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Exploring the Relationship between Eco-Certification (Green Fins) Standards and the Environmental Performance of Safari Yacht Operators in Egypt

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ABSTRACT

Marine tourism relies on the availability and accessibility of natural resources, which can degrade through overuse. Eco-certification programs like Green Fins have emerged as the world's first independent certification to control the environmental impact of marine tourism activities, particularly for safari yacht operators. This study explores the relationship between Green Fins certification and the environmental performance of safari yacht operators in Egypt, as well as the challenges they face in implementing these standards. A descriptive-analytical approach was used to detail the criteria of Green Fins environmental certification and evaluate the environmental performance of safari yacht operators. A questionnaire was distributed to both Green Fins certified and non-certified operators in Egypt's Red Sea region between September 2024 and April 2025. The results showed a positive and statistically significant relationship between obtaining Green Fins certification and waste reduction, recycling practices, resource conservation, water consumption rationalization, coral reef conservation practices, and the reduction of the ecological footprint resulting from safari yacht activities. The study also confirmed several benefits from Green Fins certification, including customer attraction, operational efficiency, and cost reduction. However, the study identified perceived challenges for safari yacht operators in obtaining Green Fins certification, such as a lack of necessary expertise and knowledge and associated financial costs.

KEYWORDS

Green Fins Certification, Safari yachts, Eco-Certification, Egypt.

استكشاف العلاقة بين معايير الشهادة البيئية (Green Fins) والأداء البيئي لمشغلي يخوت السفاري في مصر

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الملخص

تعتمد أنشطة السياحة البحرية على توفر الموارد الطبيعية وإمكانية الوصول إليها، لذا يجب أن تكون هذه الموارد في حالة جيدة وغير ملوثة؛ ومع ذلك، يمكن لبعض الأنشطة، مثل عمل مشغلي يخوت السفاري، أن تدمر الموارد الطبيعية بسبب ممارسات الاستخدام المفرط. من ناحية أخرى، تُعد برامج الشهادات البيئية، مثل (Green Fins)، أول شهادة مستقلة في العالم للتحكم في الأثر البيئي الناتج عن أنشطة السياحة البحرية بشكل عام، ومشغلي يخوت السفاري بشكل خاص. وتهدف الدراسة إلى استكشاف العلاقة بين شهادة "جرين فينز" والأداء البيئي لمشغلي يخوت السفاري في مصر، بالإضافة إلى توضيح التحديات التي تواجه مشغلي يخوت السفاري لتطبيق معايير شهادات "جرين فينز" في مصر. وقد اعتمدت الدراسة على المنهج الوصفي التحليلي لوصف معايير شهادة "جرين فينز" البيئية وتقييم الأداء البيئي لمشغلي يخوت السفاري، كما اعتمدت الدراسة على المنهج الكمي كتقنية أساسية لجمع البيانات، مستهدفة ممثلي يخوت السفاري في منطقة البحر الأحمر بمصر. تم تصميم استبيان اعتمادًا على البيانات الواردة في معايير الشهادة البيئية، بالإضافة إلى معايير الأداء البيئي لمشغلي يخوت السفاري في مصر، وقد تم توزيعه على مشغلي يخوت السفاري المعتمدين وغير المعتمدين من "جرين فينز" في البحر الأحمر، وذلك في الفترة من سبتمبر 2024 إلى أبريل 2025، وتم الحصول على 58 استجابة صالحة، وباستخدام SPSS V22، تم تحليل البيانات الأولية. وقد توصلت الدراسة إلى وجود علاقة إيجابية ذات دلالة معنوية بين الحصول على شهادة "جرين فينز" وخفض المخلفات وممارسات إعادة التدوير، وكذلك بين الحصول عليها والحفاظ على الموارد وترشيد استهلاك المياه، إضافة إلى وجود علاقة إيجابية ذات دلالة معنوية بين الحصول على الشهادة وممارسات الحفاظ على الشعاب المرجانية، وخفض البصمة البيئية الناتجة عن أنشطة يخوت السفاري. كما أكدت نتائج الدراسة على تحقيق عدة منافع كنتيجة للحصول على شهادات "جرين فينز" مثل جذب العملاء، وكفاءة التشغيل، وخفض التكاليف. وتوصلت الدراسة إلى التحديات المدركة لدى مشغلي يخوت السفاري للحصول على شهادة "جرين فينز" ومنها عدم توفر الخبرات والمعرفة اللازمة، والتكاليف المالية المصاحبة. وتوصي الدراسة بضرورة تبني وزارة البيئة وغرفة مراكز الغطس برامج التوعية وبناء القدرات للمشغلين والموظفين، وتقديم حوافز مالية ودعم فني لتسهيل اعتماد الشهادات البيئية مثل Green Fins.

