Mellen, Manon

Scuba Diving & its Environmental Sustainability: Open Water Certifications, New Diver Training & Influencing Factors for Dive Centre Management

Bachelor of Hospitality Management

ATA17S

Autumn 2021

Supervisor: Niko Kuusela

KAMK • University of Applied Sciences

Abstract

Author: Mellen, Manon

Title of the Publication: Scuba Diving and its Environmental Sustainability: Open Water Certifications, New Diver Training and Influencing Factors for Dive Centre Management

Degree Title: Bachelor of Hospitality Management

Keywords: scuba diving, tourism, sustainability, marine ecosystem, Green Fins, Japan

The purpose of this thesis was to help mitigate negative impacts on coral reefs and related ecosystems and for the author to gain professional growth in this field. The objectives were to investigate the sustainable content in beginner scuba courses, how adequate the level of training for new divers is to ensure the protection of the marine ecosystem, and the main factors influencing dive centres to be eco-friendly. The thesis was conducted in partnership with the commissioning party, The Reef-World Foundation, a UK based charity.

In the theoretical part of the thesis, sustainable tourism and its relation to scuba diving, beginner scuba diving courses, the topic of underwater damage from scuba divers, reasons for businesses to make environmentally conscious decisions, Green Fins, and a benchmark to a different industry were all portrayed.

This was followed by an explanation of the methodology; in order to achieve a mix of quantitative and qualitative data, a survey was first performed, followed by interviews. The major trends found as a result of this study were that participants believed sustainable content was lacking from beginner scuba courses and that the level of training for new divers was not enough for them to be strong, autonomous and confident divers. It was also found that an individual's mindset, awareness campaigns, upbringing and priority on making money were among the most common influencing factors for dive centres to be sustainable or not.

Thus, it was concluded that more environmental content, buoyancy practice and extra open water dives could be added to beginner courses. In addition, sustainability knowledge could be standardised across the industry, as it currently depends heavily on instructors' and business owners' personal motives. According monetary value to green practices and integrating sustainability into education systems would both be ways to achieve this and elicit the benefits of sustainability.

Another research topic which emerged from this thesis was the effectiveness of e-learning for scuba diving theory. Targeted research could be conducted to ascertain whether it works or not in the training of new divers, especially in terms of protecting the environment.

Table of Contents

1 Introduction

Scuba diving has become increasingly popular in recent years, with as many as 6 million active scuba divers worldwide (DEMA, 2021), PADI alone issuing on average one million certifications per year, from beginners all through to more experienced divers (PADI, 2019). However, that has not come without its consequences. The result is that dive sites have been damaged by divers and their entourage because of anchor damage, wastewater and boat pollutants (Dearden, Bennett, & Rollins, 2007), as well as direct coral breakage from divers which can cause infection even with the smallest of contacts (Hammerton, 2014).

Therefore, the objective of this thesis was to help mitigate negative impacts on coral reefs and related ecosystems by discovering what could be done better in certain areas of the scuba diving industry. This was achieved by carrying out research in two parts: first, a quantitative and qualitative survey, and secondly, qualitative interviews.

This topic was chosen as the author is a scuba diver herself, and through her diving trips and other outdoor excursions, has seen the pollution (micro-plastics, coral bleaching and litter, amongst others) resulting from human endeavours. Moreover, she is interested in scuba diving as a career, and wanted to take the opportunity to learn more about the field through this research topic.

To provide a thorough understanding of the research topic, the concept of sustainable tourism was introduced along with its role in the scuba diving tourism industry, followed by a general overview of scuba diving agencies and the content of their beginner certification course. Moreover, the direct impact that recreational scuba divers have on coral reefs was explained. After this, the topics of green businesses and what influences dive centre management to make eco-friendly decisions were explored, along with a description of the Green Fins project and a benchmark with an eco-business from a different industry.

2 Sustainable tourism and its role in the scuba diving industry

Tourism has a habit of leaving negative impacts on the surrounding area, because of several reasons: over-tourism, the dilution of local culture and language, and when it comes to scuba diving, destruction of natural habitat. For instance, a 2016 study showed that 50% of Latin American coral reefs were at risk of degradation in the next 5 to 10 years, due to sedimentation from tourism development as well as harmful tourist behaviour (standing on, touching the coral, etc.) (Cossio, 2016) .

This is where sustainable tourism comes in – in reality, to reduce the negative impacts of tourism immediately and effectively, there would have to be zero tourism. However, this is not plausible – therefore sustainable tourism is the middle ground, where the needs of the future meet the needs of the present. In order to do this, it takes into account what host communities, visitors and industries require in terms of economic, social and environmental issues (UNWTO, 2020). These elements can be translated visually by the following image:

Figure 1. The three pillars of sustainable tourism. (LinusWealth, 2018)

Essentially, sustainable tourism can be a tool to help society by reinforcing its strengths and overcoming its weaknesses – as long as it is applied properly as a long-term on-going process and not as a means to an end (McCool & Moisey, 2001, p. 6).

In light of that, sustainable tourism is needed in the scuba diving industry as marine tourism and scuba diving depend on an unspoilt, attractive and interesting environment – it has been shown that diver satisfaction decreases when a dive site is not aesthetically pleasing, which is usually due to damage and/or pollution (Roche, et al., 2016). Similarly, no one wants to go diving where it is dirty, the marine life is gone and everything is covered in algae (Rutten, 2017). Therefore, it is evident that the scuba diving industry depends on a healthy marine environment.

In concrete terms, being sustainable for scuba diving individuals means that they should not take anything with them when the dive is over, such as a nice-looking shell, nor leave anything behind. Divers can also practice and finesse their technique; with great buoyancy skills and situational awareness, they are much less likely to accidentally knock or kick something with their bodies, gear and/or fins. In fact, the more practice, the better – and if divers do this locally, they cut down on their travelling carbon footprint as well. Divers can also make active sustainable choices by selecting companies with green practices, such as correct dive anchoring practices, educational and conservational efforts, recycling habits, etc. In fact, the more customers go for green options and make that obvious, the more the industry will respond. On top of this, scuba divers can pick up trash during every dive, which, little by little, will make a big difference. Last of all, divers should always act as an example, assuming that others will copy them. All of these ensures that divers leave little or no trace behind. (Senger, 2020.)

As for the scuba industry as a whole, there are also ways to be sustainable. Marine Protected Areas, MPAs, which are specially delimited zones where certain practices are either banned or strictly controlled (WWF, 2020), play an important part in managing the direct impact of divers by posing restrictions and regulations on the industry, for example by monitoring boat traffic pollution (Lucrezi, 2016). MPAs also use methods such as no-take zones, meaning that nothing whatsoever can be removed from them, and zoning, which is when a larger space is divided into smaller sections for specific uses (Kelleher, 1999). Specifically, carrying capacity is utilised to estimate the maximum number of divers a site can take without causing any damage (Hammerton, 2014). Not only this, but there have been industry-wide summits to discuss eco-friendly business practices and how to raise awareness within the diving community about carbon emissions and the general promotion of sustainability (Lucrezi, 2016).

3 Main scuba diving agencies and beginner “open water” scuba diving courses

Diving certification courses have been growing in number and popularity (Hunt, Harvey, A., V., & Phongsuwan, 2013, p. 35) and there are a number of certification agencies and organisations that have established guidelines and laws, both nationally and worldwide, for the industry to abide to. The main scuba diving agencies are: the Professional Association of Diving Instructors (PADI), Scuba Schools International (SSI), the British Sub-Aqua Club (BSAC), the National Association of Underwater Instructors (NAUI), the Rebreather Association of International Divers (RAID), Professional Scuba Schools (PSS) and Scuba Diving International and Technical Diving International (SDI/TDI) (Diviac, 2021).

The beginner scuba diving course, also called the “open water” course, is a mix of theory and practice and is similar across certification agencies. In this course, the student will first study the principles of scuba diving, then they will practice scuba skills in a confined body of water, usually a swimming pool. Lastly, they will perform four open water dives, for example in a lake or in the sea, to demonstrate their know-how and pass the course. Overall, the course lasts from two and a half to four days. (Scuba Mobile Diver Centre, 2021; PADI, 2021.)

In order to understand the description of the course, key scuba diving terms need to be explained. First of all, buoyancy is known as the tendency of something to float or sink depending on the forces acting upon it (BBC, 2021). Secondly, the Buoyancy Control Device, BCD, is a device that enables divers to manage their buoyancy by pumping air into it from their air cylinder (image 1,2 and 3) (Go Dive Now, 2019).

Image 1. Buoyancy Control Device (BCD). (AquaViews, 2018)

Thirdly, the air cylinder, also known as the tank, contains pressurised air for the diver to breathe, and the regulator will bring this air from the cylinder to the diver whilst converting it to a safe and breathable pressure (AquaViews, 2021). The tank, regulator and BCD will all fit together and be worn like a backpack; see image 2 and 3 for reference.

Image 2. SCUBA cylinder and regulator. (Dreamstime, 2021)

Image 3. BCD, tank and regulator set up with the BCD. (AquaViews, 2018)

3.1 Theoretical study of scuba diving principles

The theoretical phase is the first step of the open water course. In this part, the student will be introduced to scuba diving equipment, such as how to select and use a mask, fins, snorkel, weight belt and what to wear during a dive depending on the temperature. Later in the course, they continue this topic by learning about Self Contained Underwater Breathing Apparatus (SCUBA); the air cylinder, regulator, how maintain them and how to set them up in accordance with the BCD. They will also learn about hand signals to use underwater between divers and surface support, such as how to indicate a problem or how much air is left, and how to respond to signals. (World Underwater Federation, 2002, pp. 3, 4.)

Moreover, students will delve into the science behind scuba diving by studying the basic physics of it, pressure changes and how this affects air and gas, as well as how it affects air inside of the human body. They will also study buoyancy and its importance as well as how to adjust it and the relationship between pressure and volume, known as Boyle's law. (World Underwater Federation, 2002, p. 3.)

Additionally, they will study basic human physiology and how scuba diving affects it. This will involve the human life support system, the respiratory system and a human's metabolism. They will also study common ailments, such as exhaustion, drowning, hypoxia, hypothermia, and how to prevent them. Moreover, the students will learn what ancillary equipment is available to them and their proper uses and storage, such as dive computers, watches, compasses, lamps, knives, buoys, lines, bags, slates, etc. (World Underwater Federation, 2002, p. 4.)

In addition, there will be a section about the correct maintenance and storage of all diving equipment, such as after-dive care, how store it in and off-season, keeping everything clean and rinsing everything in fresh-water, the prevention of corrosion for anything made of metal and regular testing and servicing (World Underwater Federation, 2002, p. 4).

Importantly, the student diver will learn about what to do in emergencies, such as how to rescue themselves and their fellow divers. They will see how the majority of serious incidents can be avoided through careful dive planning and early recognition of any risks, followed by self-rescue techniques, how to do a shared ascent, a buoyant ascent, a free ascent and how to perform resuscitation on the surface of the water, as well as how to tow and land someone and call for help. Hazards like the danger of breath-holding, mask squeeze, equalisation and the dangers of a rapid ascent will also be included in this section. (World Underwater Federation, 2002, p. 4.)

Furthermore, the course will include safe diving behaviour, like how to organise a dive and plan ahead for problems, risky areas, weather and tides, the buddy system, elements of dive safety, pre-dive briefings, equipment checks, emergency procedures and what to do in case of separation. The students will also learn about the environment and conservation, which will include how to choose a dive site, how to recognise aquatic life – both dangerous and otherwise – and how to act towards it. (World Underwater Federation, 2002, pp. 4, 5.)

3.2 Confined water skills

In the second part of this course, the confined water section, students will practice the skills viewed in the theory section. Before they go in the water for the first time, they will perform the BWRAF pre-dive check with their buddies to make sure their equipment is ready to go and then practice getting in and out of the water whilst wearing their scuba gear. (World Underwater Federation, 2002, p. 5.) The BWRAF check stands for Buoyancy, Weight, Releases, Air and Final check and the students, usually in pairs of two, will go through each of these together and check that they are in order before getting into the water (Knight, 2016).

Subsequently, they will become familiar with the equipment mentioned in section 3.1, and practice for example mask clearing and how to deal with small issues, all in shallow confined water. The instructor will go through each skill and make sure that every student has demonstrated they are able to perform it. They will also start to familiarise themselves with buoyancy control as they become used to wearing the scuba gear and breathing underwater, amongst other things. (World Underwater Federation, 2002, pp. 5, 6.)

3.3 Open water dives

After learning the theory and practising in confined water, students will perform four dives in open waters, which could be the sea, a lake, a spring, etc. Here, they will continue to familiarise themselves with the subjects previously listed and especially learn to control their buoyancy and overall improve their basic skills. (World Underwater Federation, 2002, pp. 5, 6.)

The following table shows a comprehensive list of all the skills which are first learned about in theory, then practised in the pool, and finally executed in open water. To complete and pass the

open water course, the student must prove to the dive instructor that they are able to successfully do all of them.

Name _____

PADI Skill Practice Slate

Rate yourself on each skill as you learn or refresh it:

☺ = I am comfortable with this skill. 😐 = I want more practice with this skill.

SKILLS	☺	😐	SKILLS	☺	😐
Gear setup, donning and adjustment			Cramp release – self & buddy		
BCD inflation/deflation on surface			Descent with visual reference		
Regulator clear – exhalation & purge			Hover – 30 seconds		
Regulator recovery – arm sweep & reach			Horizontal swim – adjust trim		
Clear partially flooded mask			Air depletion & alternate air source use		
Alternate air source use			Alternate air source swim and ascent		
Descent and equalization			Controlled emergency swimming ascent		
Hand signals			Weight and trim check with buddy		
Underwater swimming			Tired diver tow – 25 metres/yards		
SPG use and air monitoring			Remove & replace scuba kit – surface		
Ascent			Descent – stop before contacting bottom		
Oral BCD inflation at surface			Underwater swim over sensitive bottom		
Predive safety check – BWRAF			Hover – oral BCD inflation – one minute		
Deep water entry _____			Free-flow regulator breathing		
Proper weighting and weight check			No mask swim		
Snorkel-to-regulator exchange			Ascent without contacting bottom		
Surface swimming – good surface habits			Remove & replace scuba kit – underwater		
Five point descent			Remove & replace weights – underwater		
Neutral buoyancy – low pressure inflator			Exiting water		
Clear fully flooded mask			Skin diving skills		
Remove, replace and clear mask			Disconnect low pressure inflator hose		
No mask breathing			Loose cylinder band – resecure		
Respond properly to air depletion			Weight removal & replacement – surface		
Air management within 20 bar/300 psi			Emergency weight drop		

PRODUCT NO. 60258 (Rev. 09/13) Version 1.0
100PDI13

Image 4. PADI skill practice plate. (PADI Pros, 2015)

4 Damage to the marine environment from scuba diving

Scuba diving inherently has an impact on the marine ecosystem, whether it be because of the boats used to access dive sites, the divers themselves, or the infrastructure built to support such activities on land (Davenport & Davenport, 2006). The highest kind of direct damage by divers themselves is skeletal breakage, especially to branching species of coral (images 5 and 6), tissue abrasion and coral disease – when divers touch a coral, they can break even the finest of outer layers, making the coral prone to infection (Roche, et al., 2016; Hammerton, 2014).

