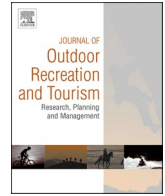


Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

## Journal of Outdoor Recreation and Tourism

journal homepage: <http://www.elsevier.com/locate/jort>

# Scuba diving operators' perspective of scuba diving tourism business in Nusa Penida, Indonesia

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## ARTICLE INFO

**Keywords:**

Challenges  
Sustainability  
Nusa penida  
Dive operator  
Scuba diving

## ABSTRACT

Nusa Penida is not only the leading diving destination in Indonesia but also one of the most famous diving points in Southeast Asia. However, it is not a mature tourist area due to its unsustainable tourism development. Furthermore, the problems experienced by diving tourism businesses in this area have rarely been studied. Therefore, this study aims to explore the challenges that affect tourism sustainability in the scuba diving tourism industry in Nusa Penida, from the perspective of dive operators. Drawing on qualitative data collected through 10 semi-structured interviews with diving operators, seven themes emerged from the study (i.e. environmental issues, lack of trained staff and guides, water sport activity, lack of enforcement, lack of government support, unhealthy competition, and irresponsible operators). These findings are expected to provide substantial theoretical and practical implications for researchers, diving business managers, and local governments in sustainable business management.

**Management implications:**

- It provides policymakers with insights as to how to revise development plans and reinforce regulations for future tourism sustainability.
- It aids managers of diving tourism businesses in gaining awareness and understanding the potential challenges in small diving business operations as well.
- This helps prepare future diving entrepreneurs for the marketing and management aspects of their business.
- This research could be applied by similar destinations to craft an effective business strategy that meets their desired outcomes.

## 1. Introduction

Despite being a niche sector, scuba diving is a form of adventure tourism that has high economic value (Fossgard & Fredman, 2019; Musa & Dimmock, 2013; Zimmerhackel et al., 2019), contributing at least USD4 billion non-market values annually to the Southeast Asia region (Pascoe et al., 2014). Particularly, muck dive tourism is worth over USD 150 million, contributing significant income generation and employment to many island and coastal communities in Southeast Asian countries (De Brauwert et al., 2017). Scuba diving is an outdoor leisure sport activity that has become increasingly popular (Bentz et al., 2016; Emang et al., 2017; Szuster et al., 2011). It has become a source of

income for many marine destinations, offering significant economic impacts for the local people (Dimmock & Musa, 2015; Tapsuwan and Rongrongmuang, 2015). Scuba diving offers positive ways to experience the underwater world and brings physical and psychological benefits to divers (Dimmock, 2009; Gregory & Dimmock, 2019; Kovacs & Walter, 2015). The psychosocial benefits of scuba diving are especially valuable to disabled individuals (Carin-Levy & Jones, 2007). It further motivates social interaction among divers by encouraging a scuba 'buddy' for safety purposes (Kovacs & Walter, 2015). Since scuba divers are willing to pay significant amounts of money to experience the underwater world (De Brauwert et al., 2017), diving guarantees a promising income to both business operators as well as local communities. Thus, if appropriately

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Received 17 March 2020; Received in revised form 4 August 2020; Accepted 6 September 2020

Available online 16 September 2020

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managed, scuba diving can improve locals' income and livelihood, conservation efforts, as well as divers' underwater experience (Albayrak et al., 2019; Emang et al., 2019; Lucrezi et al., 2017). Consequently, many potential destinations have been established as diving destinations. Dimmock and Musa (2015) highlighted that the scuba diving tourism system encompasses four essential elements, namely the marine environment, divers, the host community and the scuba diving tourism industry. The diving business community is an essential stakeholder because without diving businesses, diving tourism would not be able to develop and grow. All these four elements interact to ensure the sustainability of the entire scuba diving system. This research was triggered by evidence that the diving business industry in Nusa Penida faces various challenges, thus providing a need to fully understand these challenges. Based on the author's personal observation and informal interviews with local authorities, most small and medium dive operators experience difficulties due to unsustainable tourism practices and external challenges.

Dive operators are one of the stakeholders who are responsible for sustainable tourism. Upon reviewing studies in the hospitality and tourism field, it was found that published research work on the business aspect of diving is, as of yet, limited. This is because most research on scuba diving has mainly focused on divers (Emang et al., 2019; Lucrezi et al., 2019). Though diving has been extensively researched from the tourism perspective, virtually nothing is known about the diving business in Nusa Penida since it has been limited by a paucity of primary and secondary data. As previously stated, the literature on scuba diving businesses is still scarce, while extant literature on diving tourism has mostly concentrated on quantitative approaches (Haddock-Fraser & Hampton, 2012). Therefore, to develop a better understanding of the problems faced by scuba diving businesses, a qualitative approach was deemed more suitable than a quantitative approach. Furthermore, limited research attention has been given to the perspectives of dive operators concerning sustainable development (Lucrezi & Saayman, 2017). Therefore, this study is timely in its attempt to fill this gap.