الكلمات الدالة

الشهادات البيئية، الجرين فنز، يخوت السفاري، الأداء البيئي، السياحة.

Introduction

Tourism can generate substantial revenue for a destination, but it may also have adverse effects if not properly managed. It can exert considerable pressure on the environment, leading to the degradation of natural resources. If tourism activities are not conducted with environmental sensitivity, they can contribute to significant ecological harm. Since environmental resources are a fundamental component of the tourism experience, their protection is essential for sustainable tourism development (Milioti et al., 2020). On the other hand, Yacht tourism has become a key asset for countries relying on tourism for development, offering environmental benefits, investment opportunities, job creation, foreign exchange income, and socio-economic growth. Increasing investments and incentives further enhance its impact globally (Sevinç & Güzel, 2017).

In this concern Deloitte (2016) mentioned that the yachting industry has seen significant growth since 2014, with powerboats dominating the market at 89%. This growth is fueled by the rising popularity of marine tourism and luxury water-based experiences. Moreover, Yacht tourism is increasingly recognized as important and is frequently mentioned in the literature as a high-economic-return tourism sector (Hall, 2001; Payeras et al., 2011; Luković, 2012; Albayrak, 2013; Sevinç & Güzel, 2017).

In the concern of minimizing the negative impacts of tourism in the environment and particularly in yachting tourism environment, the environmental association developed many eco-certifications. These Certifications and standards provide clarity for sustainable business strategies, enhance performance by reducing environmental impact and ensure compliance with environmental management practices in tourism and hospitality (Font, 2002). Green Fins is considered as one of the eco-certifications which was designed to promote sustainable diving and snorkeling tourism practices. Developed by the UNEP Regional Seas program, it was launched in 2004 in East Asia to address the negative impacts of coastal tourism.

Green Fins provides a set of environmental standards and guidelines for dive operators. These standards, outlined in the Green Fins Code of Conduct (Zain al Abidin and Mohamed, 2014), aim to minimize the environmental impact of the diving and snorkeling industry. This study aims to achieve the following objectives: -

- Assessing the environmental impact of safari yacht operations in Egypt
- Exploring the potential benefits of Green Fins certification for safari yacht operators and the marine environment
- Identifying the challenges faced by safari yacht operators in implementing Green Fins standards
- Proposing recommendations for improving the adoption and implementation of Green Fins standards in Egypt
- Evaluating the awareness and perception of safari yacht operators regarding Green Fins certification

Eco-Certification and Environmental Performance

The concept of eco-certification has been explored in various contexts, highlighting its potential to improve environmental performance in tourism-related industries. For instance, Anderson et al. (2013) discuss eco-labeling within the North American travel tour industry, emphasizing the role of tour operators in promoting sustainable

practices through eco-certification. Their findings suggest that eco-labeling can serve as a catalyst for enhanced environmental performance, as operators strive to meet certification standards that align with sustainable tourism practices.

In the context of Egypt, research by Gomaa (2014) indicates that while there is an acknowledgment of the importance of environmental certification among travel agencies, significant barriers hinder the achievement of such certifications. These barriers include a lack of awareness and insufficient resources to navigate the certification process. This situation is likely mirrored among safari yacht operators, who may similarly struggle with the complexities associated with meeting eco-certification requirements like those set by Green Fins. The necessity for improved communication and education regarding eco-certification is evident, as it plays a critical role in enhancing both travel agencies' and yacht operators' environmental performance.

Barriers to Eco-Certification

Gomaa's (2014) findings highlight specific barriers faced by Egyptian travel agencies in pursuing environmental certification. These barriers are likely applicable to safari yacht operators as well, suggesting that they may encounter similar challenges such as knowledge gaps and limited access to necessary information. The study underscores the importance of addressing these barriers to facilitate a smoother transition toward eco-certification for operators in the tourism industry, including those involved in safari yacht operations.

The alignment of challenges faced by travel agencies and yacht operators indicates a broader issue within the Egyptian tourism sector regarding eco-certification. Without addressing these barriers, the potential benefits of eco-certification in improving environmental performance may not be fully realized. This is particularly concerning in coastal and marine environments where the impacts of tourism can be profound (Esparon, et al, 2014).

Green Fins approach

Marine tourism, including scuba diving and snorkeling, offers invaluable opportunities to connect people with the ocean and foster a sense of environmental stewardship (Dimmock, & Musa, 2015). However, without proper management, these activities can significantly harm fragile ecosystems like coral reefs (Sale, 2008).

Green Fins, a globally recognized conservation program developed by The Reef-World Foundation and the UN Environment Program, provides a proven approach to minimizing the negative environmental impacts of marine tourism. By implementing environmentally friendly guidelines, Green Fins empowers divers, operators, and coastal communities to protect coral reefs (Hunt, et al, 2013).