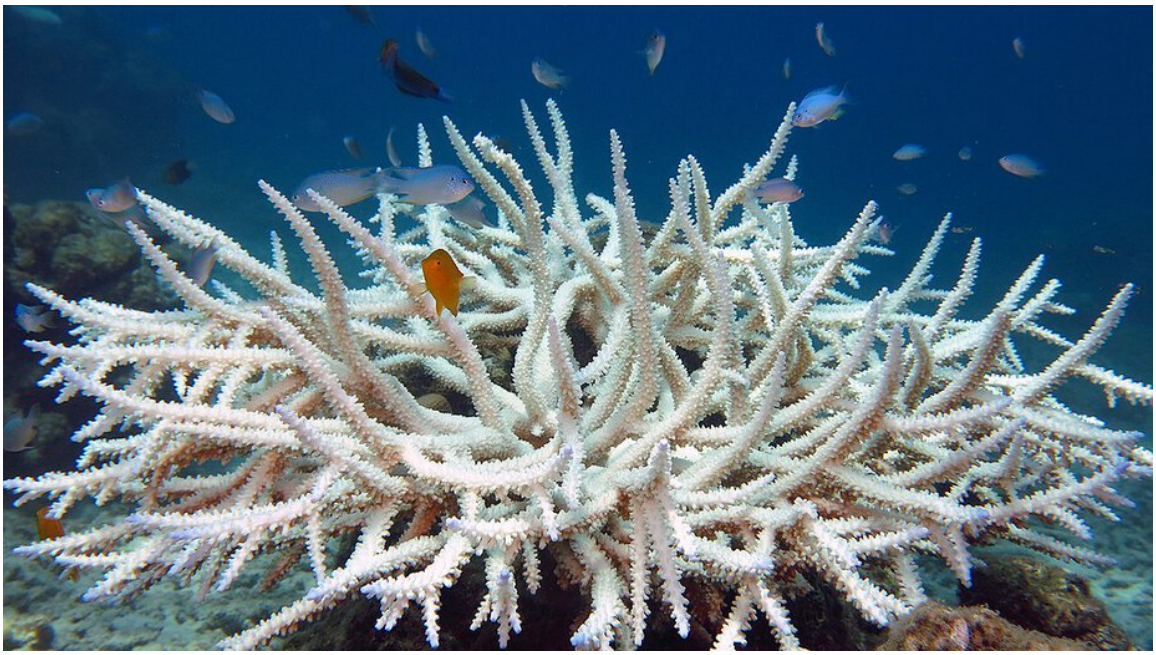


Image 5. Photo of bleached branching type coral. (The bastion staff, 2018)

Image 6. Photo of branching type coral (AquaViews, 2019). Very easily broken by accidental touch from diver.

Moreover, the most common way of divers inflicting damage is kicking from fins and contact from SCUBA equipment, which is increased when using a camera (Barker & Roberts, 2004). In fact, a study made by a UK charity, The Reef-World Foundation, the international coordinators of the Green Fins project, found similar results in the Philippines. A total of 30 dive sites were visited over a period of two years, from 2012 to 2014, and Green Fins representatives followed randomly selected guests and workers during dives from 44 different dive operators. In total, 573 diver contacts were recorded and the mean number of reef contacts per diver during a dive was 5.7, or 0.12 contacts per minute. Of these, 25.3% resulted in observable damage to the reef or marine life; the following graph shows which substrate was affected and if there was damage. (Roche, et al., 2016.)

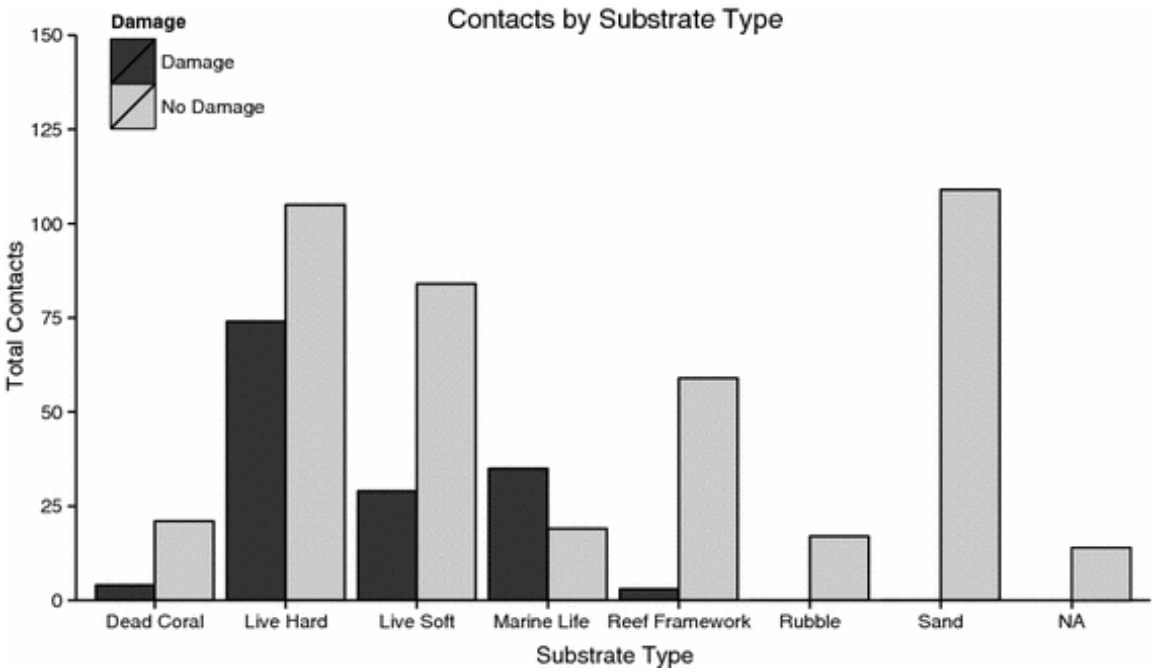


Table 1. Recreational diver reef contacts by substrate type. Dark bars indicate damaging contacts, and lighter bars indicate no observable damage. (Roche, et al., 2016.)

More exactly, of the total 179 contacts occurring with live coral, 41.3% ended in visible damage. 25.7% of contacts with soft coral ended in damage, and for all other marine life, 64.8% resulted in observable damage.

These contacts were made primarily with fins, hands and dive equipment. However, the contacts made with a camera turned out to be the ones which resulted in the highest proportion of damage, which agrees with the findings by Barker and Roberts in their 2004 study about scuba diver behaviour and the management of diving impacts on coral reefs.

In fact, both of the studies discovered that intervention during a dive demonstrated effectiveness in lowering contact with the reef, suggesting divers should be closely monitored during a dive (Barker & Roberts, 2004). Small groups also proved to be beneficial as the dive instructor was better able to intervene and correct behaviour (Roche, et al., 2016).

5 Benefits of being a green company

Marine tourism depends on an unspoilt, attractive and interesting environment because diver satisfaction decreases when a dive site is not aesthetically pleasing (Roche, et al., 2016). Naturally, this would incite a marine-based business to be eco-friendly and conscious of the environment it depends on. However, this is not always the case.

On the one hand, it is true that in order to be sustainable, it is necessary to evaluate, measure and follow the impact of your company on its surroundings. In order to do this effectively, a proper system has to be set up – and starting from zero, or indeed wanting to install change when the company is already up and running, takes a lot of work; planning, strategising, implementing. Ultimately, this will take time, resources and money. (Rapid Finance, 2021.)

On the other hand, there is proof that these efforts will be worth it, and save money in the long run – in his book "An Introduction to Green Process Management", Samuel Windsor turns the argument around to make his point. He demonstrates that waste from a product or service is usually a result of inefficiency; therefore, by disposing of the waste and being green, there would be a direct and measurable bearing on the company by saving money. For instance, this waste could be the inefficient use of resources needed to run the business or excess emissions from inefficient transportation. Thus, streamlining the company's logistical operations would eradicate these issues and certainly be beneficial. (Windsor, 2010, p. 39.)

As Windsor suggests, by looking at the opposite of being green, he proves that being green is more sensible and cost effective in the long run. It is also undeniably a selling point – it leads to an enhanced brand image and positive marketing, which will attract customers, especially thanks to the rising green trend. Additionally, being eco-friendly is good for a business in that it can increase staff retention. A company doing so and using eco-friendly products which are generally better health-wise, shows that they care about the planet, about society as a whole, and in due course, about their employees – this keeps the latter happy and more productive, and more likely to keep them working at the same place. (Staples, 2020.)

Not only this, but naturally a business aims to, simply put, provide a quality service in order to attract and retain customers and turn a profit. In point of fact, to once again quote Samuel Windsor, he makes the parallel between quality and sustainability, to elicit the fact that they go hand in hand. He explains that they have many points in common; neither of them have a universal

definition nor are they listed in financials unless there is a problem; they are both difficult to measure; not one group in the organisation has complete responsibility; they are both good for marketing but may not be considered a priority if financial or logistical issues arise. Likewise, neither of them is ever completely achievable, i.e., nothing is perfect, and nothing is completely green, and they are both processes that must be continuously managed. They are also based on a philosophy that have different meanings to different people and are different and unique in each industry. Therefore, Windsor has effectively proven that quality and sustainability are intertwined as they have much of the same characteristics – one cannot have one without the other, especially for scuba diving, where the long-term continuation and success of the industry depends so heavily on environmental sustainability. (Windsor, 2010.)

5.1 Green business benchmark: Anne Veck Hair Salon in Oxford, UK

Whether scuba diving companies act sustainably or not, and whether they say it costs or saves them money, inspiration from other industries is readily available. A hairdressing salon in Oxford, UK, has built their success on sustainability by winning green awards and putting themselves at the forefront of the industry as pioneers (Mellen, 2017). They employ modern technology to decrease on their expenses; a machine called BlueGen enables them to generate their own electricity (SolidPower, 2020) and reduce their energy use and carbon emissions by around 50% (Mellen, 2017).

Being green has also helped them to attract customers; the owners of the business noted that people chose them to do their hair because of their sustainable certifications and actions, and the proof was in the numerous client reviews about it, as well as their sales going up each year since their sustainable renovation in 2013 (Mellen & Veck, 2020).

5.2 Green Fins

Additionally, in the context of this thesis, and in the context of green businesses, it is important to know about The Reef-World Foundation's main project, called "Green Fins" – GF for short – which is a partnership with the United Nations Environment Programme and participating governments where GF is implemented. This initiative is a management approach that is adopted at the national level to help protect and conserve coral reefs by issuing a green certification to

companies, which they obtain by adhering to a code of conduct or best practices which will promote sustainability. It is a way for scuba diving and snorkelling companies to positively market themselves by proving that they follow green practices. (About Green Fins, 2020.)

Companies join the initiative for free by agreeing to adhere to a 15-point code of conduct, and their behaviour and practices are then monitored by a yearly on-site and underwater assessment. In addition, they receive environmental training for their staff and a one-to-one feedback session with management on how they can best reduce their threat to the marine environment based on their assessments. They are given scores based on how well they do in relation to each point in the code of conduct developed by The Reef-World Foundation as part of a weighted system called Green Environmental Awareness Rating System (GEARS). In the end, the lower the score, the better they are doing. The following image (image 7) explains each of the 15 points. (About Green Fins, 2020.)

Image 7. Green Fins' 15-point code of conduct. (Green Fins, 2021)

6 Research task

The purpose of this research paper was to help mitigate negative impacts on coral reefs and related ecosystems and for the author to gain professional growth in this field. The objectives were to investigate the sustainable content in beginner scuba courses, how adequate the level of training for new divers is to ensure the protection of the marine ecosystem, and the main factors influencing dive centres to be eco-friendly.

6.1 Commissioning party

The commissioning party for this thesis is 'The Reef-World Foundation', a UK based charity (Registered No: 1157096). They endorse various projects pertaining to marine conservation, focusing on education and the safekeeping and improvement of the underwater ecosystem, notably the afore-mentioned Green Fins initiative (The Reef-World Foundation, 2021).

Accordingly, this thesis will be useful for the charity's objectives by helping to gain a better understanding of how to positively influence behaviour change, which will help mitigate negative impacts on coral reefs and related ecosystems. The input of the commissioning party was to compose, in conjunction with the author, the research questions, interviews and surveys, so that the research would follow a path which suited everyone's interests and needs, as well as to support the thesis by providing contacts for that research.

6.2 Research questions

The research questions guiding the thesis were the following:

1. In terms of preventing damage to the marine environment, should any environmental and sustainable content be added to current beginner "open-water" certification courses?

The author thought it pertinent to include such a question as she wanted to bring to light what beginner diving courses actually include, and whether the level of sustainable content is enough

to educate divers about correct behaviour and if it is enough to arm them with the knowledge to be ambassadors of sustainability and create behavioural change.

2. How adequate is the level of training for new divers in order to ensure the protection of the marine ecosystem?

Moreover, this question was posed because one can naturally assume that newly qualified divers have less skills and less control over themselves, as they evidently have less diving experience and are therefore more prone to accidents and/or accidentally damaging the marine environment.

3. What are the main influencing factors for dive centre management to involve sustainable approaches in their daily operations?

By asking this, the author wished to explore the mindset of dive centre management and why dive centres decide to be sustainable or not: if they are, why? On the other hand, why not? Does it stem from passion for the underwater world? Is it for financial reasons?

