actors using social network analysis. It identified complex patterns of relationship between them, such as degree centrality, semi-betweenness centrality, and homophily relationship. Considering the complexity of the relationship, and as an initial step to overcome various existing issues, this study recommends a comprehensive evaluation, especially rearranging the roles, authorities, and rights of each stakeholder such as the Karangasem government, traditional and official villages, various local community groups, and representatives of the businesses.

Acknowledgments

The Authors gratefully acknowledge the support from the Next Generation Fellowship Program and TAOYAKA Program for Leading Graduate Schools at the Japanese Ministry of Education, Culture, Sports, Science, and Technology. We would also like to thank the members of Funck Sensei laboratory for all their useful comments and insights into this work.

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