Green Fins, through its website, promotes responsible marine tourism by educating divers and snorkelers on environmentally friendly practices in marine habitats, particularly coral reefs. They offer free educational info graphics to help divers and snorkelers quickly grasp the best practices for eco-friendly diving and snorkeling. Inexperienced or irresponsible divers and snorkelers can easily damage coral reefs. Through continuous guidance and reminders during diving and snorkeling activities, Green Fins aims to minimize such impacts (https://greenfins.net/).

This program offers the only internationally recognized environmental standards for marine tourism. Through practical, cost-effective solutions, Green Fins guides operators in adopting sustainable practices, such as eliminating anchoring, fish feeding, and chemical pollution. Furthermore, it provides comprehensive training, support, and resources to ensure successful implementation and ongoing improvement (Hunt, et al, 2013).

The Green Fins initiative has developed a comprehensive set of guidelines to encourage best practice for an environmentally sustainable scuba diving industry; this is known as the Green Fins Code of Conduct (COC). (Zainal B Rahman 2022)

Green Fins Certified Members are scored – based on the Green Fins Code of Conduct – out of 330. The lower the score, the lower the impact on the environment. Based on the results of their assessments, Certified Members are classed as Gold, Silver, or Bronze by their environmental performance. Operations that score 150 or higher are classed as Restricted Members and will need to be reassessed to receive membership benefits.

For operators wanting to become members in active Green Fins countries:

1- The owner or manager registers a personal account for themselves on the Green Fins Hub.
2- Manager registers the operation in the Hub by selecting 'Certified Member' when prompted.
3- The local Green Fins team will contact the manager to schedule an assessment when the Member has guests.
4- Members will be assessed annually and must show continued improvement to maintain active status. (The Egyptian Chamber of Diving and Water sports ,2004)

According to the conduct code of green fins certification (15 article) , the obtaining Green Fins certification for yacht safari tourism involves adopting environmentally friendly practices to reduce the environmental impact of diving and snorkeling, which are usually part of such tours. Certified operators must embrace water conservation practices such as installing water-saving devices and encouraging proper water usage by clients. Waste reduction and recycling processes are also required, including minimizing single-use plastics and implementing onboard waste segregation systems. To protect coral reefs, operators follow strict criteria including safe anchoring practices, avoiding protected marine environments, and educating divers and snorkelers on non-intrusive behavior. Green Fins also emphasizes education and awareness as vital components of marine conservation. These combined practices ensure that yacht safari operations meet environmentally sustainable standards. IN addition to operational changes, the certification highlights the importance of education and awareness in marine conservation. Certified operators must train staff in sustainable methods, coral reef ecosystems, and how to minimize environmental impacts. This training equips staff to educate guests about conservation principles. Equally important is raising tourist awareness through pre-dive briefings, educational content, and interactive activities that emphasize the importance of protecting marine habitats. Through these educational efforts, the certification not only enhances the environmental responsibility of yacht safari tourism but also fosters

a broader conservation culture among all involved, ensuring the long-term sustainability of marine biodiversity. (Green Fins, n.d.)

Yacht Tourism Definition

Kalemdaroglu et al. (2004) identify significant growth potential for yacht tourism, emphasizing its ability to fulfill travelers' desires for freedom, exploration, adventure, and immersion in nature and history. This aligns with the evolving travel market, where sophisticated travelers seek active and nature-centric experiences. Yacht tourism perfectly caters to these demands.

The term "yacht" originates from the Dutch word "jacht," meaning "hunt." Initially, yachts were swift, lightweight sailing vessels used by the Dutch navy for combatting piracy and other maritime threats. The rise of steamboats and other powered vessels later transformed yachts into primarily recreational craft (Pardali et al., 2018).

Yachting typically involves sailing vessels equipped with a keel for stability. These vessels often include onboard living accommodations (The Scout Information Centre, 2011).

Yachting tourism encompasses a range of leisure activities conducted on water vessels, including cruising, fishing, racing, and other nautical pursuits. Based on the vessel type, it can be categorized as sailing or powerboating. Ownership can be further distinguished as chartered or private (Allan, 2016).

Yachts and Marinas

Yachts come in various types and sizes, including motor yachts, sailing yachts, and mega yachts. Commercial and private yachts can range from 10 to several dozen meters in length. Generally, a yacht is considered smaller than 12 meters with a capacity of up to 36 passengers. Mega yachts, on the other hand, exceed 50 meters in length (Chen et al., 2016).

Marinas are specialized nautical harbors that go beyond basic boat mooring and storage. They offer a wide range of amenities and services designed to enhance the tourist experience, extend the tourism season, and stimulate nautical and tourism spending (Šamanović, 2002).