7 Methods

The methods of this thesis consisted of a two-part research; first, a survey sent to dive shops globally using Google Forms, then, interviews conducted and recorded over Skype, lasting around 30 minutes. The survey was conducted this way to first see what kind of answers would be received from it, and then, based on those, draft the interview to fill any gaps in knowledge.

The above-mentioned points were the original plan. The commissioning party then asked, during the research process, if the author could conduct an additional survey research extensively in Japan, as they were expanding GF there. As the author wanted this thesis to be as useful as possible, as well as having personal interest in that culture and conversational level Japanese language skills, she accepted to do this.

7.1 Reliability and privacy

Since qualitative content analysis research relies on the researcher's insight and perception, it can be difficult to ascertain the reliability and validity of their work (Elo & Kyngäs, 2008; Graneheim & Lundman, 2003). However, this can be verified by clearly reporting how the results were created and making it clear to the reader how the analysis process went and how conclusions were reached (Schreier, 2012). Therefore, for this thesis, everything from the method process to the results were clearly detailed. The theoretical foundation and sources were also marked accurately, intellectual property and anonymity were respected, participation by third parties were voluntary, the author did not make fake results to please the commissioning party nor any other party, and all survey and interview content was deleted after the thesis was over.

Likewise, the interviews, surveys and outcome of the research had a strong correlation to the present-day scuba diving industry, therefore it is important to note the same study may obtain different results in the future because of possible changes in the diving industry.

Additionally, the commissioning party imposed a Non-Disclosure Agreement upon the author and the thesis as sensitive information about the businesses that The Reef-World Foundation is in partnership with was shared with the author. This meant that the thesis had to be first reviewed by the commissioning party before being published, for them to decide whether the data included could be made available to the public.

7.2 Theoretical study and process of acquiring it

Literature material concerning the relevant topics was acquired from Kajaani University of Applied Sciences' library and eBook platform, from other online sources and from the commissioning party's database. In choosing the literature, so as not to waste time on irrelevant sources, a variety of texts were chosen based on their titles, then their relevance and utility was assessed upon a quick analysis of their contents table. If they seemed promising, the author would go on to read the text. If, after reading the first few pages, the article was deemed irrelevant for the research topic, it was abandoned. The same kind of process was administered for other types of sources such as pictures and websites – they were chosen based on their headings and assessed worthwhile in their introduction.

7.3 Method of planning the research: survey and interviews

For the primary research of the thesis, the author planned to conduct a survey and a number of interviews. The intention of the survey was to obtain quantitative and qualitative data, whilst that of the interviews was to obtain qualitative results.

7.3.1 Planning the survey

The survey was distributed using the Google Forms platform, chosen for its easy-to-use interface and because it was free. It was for all members of staff who practice regular diving, including owners and managers, and was originally planned to be sent to 100-150 dive centres. This was then increased upon the author accepting to do extra research in Japan. As a result, the survey was sent to a total of 141 dive shops globally (excluding Japan) and 595 dive shops in Japan; meaning, 736 dive shops in total.

The author hoped to receive between 140-200 answers. The dive centres that were contacted were found through two methods: firstly, thanks to the data provided by the commissioning party, meaning businesses affiliated with the Green Fins initiative, and secondly, thanks to online searches done by the author through the Google Maps tool. This was done in order to have a wide variety of respondents; ones who already had a green mindset, aka the Green Fins members,

and ones who were not GF members and did not necessarily have green practices at the heart of their business or had not been exposed to additional environmental training.

Mostly open-ended questions were used so as to not influence how the participant would answer (thus avoiding 'leading' questions), resulting in both quantitative and qualitative answers. They asked participants what beginner certification, known also as the "open water" course, they had taken, and if sustainable content had been included. Then, the survey moved onto slightly deeper questions about their thoughts on the quality of the course, if and why they interfered with the marine environment, if they had had any diving accidents, what they thought about new divers, etc. Lastly, the survey inquired about the dive centres they worked at, what values it held most important (environment, safety, training, customer satisfaction, etc.), their view on being an environmentally sustainable business – for example, does it cost money, or save money? – and so on and so forth.

The Japanese survey was translated by a contact of the commissioning party who was working in Japan to start GF there. They saw the English survey being distributed, translated it, and asked The Reef-World Foundation if it could be distributed in Japan. The author checked this version of the survey to ensure consistency, using her own language skills and a dictionary, before sending it out.

7.3.2 Planning the interviews

The interviews were drafted after the survey had been written and a majority of the answers had been accumulated. It was done in this order to get an idea of what the author still wanted to find out that the survey had not given answers to. The interviews were done over skype (chosen for its easy-to-use recording tool) and lasted around 30 minutes.

A total of seven individuals within the diving industry were chosen: two recently qualified scuba divers, three scuba diving instructors and two dive shop owners/managers. They were found through scuba diving Facebook groups and through the commissioning party. They were chosen based on their scuba diving level and/or professions and to provide a wide scope of information relating to the research questions.

A structured interview type was chosen, as the author had specific topics in mind. This means that they were pre-written and the order in which they were asked was also pre-determined. It

was also decided in advance that during the interview itself, it would be acceptable to diverge from the set questions depending on what the interviewee said, as this is an acceptable method of interviewing if something seemed pertinent and/or interesting. (IndianScribes, 2018.) The interviews themselves were based upon the research questions and upon a combination of Patton's theory about six types of interview questions.

As it happens, Michael Patton believed that there are six types of questions that can be asked during an interview: firstly, behavioural or experiential questions, which are based on what a person has done. Secondly, opinion or belief-based questions, with the aim to find out what that person thinks about the topic at hand. Thirdly, questions founded on feelings, with the intent of prompting emotional responses. On the other hand, he then stated that there are also questions based on knowledge, designed to learn what the interviewee understands. Next, there are also sensory questions, based on the senses (what the person has seen, smelled, touched, tasted and heard). Lastly, background/demographical questions were also a part of the six, relating to age, location, education, profession, etc. (Patton, 2002.)

Therefore, using a mix of Patton's six types, three different sets of interview questions were drafted for this research, for each of the interviewee groups (new diver, instructor, owner/manager), although many of the questions were the same or similar. In order to paint a picture of each interviewee and who they were, background questions were first asked – for instance, by saying "could you tell me about yourself?", "where you are located?", "what do you do in your day-to-day?", etc. Then, experiential, opinion and sensory questions were posed, for example: "how did you interact with the marine life during your first few dives?", "how long have you been teaching scuba diving?" and "do you think the level of training for new divers is enough to make sure the environment is not damaged?". However, feelings and knowledge questions were not included, as they did not fit this type of research.

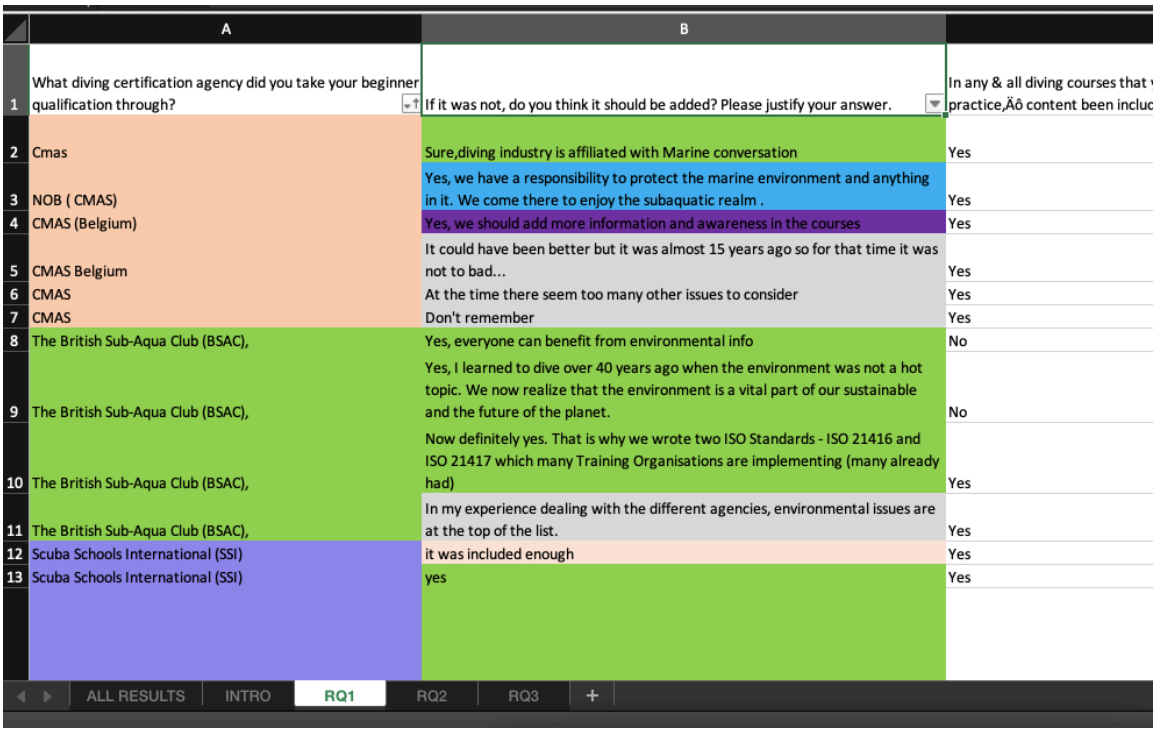
7.4 Method of analysing the results

A qualitative inductive analysis was used, which is termed as the process of analysing details to discover patterns and themes, to then go on to confirm these by using intrinsic principles rather than a strict set of rules (USC Libraries, 2021). This method was used because the author deemed it the best way to analyse this type of data, and also because she believed it was the method she could best use compared to others.

On the whole, the author strived to remain unbiased, both when performing the interviews, and when analysing the answers. However, it is also put forward that a qualitative methodologist will inherently reflect introspectively even when trying to find a balance between objectivity and subjectivity, inevitably resulting in a certain degree of bias (USC Libraries, 2021). Thus, the author accepted that complete impartialness was impossible and embraced this philosophy.

7.4.1 Analysing the survey

The survey was sent out using Google Forms. Subsequently, the results in English were downloaded from that into an Excel file (see image 8 below), divided according to research question and analysed using colour coding. Then, in another separate Excel file, further analysis was done using colour coding once again to find popular answers and themes, which produced both quantitative and qualitative data.



	A	B	
1	What diving certification agency did you take your beginner qualification through?	If it was not, do you think it should be added? Please justify your answer.	In any & all diving courses that practice,Äô content been incluc
2	Cmas	Sure,diving industry is affiliated with Marine conversation	Yes
3	NOB (CMAS)	Yes, we have a responsibility to protect the marine environment and anything in it. We come there to enjoy the subaquatic realm .	Yes
4	CMAS (Belgium)	Yes, we should add more information and awareness in the courses	Yes
5	CMAS Belgium	It could have been better but it was almost 15 years ago so for that time it was not to bad...	Yes
6	CMAS	At the time there seem too many other issues to consider	Yes
7	CMAS	Don't remember	Yes
8	The British Sub-Aqua Club (BSAC),	Yes, everyone can benefit from environmental info	No
9	The British Sub-Aqua Club (BSAC),	Yes, I learned to dive over 40 years ago when the environment was not a hot topic. We now realize that the environment is a vital part of our sustainable and the future of the planet.	No
10	The British Sub-Aqua Club (BSAC),	Now definitely yes. That is why we wrote two ISO Standards - ISO 21416 and ISO 21417 which many Training Organisations are implementing (many already had)	Yes
11	The British Sub-Aqua Club (BSAC),	In my experience dealing with the different agencies, environmental issues are at the top of the list.	Yes
12	Scuba Schools International (SSI)	it was included enough	Yes
13	Scuba Schools International (SSI)	yes	Yes

ALL RESULTS | INTRO | RQ1 | RQ2 | RQ3 | +

Image 8. Screenshot sample of survey analysis. Answers divided according to research question and initial colour coding analysis performed.

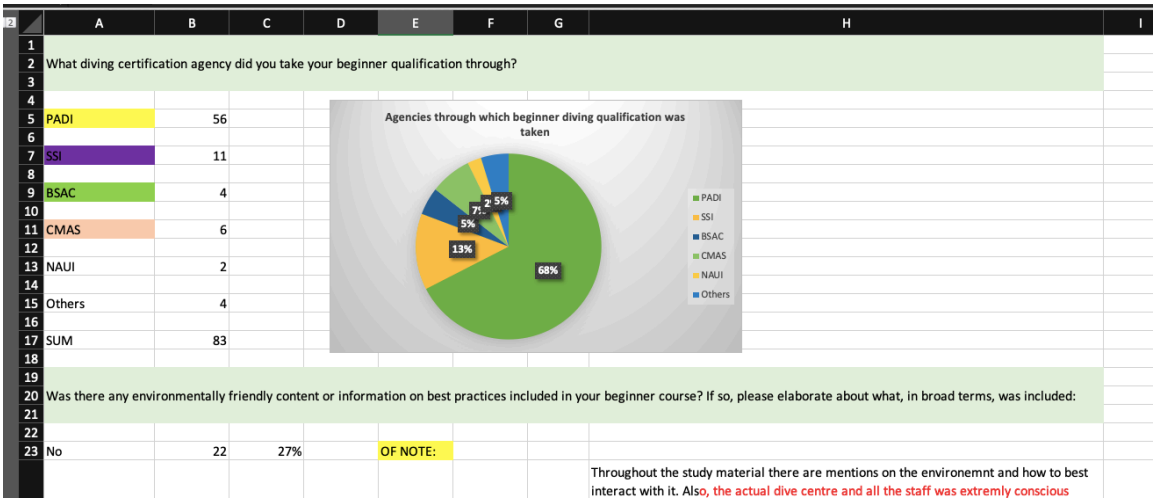


Image 9. Screenshot sample of survey analysis. Further analysis done using colour coding (note that colour of pie chart and colour of other elements are not matching).

A similar process was applied for the Japanese survey, except the results were not first downloaded from Google Forms into an Excel file, because Excel did not support Japanese language (everything came up as unreadable symbols). Hence, the results were analysed, organised and categorised straight from Google Forms, with the help of Google Translate, into a single Excel document (similar to image 8 and 9).