## 2. Literature review

### 2.1. Scuba diving tourism in Nusa Penida

The district of Nusa Penida, located on the southeast coast of Bali, is among the best-known tourist destinations in Indonesia and had a resident population of 59,196 at the end of 2018 (Pemerintah Kabupaten Klungkung, 2018). The region is part of the Klungkung regency and comprises three islands (e.g. Nusa Penida Island, Nusa Lembongan Island and Nusa Ceningan Island) covering a total land area of 20,284 ha (see Fig. 1). Located within the coral triangle (Coral Triangle Centre, 2020; Ruchimat et al., 2013), a 200 km<sup>2</sup> Marine Protected Area (MPA) was gazetted in Nusa Penida in 2010 to protect marine biodiversity (Eriksson et al., 2019). There are five entrances to the island of Nusa Penida and one ferry harbour. Some dive sites, such as Manta Point, are named after famous marine megafauna. These sites attract substantial dive and boat traffic, which in turn raises concerns about coral reef health and dive safety due to overcrowding.

The primary source of income for Nusa Penida's locals was originally in the agriculture and fisheries sector. Due to geographical and topographical conditions, the district of Nusa Penida is one of the poorest districts in the Klungkung regency (Wayan Yogi Swara et al., 2018). Thus, some fishermen in Nusa Penida work in tourism for additional income by guiding tourists' snorkelling activities (Eriksson et al., 2019). Therefore, tourism is an alternative source of livelihood for local people to improve their living standards. Now, over half of the population works in the service sector, which includes tourism. Realizing the importance of tourism development in Nusa Penida, local authorities were given the power to develop the island. In fact, based on Butler's Tourism Area Life Cycle, Nusa Penida is currently in the development stage. The island has high quality marine resources and offers a variety

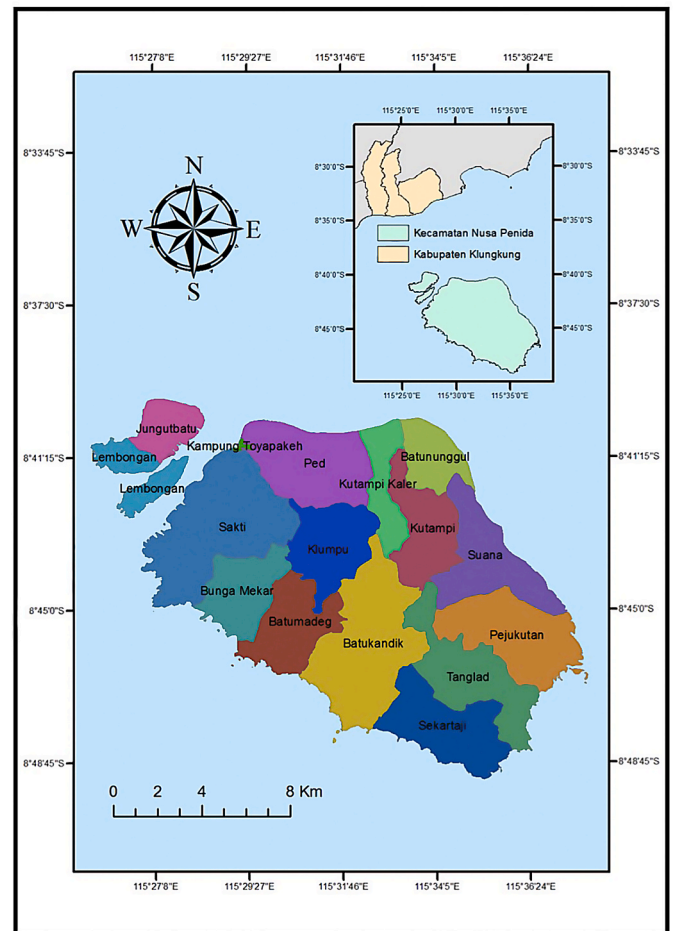


Fig. 1. Map of nusa penida. Adapted from Badan Pusat Statistik Kabupaten Klungkung (2019).

of marine tourism products and services. The main reason tourists visit Nusa Penida is for its diving activity and ocean sunfishes, i.e. molidae and manta (Thys et al., 2016). As the island is a stopover for divers or visitors coming from Bali, most visitors choose not to stay on the island, resulting in economic losses to the local economy.