Services provided by tourist ports (marinas) to ships and passengers include (Pardali et al., 2018):

- **Port Operations:** Mooring and anchorage, clear traffic signage, weather-protected berths, boat launching ramps, warehouses, parking, easy access to inland areas, dry storage for repairs and wintering, and robust safety and security measures.
- **Commercial Services:** Water and fuel supply, marine equipment and food provisioning, restaurants, bars, electricity, modern communication systems, waste disposal facilities, banking services, and comprehensive hygiene facilities (restrooms, showers, laundry, dry cleaning).
- **Public Services:** Customs clearance and coast guard services.
- **Repair and Maintenance:** Boat repair and maintenance units, technical support for electronics and marine equipment.
- **Tourist and Cultural Amenities:** Information centers, tourist attractions, entertainment venues, sports facilities, museums, and cultural events.

According to Minister of Tourism Decree No. 444 of 2011 concerning diving, marine activities centers, safari yachts must meet the following requirements:

- **Living Facilities:** These include dining areas, a library, crew cabins, diving equipment storage, a kitchen, and a food storage area.
- **Essential Equipment:** This includes an air compressor, diving cylinders, a first aid kit, radio and telephone communication devices, and satellite communication equipment, especially for yachts operating in remote islands.
- **Records:** The yacht must maintain a daily log of all passengers, including their nationalities and passport numbers, as well as a crew list.

Safari yachts are classified and rated by the Ministry of Tourism into three, four, and five-star categories, based on the specific criteria set by the ministry for each category.

Research methodology

The descriptive-analytical approach was adopted to describe the criteria of the Green Fins environmental certification and the environmental performance of safari yacht operators. The study relies on a quantitative approach as the primary data collection technique, targeting Yacht Safari Representatives in the Red Sea region of Egypt. A questionnaire, designed via Google Forms, was distributed and published through email, Facebook, and WhatsApp from September 2024 to April 2025, The researchers relied on the data contained within the environmental certification criteria, as well as the environmental performance of safari yacht operators in Egypt, for the questionnaire design. resulting in a total of 58 respondents. The collected data will be analyzed using SPSS V.22 to explore the relationship between Green Fins certification and the environmental performance of safari yacht operators, focusing on current practices, challenges, and the perceived benefits of eco-certification. This approach aims to provide actionable insights into improving sustainability in marine tourism, despite potential limitations such as sample size and self-reporting bias.

The survey questionnaire comprised seven main sections:

- The first section addressed Waste Reduction and Recycling.
- The second section covered Water Conservation Measures.
- The third section focused on Practices to Protect Coral Reefs.
- The fourth section examined Environmental Training for Crew Members.
- The fifth section explored Awareness about Marine Conservation and Responsible Tourism.
- The sixth section investigated Green Fins Certification Benefits.
- The seventh section aimed to Identify Challenges Faced by Egyptian Yacht Operators in Obtaining Environmental Certifications.

Reliability and Validity

Reliability and validity tests, encompassing internal consistency and construct validity, were conducted to ensure the items within the survey tools ability to measure the designated variables and to verify the validity of these items. Table (1) presents the findings of the Cronbach's Alpha tests, all of which yielded values exceeding (0.71).

Table (1) Reliability Coefficient

Variables	Reliability Coefficient
implement waste reduction and recycling	0.77
implement water conservation measures	0.75
implement practices to protect coral reefs	0.79
environmental training to your crew members	0.73
awareness about marine conservation and responsible tourism	0.76
Green Fins certification benefits	0.74

As evident from Table (1), the results of the Cronbach's Alpha tests, all of which were greater as (0.70), a value exceeding the acceptable threshold, thereby confirming the internal consistency reliability of the questionnaire.

Safari Yacht Operation Centers

The sampled individuals were distributed across the Red Sea, Hurghada, El Quseir, and Marsa Alam, with varying response rates as illustrated in the following figure:

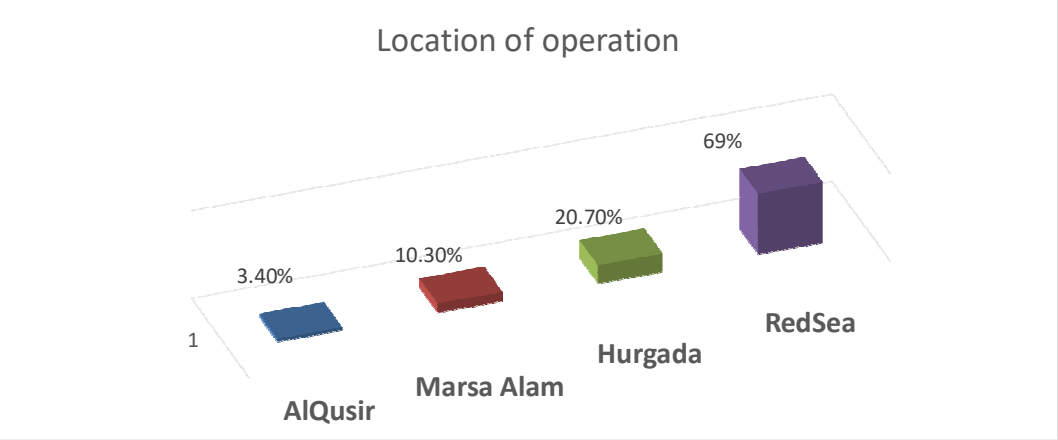

Figure No. (1) Location of operation.