7.4.2 Analysing the interviews

An edited transcribing method was utilised for the interviews, as opposed to a verbatim one (meaning everything is written down literally), because the focus was on the content, meaning, on *what* was said; not *how* it was said (Dieste, 2019). Therefore, the interviews were transcribed, using an online tool called OTranscribe, whilst taking away phrases like “let me see”, “uumm…”, “I think”, etc., that did not add to the quality of the reply, to make it clearer to read and analyse. Likewise, colloquial language, incorrect grammar and repetitions were also omitted, especially when the author spoke with non-native English speakers, again to make it easier for the author to go through afterwards. For example, “now, I think that with the years, with the latest years, I can see that people, mostly young people, are […]” was changed to “now, in recent years, mostly young people are […]”. Thereafter, the transcriptions were printed and evaluated using colour coding for common themes and patterns (image 10).

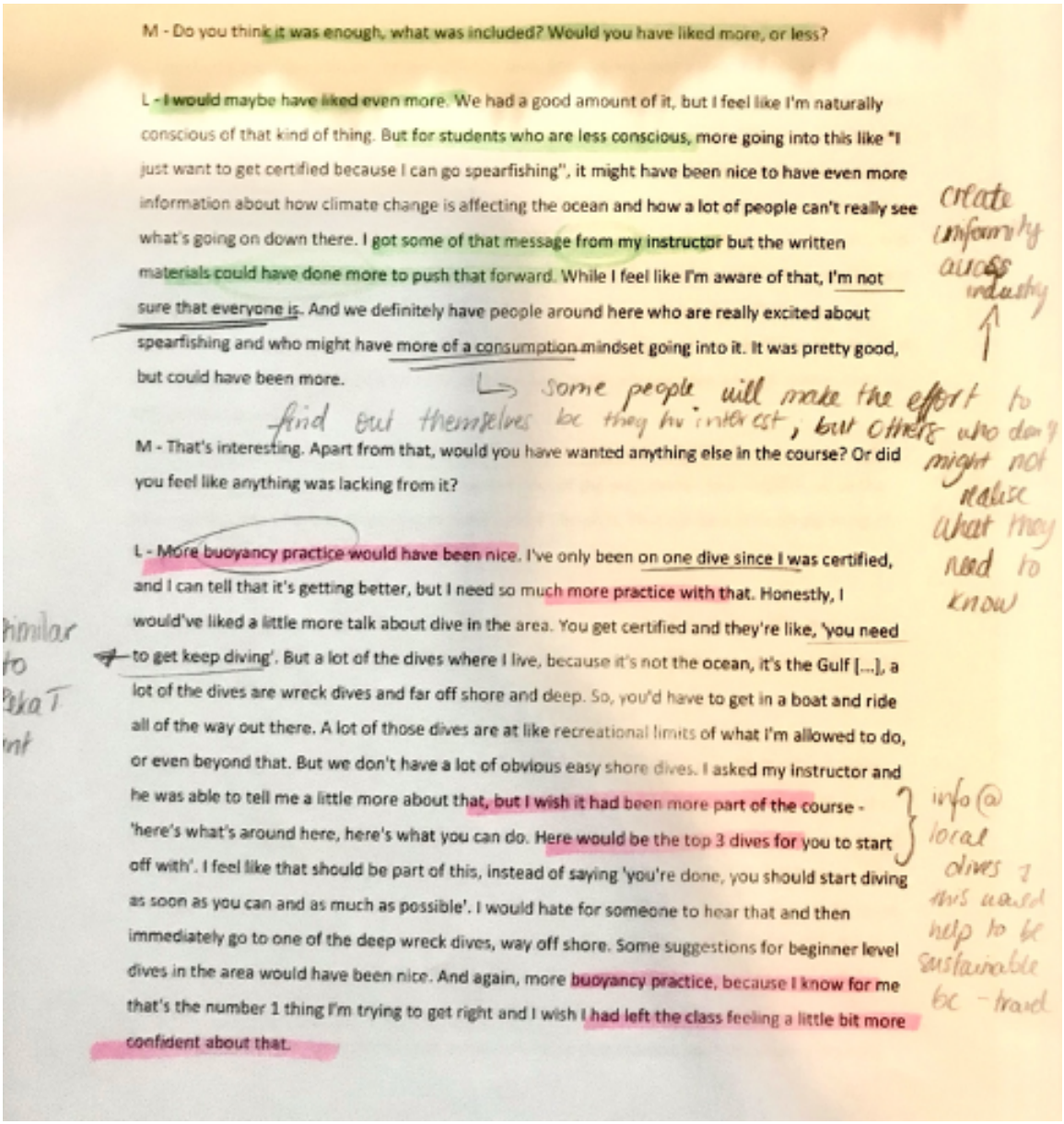


Image 10. Sample photo of interview analysis process. Note colour coding and handwritten remarks.

8 Results

The overall aim of this thesis was to help mitigate negative impacts on coral reefs and related ecosystems. This chapter presents the findings of the survey and interviews.

8.1 Survey results

There was a total of 140 responses to the survey, of which 40.7% (57 responses) were from Japan, and 59.3%% (83 responses) were from the rest of the world, from specifically the following countries:

USA	UK	Malta	Philippines	Egypt	France
12	9	8	5	4	4
Thailand	Malaysia	Greece	Spain	Austria	Curacao
3	3	3	2	2	2
Croatia	Indonesia	Turkey	Germany	Poland	Honduras
2	2	2	1	1	1
Sri Lanka	Netherlands	Cyprus	DO	Bonaire	Australia
1	1	1	1	1	1
Oman	Italy	Ecuador	Emirates	Timor-Leste	Cook Islands
1	1	1	1	1	1
Grenada	NZ	Saudi Arabia	Singapore	Japan	Taiwan
1	1	1	1	1	1

Table 2. Location of survey respondents, excluding Japan (n=83).

Giving that the survey was sent to a total 736 dive shops in total, the result rate was 19.02%. The results across both surveys presented similar findings.

For the survey sent globally (excluding Japan), upon being asked whether the participants' company, or the company they worked for, was a part of Green Fins, 20 answered "yes" (24%, n=83) and 63 answered "no" (76%, n=83), which is represented through the following pie chart:

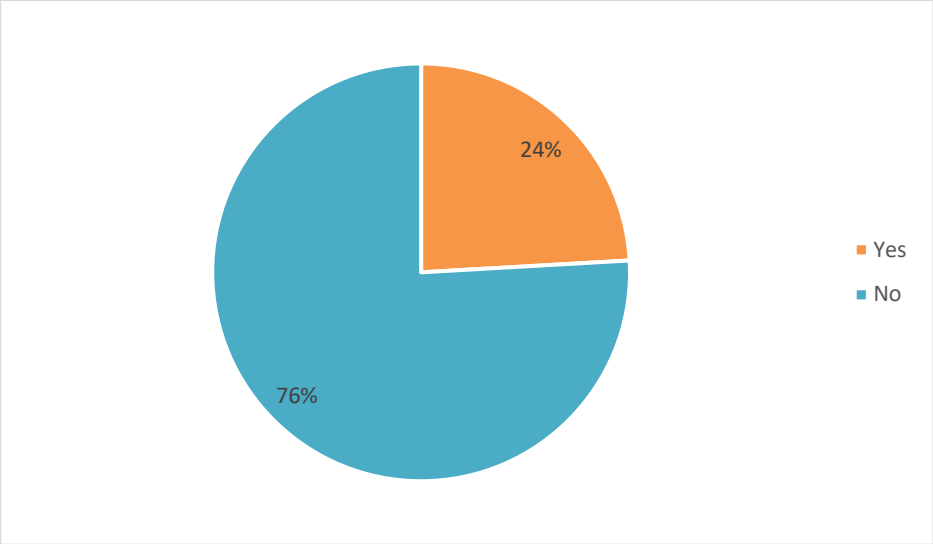


Chart 1. Pie chart depicting Green Fins membership from the global survey (excluding Japan) (n=83).

Of the 57 responses from the Japanese survey, 48 (84%, n=57) of them said they were not a part of Green Fins, and 9 said they were (16%, n=57).

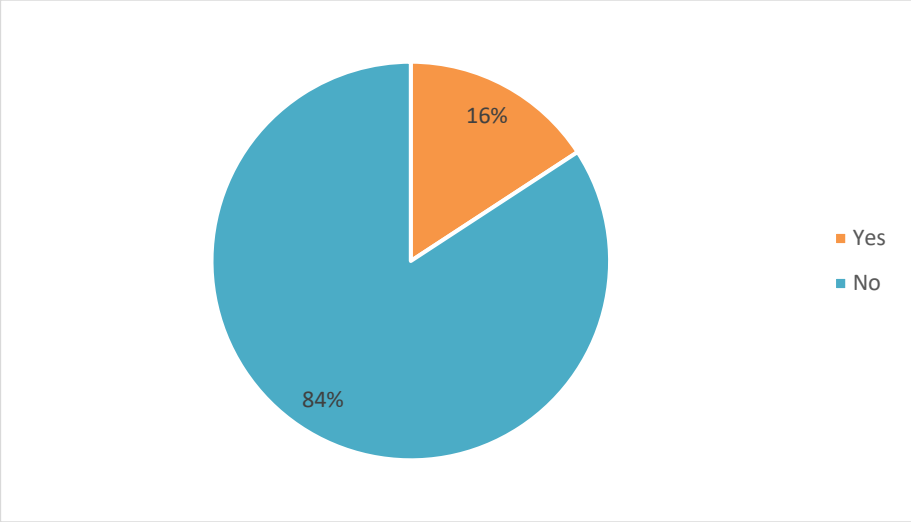


Chart 2. Pie chart depicting Green Fins membership from the Japanese survey (n=57).

From now on, the global survey (excluding Japan) will be referred to as “GS” and the Japanese survey will be referred to “JS” for ease of reference.

8.1.1 Material included in certification courses

In the GS, when asked whether environmentally friendly content was included in their beginner course, the majority (29%, n=83) answered that only basic information had been included, followed by 27% (n=83) of answers saying that no content had been included. On the other hand, 24% (n=83) of them said it had included a good level of content. 20% (n=83) of results were inconclusive. As for the JS, the majority (30%, n=57) answered that there had been a good level of environmentally friendly content in their course; 19% (n=57) answered that the info had been there but was basic, and 25% (n=57) answered it had not been included. 26% (n=57) of them were inconclusive. In both surveys, a number of them said that they had done their beginner courses so long ago that they either could not remember, or environmental issues were not as big of an issue at the time.

If they had answered “no”, a follow-up question asking if they thought environmentally friendly content should be added was posed: in the GS, the most popular answer was “yes” (39%, n=83), followed by the answer that it was already included (18%, n=83). 12% (n=83) of answers said it had been included but could have had more, 4% (n=83) said it should not be included and 28% (n=83) of answers were not pertinent to the question (inconclusive). In the JS, the most popular answer was also “yes” (32%, n=57), 19% (n=57) said it was already included, 6% (n=57) said no and 43% (n=57) were inclusive. Moreover, across both surveys, four participants noted that safety should be the first concern, and six participants mentioned that buoyancy, while technically not directly to do with the environment, should be taught more because it would prevent so many people from touching the bottom.

Next, they were asked if in any of the courses that they had ever taken, except for ones pertaining specifically to sustainability, environmental matters, or ‘best practice’ content, had been included. For the GS, 70% (n=83) said “yes” and 30% (n=83) said “no”, and they said it had been across many levels of diving, from open water and advanced open water through to dive master and instructor and above. For the JS, 26% (n=57) said “yes” and 25% (n=57) said “no”; however, 49% (n=57) of the results were inconclusive. Of note, one of the “no” answers specified that they thought it was because the courses were often focused on profit.

8.1.2 Training for new divers

Moreover, 41% (n=83) of the GS participants reported not feeling confident enough to control their buoyancy properly when they were newly qualified divers; however, 60% (n=57) of the JS participants reported not having confidence, as opposed to 33% (n=57) saying they did (7% were inconclusive (n=57)). In both of the surveys, although most were satisfied with the content in their beginner course, a significant amount said that they would have liked more buoyancy training and more open water dives (dives not in the pool), as well as pointing out that they were happy at the time but have since realised (now that they have more experience) that their skills were not enough.

Similarly, the GS answers were divided when asked if new divers should only be allowed to scuba dive in certain dive sites, such as those where they would not come into close contact with coral and other sensitive marine life; 29% (n=83) were in favour, 30% (n=83) were against, but a prevalent response was that it should be up to the dive guide to decide on a case-by-case basis (by doing, for instance, a check dive), and that the issue should be dealt with by improving the skills of the diver, notably their buoyancy, in the first place. The same went with the JS: 32% (n=57) in favour versus 33% (n=57) against, and 12% (n=57) agreed with the case-by case notion.

What's more, 56.6% (n=83) of the GS and 53% (n=57) of the JS reported touching the marine environment on purpose. They said it was for the following reasons: personal curiosity, scientific research, trash collection (most popular answer) and the instructor had encouraged it/ had done so themselves.

8.1.3 Dive shops as eco-friendly businesses

Both the GS and JS stated that the reasons for opening the dive shop they worked at or owned were sharing their passion for the underwater world and the sport; educating others in a sustainable way; furthering conservational efforts; and just for business reasons, for example making money (33%, n=57, for the JS versus 13% for the GS, n=83).

Then, when asked to cite certain terms in order of importance, the most widespread were profit, safety and environmental sustainability, and for the JS, customer and employee happiness. The following table shows the results numerically.

Environment/sustainability in their answer	42	51%
Safety as first answer	34	41%
Profit in their answer	13	16%
Environment/sustainability as first answer	10	12%
Profit as first answer	7	8%

Table 3. GS terms in order of importance (n=83).

Customer happiness in answer	28	49%	Environment/sustainability in their answer	27	47%
Customer happiness as first answer	14	25%	Safety as first answ	22	39%
Employee happiness in answer	8	14%	Profit in their answ	9	16%
Employee happiness as first answer	6	11%	Environment/sustainability as first answer	8	14%
			Profit as first answ	3	5%

Table 4. JS terms in order of importance (n=57).

In explanation to their choice (in both surveys), participants stated that the environment was central to their services and that good training was a key way of lowering the impact of divers on the environment, and that a dive centre was one of the one best places to do so and educate the public about environmental issues and how their actions affect this. Another explanation was that profit is necessary in the long run, as with all businesses – as without it, you cannot do anything else, be it environmental or safety related. Also, the ones that said safety was most important pointed out that without it, customers would not come back; indeed, they said that first-rate safety measures lead to higher profits. One answer noted that all the terms were of equal importance as business could not survive without one of them.