The influx of tourists to Nusa Penida has resulted in a myriad of problems economically, socially and environmentally. Thus, like other islands in the world, tourism sustainability is currently the main problem in Nusa Penida. Several tourism studies have been undertaken in Nusa Penida on various issues including tourism development (Nyoman et al., 2019), marine ecotourism (Thys et al., 2016) and marine conservation area governance (Eriksson et al., 2019; Yunitawati & Clifton, 2019). These studies have revealed that the island's tourism development is a point of criticism as it is not in line with current economic development. For example, most development is focused on the West region of the island which has more tourism activities while other regions remain neglected. Likewise, the public facilities in Nusa Penida are generally inadequate or under maintenance. Transportation between Nusa Penida islands largely relies on traditional motorboats, while mobile signals are weak because of the lack of a telecommunications tower on the island (Ekbis, 2019). Fibre optic coverage is limited in most areas as well. This has affected tourism businesses' operations for some time. Apart from that, the road conditions in some areas are poor (e.g. narrow, cracked, potholes), which affects resorts located near the cliff point as there are only muddy roads instead of tar road access. The roads to access less popular tourist destinations such as Seganing waterfall, Manta Point cliff and Banah cliff point are also of poor quality. This is similar to the case of Tioman Island in Malaysia (Chia et al., 2018) where

road accessibility is one of the problems on the island.

## 2.2. Scuba diving business in Nusa Penida

The history of the diving business in Nusa Penida dates back to 2009 when the first diving business launched on the island. Dive spots in Nusa Penida were actually discovered when Bali dive pioneers started an expedition back in 1978. More divers in Bali then started diving businesses around Sanur, the closest harbour to Nusa Penida. However, not a single dive operator attempted to open a business on the Nusa Penida island itself until “MM Dive” became the first one in 2009. The island now has 22 registered scuba diving businesses with more planning to open. Of the 22, eight are owned by locals, 12 are owned by foreign investors and two have mixed ownership. The diving business in Nusa Penida is mainly operated by non-local businesses from the mainland of Bali (Yunitawati & Clifton, 2019). Most dive shops are found in the West region of the island where most of its businesses and tourism activities are located. Diving businesses generally operate at a small scale, offering limited services such as sightseeing and snorkelling activities. Nevertheless, the growth of scuba diving has altered the nature of interactions between people and tourism businesses, which has encouraged these businesses to re-think and change their business model (Leung & Bai, 2013). All diving businesses in Nusa Penida partner with either PADI or SSI, which are international diving agencies. These organizations act to monitor and regulate operating standards for the diving businesses (PADI, 2019). Besides, Nusa Penida has associations such as PUWSI (Indonesia Recreational Diving Business Association), whose members include diving business owners, and P3B (Bali Professional Divers Association), whose members are professional local divers. Besides scuba diving operators, water sports companies also offer scuba diving packages; however, they are not affiliated with professional diving agencies. Overall, the scuba diving business culture in Nusa Penida is unique compared to other regions because it is primarily based on trust. Many scuba diving businesses face significant challenges to maintain service quality and satisfy divers' experience.

## 2.3. Scuba diving tourism and tourism sustainability

Greater competitiveness within the scuba diving industry, poor legislation, governance issues, poor road networks and divers' lack of understanding of the marine environment (Dimmock et al., 2013; Dimopoulos et al., 2019; Haddock-Fraser & Hampton, 2012; Jentoft et al., 2012; Naidoo et al., 2018) are causing sustainability challenges for the scuba diving industry. The scuba diving literature has also emphasized the irresponsible behaviour of scuba divers and snorkelers (Hunt et al., 2013; Musa et al., 2011; Wongthong & Harvey, 2014). As a result, many small dive operators experience challenges in developing a sustainable business plan. This is exacerbated by the fact that managerial and senior positions in larger dive shops are mostly filled by outsiders instead of local villagers. Therefore, the rapid growth of diving tourism without proper planning has caused negative impacts for the industry. Today, one of the main considerations for divers in selecting a diving destination is the sustainability practices of the destination (Iniesta-Bonillo et al., 2016; Naidoo et al., 2018), since tourism sustainability can shape a diver's experience. Musa and Dimmock (2013) contended that the sustainability of scuba diving comprises three crucial elements: (1) conservation of the environment, (2) roles of scuba diving operators and (3) the satisfaction of divers. Therefore, there is a need to balance these three components to ensure sustainability. From the divers' perspective, sustainability can be achieved through responsible diving behaviour (Anderson & Loomis, 2011) which includes various behavioral obligations and sanctions that refrain divers from destroying the marine ecosystem. For diving operators, business costs have been shown to affect the sustainability of dive operations (Dimopoulos et al., 2019). Finally, from the conservation aspect, environmental impacts have been cited to influence tourism sustainability (Haddock-Fraser & Hampton,

2012).