As Figure (1) illustrates, the responses from the sampled individuals show that 38 operators (65.5% of the total sample) responded from the Red Sea operational site. Furthermore, 12 operators from the Hurghada region responded (20.7%), and 6 operators from the Marsa Alam area responded (10.2%). This discrepancy may be attributed to the varying distribution of safari yachts in these areas, which in turn depends on the volume of demand and tourist traffic in those areas.

Green Fins Certification Status

To determine which of the sampled individuals had obtained a Green Fins certification, a direct question was posed, and the responses are illustrated in the following figure:

Table (2) Level of Green Fins Certification Attainment

Have you or your company obtained the Green Fins certification?

	Frequency	Percent	Valid Percent
No	52	89.7	89.7

	Yes	6	10.3	10.3	
	Total	58	100.0	100.0	

As Table (2) illustrates, the majority of sampled individuals have not obtained Green Fins certification. Specifically, only 6 operators (10.3% of the sample) have acquired this certification, while 52 individuals (89.7%) have not. This significant disparity reflects the limited capacity of many operators to obtain an important environmental certification such as Green Fins.

Waste Reduction and Recycling Practices of Safari Yacht Operators

To identify the measures taken by safari yacht operators in waste reduction and the adoption of recycling approaches, five statements were posed to the respondents to achieve this objective. The responses varied, as illustrated in the following table.

Table (3) implementing waste reduction and recycling

Statement	Frequencies\ Percent					mean	Std. Deviation
	Never	Rarely	Sometimes	Often	Always		
My company adopt water-saving measures?	2	22	16	12	6	**2.293**	**1.452**
	3.4%	**37.9 %**	**27.6%**	**20.7 %**	**10.3%**		
We effectively reduce the amount of plastic waste generated by our yacht voyages.	**3**	**16**	**20**	**14**	**5**	**2.346**	**1.821**
	5.1%	**27.6%**	**34.420%**	**24.1 %**	**8.6%**		
We diligently sort recyclable waste (e.g., cans, bottles, food scraps) on board the yacht.	**4**	**4**	**8**	**16**	**26**	**3.066**	**1.118**
	6.8%	**6.8%**	**13.6%**	**27.6 %**	**44.8%**		
We utilize eco-friendly and biodegradable products, actively avoiding materials harmful to the marine environment.	**4**	**5**	**8**	**18**	**23**	**3.00**	**1.331**
	6.8%	**8.6%**	**13.6%**	**31%**	**39.6%**		
We actively educate both yacht crew and guests on the importance of marine conservation and the implementation of sustainable practices.	**3**	**3**	**7**	**22**	**23**	**3.106**	**0.926**
	5.1%	**5.1%**	**12%**	**37.9 %**	**39.6%**		
The Total Mean	**5.4%**	**17.2%**	**19.5%**	**28.3 %**	**28.6**	**2.881**	**1.812**

As Table (3) illustrates, 28.6% of the sampled individuals expressed complete acceptance, indicating they "always" implement procedures supporting waste reduction and recycling. The most prominent of these practices was "sort recyclable waste (e.g., cans, bottles, food scraps) on board the yacht," accounting for 44.8%.

Additionally, 28.3% of the sampled safari yacht operators reported "often" undertaking measures that support recycling and waste reduction. The most notable action they commonly perform is to "educate both yacht crew and guests on the importance of marine conservation and the implementation of sustainable practices," representing 37.9%. Furthermore, 19.5% of the sampled individuals indicated that they "sometimes" apply waste reduction and recycling procedures. The most common practice they sometimes engage in is to "effectively reduce the amount of plastic waste generated by our yacht voyages," at 34.4%. Conversely, 17.2% of the sampled individuals stated they rarely engage in waste reduction and recycling practices, while 5.4% reported not undertaking any waste reduction or recycling practices at all.

Water Conservation Measures of Safari Yacht Operators

To ascertain the extent of safari yacht operators' commitment to water conservation measures, including preventing water leakage on yachts and ensuring efficient water usage in daily activities to minimize waste, the preliminary data were analyzed, as presented in the following table.