Relating specifically to the JS, they said it was natural to prioritise guest satisfaction if they were receiving monetary compensation from them. Some others stated that happy employees would lead to happy customers and vice versa. One commented that pursuing profits and customer satisfaction were proportional to each other.

Overall, 80% (n=83) of the GS and 100% (n=57) of the JS affirmed that the environment was a key factor in their business model. They also confirmed taking part in clean-ups, conservation, recycling, using sustainable products in the shop, not using single-use plastics and teaching environment specialty courses. A few specified that they always went in small groups per guide/ instructor, others mentioned solar energy, using local products and donating to charities. The JS mentioned the prohibition of gloves and making sure to not pollute the water through oil, fuel, trash or sunscreen.

Equally, they were asked whether they thought being environmentally sustainable costs money or saves money. The overall reactions were:

It costs	- Does not cost Neutral It saves money	Costs but it is worth it	Inconclusive
26 responses; 31%	14 responses; 17%	27 responses; 33%	16 responses; 19%

Table 5. GS answers & percentages to the question “does being environmentally sustainable cost or save money?” (n= 83).

It costs	- Does not cost Neutral It saves money	Costs but it is worth it	Inconclusive
12 responses; 21%	12 responses; 21%	12 responses; 21%	21 responses; 37%

Table 6. JS answers & percentages to the question “does being environmentally sustainable cost or save money?” (n=57).

As we can see, a small majority of the GS participants thought that, while it does cost money to be sustainable, it is worth it in the end. In fact, those who said that specified that they saw it as a

needed component to their business, the same as advertising and servicing kit, rather than an option. It was also stated that if being green was introduced in the planning stage of the business, then it would come naturally and not cost extra. The answers in the JS were divided; all 21% (n=57), except 37% (n=57) that were inconclusive.

Moreover, in both surveys, dive shops said that when seeing bad diver behaviour (like touching marine life) it was corrected most often by signalling during the dive (for instance by making an X with their fingers), by talking after the dive and by diminishing incorrect behaviour overall by performing a pre-dive briefing.

8.2 Interview results

In total, seven individuals were interviewed for this part of the research. They were from different parts of the world and chosen based on their professions and scuba diving levels (table 7).

Occupation/diving level	Location
Newly qualified diver	Kandy, Sri Lanka
Newly qualified diver	Florida, USA
Instructor	Sydney, Australia
Instructor & biologist	USA
Ex-instructor & ex dive shop owner	Calgary, Canada
Dive shop owner, instructor & biologist	Bobota, Colombia
Tioman dive centre general manager	Malaysia

Table 7. Interviewee information (n=7).

8.2.1 Content in beginner “open-water” courses

In answer to questions about course satisfaction, the two newly qualified divers stated that although they were very happy with their course, they would have liked more buoyancy; in fact, one of them did a fun dive the following week, and strongly appreciated the extra practice in an easy and safe environment.

Similarly, the other five out of the seven interviewees specifically stressed the importance of good buoyancy, because, as one of them said, a “beginner diver is […] more dangerous”; they don’t have full control of their buoyancy, so they are “going up and down and stand a bigger risk of damaging corals and the ocean reefs”. Some went on to specify that they would add more open water dives to the course so that buoyancy, as well as other skills, could be mastered properly, as it takes time to memorise them.

One interviewee also mentioned that he would add the SSI specialty environmental program into the open water qualification, instead of having it as a separate course like it currently is. His justification was that more education on that subject would help people better understand what is going on in nature. Similarly, another interviewee acquiesced that while there is environmental information in the open water course – mainly about not bothering marine life – overall, there could be more in-depth information, and information on topics like pollution, plastic and recycling. On the hand, another person observed that the PADI specialty environmental program (equivalent to the SSI one) had no real value, as it contained only superficial information.

The two interviewees who were also biologists said that thanks to their knowledge, they always added extra marine and sustainability information into the courses they teach. One of them noted that PADI could include more in-depth knowledge about the environment, not in the open water course, but in the instructor course, so that the instructors would be better equipped to pass on the knowledge to new divers.

Additionally, one participant commented that the open water course could teach more about fin use and kicking with fins, as that can do a lot of damage. Both of the newly qualified divers said that there had been environmental content in the course, but the instructor was the one who really emphasised it through sharing personal experiences and repetition and made them realise how important it is. One of them said that they would have liked more content of that kind, for two reasons: first, local information on easy dives to build up her skills and second, the content

might not have been enough to get the attention of those who are not as conscientious about sustainability.

8.2.2 Training for new divers

The answers about whether the level of training for new divers was enough to ensure the protection of the marine ecosystem were varied, with some similarities and some dissimilarities. Two respondents said that the level of training was usually not enough, and that it always depended on both the instructor and diver themselves; factors such as if the former understood and communicated well with each other, if the diver had natural talent – it was reported by one person that people who were comfortable in the water always did better in the open water course – and if the conditions were good all played favourably in diver training. One participant thought that simply adding more sustainable content into the course would be the only change necessary to bring the training of new divers to a good enough level.

Nevertheless, one respondent believed that once qualified, new divers would have the skills to do easy dives under their supervision but would not actually yet be autonomous. Another participant agreed with this idea and added that once the open water was passed only the tools for diving were achieved, but regular practice was key in maintaining and improving skills – once a year on holiday was not enough.

In fact, it was reported by two respondents that because every dive site and diver is different – some new divers are already proficient, whilst some experienced divers less so – it was difficult to say whether new divers should be restricted to dive sites where they would be less prone to damaging the environment, or even if such a practice were logistically possible on an industry-wide scale, although it was reported that some dive shops had this ideology running in the background. In fact, two instructors mentioned that when they knew they had new or inexperienced divers, they would visit a designated place for these occasions, known colloquially as the “sacrificial” dive site. Another thought that you did not have to officially restrict where new divers can and cannot go, but the general rule was that if you are not familiar with a dive site, you went with a guide, and it then became their responsibility to assess the situation. One other thought it would be a good idea to instate a global “rate the dive” type of system, where each site would be rated against necessary experience (for example, dive is possible with 20+ logged dives, etc). Similar to the works of Roberts and Barker (2004) and Roche, et al. (2016), one participant stated that fins

caused a lot of damage to the reef, so it might be beneficial for students to be taught more about how to kick and move when wearing them.

Moreover, one participant stated that if the theory part of the course was done online, it was never learnt properly, and those students would then perform poorly in the pool section of the course. In addition, they reported that too many students were being passed who should not be, as instructors were afraid of negative feedback, especially online, which could damage their business. As opposed to this, another participant stated that the transition to e-learning in recent years had been extremely beneficial as they were freelance, and the content was easily available in different languages.

From the new divers' point of view, they both felt satisfied with their newly acquired knowledge and skills when they passed. One specified that they had no prior knowledge before the course, so it fulfilled and went beyond his expectations, which includes the environmental content. They both said that the best thing about their course was their instructor. One of them reported that their teacher helped them be a better diver by pointing out that it takes time and practice to be a skilled diver, and they would not be able to learn everything from the open water course and as a result, they were able to deal with things more calmly. However, this same student felt there could have been less people in the course – there were eight in total – as sometimes the pace was too fast. They also said that they encountered bad visibility on one of their open water dives, which was good in hindsight: although they would not have chosen bad conditions for their dive, they were grateful for the opportunity to learn how to deal with a tough situation.

8.2.3 Motivating factors to being a green business

Opinions about whether being a green business was a financial benefit were mixed. Five out of the seven were not sure but thought it was a financial benefit in the long run, although they could not prove it with hard facts and figures.

Additionally, one participant said that to achieve sustainability is not easy, as it is necessary to have certain systems in place, like recycling and oil catchment points (so that boat oil is not dumped randomly). This is especially challenging in remote locations where nothing is yet set up, so it naturally requires time, effort and money. Another participant agreed with this and also pointed out that if an accident happened in a remote location, such as boat leakage, the next shipment for repairs might be months away, and the boat would be leaking the entire time.

One interviewee noted that being green could be financially beneficial by exchanging used cans for money and using plastic to make building blocks, which is cheaper and a good allocation of otherwise useless materials, although it takes longer than traditional practices because the plastic has to be gathered. Another noted that it was monetarily advantageous, but required the right customer, as it tended to be more popular with wealthier and higher educated people.

On the other hand, one participant noticed that their customers seemed more concerned about price and safety. Conversely, one noticed that recently, amongst her customers, more of the young people were becoming interested in the environment, such as how to take care of the marine life.

Moreover, one participant said that taking green measures was not a financial benefit, because it took more time and effort. For example, they would spend extra time with clients trying to fix an old mask rather than get them to buy a new one.

As for sustainable precautions put in place by dive centres, three of the interviewees said that gloves were not allowed because divers wearing them were more likely to touch things. Other precautions were instructors carrying mesh bags for trash collection during dives and banning single-use plastics, like bottles and containers. In fact, two respondents related that they were able to set a green example and get other companies to follow them thanks to their influence; by banning the use of single use containers in their shop, and not doing business with anyone who used them, others followed suit.

Furthermore, one interviewee said that their dive shop's main values were first of all, education and conservation; they said that in the long run, educating customers, staff and especially the locals was more useful than other sustainable measures. To them, profit came afterwards. Another said that safety was their first priority, and the environment a close second. Overall, the opinion about why some companies do not make more efforts to be green was that their priority was to make money.

From the new diver's point of view, word of mouth was reported to be a significant factor for choosing which dive centre they patronised. Environmental aspects were also important to them but came after. They both conveyed that they would choose a green dive shop even if it meant paying more, as diving was expensive anyway. Another participant said that when looking at new locations and which dive shop to go for, they looked primarily for interesting and unusual locations, not whether the dive shop was green or not, although if they were, that would contribute to them becoming a loyal customer.

8.2.4 The green mindset

When asked where their green mindset came from, one participant said it came from exposure, thanks to programs like Green Fins that raise awareness. Another said they had gotten lucky with their past diving teachers, as they taught them the importance of sustainability. Another said it had been instilled in them from a young age, and another replied that they had recently moved to an area where conservation was prevalent, and this spiked their interest.

Also, it was reported by one participant that different cultures have different outlooks on what environmentalism is. Reportedly, this, as well as someone's upbringing and education, plays a role which would naturally affect mindset and actions. For instance, an individual with a lower level of education might not have grown up with the same level of respect for the environment that someone with a higher level of education did. In fact, two participants remarked that when they had seen bad practices from locals, such as manipulating fish for a photo, or throwing boat fuel overboard, it was because of lack of training and ignorance of correct practices.

One participant said that the law required them to apply for a special environmental permit to perform diving activities. The challenge there was that, in their area, there were many illegal businesses who did not bother acquiring it.

Subsequently, all of the respondents, except the new divers, answered that in order to convince other dive shops to be green, they would talk to the owners and point out the long-term benefits. Moreover, it was also conveyed that individuals struggling for money would do whatever they could to get money now rather than later, thus not seeing the long-term profits.

9 Discussion

The purpose of this study was to help mitigate negative impacts on coral reefs and related eco-systems by exploring what sustainable content is included in beginner courses, discovering whether the level of training for new divers was sufficient so that they do not damage the marine ecosystem, and investigating the main factors which influence dive centre management to make sustainable decisions. The methods used were a survey and interviews.

Additionally, the first research question was changed from:

1. What material is currently included in standard diving certification courses?

    i. In terms of preventing damage to the marine environment, what environmental and sustainable content should be added to the above-mentioned certification courses – if any?

To:

1. In terms of preventing damage to the marine environment, should any environmental and sustainable content be added to current beginner “open-water” certification courses?

This was because the author felt that having a main question and a sub-question was confusing, and that the topic of what was included in standard certification courses would be covered as part of the literature review anyway. In addition, as the research progressed, the author felt it would be more plausible to examine only the beginner course as opposed to certification courses in general, as this was too broad of a subject.

9.1 Environmental and sustainable content in the open water scuba qualification related to new diver training

In general, the majority of the results suggested that more sustainable content should be added to the beginner course, as the overall impression from the survey and interviews is that only basic information is currently included. This was expected, as the author has passed their open water qualification in the past and thought that herself.

In particular, while not directly an environmental topic, it was suggested that buoyancy should be given more importance as it is essential in avoiding accidental contact and damage to the reefs. This was an expected result as it is widely known in the scuba diving community that buoyancy is very important but takes time to master properly. Unexpectedly, some believed that because the open water course is already very short and students already have much to learn, more sustainability information should not be added as there is not enough time and it would potentially distract them from other important fundamentals of the course, such as the afore-mentioned buoyancy.

An underlying theme implied across all answers is that the level of environmental and sustainable content varies according to the instructor; it is they who decide what to add, they who choose what is important. Therefore, this implies that there is no industry-wide consistency; ultimately, one instructor could choose not to add more environmental content on top of the basics already included, compared to another instructor who could choose to add a lot; so, it would seem that students are receiving different information, thus leading to varying levels of interest and carefulness towards the environment.

Similarly, restricting where new divers can go depending on the delicateness of the dive site seems once again subjective and inconsistent. Firstly, each and every dive site is different and subject to different topographical conditions, meaning it could be extremely difficult to establish a standardised “rate the dive” system, as suggested by one participant. Secondly, making it the responsibility of the dive guide to decide if a diver is good enough or not is very bias; one dive guide might make a certain decision, which could turn out to be the wrong one, whilst another guide might choose differently. Not only this, but the true problem might not be solved, which is the diver’s skills. Thus, the priority should be making sure new divers acquire and become proficient in the necessary basics from the beginning, not dealing with the issue later on.

As a matter of fact, the results suggested that the level of training for new divers is not enough for them to be completely autonomous divers (meaning, independent, strong and reliable divers, but still with others; not solo divers) upon finishing their open water course, because of the lack of time. This answer was anticipated because the author felt this way herself upon completing her own course and did not feel prepared to go on her first fun dive; in fact, since respondents of the survey and interviews reported similar feelings of nervousness, additional open water dives, where new divers are given more independence to build experience in a challenging but controlled situation should be added in order to rectify this issue. Thus, the current four open water dives could be increased to six open water dives. This is especially true as for some, four dives

might be enough, particularly if conditions are perfect, but this is hardly ever the case; therefore, four dives might not be reliable enough in order to get every student to the same level. Then again, many training agencies say that they recognise the lack of environmental content and have addressed this through the design of additional courses, such as Advanced Open Water courses and speciality courses. However, these are more time consuming and an additional cost, which can deter tourists when on holiday; plus, the scope of this thesis was to look only at the entry level courses and determine whether adequate environmental content and skill training to reduce negative impacts to the marine environment (notably coral reefs) were included.