## 3. Methodology

In this study, an exploratory approach permitted the researchers to gain new insights into a relatively undiscovered research area (Dimopoulos et al., 2019), i.e. diving businesses in Nusa Penida. This study was carried out in two phases (1) informal interviews with industry players (e.g. Indonesian Recreational Diving Business Association); and local authorities (vice sub-district head); and (2) in-depth semi-structured interviews with 10 interviewees. A two-section interview guide was prepared for this purpose. The first section covered background information about the interviewee's profile and business operations. In the second section, the interviewees were asked about the challenges faced by scuba diving businesses.

The first phase of the investigation took place between 18 and August 28, 2019 with the aims of fully understanding the diving industry and building rapport with key diving business players. An informal meeting was arranged with industry players and government officials via the researcher's personal network. During the meeting, the researcher introduced the attendees to the purpose of the study and attempted to understand the daily operations of dive operators in Nusa Penida. To identify potential interviewees for the next phase of the study, a snowball sampling technique was used whereby the industry players were asked to recommend potential respondents. The researcher then conducted field observations in Nusa Penida to ascertain the eligibility of potential interviewees. Confirming the eligibility of interviewees was a challenge as it was difficult to reach potential respondents during the peak tourist season. In order to qualify as a respondent, the interviewee had to be from a scuba diving business's top management, i.e. manager, owner or chief executive officer. This was paramount because these individuals are generally more experienced in the marketing, operations and overall businesses in the diving industry.

Following the first phase, the second phase commenced from 30 October to November 15, 2019 after the key informants helped provide a better picture of the diving industry. Before the actual interviews, the researcher requested potential interviewees to participate in the interview via telephone and email based on recommendations from the industry players. However, only a few responded and were willing to participate. Therefore, the researcher decided to visit the remaining dive operators in person to set an interview date and time. Finally, ten interviews were secured. Potential interviewees were informed of the aims of the study and the use of the information to increase data credibility, as suggested by Björk and Kauppinen-Räsänen (2019). Interviewees were also requested to select a suitable venue and time for the interviews. The majority of the interviews took place in the afternoon or evening due to busy working hours between 7.00 a.m. and 2.00 p.m. All the interviews were conducted at the interviewees' dive shops where the interviewees felt most comfortable with the interview process. Interviewees were guaranteed full confidentiality and anonymity and were given the choice to end the interview at any point. They were also encouraged to narrate their views without intervention. The interview procedure was terminated when no new info was attained or when the interviewee decided to end the interview. However, no interviewee chose to end the interview early. The findings emerged exclusively from Phase Two interviews.

### 3.1. Data analysis

Among the ten interviewees, six were local villagers and four were expatriates from Europe. Six interviews were conducted in the English language while the remaining four were conducted in Bahasa Indonesia, the language that interviewees were familiar with. All interviews were audio-recorded with the permission of the interviewees and were transcribed verbatim as soon as possible after the interviews. These transcriptions were supplemented by field notes taken during interviews.

Translation into English was completed by the researcher and co-researcher who took turns reading the Bahasa Indonesia and English manuscripts to cross-check inter-rater reliability. The ‘DO’ code was assigned as the abbreviation of ‘Dive Operator’ to protect the anonymity of respondents. The transcribed interview scripts were read independently by the researchers several times and were deliberated in combination with researchers’ field notes and observations to determine the validity of the findings.

Classical coding techniques and thematic analysis were used to sort, organize and interpret data from the transcribed manuscripts. These techniques offered a flexible method to connect data to concepts, identify broad themes and advance generalizations (Neuman, 2014). Following Lincoln and Guba’s (1985) suggestion, this study employed validation procedures to enrich the trustworthiness of the data. First, member checks were used to ensure that the description truly represented the underlying concepts (Buchbinder, 2011). Each transcript was then sent to the corresponding interviewee for confirmation and was corrected accordingly. Second, triangulation of the responses was achieved to confirm the findings. Meanwhile, the reliability of the study was enhanced by the use of a standardized interview guide and tape-recorded interviews (Appleton, 1995). There is also an ethical aspect that needs to be mentioned. To safeguard the anonymity of interviewees, no identifying information was revealed in their quotes. Further, interviewees’ names and tour operators’ names appearing in other interviewees’ narratives were substituted with pseudonyms. Saturation was achieved with 10 participants’ narratives; no further interview was conducted thereafter.