Table (4) Water Conservation Measures of Safari Yacht Operators

	Frequencies\ Percent					**mean**	**Std. Deviation**
	Never	Rarely	Sometimes	Often	Always		
Our company adopt water-saving measures?	2	20	16	10	10	**2.4**	**1.062**
	3.4%	**34.5%**	**27.6%**	**17.2%**	**17.2%**		
I promptly report any water leaks onboard the yacht.	**10**	**10**	**11**	**12**	**15**	**2.346**	**1.923**
	17.2%	**17.2%**	**18.9%**	**20.7%**	**25.9%**		
I use water efficiently in daily activities (e.g., showering, washing dishes) to minimize waste.	**3**	**2**	**9**	**22**	**22**	**3.093**	**1.419**
	5.1%	**3.4%**	**15.5%**	**37.9%**	**37.9%**		
I contribute to educating guests on the importance of rationalizing water consumption and conservation.	**4**	**5**	**13**	**19**	**17**	**2.853**	**1.535**
	6.9%	**8.6%**	**22.4%**	**32.8%**	**29.3%**		
I participate in implementing the specified water conservation procedures on the yacht.	**2**	**5**	**9**	**19**	**23**	**3.066**	**1.623**
	3.4%	**8.6%**	**15.5%**	**32.8%**	**39.7%**		
The Total Mean	**7.2%**	**14.46 %**	**19.9%**	**28.3%**	**30%**	**2.751**	**1.917**

As Table (4) illustrates, 30% of the sampled individuals expressed their complete agreement with the statements under the "Water Conservation Measures of Safari Yacht Operators" variable, indicating they "always" implement water conservation procedures. The most prominent practice they consistently perform is "participating in implementing the specified water conservation procedures on the yacht."

Furthermore, 28.3% of respondents indicated that they "often" carry out water conservation and waste reduction measures. The most notable of these actions is "educating guests on the importance of rationalizing water consumption and conservation," at a rate of 32.8%.

Additionally, 19.9% of the sampled individuals confirmed that they "sometimes" undertake water rationalization measures, with their most prominent practice being "educating guests on the importance of rationalizing water consumption and conservation."

Conversely, 14.5% of the sampled individuals reported rarely engaging in water rationalization procedures. The practice they seldom perform most frequently is "promptly report any water leaks onboard the yacht," accounting for 17.2%.

Coral Reef Protection Practices and Ecological Footprint Mitigation

To determine the extent of safari yacht operators' commitment to coral reef protection practices, their efforts to mitigate their ecological footprint on marine ecosystems, and their degree of participation in marine debris removal efforts, frequencies and percentages were utilized, as illustrated in the following table.

Table (5) Coral Reef Protection Practices and Ecological Footprint Mitigation

Statement	Frequencies\ Percent					mean	Std. Deviation
	Never	Rarely	Sometimes	Often	Always		
To what extent does your company implement practices to protect coral reefs?	2	4	9	17	21	**2.8**	**1.213**
	3.4%	**6.8%**	**15.5%**	**29.3%**	**36.2%**		
Our company contributes to the protection of coral reefs through its environmental practices.	**12**	**11**	**15**	**10**	**10**	**2.25**	**1.321**
	20.7%	**18.7%**	**25.9%**	**17.2%**	**17.2%**		
Our company strives to mitigate its ecological footprint on marine ecosystems.	**3**	**2**	**13**	**21**	**19**	**3.00**	**1.435**
	5.2%	**3.4%**	**22.4%**	**36.2%**	**32.8%**		
Our company actively participate in marine debris removal efforts?	**3**	10	22	6	18	**3.00**	**1.531**
	5.2%	**17.2%**	**37.9%**	**10.3%**	**31%**		
The Total Mean	**8.5%**	**11.4%**	**25.4%**	**23.3%**	**29.3%**	**2.70**	**1.818**

As Table (5) illustrates, 29% of respondents reported always engaging in practices to protect coral reefs. In contrast, 25% of the sampled individuals indicated they sometimes undertake practices to protect coral reefs and mitigate their ecological footprint. Meanwhile, 23% confirmed they usually do so. Conversely, nearly 20% of respondents reported they rarely or never engage in practices to protect coral reefs or mitigate the ecological footprint of marine activities.

Environmental training by Safari Yacht Operators

To ascertain the extent to which safari yacht operators provide environmental training to their employees and offer opportunities for acquiring new skills that contribute to marine sustainability, the data were analyzed and are presented in the following table.

Table (6) Environmental training to crew members.