Another course of action suggested by one respondent was adding more environmental content, which could be enough to improve the level of new divers, as the knowledge gained about the impact that divers have, such as the importance of not touching or taking anything, being a role model to other divers and collecting debris could potentially be the push they need to become better divers from the start. The following figure illustrates this hypothetical process.

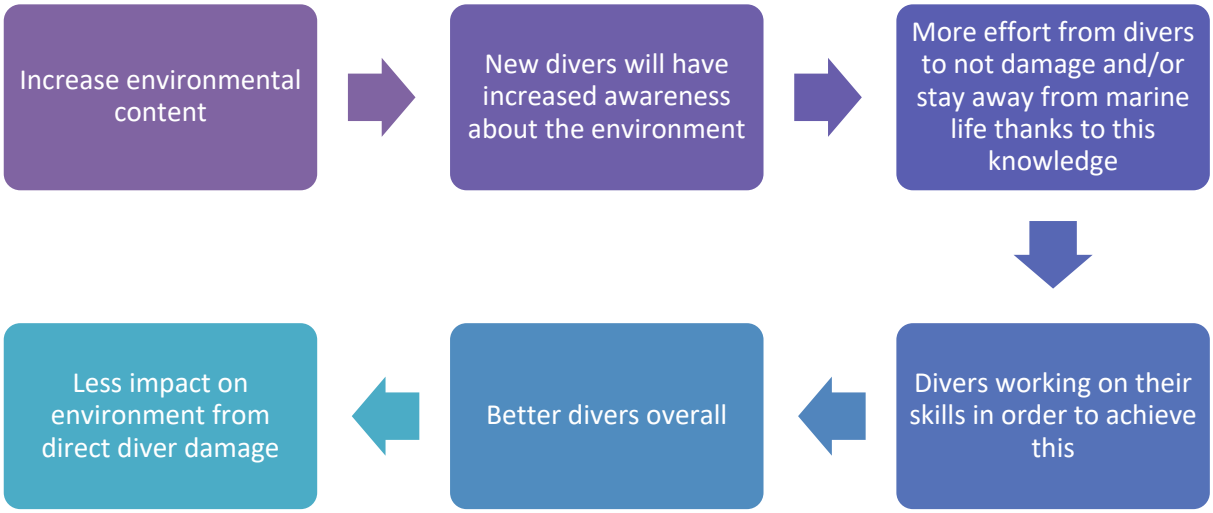


Figure 2. Process and possible outcome of adding more environmental content into the open water scuba course.

It is interesting to note that newly qualified divers in Japan reported feeling less confident (see section 7.1.2) about their skills upon completion of their course than compared to the rest of the world. While unanticipated, the author is not surprised at this outcome: having lived in Japan for two years, in her experience, Japanese people seem less inclined to portray themselves confidently as much as other cultures might. This could stem from the way of life in japan; in society, the Japanese strive to conduct their day-to-day business so as to not offend nor inconvenience anyone (Nakata, 2014; Tsunekawa, 2019). In relation to this thesis, speaking confidently about

themselves might insinuate putting themselves above someone else, thus highlighting the gap in skill between two people and potentially making one person feel inadequate. Therefore, from this result, it is difficult to ascertain whether scuba diving information is absorbed differently by different cultures, or if this question was simply badly phrased for Japanese people, who would inherently not answer this question with impartiality.

Moreover, even though one participant stated that e-learning was beneficial to them, two participants believed that the rise of online learning led to divers being worse in the pool and not properly knowing the diving theory. While the author is inclined to agree with this opinion, especially if it means that students are not taking in the environmental information properly along with the rest, separate research into the effectiveness of e-learning for open water scuba diving courses should be conducted and consequently used as proof for change within the industry depending on the outcome; maybe reverting back to traditional classroom-based learning, or ensuring more arduous tests are conducted to check students' knowledge.

9.2 Main influencing factors for dive centre management to involve sustainable approaches in their daily operations

Unexpectedly, the participants seemed unclear as to why they should or should not be a green business. Unlike the benchmark with Anne Veck Hair Salon (see section 4.2), most of them could not say in certain terms whether being green was financially advantageous or not and if it led to an increase in customers and revenue. It is surprising because (as described in section 7.2.3) although the environment was not the number one priority for divers when choosing a dive shop, it certainly factored into their decision and affected their customer loyalty, thus suggesting it could be used to a company's advantage, for instance as their unique selling point. In fact, in order for this example to become widespread in the industry, green factors could be attributed a monetary value – this might ensure that people who prioritise making profit in the short term and who think less about the environment also become sustainable businesses. As one participant mentioned, their government put in place a special environmental permit needing to be acquired for scuba diving; similarly, there could be monetary benefits and incentives introduced for companies showing sustainable actions.

Moreover, it was suggested that awareness campaigns are influencing factors in green businesses, as this is where some participants thought their green mindsets came from – this, as well

as their upbringing. Naturally, the way a person thinks is shaped by their past experiences, their background, their family, cultural influences and so on and so forth. So, if respondents reported acquiring a green mindset from a young age and from outside information and influences, sustainability could be introduced into education systems. This way, the issue of inconsistency within the industry, which was mentioned previously – how dive centres make sustainable decisions based on their mindset and values and not on hard facts, meaning each business will differ – might be addressed.

Furthermore, an interesting and somewhat unexpected result was the difference with Japan in what they valued the most as businesses: while in the rest of the world, customer satisfaction and employee happiness were not prevalent answers, it was amongst the most popular answers in the Japanese survey. This could be due to the Japanese mentality of "omotenashi", which translates into English as "hospitality", although there is no true accurate translation, as omotenashi goes beyond what is considered as hospitality in western society (Toki, 2021). It permeates the entire culture, not only the service sector, and is more about going above and beyond the customer's expectations by planning ahead and anticipating the client's every need, all whilst knowing that some things will happen unexpectedly (Toki, 2021). Thus, if they place significance on customer as well as employee satisfaction, it would naturally be a key business value. Therefore, to turn this into an influencing factor for green businesses, people could be targeted at an individual level in order to alter their preferences, i.e., if the customer wants sustainability, the market will react.

9.3 Summary

To summarise, the findings of this research highlight that there should be more sustainable content added to the beginner courses, and more emphasis put on buoyancy. This, along with adding more dives to the open water course, might help with the overall level of training for new divers, which was suggested to be not sufficient. Moreover, there seems to be an industry-wide inconsistency in environmental information because of the subjectiveness of instructors; correspondingly, instigating a "rate the dive" system might not reach the root of the problem either. Furthermore, it was unsure whether demographics affect how new divers absorb information due to the Japan versus rest of the world dissimilarity. Not only this, but conferring monetary value to green processes could be one way to overcome uncertainty about whether being a green business is a financial benefit or not, and a way to obtain a majority of the industry on board with sustainability.

Furthermore, targeting the customer to influence their preferences and create demand for green business could be another way to do this. As for what already works, awareness campaigns seem to have been effective in instilling green mindsets in people and could be furthered by integrating sustainability into education systems from a young age. Additionally, it seems that the rise of e-learning is of mixed opinion about its effectiveness.

The discoveries from this study are important because they show that there are many sustainability improvements which can still be made within the industry and provide a starting point for further development of these improvements. In particular, after reading this study, one could ask themselves whether the recent shift towards e-learning in scuba diving is effective enough for the training of new divers, especially in terms of protecting the environment.

However, a limitation of the study is that it could have had a more pointed aim; instead of three research questions, it might have been better to choose only one so as to explore the topic in more depth. In addition, some of the responses did not directly answer the research questions and there were inconclusive answers; for the Japanese survey, this could have been due to errors in translation. As for the interviews, it could have been due to the structure; strictly sticking to pre-decided questions could have been more helpful instead of picking up on interesting topics as the interviews progressed, because this relied too much on the bias of the author. The same goes for the survey; most of the questions were open-ended, so the respondents answered about related topics but did not actually answer the question – it might have been better to include more “checkbox” or “multiple choice” questions.

Lack of experience was also a limitation; there seemed to be a tendency to digress away from the research questions, both during the literature review and the research process. In retrospect, the author could see that having better know-how on writing a lengthy research paper would have been useful.

Moreover, although there was enough data for the research, a wider scope could have been provided by interviewing more Green Fins members for interviews (only one was interviewed). However, the author was unable to get in contact with them, and due to timing of the thesis, the research had to progress to the next stage. Therefore, another possible avenue for further research could be a similar study but with a more focused and relevant group, in order to compare findings.

Overall, the author learned, not only in-depth information about the scuba diving industry, but also about the entire thesis and research process. In hindsight, the author would choose to

conduct research slightly differently by concentrating on one precise topic and having only one research question, which could bring more concise results. She would also improve the accuracy of her answers by thinking more about what kind of answers the survey and interviews would bring, instead of focusing only on how they relate to the research questions and theory.

10 Conclusion

The purpose of this study was to help alleviate negative impacts on marine ecosystems by exploring what sustainable content is included in beginner courses, discovering whether the level of training for new divers was enough so that they do not damage the marine ecosystem, and investigating the main factors which influence dive centre management to make sustainable decisions.

The results from this research showed that sustainable content and extra practice dives with a focus on buoyancy should be added to the open water course and that whether dive centres are sustainable or not is extremely subjective, as it depends on an individual's mindset, which is in turn influenced by awareness campaigns and economic reasons, amongst others.

These results are important as they highlight gaps in sustainability for the scuba diving community, which other studies did not show; for example, as mentioned in section 4, when divers are using cameras, the rate of contact and damage to the reef increases (Roche, et al., 2016). However, their study does not explore why this is, or what to do about it, but the findings of this research start to shed some insight on these questions.

In consequence, to have the most usefulness, this thesis needs to reach the highest number of people possible; for this reason, the author plans to share the thesis with Scuba Schools International (SSI), relevant sustainable organisations, such as Earth Dive, Ghost Diving, etc, scuba diving Facebook groups and the commissioning party The Reef World Foundation, who may use it for social media and other purposes.

Another way of thinking about this research problem might be to consider it solely from the point of view of trainee divers, or instructors, or business owners – unlike this research, which spanned all three groups – as it might offer a more detailed and specific insight. Similarly, this thesis questioned the effectiveness of e-learning for scuba divers and brought about the subject of whether demographics and culture affect how new divers absorb information; therefore, these present themselves as new potential research avenues.

In conclusion, in order to ensure the safekeeping of the marine environment, by the end of the open water course, participants should be good divers, not 'good enough' divers.

11 Bibliography

AquaViews. (2018, Nov). *5 Best Travel BCDs: Our Top Picks*. Retrieved from AquaViews: https://www.leisurepro.com/blog/scuba-gear/top-5-travel-friendly-bcds/

AquaViews. (2019, April 19). *Playing With Fire Underwater: Fire Coral Demystified*. Retrieved from AquaViews: https://www.leisurepro.com/blog/explore-the-blue/playing-with-fire-underwater-fire-coral-demystified/

AquaViews. (2021). *AquaViews*. Retrieved from How a Scuba Diving Regulator Works: https://www.leisurepro.com/blog/explore-the-blue/playing-with-fire-underwater-fire-coral-demystified/

Barker, N. H., & Roberts, C. M. (2004). *Scuba diver behaviour and the management of diving impacts on coral reefs.* Retrieved from https://www.dcbd.nl/sites/www.dcbd.nl/files/documents/Barker%2520Roberts%25202004%2520Biol%2520Cons.pdf: Elsevier.

BBC. (2021, March). *What is buoyancy?* Retrieved from BBC Bitesize: https://www.bbc.co.uk/bitesize/topics/zc89k7h/articles/zytqj6f

Cossio, C. (2016, April 18). *Coral Reefs and the Unintended Impact of Tourism*. Retrieved from Earth Justice: https://earthjustice.org/blog/2016-april/coral-reefs-and-the-unintended-impact-of-tourism#:~:text=When%20tourists%20accidently%20touch%2C%20pollute,the%20reef%2C%20corals%20experience%20stress.&text=When%20light%20is%20blocked%2C%20the,driven%20by%20the%2

Davenport, J., & Davenport, J. (2006). The impact of tourism and personal leisure transport on coastal environments: A review. *Estuarine, Coastal and Shelf Science 67* , 280-292.

Dearden, P., Bennett, M., & Rollins, R. B. (2007). Perceptions of Diving Impacts and Implications for Reef Conservation. In *Coastal Management* (pp. 305 - 317). Retrieved from https://www.researchgate.net/publication/248987407_Perceptions_of_Diving_Impacts_and_Implications_for_Reef_Conservation: Taylor & Francis.

DEMA. (2021). *Fast Facts: Recreational Scuba Diving and Snorkeling.* Retrieved from https://www.dema.org/store/download.aspx?id=7811B097-8882-4707-A160-F999B49614B6: Diving Equipment and Marketing Association (DEMA) .

Dieste, T. (2019, Feb 06). *What is transcription? Everything you need to know about it*. Retrieved from Amber Script: https://www.amberscript.com/en/automatic-transcriptions/what-is-transcription

Diviac. (2021, March). *Scuba Diving Agencies | Where to Get Your Scuba Diving Certification*. Retrieved from Diviac: https://logbook.diviac.com/padi-ssi-naui-cmas-bsac-dive-agencies/

Dreamstime. (2021). *Scuba diving air tank with regulator set. 3d rendering illustration*. Retrieved from Dreamstime: https://www.dreamstime.com/scuba-diving-air-tank-regulator-set-d-rendering-illustration-scuba-diving-air-tank-regulator-set-d-rendering-image153879666

Elo, S., & Kyngäs, H. (2008). The qualitative content analysis. *Journal of Advanced Nursing*, 107-115. Retrieved from file:///Users/manonmellen/Downloads/EloKyngas2008.pdf.