#### 4. Findings

In total, data from ten interviews was obtained and analyzed in the second phase of interviews. The findings indicate that most of the respondents were males while most of the diving businesses they represented were under foreign ownership. Thematic codes which examine dive operators’ marketing and operations can be found in Table 1 alongside the themes and examples of respondents’ responses related to the codes. The following sections describe the challenges faced by scuba diving businesses in Nusa Penida as divulged by the interviews.

##### 4.1. Environmental issues

All the interviewees agreed that environmental issues, mainly trash issues, have the greatest immediate impact on the island. One interviewee (DO6) expressed his viewpoint this way:

“Nusa Penida is seriously affected by trash issues. I mean, there is trash everywhere, right? Many islands do not have trash collection points and most of the trash will not even go off the island. The trash problem will not be solved until there is government action.”

Another interviewee (DO2) addressed the increasingly serious trash issue by offering a solution. He suggested:

**Table 1**  
Respondents’ demographic profile.

Code	Gender	Designation	Business ownership
DO1	Male	Director	Local
DO2	Male	Operation Manager	Foreign
DO3	Male	Operation Manager	Local
DO4	Male	Operation Manager	Foreign
DO5	Female	Operation Manager	Foreign
DO6	Female	Director	Foreign
DO7	Male	Director	Local
DO8	Male	Operation Manager	Foreign
DO9	Female	Director	Foreign
DO10	Male	Marketing Manager	Foreign

“If I have to choose, I would rather burn it than throw it into the ocean. It is not ideal but it is what it is. It would be nice to have a solution.”

A majority of the interviewees believe that waste and the marine environment are not well managed, leading to the degradation of healthy coral reefs. One interviewee (DO3) commented:

“The coverage of coral reefs is impacted, in that it has reduced. Scientifically, I cannot say the percentage of reduction but we can visually see the difference during dives. Coral reef species are decreasing and will soon be destroyed.”

A common comment from the interviewees was that the negative environmental impact is due to human activities. They blame irresponsible human activities for causing deterioration of the natural environment. Below are some interview quotes that illustrate this:

“They (divers) dive in shallow waters and make contact with the coral reefs ... the worst is the ‘sea walker’ diver.” – DO3

“Environmental problems start when people apply sunblock or sun cream. It has a huge negative impact on the coral reefs. Besides, non-divers often swim without proper finning, which leads to direct contact like stepping on coral reefs and destroying them.” - DO1

##### 4.2. Lack of trained staff and guides

The second most critical problem in the scuba diving business, according to the interviewees, is the lack of trained staff and guides. Most of the time, the diving business owner is also responsible for other jobs since it is tough to hire local staff. For example, one interviewee (DO10) explained:

“Yes, my staff are barely enough to make up the diving crew. I need back-up people to work in reception, to prepare food in the kitchen and to fill up compressor tanks.”

Some interviewees agreed that trained staff and guides are essential, especially for the duties of dive master and dive instructor. One respondent shared her views in this manner:

“I think it is a good opportunity for dive businesses to train locals to become dive guides, snorkel guides or boat crew. They can provide more specialized training too, such as to work with diving equipment. It is good to have people who are experienced or qualified.” - DO9

Respondents also linked the lack of trained staff to safety concerns as untrained staff may not follow standard operating procedures. The interviewees elaborated:

“Many guides are not familiar with the currents. Two people went missing recently! So many accidents happen while business owners just focus on money.” - DO4

“Two guides went as deep as 50 m and only one came up. It’s just absurd. I feel bad for the victim who did not follow procedures.” - DO2

“You can ask how many dive operators have guides of good standard. You can even ask dive companies if they educate their guides. Do you know that many local people do not even have a divemaster license?” - DO5

Locals’ lack of skills is not a new phenomenon in the scuba diving industry (Mograbi & Rogerson, 2007). In fact, diving tourism in Malaysia suffers from a severe shortage of trained local diving personnel (Daldeniz & Hampton 2012). Due to the high cost of training for dive masters and dive instructors, many dive operators cannot afford to



provide such training for their local staff.