Statement	Frequencies\ Percent					mean	Std. Deviation
	Never	Rarely	Sometimes	Often	Always		
Our company provide environmental training to your crew members?	-	8	18	18	14	**2.8**	**0.991**
	-`	**13.8%**	**31%**	**31%**	**21.1%**		
The yacht crew receives regular training on best environmental practices.	**2**	**5**	**11**	**21**	**18**	**2.95**	**1.325**
	3.4%	**8.6%**	**18.9%**	**36.2 %**	**31%**		
The company provides opportunities for acquiring new skills that contribute to marine sustainability.	**2**	**6**	**15**	**26**	**9**	**2.77**	**1.135**
	3.4%	**10.2%**	**25.9%**	**44.8 %**	**15.5%**		
The Total Mean	**2.26%**	**10.9%**	**25.3%**	**25.3 %**	**22.5%**	2.84	1.332

As Table (6) illustrates, 22.5% of the sampled individuals indicated the availability of "Provision of Environmental Training and Skill Development by Safari Yacht Operators." Furthermore, 25.3% of the sampled yacht operators confirmed that such training is usually available, while another 25.3% stated that these training opportunities are sometimes available. Conversely, 13% of the sampled individuals reported a lack or rarity of such training. Additionally, Table 5 reveals that 44.8% of the sampled safari yacht operators usually provide opportunities to enhance employee skills related to marine sustainability.

Contribution of Safari Yacht Operators to Marine Environmental Awareness and Responsible Tourism

To determine the extent to which safari yacht operators contribute to increasing awareness of marine environmental conservation and establishing a responsible tourism approach, the following data were collected and analyzed.

Table (7) Contribution of Safari Yacht Operators to Marine Environmental Awareness and Responsible Tourism

Statement	Frequencies\ Percent					mean	Std. Deviation
	Never	Rarely	Sometimes	Often	Always		
To what extent do you increase your guests' awareness about marine conservation and responsible tourism	--	4	**14**	**22**	**18**	**3.4**	**1.426**
	--	**6.9%**	**24.1%**	**37.9 %**	**31.0%**		
We provide tourists with information on local marine life and the importance of its conservation.	**3**	**9**	**15**	**6**	**25**	**2.9**	**1.614**
	5.2 %	**15.5%**	**25.9%**	**10.3 %**	**43.1%**		

We offer clear guidance to tourists on how to engage in responsible tourism activities (e.g., avoiding touching coral reefs, proper waste disposal).	**6**	**4**	**23**	**21**	**4**	**2.49**	**1.591**
	10.3%	**6.9%**	**39.7%**	**36.2 %**	**6.9%**		
We share stories or examples with tourists about the positive impact of responsible tourism practices on the marine environment.	**3**	**6**	**20**	**14**	**15**	**2.7**	**1.705**
	5.2%	**6.9%**	**34.5%**	**24.1 %**	**25.9%**		
The Total Mean	**5.2%**	**9.05%**	**31.05%**	**27.1 %**	**26.7%**	**2.87**	**1.992**

As Table (7) illustrates, 31% of the sampled individuals reported contributing to increased awareness of marine environmental conservation and responsible tourism practices irregularly (sometimes). Furthermore, 26.7% of respondents confirmed their consistent and continuous contribution to raising environmental awareness. Conversely, 14.7% of respondents indicated their lack of interest in enhancing customer awareness regarding the necessity of marine environmental preservation and adopting a responsible tourism approach.

Perceived Benefits of Green Fins Certification

To identify the benefits of Green Fins certification for safari yacht operators—including its role in reputation enhancement, operational efficiency improvement, attracting environmentally conscious customers, and its contribution to cost reduction—the data presented in the following table were analyzed.

Table (8) Green Fins certification benefits

Statement	**Frequencies\ Percent**					**mean**	**Std. Deviation**
	Never	Rarely	Sometimes	Often	Always		
Green Fins certification improved your company's reputation.	2	**6**	**14**	**12**	**24**	**2.99**	**1.525**
	3.4%	**10.3%**	**24.1%**	**20.7 %**	**41.4%**		
Green Fins certification led to operational efficiency improvements.	**3**	**10**	**12**	**26**	**8**	**2.7**	**1.434**
	3.4 %	**17.2%**	**20.7%**	**44.8 %**	**13.8%**		
Green Fins certification attracted environmentally conscious customers.	2	--	20	20	16	**2.96**	**1.522**
	3.4%	**--**	**34.5%**	**34.5 %**	**26.7%**		
Green Fins certification been cost-effective for your company.	2	16	20	18	2	**2.35**	1.498
	3.4%	27.6%	34.5%	31%	3.4%		
The Total Mean	**3.4%**	**13.8%**	**28.5%**	**32.8 %**	**21.3%**	**2.65**	**1.873**

As Table (8) illustrates, 21.3% of the sampled individuals perceive the full benefits offered by Green Fins certification, while 32.8% of respondents expressed partial awareness of these benefits. Conversely, 17% of respondents affirmed their lack of awareness regarding the benefits associated with obtaining Green Fins certification.
Furthermore, Table (8) reveals that 41.4% of respondents unequivocally confirmed the role of Green Fins certification in enhancing the reputation of safari yacht operators who acquire it. Additionally, 44.8% of respondents affirmed that operators obtaining this certification generally experience improved operational efficiency. Moreover, 34.5% of respondents highlighted the significant role of these certifications in attracting environmentally conscious customers and emphasizing the importance of environmental preservation. Finally, 31% of respondents indicated that Green Fins typically plays a role in reducing costs.