Go Dive Now. (2019). *BUOYANCY COMPENSATING DEVICE*. Retrieved from Go Dive Now: http://godivenow.com/about-the-gear/bcd

Graneheim, U., & Lundman, B. (2003). Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today*, 105-112. Retrieved from https://d1wqtxts1xzle7.cloudfront.net/5806922/lec_566823_graneheim_-_jan_25.pdf?response-content-disposition=inline%3B+filename%3DQualitative_content_analysis_in_nursing.pdf&Expires=1614704763&Signature=G5k-rgl-a~Fr8pRplnU7ENQIcmeH.

Green Fins. (2021, Jan). *CODE OF CONDUCT*. Retrieved from Green Fins: https://greenfins.net/material/gf_all_eng_codeofconduct_a4/

Hammerton, Z. (2014). *SCUBA-diver impacts and management strategies for subtropical marine protected areas.* Gold Coast: Southern Cross University ePublications@SCU.

Hunt, C., Harvey, J., A., M., V., J., & Phongsuwan, N. (2013). The Green Fins approach for monitoring and promoting environmentally sustainable scuba diving operations in South East Asia. *Ocean & Coastal Management*, 35-44.

IndianScribes. (2018, November 7). *Preparing Questions for a Qualitative Research Interview*. Retrieved from IndianScribes: https://www.indianscribes.com/preparing-qualitative-research-questions-for-an-interview/

Kelleher, G. (1999). *Guidelines for Marine Protected Areas.* Cambridge : IUCN, Gland, Switzerland, and Cambridge, UK.

Knight, M. (2016, Nov 8). *DIVING FUNDAMENTALS: THE BUDDY CHECK* . Retrieved from Scuba Diver Life: https://scubadiverlife.com/diving-fundamentals-buddy-check/#:~:text=The%20standard%20PADI%20pre%2Ddive,%2C%20air%2C%20and%20final%20ok.

LinusWealth. (2018, March 9). *Sustainable Tourism* . Retrieved from Sustainable Environment: https://www.sustainable-environment.org.uk/Economy/Tourism.php

Lucrezi, S. (2016, Jan 18). *How scuba diving is warding off threats to its future*. Retrieved from The Conversation: https://theconversation.com/how-scuba-diving-is-warding-off-threats-to-its-future-52504

McCool, S., & Moisey, R. (2001). *Tourism, Recreation and Sustainability: Linking Culture and the Environment.* CABI.

Mellen, K. (2017, JUNE 29). *Anne Veck Oxford wins Best Green Salon Award*. Retrieved from Anne Veck Hair : https://www.anneveckhair.com/green-salon/

Mellen, K. 2021. Local business owner. E-mail. 23.01.2021

Nakata, Y. (2014, Oct 6). *The Honesty and Facade of Honne and Tatemae*. Retrieved from GaijinPot Blog: https://blog.gaijinpot.com/honne-tatemae/#:~:text=Why%20do%20Japanese%20people%20have,mean%20just%20to%20be%20polite.&text=Because%20of%20that%2C%20Japanese%20people,is%20very%20important%20to%20them.

PADI. (2019). *2019 Worldwide Corporate Statistics.* Retrieved from https://www.padi.com/sites/default/files/documents/2019-02/2019%20PADI%20Worldwide%20Statistics.pdf: PADI.

PADI. (2021). *Open Water Diver*. Retrieved from PADI: https://www.padi.com/courses/open-water-diver#:~:text=In%20the%20PADI%20Open%20Water,tropical%2C%20temperate%20or%20cold%20water.

PADI Pros. (2015, Oct 25). *open water Archives* . Retrieved from PADI Pros: https://pros-blog.padi.com/tag/open-water-dives/

Patton, M. (2002). *Qualitative research and evaluation methods (3rd ed.).* Thousand Oaks, CA: Sage.

Rapid Finance. (2021, Mar). *The Pros and Cons of Going Green*. Retrieved from Rapid Finance: https://www.rapidfinance.com/blog/the-pros-and-cons-of-going-green/

Roche, R., Harvey, C., Harvey, J., Kavanagh, A., McDonald, M., Stein-Rostaing, V., & Turner, J. (2016). Recreational Diving Impacts on Coral Reefs and the Adoption of Environmentally Responsible Practices within the SCUBA Diving Industry. *Environmental Management 58*, 107–116.

Rutten, A. (2017, Nov 21). *MAKING SUSTAINABLE TOURISM THE STANDARD IN THE DIVE INDUSTRY*. Retrieved from Scuba Diver Life: https://scubadiverlife.com/making-sustainable-tourism-standard-dive-industry/

Schreier, M. (2012). Chapter 12: Qualitative Content Analysis. In *The SAGE Handbook of Qualitative Data Analysis* (pp. 170-183). Thousand Oaks, CA. Retrieved from https://is.muni.cz/el/fss/jaro2020/SOCb2500/Flick_2014_Methods_Handbook.pdf#page=195: SAGE.

Scuba Mobile Dive Centre. (2021). *SSI Open Water Diver Course*. Retrieved from Scuba Mobile Dive Centre: https://scubamobile.com/tours/open-water-diver-course-ssi/#:~:text=The%20SSI%20Open%20Water%20Diver%20Course%20consists%20of%203%20phases,SSI%20Open%20Water%20Diver%20certification.

Senger, T. (2020, Jan). *Sustainable Diving: A guide to being a sustainable diver*. Retrieved from DIVEIN: https://www.divein.com/articles/sustainable-diving/

SolidPower. (2020, May). *Benefits for Business | SOLIDpower*. Retrieved from SOLIDPOWER: https://www.solidpower.com/en/bluegen/for-businesses/benefits-for-businesses/

Staples. (2020, May). *6 Ways Going Green Benefits Your Business*. Retrieved from STAPLES: https://www.staplesadvantage.co.uk/get-inspired/sustainability/6-ways-going-green-benefits-your-business/

The bastion staff. (2018, Dec 28). *The Curious Case of Andaman and Nicobar's Degraded Coral Reefs*. Retrieved from The bastion: https://thebastion.co.in/politics-and/environment/the-curious-case-of-andaman-and-nicobars-degraded-coral-reefs/

The Reef-World Foundation. (2020, April 9). *About Green Fins*. Retrieved from Green Fins: https://www.greenfins.net/about-green-fins

The Reef-World Foundation. (2021, March). *The Reef-World Foundation*. Retrieved from The Reef-World Foundation: https://reef-world.org/

Toki. (2021, Feb 25). *Toki*. Retrieved from "OMOTENASHI" : THE PHILOSOPHY OF JAPANESE HOSPITALITY : https://www.toki.tokyo/blogt/2015/6/24/omotenashi-japanese-serving-philosophy

Tsunekawa, K. (2019, Aug 22). *Behind the Stereotype: "Japanese People Are So Polite and Nice!"*. Retrieved from Live Japan Perfect Guide: https://livejapan.com/en/article-a0001921/

UNWTO. (2020). *Sustainable development*. Retrieved from UNWTO: https://www.unwto.org/sustainable-development

USC Libraries. (2021, Jan 21). *8. The Discussion - Organizing Your Social Sciences Research Paper*. Retrieved from USC Libraries: https://libguides.usc.edu/writingguide/qualitative

Windsor, S. E. (2010). *An Introduction to Green Process Management.* ASQ Quality Press. Retrieved from: https://kamezproxy01.kamit.fi:2252/lib/kajaani-ebooks/reader.action?docID=3002662.

World Underwater Federation. (2002). *C.M.A.S. Diver TRAINING PROGRAM.* Retrieved from https://web.archive.org/web/20110719031511/http://www.saa.org.uk/Portals/0/Club_manual/CGM/11.2.%20DIVER%20TRAINING%20PROGRAM.pdf: CMAS.

WWF. (2020, Jan). *Marine Protected Areas*. Retrieved from WWF: https://wwf.panda.org/discover/our_focus/oceans_practice/solutions/protection/protected_areas/

12 Table of figures

13 Appendices

APPENDIX 1: email template inviting dive shops to participate in survey

Do you work at a dive centre? Do you care about the environment?

Dear Dive Centre,

My name is Manon and I study Tourism at the University of Applied Sciences in Kajaani, Finland. I am currently writing my thesis about the scuba diving industry and its environmental sustainability. As part of my research, I have made a survey - which is where you come in!

I am kindly asking you to complete the questionnaire to help me - and in turn, help the environment! The answers you provide will give clarity on certain environmental issues and bring pertinent questions to mind about whether you and your company are making the right decisions.

The survey takes about 10 minutes to complete and is for **all** staff (no matter where in the company hierarchy) at your centre who are divers. You may access it from the following link:

https://forms.gle/Jog3Voz38qCKTCey9

I'd be really grateful of your participation!

Best regards,

Manon Mellen

Student - Opiskelija

ATA17S - Bachelor's Degree Tourism

Kajaanin Ammattikorkeakoulu Oy

Kajaani University of Applied Sciences

Kuntokatu 5, FI-87100 Kajaani

manonmellen@kamk.fi

www.kamk.fi

APPENDIX 2: email template inviting dive shops to participate in survey in Japanese

スキューバダイビング業界とその環境の持続可能性のアンケート

こんにちは、

マノンと申します。私はフィンランドのカジャアニ応用科学大学で観光学を専攻しています。

学士論文の一環として、スキューバダイビング業界とその環境の持続可能性を研究するための調査へのご協力をお願いいたします。

アンケートは 10 分程度かかります。ご回答いただいた内容は匿名で、研究目的にのみ使用され、データ分析後に破棄いたします。

ご協力ありがとうございます。

https://forms.gle/iWkAMKtzsapvW6ku9

Manon Mellen

Student - Opiskelija

ATA17S - Bachelor's Degree Tourism

Kajaanin Ammattikorkeakoulu Oy

Kajaani University of Applied Sciences

Kuntokatu 5, FI-87100 Kajaani

manonmellen@kamk.fi

www.kamk.fi

APPENDIX 3: message on diving Facebook groups asking to participate in interviews

Hey guys! I'm writing my Bachelor thesis about scuba diving sustainability and I want to interview some people for my research. I'm looking for newly qualified divers (within last 2 months or so) and instructors. Anyone up for it?? Thanks x

APPENDIX 4: email template inviting Green Fin dive shops to participate in interviews

Hello,

My name is Manon, and I have been passed on your contact details from the International Coordinators of Green Fins (The Reef-World Foundation), who I am currently working in partnership with to carry out some research on the environmental sustainability of the marine tourism sector.

You have been randomly selected out of 150+ active Green Fins dive centres to be involved in this research. You do not have to participate and any information you provide will be kept entirely confidential and has no impact on your Green Fins membership or active status!

I would like to interview dive shop owners/managers. It would be over Skype (and recorded for my notes, but all materials will be deleted after the research is completed) and take around half an hour. All responses will greatly help our research and will allow The Reef-World Foundation to better equip themselves to ensure the survival of coral reefs and the overall sustainability of the scuba diving industry!

I hope some of you would be willing to help me!

Many thanks,

Best regards,

Manon Mellen

Student - Opiskelija

ATA17S - Bachelor's Degree Tourism

Kajaanin Ammattikorkeakoulu Oy

Kajaani University of Applied Sciences

Kuntokatu 5, FI-87100 Kajaani

manonmellen@kamk.fi

www.kamk.fi

APPENDIX 5: survey template in English

A Survey about the scuba diving industry's environmental sustainability

Hello, my name is Manon Mellen. I am a Tourism undergraduate at the Kajaani University of Applied Sciences in Finland.

As a part of my Bachelor thesis, I am conducting a survey to study the scuba diving industry and its environmental sustainability. Answering the survey takes around 10 minutes and your responses will be kept anonymous, used for research purposes only and will be destroyed after the data analysis.

Thank you for your participation!

Manon Mellen

ATA17S – Bachelor's Degree Tourism Kajaani University of Applied Sciences

manonmellen@kakm.fi

* Required

1. Country of Residence: *
2. Current Diving level (Rescue, Dive Master, Instructor, etc...): *
3. Is the dive centre you work for a part of the Green Fins initiative? *
    - Yes
    - No
4. Is your dive centre a part of any other environmental protection programme (or similar)? *
5. What is your position at your dive centre (owner, manager, instructor, dive master, assistant, etc.)? *

Diving Certification Courses

6. What diving certification agency did you take your beginner qualification through? * *Mark only one oval.*

- o Professional Association of Diving Instructors (PADI) Scuba Schools International (SSI)
- o The British Sub-Aqua Club (BSAC),
- o The National Association of Underwater Instructors (NAUI) Scuba Diving International (SDI)
- o Rebreather Association of International Divers (RAID) Professional Scuba Schools (PSS)
- o Other:

7. Was there any environmentally friendly content or information on best practices included in your beginner course? If so, please elaborate about what, in broad terms, was included: *
8. If it was not, do you think it should be added? Please justify your answer. *
9. In any & all diving courses that you have taken in the past, has any environmental or 'best practice' content been included (excluding courses related specifically to that matter)? * *Mark only one oval.*
   - o Yes
   - o No
10. If "Yes', please specify which course it was and, broadly, what kind of content it had:

Training for new divers in relation to the protection of marine ecosystem

11. When you passed your open water certification (or similar) did you feel confident enough to correctly control your buoyancy on your first fun dive? *

12. Were you satisfied with the content in your beginner course (the one you took yourself)? Did you feel that anything needed to be added? *

13. When you were a beginner (around 20 dives or less), how many times would you say you accidentally touched the marine environment during a dive (reef, animals, etc)? * *Mark only one oval.*

    - o 0
    - o 0-3
    - o 3-5
    - o 5-8
    - o 8+

14. Have you ever had any accidental contact with marine life, coral reefs or similar? Please elaborate, especially if the contact resulted in a more serious incident (cuts scrapes, damage, etc...). *

15. In your opinion, should new divers only be allowed to scuba dive in certain dive sites, such as those that mean they will not come into close proximity to coral reefs and/or strong currents or dive sites where close contact with large or sensitive marine life is present (manta Rays, marine life breeding grounds, etc...)? *

16. Do you ever touch or interfere with the marine environment on purpose? * *Mark only one oval.*

    - o Yes
    - o No

17. If 'Yes', for what reason? *Check all that apply*.

    - o Personal Curiosity
    - o Scientific Research
    - o Trash Collection

- Instructor encouraged it/ did so themselves
- Other:

Influencing factors for businesses to be eco-friendly

18. What was the motivation behind the opening of your dive centre (and/or the one you work at)? *
19. What values does your dive centre hold most important? Pick 3 and rank them in terms of importance, starting with the one that you feel is most important: Profit; Equality; Customer Satisfaction; Employee Happiness/Satisfaction; Environment/ Sustainability; Safety; Rigorous Training. *
20. Please add (explain) to the above question in your own words: *
21. Would you say that the environment is a key factor in your business model? * *Mark only one oval.*
    - Yes
    - No
22. If 'Yes', in what concrete ways are you representing this (how is the business being eco-friendly?
23. If 'No', why?
24. In your opinion, does being environmentally sustainable cost money, or save money? Do you feel that you would like to be environmentally friendly, but in order to be profitable, you cannot be? Please explain. *
25. During a dive, is bad diver behaviour (eg. divers touching marine life) corrected? If so, how is it usually corrected (with signs, speaking with the person, briefing before the dive, etc...)? *
26. Of the following, please select all those that apply to the following statement. My dive centre: * *Check all that apply.*

- Uses Anchors at all dive sites
- Uses mooring buoys at all times
- Allows the boat to drift with the current and picks the divers up without the need to anchor or moor
- Always performs a pre-dive briefing
- Performs pre-dive briefings which include correct v.s. incorrect diver behaviour and encourages customers to be eco-conscious
- Performs Clean-Ups (Beach, Reef or otherwise)
- Sells marine souvenirs
- Participates in, promotes, supports and/or hosts Education Programs
- Conducts Reef Monitoring or other marine ecological monitoring programmes (Turtle, Shark monitoring etc)
- Has garbage facilities on board which are dealt with responsibly (bin has a lid, is removed daily and safely disposed of/recycled where possible)
- Carries out staff training regarding most updates on environmental practices
- Enforces a 'No-Touch' policy for all diving and snorkelling
- Other:

27. Please include anything of note else that your dive centre does: *
28. Do you have any criticisms or feedback about your dive centre in terms of environmental matters - things you'd like to improve, things you think you do well, etc.? (Remember that this survey is anonymous) *
29. Do you think a separate environmental course should be available as an add-on (either free or for an extra fee)? Or should it be included from the start? Please explain. *

APPENDIX 6: survey template in Japanese

スキューバダイビング業界の環境持続性に関する調査

私はフィンランドのカジャアニ応用科学大学で観光学を専攻していましたマノン・メレンです。

学士論文の一環として、スキューバダイビング業界とその環境の持続可能性を研究するための調査へのご協力をお願いいたします。

アンケートは 10 分程度かかります。ご回答いただいた内容は匿名で、研究目的にのみ使用され、データ分析後に破棄いたします。

ご協力ありがとうございます。

マノン・メレン

ATA17S - 観光学の学士号

カジャアニ応用科学大学

manonmellen@kamk.fi

1. ダイビングレベル
2. 働いているダイビングセンターは、グリーンフィンの活動に参加していますか？
    - はい
    - いいえ
3. 働いているダイビングセンターは、他の環境保護プログラム（または類似のプログラム）に参加していますか？
4. 働いているダイブセンターでのポジション（オーナー、マネージャー、インストラクター、アシスタントなど）。

ダイビングのコース

5. ダイビングビギナーの資格はどこのダイビング検定機関で取りました？
    - Professional Association of Diving Instructors (PADI) Scuba Schools International (SSI)
    - The British Sub-Aqua Club (BSAC),
    - The National Association of Underwater Instructors (NAUI) Scuba Diving International (SDI)
    - Rebreather Association of International Divers (RAID) Professional Scuba Schools (PSS)
    - Other:
6. ビギナーコースには、環境に配慮した内容やベストプラクティスに関する情報が含まれていましたか？含まれていた場合、詳しく記載ください。
7. 含まれていなかった場合、追加すべきだと思いますか？詳しく記載ください。
8. 過去に受講したダイビングコースの中で、環境や「ベストプラクティス」の内容が含まれていたことはありますか？詳しく記載ください。
9. 含まれていた場合どのような内容であったか詳しく記載ください。

新しいダイバーのトレーニング

10. オープンウォーターの資格を取得した時、初めてのファンダイブで浮力を正しくコントロールできる自信はありましたか？
11. 初級コース（受講されたコース）の内容に満足しましたか？コースに追加されるべき内容があると感じましたか？
12. 初心者の頃（20 ダイブ程度以下）、ダイビング中に誤って海の自然生物（リーフや動物など）に触れてしまったということは、何度ほどありますか？
    - 0
    - 0-3

- 3-5
- 5-8
- 8+

13. これまでに海洋生物やサンゴ礁などに誤って接触したことはありますか？特に、その接触がより深刻な事件（切り傷、擦り傷、損傷など）につながった場合は、詳しく記載ください。
14. 新規ダイバーは、サンゴ礁や強い潮流に近づかない場所や、大型の海洋生物や敏感な海洋生物（マンタ、海洋生物の繁殖地など）が生息している場所など、特定のダイビングポイントでしかスキューバダイビングをすることができないようにすべきだと思いますか？
15. 意図的に海洋環境に触れたり、干渉したりすることはありませんか？
16. はい、と答えた場合の理由。
    - 個人の好奇心
    - 科学的研究
    - ゴミの収集
    - 講師が勧めてくれた/自らやっていた

会社のきっかけ

17. ダイブセンター開設のきっかけは何ですか？
18. 働いているダイビングセンターが最も大切にしている価値観は何ですか？3 つ選んび、最も重要だと思うものから順にランク付けしてください。＜利益、平等さ、従業員の幸福・お客様の幸福・満足、環境・持続可能性、安全性、厳しいトレーニング＞
19. 上記の回答を詳しく説明してください。
20. ビジネスモデルを考える上で、環境は重要な要素だと思いますか？

- はい
- いいえ

21. はいと答えた場合、具体的にどのような環境に配慮した事業を行っているか記載ください。
22. いいえの場合、何故か記載ください。
23. 環境に優しいことはお金がかかる、または節約になる、どちらだと考えますか。環境に配慮した企業でありつつ利益を上げるためには、環境に配慮した企業であることができないと感じていますか？詳しく記載ください。
24. ダイビング中、ダイバーの悪い行動（海の生物に触れるなど）は修正していますか？どのように修正していますか？
25. 下記の中から、該当するものを全てお選びください。働いているダイビングセンターは：

- 常にダイブサイトでアンカーを使用しています。
- 常にダイブサイトでブイを使用しています。
- 流れに合わせてボートをドリフトさせ、アンカーや係留を使用せずダイバーを拾います
- 常にダイブ前にブリーフィングを実施しています。
- 常にダイブ前のブリーフィングを行い、正しい V.S.不正確なダイバーの行動を伝えることでお客様に環境に配慮した行動を促します。
- 清掃の実施（ビーチ、リーフなど）
- 海のお土産を販売
- 教育プログラムへの参加、推進、支援、および/または主催
- リーフモニタリングやその他の海洋生態モニタリングプログラムの実施（カメ、サメのモニタリングなど）

- 船内のゴミ施設があり、責任を持って処理されています（ゴミ箱には蓋があり、毎日取り出し、安全に処理されていること、可能な限りリサイクル）。
- 環境活動の最新情報に関するスタッフ教育を実施します。
- すべてのダイビングとシュノーケリングに「ノータッチ」ポリシーを適用します。

26. 何か追加しますか？

APPENDIX 7: interview template for new divers

→ Your name is ?? Nice to meet you and thank you for agreeing to this interview!

→ As I mentioned before, I am a student at a university of Applied Sciences in Finland. I am writing this thesis about the sustainability of scuba diving as I am a scuba diver myself, and particularly interested in working in this field later on.

→ May I have your permission to cite your name in my thesis?

→ And do I have your permission to publish what is said during this interview in my thesis?

PART 1

- When did you do your beginner certification course? Which course?
- Did your course include diving signals? Buddy system? Mask clearing? Different types of water entry? Pre-dive checks?
- What was the best thing about your course?
- What did you not like about it// 'worst' thing?
- Did they teach you about sustainability?
- Would you have added any other content to the course / Did you think anything was lacking from your course?
- Did anything happen during your open water dives incident wise?

PART 2

- How did you interact with the marine life during your first few dives?
- For example, did you touch anything? Coral, fish, etc…
- What did your instructor say about the marine life/interacting with it?
- What was your impression of the instructor?
- How did you feel when your beginner course (open water) course was finished?

- Now that you are qualified, how many dives in total have you completed?
- How did you feel during your first fun dive? Worried about anything?

PART 3

- How did you choose the dive centre that you did your training with?
- What criteria do you involve in your search? What is most important to you?
- → What about environmental/ green criteria?
- Would you recommend that company? Why? Why not?
- If you have to choose between a more expensive but 'eco' diving company, and a cheaper, but not eco one, which one would you go for?
- Now that you are a diver, has this affected your mindset?
- Scenario: next diving holiday. What is your organisational process? What are you deciding first? Etc
- Thank you for all that valuable information, is there anything else you'd like to add before we end?

APPENDIX 8: interview template for instructors

Intro

- May I have your permission to cite your name in my thesis?
- And do I have your permission to publish what is said during this interview in my thesis?
- Tell me a little bit about yourself, your job etc…

PART 1

- How long have you been teaching?
- What has changed over the years / big differences between then and now?
- Is it better now?
- Is the course content really being properly absorbed?
- What seems to be the most important things to your 'students' whether it be new divers or old?
- If you could, what changes would you make to the open water/beginner course? What would you add?

PART 2

- In your opinion, should newly qualified divers only be allowed to scuba dive in certain dive sites? (meaning they will not come into close proximity to coral reefs/ strong currents/ sensitive/vulnerable dive sites)
- Overall, do you think the level of training for new divers is enough to make sure the environment is not damaged?
- Ex: new diver facing their first fun dive. Are they ready? Trained enough? To not damage the environment.

PART 3

- Financially, do you think a company being green is a benefit? Or not?

- Concrete examples? Have you witnessed this?
- Why [do you think] you are an eco-company and the one next door isn't?
- Most important thing for a company to do eco-ly ?
- Do you know of the Project AWARE Specialist PADI course? What do you think of it?
- Have you encountered any not sustainable companies?
- Why do you think they were like that?
- How would you convince them to change?

APPENDIX 9: interview template for dive shop owners

Intro

- May I have your permission to cite your name in my thesis?
- And do I have your permission to publish what is said during this interview in my thesis?
- Tell me a little bit about yourself, your job etc…

PART 1

- How long have you been teaching?
- What has changed over the years / big differences between then and now?
- If you could, what changes would you make to the open water/beginner course?

PART 2

- Overall, do you think the level of training for new divers is enough to make sure the environment is not damaged?
- Ex: new diver facing their first fun dive. Are they ready? Trained enough? To not damage the environment.

PART 3

- What is your company's mission statement?
- What are your main values? Ie. Safety, environment, customer satisfaction, employee happiness, etc…
- Financially, do you think a company being green is a benefit? Or not?
- Concrete examples? Have you witnessed this?
- Why are you an eco-company and the one next door isn't?
- What led you to being part of Green Fins?
- Do you strive to improve that score? Why?

- Have you encountered any ‘not -sustainable’ companies?
- Why do you think they were like that?
- How would you convince them to change?
- Most important thing for a company to do eco-ly ?

APPENDIX 10: non-disclosure agreement

Date: 06.05.2020 Parties:

Mutual NON-DISCLOSURE AGREEMENT

Manon Mellen, a student at the Kajaani University of Applied Sciences in Finland whose registered address is Ketunpolku 1, FI-87101, Kajaani. She is a UK national and is currently residing at Ketunpolku 5, F15 E Kajaani 87100.

AND

The Reef-World Foundation, a UK Registered Charity with No: 1157096 hereafter referred to as Reef- World and represented for the purpose of this Agreement by its Founder and Trustee Anne Paranjoti. Reef-World are the designated international coordinators of the Green Fins initiative and act on behalf of the UN Environment who hold the original IPR rights to the Green Fins initiative. Reef-World maintain all IPR rights to the Green Fins Assessment system and associated data and are the only body authorised to make any changes to the image, brand or design to the Green Fins initiative. Reef-World have agreed to become the Commissioning Party for Manon Mellen as part of her bachelor of Tourism.

1. Each of the parties to this Agreement intends to disclose information (the Confidential Information) to the other party for the purpose of **supporting Manon Mellen's thesis titled: The Diving Tourism Industry: A Closer Look on its Sustainability and Environmental Effect** (the Purpose).

2. Each party to this Agreement is referred to as 'the Recipient' when it receives or uses the Confidential Information disclosed by the other party.

3. The Recipient undertakes not to use the Confidential Information disclosed by the other party for any purpose except the Purpose, without first obtaining the written agreement of the other party.

4. The Recipient undertakes to keep the Confidential Information disclosed by the other party secure and not to disclose it to any third party **except to its employees or professional advisers** who need to know the same for the Purpose, who know they owe a duty of confidence to the

other party and who are bound by obligations equivalent to those in clause 3 above and this clause 4.

5. The undertakings in clauses 3 and 4 above apply to all of the information disclosed by each of the parties to the other, regardless of the way or form in which it is disclosed or recorded but they do not apply to:

a) any information which is or in future comes into the public domain (unless as a result of the breach of this Agreement); or

b) any information which is already known to the Recipient and which was not subject to any obligation of confidence before it was disclosed to the Recipient by the other party.

6. Nothing in this Agreement will prevent the Recipient from making any disclosure of the Confidential Information required by law or by any competent authority.

7. The Recipient will, on request from the other party, return all copies and records of the Confidential Information disclosed by the other party to the Recipient and will not retain any copies or records of the Confidential Information disclosed by the other party.

8. Neither this Agreement nor the supply of any information grants the Recipient any licence, interest or right in respect of any intellectual property rights of the other party except the right to copy the Confidential Information disclosed by the other party solely for the Purpose.

The undertakings in clauses 3 and 4 will continue in force **for five years.**

This Agreement is governed by, and is to be construed in accordance with, English law. The English

Courts will have non-exclusive jurisdiction to deal with any dispute which has arisen or may arise out of, or in connection with, this Agreement.

Signed by Manon Mellen from Kajaani University of Applied Sciences.

Signature

_____

Name Manon Mellen

Student number 46610

Signed by James J. Harvey from The Reef-World Foundation.

Signature

_____

Name *James J. Harvey*

Position *Director*

2