#### 4.3. Water sport activities

One of the controversial interview findings in this study is dive operators' dislike of water sport activities. These activities, such as a pontoon, damage and affect the health of coral reefs (DO1, DO3, DO6, and DO9). Moreover, water sport activity is dangerous in the eyes of the interviewees. One interviewee expressed his concern by stating the following:

"There are jet skis and boats that go very fast. Tourists have no idea that the surface marker buoy is just a few meters from them when their boats are passing by - it is crazy! It may cause you to lose your head. This is why lots of accidents happen and people die as well. Also, I do not see the necessity for a pontoon in Nusa Penida. The buoys and moorings are everywhere and destroy the corals." -DO2

This was further supported by two interviewees who explained:

"I hate water sports. I'm sure many diving professionals also hate them. They are dangerous and they are not good for the environment! Look at the damage they have caused in Buyuk. There are anchor chains and concrete everywhere. It is breaking the reefs and it is disgusting. The corals used to be amazing but now it is a pile of nothing." - DO6

"It's a huge problem. They generate a lot of money so permits are given to them, but I don't know how much reassessment is done on their environmental impact. You can see the damage they have done. The anchors have damaged the corals and people walk on the seabed. That's against the rules of the MPA and should not be allowed. They don't care for the environment. Furthermore, the sewage discharged from the pontoon goes straight into the sea and kills corals. This needs to be stopped!" - DO9

#### 4.4. Lack of enforcement

Another problem uncovered in this study's analysis is the lack of enforcement. Two interviewees claimed:

"As far as I know there's almost no enforcement whatsoever, so it's a bit of a joke." - DO2

"Even though there are regulations in MPA, there is no enforcement or patrol." - DO9

Another interviewee (DO8) added that the government puts more emphasis on tourism development in Bali and will only pay attention to Nusa Penida if something happens. He reiterated:

"At the moment, the government mostly focuses on Bali. I think the government has not regulated that much. Right now, they have temporarily closed their eyes. They will start paying attention if something happens."

The findings also revealed that fishing is an issue in Nusa Penida; however, there is a lack of enforcement in this matter. Below are some interview excerpts that illustrate this issue:

"In Nusa Penida, fish bombing was prohibited long ago. It is illegal, yet some fishermen from nearby islands bomb Nusa Penida waters. Some come quietly with compressors, long hoses and potassium chemicals to fish. However, no action is taken." -DO3

"There are still fishing issues which are difficult to solve. Though there are regulations, no one is enforcing them." -DO6

#### 4.5. Lack of support from the government

The role of the government, particularly the local government, is significant as a facilitator, coordinator and regulator of tourism planning and development (Churugsa et al., 2007). Most interviewees realized that there is a lack of support from the government. Comments regarding this issue included:

"The government doesn't care about the diving industry." - DO10

"There is not much communication that I see from the government." - DO6

"The government has played a minimal role in developing the diving industry. I refer to the government in broad terms. Supposedly, the ones who take care of development should understand tourism, environmental and spatial aspects because they are linked to each other. When tourism is developed but the spatial aspect is not considered, it is a mess. There has been no control, or if there is, it has been minimal - probably just once a year - in monitoring diving businesses." - DO3

However, some interviewees recognize the efforts of the government in promoting the destination, as one interviewee said:

"There are many government promotions in this area." - DO9

#### 4.6. Unhealthy competition

The findings indicate potential conflict that has led to unhealthy competition among diving business operators in Nusa Penida. This was revealed by the following quotes:

"I have heard and seen operators compete in a way that is not fair to everyone. Hopefully, there's not going to be something like 'price-fighting' one day." - DO2

"With the establishment of so many dive centres, we have to survive. We have to enter and compete in the diving industry." - DO3

"I would say the competition is not very healthy." - DO4

"There is growing competition." - DO5

"We did not have too much competition before. I mean, if you go somewhere and you want to dive, you see us. Now, customers have started to compare and have other options to choose from." - DO8

#### 4.7. Irresponsible operators

The interview findings suggest a negative depiction of diving operators as irresponsible due to certain practices. This was mentioned by one of the interviewees:

"Some companies know the necessary distance when diving while some companies don't know or don't care and go too close. We have been discussing with other dive shops as well that it would be good to have buoys to indicate areas that are safe for boats. Otherwise, for those who are not divers, if they pop up and there's a boat there ... I mean, accidents happen." - DO2

The findings also imply that some irresponsible dive operators hire unprofessional staff who lack important skills. These staff are often not given proper safety training, which causes accidents. The respondent dive operators shared their own experiences:

"They cause many problems with the 'sea-walker' activity. It is insane! The whole thing is totally wrong - they are just doing it for the money. Some operators hire new guides that have not learned proper diving skills. They do not care about the coral reefs because

they work for money as guides in the water sports business. The bad thing is when water sport business owners try to sell cheap packages and hire people that are not professionals.” – DO4

“I have witnessed many dive centres hire unprofessional staff who lack education. Most of the staff don’t know how to dive safely. These businesses want to satisfy the people who come to the island, which is why they lower their safety standards and do not make these activities safe anymore. Accidents happened, unfortunately.” – DO5

A similar sentiment was expressed by another interviewee:

“There are always 10 to 20 per cent of dive shops that do not teach or train their divers properly. They just let them do whatever they want in the water; that’s the problem.” – DO6

Additional findings are included in the discussion section.

## 5. Discussion

Scuba diving is a popular recreational activity in Nusa Penida, but human activities and business practices have impacted its sustainability. Therefore, actions must be taken for the destination to be developed in sustainable ways. As [Lucrezi et al. \(2017\)](#) pointed out, it is difficult to declare sustainability goals unless the interaction of the three pillars (i.e. economic, social and environmental) is understood. [Hillmer-Pegram \(2014\)](#) highlighted that there are several concerns in diving tourism and applied a resilience framework to understand social–ecological dive tourism systems. This study was undertaken to obtain a deeper understanding of the challenges faced by scuba diving businesses in Nusa Penida. Based on in-depth interviews with dive operators, seven key challenges were found in the scuba diving business. Environmental challenges are expected to have the most significant impact on scuba diving businesses ([Dimopoulos et al., 2019](#)) due to poor trash disposal mechanisms and continuous coral reef degradation. The trash issue is a severe problem on the island as there is a lack of sewage and garbage treatment ([Kossmann, 2015](#)). This is in line with previous studies ([Chia et al., 2018](#); [Chong, 2020](#); [Jitpakdee & Thapa, 2012](#)) that found a lack of marine waste management on islands. The trash in the ocean can entangle, entrap or be eaten by marine species. This degradation of marine environments would result in financial losses for businesses since divers would not be interested in diving in such environments. Other studies have reinforced that if a scuba diving business is managed correctly, it will benefit the environment ([Gier et al., 2017](#); [Lucrezi et al., 2017](#)). Thus, diving business operators play an important role in educating their staff and guests to act responsibly ([Anderson & Loomis, 2011](#); [Dimopoulos, 2019](#)). For example, some dive operators organize beach clean-up programs or join local organizations (e.g. Trash Hero) to collect trash.

Staff members comprise vital human capital for small and medium enterprises and consequently require human capital development. It is suggested that staff skill building contributes to sustainable and responsible development ([Koutra & Edwards, 2012](#)). Indeed, well-trained staff (i.e. dive instructors) are crucial in the scuba diving business ([Andy et al., 2014](#); [Giglio et al., 2018](#)). However, in this study, there appeared to be limited training opportunities for staff to improve their dive operation knowledge and skills (i.e. product, service and formal diving knowledge). [Giglo et al. \(2018\)](#) highlighted that a lack of staff training is one of the main barriers to pre-dive briefings. Our findings also reveal that some dive operators do not have proper planning and knowledge improvement programs for their staff and dive marshals due to high costs. Besides, small dive operators generally do not have access to enough dive professionals to train their local staff. The lack of formal education and language barriers are also common challenges for local staff. Failing to provide proper training to dive staff puts inexperienced scuba learners in danger; thus, internationals or expatriates are often recruited to fill vacancies for dive professionals.

Our interviews with scuba diving operators advocate that the unsustainability of diving operations relate explicitly to water sport activities. The number of tourists engaging in surfing, snorkelling, diving, sailing and water sports is increasing ([Kossmann, 2015](#)). The majority of the interviewees felt that the availability of water sport activities poses a significant threat to their dive operations while directly and indirectly impacting the marine ecosystem. These water sport companies have giant pontoons or jetties for cruises and big boats to berth near the shore. A pontoon is a big platform up to 100 m in length, constructed for boats to berth and for tourists to enjoy recreational activities in the middle of the sea. A big pontoon can accommodate a maximum of 1000 visitors and has several facilities (e.g. restaurant, slides and kids’ pool) on board. Typically located 200–300 m from the shore, a pontoon is attached to the sea bed with mooring lines mounted to concrete for stabilization. During low tides, there is a high tendency for the pontoon to destroy coral reefs in shallow areas. Although the government regulates zoning to an extent, some water sport activities are carried out in the wrong zone ([Darma et al., 2010](#)). Consistent with this, our interview findings show that there is a lack of planning and monitoring of water sport activities by the authorities. Therefore, when water sports are conducted at large scales and in the wrong zone, they jeopardize diving businesses.

Constant engagement and long-term commitment between community groups, NGOs and the government are crucial for marine protected areas’ sustainability ([Mills et al., 2010](#)); however, the government is said to lack strong political will ([Yunitawati & Clifton, 2019](#)). The interviewees in this study felt that the government has overlooked the development of the diving industry. For example, due to unnecessary bureaucracy in the local government, the permissions process takes much longer than initially expected. While waiting for license approval, some diving operators operate their businesses without a valid business license. Additionally, the competition among island tourism businesses influences the economic development of island economies ([Stauvermann & Kumar, 2016](#)). Interviewees admitted that there is unhealthy competition on the island due to unstandardized service prices. The situation becomes worse when small dive operators lower their service quality and price to compete with bigger dive operators. As a result, the benefits (e.g. commission) of dive instructors reduce.

Similar to previous studies ([Cheablam & Shrestha, 2015](#); [D’Anna et al., 2016](#); [Arias et al., 2016](#)), lack of enforcement is another problem found in this study that results in difficulties spotting illegal activity. [Ban et al. \(2011\)](#) highlighted that the cost of enforcement in a marine setting, especially in marine protected areas, is always on the high side and is logistically difficult due to ‘borderless’ waters. However, enforcement can be optimized if the authorities take serious action ([D’Anna et al., 2016](#)). Nevertheless, the interviewees agreed that limited government officials monitor the area, to the extent that some locals still fish in restricted areas. The findings also reveal complaints about the lack of environmental education for visitors, particularly from dive operators either from Bali or Lembongan. These irresponsible operators do not inform their guests to follow the ‘dos’ and ‘don’ts’ while snorkelling or diving, allowing them to engage in unethical activities (i.e. touching corals and fish). Several interviewees pointed out that there are other unsustainable practices in diving operations such as lower safety standards and the hiring of unprofessional staff. Therefore, there is still the challenge of dive operators who do not care about the destination’s sustainability. Overall, all interviewees agreed on the issues facing the Nusa Penida island and call for more cooperation between all the parties involved.

### 5.1. Implications

This study makes valuable contributions to both academia and the industry. The findings reveal useful information from the diving businesses’ perspective that is under-researched in the scuba diving tourism literature. These findings are meaningful and promising for future

research in the scuba diving tourism field. The following sections discuss the implications of the study and potential directions for future research.

### 5.2. Theoretical implications

From a theoretical perspective, research on sustainability in the diving industry is minimal. Thus, this study extends the knowledge on sustainability in the diving tourism context that has been neglected in the literature. This is one of the first attempts to explore business challenges from the perspective of dive operators in Nusa Penida. To this end, this study employed a qualitative approach to examine the challenges faced by diving businesses in sustainability. Our research broadens the literature on sustainable diving tourism by revealing two unique challenges faced by diving businesses, namely water sport activities and irresponsible operators. Its results not only enrich existing theoretical research but also provide further inspiration for managers and owners in the diving tourism industry. The findings of the present research are expected to improve our understanding of diving business operations and its challenges. As such, it not only has pertinent value for scholars in the development tourism sustainability research but also provides a reference point for future sustainability studies.

### 5.3. Limitations and suggestion for future study

Several limitations of this study should be highlighted to improve research findings in the future. First, the study site was in Nusa Penida only; thus, the findings may not be generalizable to other tourism destinations. Second, this study was solely based on scuba diving operators' opinions; as such, bias might be present in the findings owing to the lack of representativeness of the sample. Finally, as the data collection period was during the peak tourist season, the scope of this study was limited to a smaller sample. Hence, generalizability to the whole population of business operators may be restricted. Future research should replicate this study in other scuba diving destinations and maximize sample sizes by collecting data during off-peak or shoulder seasons. Since the data source was limited to a single stakeholder group, future studies should verify the findings among different stakeholder groups such as the government, tourists and local communities. By doing so, a broader and more precise picture of sustainability challenges in diving tourism can be obtained.

### CRedit authorship contribution statement

**Azalia Gerungan:** Data curation, Methodology, Writing - original draft. **Kei Wei Chia:** Conceptualization, Supervision, Investigation, Writing - review & editing.

### Declaration of competing interest

No potential conflict of interest was reported by the authors.

### Acknowledgements

This research would not have been possible without the support of the 10 respondents who agreed to participate and we are deeply grateful to them for providing the data for this material.

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