Challenges Encountered safari yacht operators in obtaining Green Fins certification

To identify the main challenges Encountered safari yacht operators in obtaining Green Fins certification, an open-ended question was posed to the sampled individuals, and their responses regarding these challenges varied.
Lack of resources or time emerged as the most significant challenge, accounting for 34.50%. This suggests that many companies may lack sufficient human or material capabilities, or adequate time, to fulfill the certification requirements. Directly following this is the cost of certification, at 25.50%, indicating that the financial burden presents a substantial barrier for companies, particularly small and medium-sized enterprises.
Ranking third in importance is the challenge of limited support or guidance, at 22%. This highlights the need for more assistance and direction for companies throughout the accreditation process. Difficulty in meeting certification criteria constitutes a challenge for 14.50% of respondents, implying that some companies find it arduous to satisfy the necessary technical or operational requirements.
Conversely, the least common challenges are only needing to have benefits from the government and being already certified, both at 2% each. This reflects that the majority of companies have not yet obtained the certification or do not solely rely on government incentives as their sole motivation. Overall, the primary challenges are concentrated in resources (time and capital) and a lack of external support, in addition to difficulties in meeting the established criteria.

Challenges Encountered by Safari Yacht Operators in Implementing Sustainable Environmental Practices

Sampled safari yacht operators expressed facing multiple challenges in implementing sustainable environmental practices. Foremost among these is limited knowledge or expertise, constituting 26.50% of responses, indicating their perceived lack of sufficient understanding or specialized skills necessary for effective implementation. This is directly followed by financial constraints, at 23%, confirming that cost remains a primary impediment not only for obtaining certifications but also for the execution of environmental practices themselves. Furthermore, operational disruptions represent a significant challenge, accounting for 20.50%, suggesting that integrating sustainable practices may disrupt daily operations or necessitate substantial modifications. Additionally, staff resistance accounts for 14.50% of the challenges, reflecting that

their non-acceptance or opposition to change can impede the adoption of new practices.

Hypothesis Testing

The First Hypothesis: There is a relationship between the Water Conservation Measures of Safari Yacht Operators and obtaining the Green Fins certification.

To test the hypothesis, both the Chi-square test and Spearman's rho correlation coefficient test were employed.

Table (9) Chi-square

	Obtaining the Green Fins certification	Water Conservation Measures of Safari Yacht Operators
Chi-Square	18.241[a]	8.069[b]
df	1	4
Asymp. Sig.	.000	.019

As Table (9) illustrates, the Asymp. value is (0.00), which is less than 5% (0.05). This indicates a statistically significant relationship between the two variables. That is to say, obtaining Green Fins certification by safari yacht operators supports the implementation of water and resource conservation measures.

To determine the strength of the relationship between the variables, Spearman's rho correlation coefficient test was employed.

Table (10) test the relationship between the Water Conservation Measures of Safari Yacht Operators and obtaining the Green Fins certification.

	Variables		Obtaining the Green Fins certification	Water Conservation Measures of Safari Yacht Operators
Spearman's rho	Obtaining the Green Fins certification	Correlation	1.000	.435*
		Sig.	.	.008
	Water Conservation Measures of Safari Yacht Operators	Correlation	.435*	1.000
		Sig.	.008	.

* Correlation is significant at the 0.05 level (2-tailed).

As Table (10) illustrates, the Sig. value is less than 5% (0.05), which indicates a statistically significant relationship between the two variables. Furthermore, the Correlation Coefficient value is .435*, signifying a moderately strong relationship between the variables. The positive value of the Correlation Coefficient further indicates a direct (or positive) correlation. Consequently, a relationship exists between safari yachts obtaining Green Fins certification and the conservation of water and resources.

The Second Hypothesis: There is a relationship between Coral Reef Protection Practices and Ecological Footprint Mitigation and obtaining the Green Fins certification.

To test the hypothesis, both the Chi-square test and Spearman's rho correlation coefficient test were employed.

Table (11) Chi-square

	Obtaining the Green Fins certification	Coral Reef Protection Practices and Ecological Footprint Mitigation
Chi-Square	18.241[a]	11.138[b]
Asymp. Sig.	.001	.001

As Table (11) illustrates, the Asymp. Sig. value is (0.00), which is less than 5% (0.05). This indicates a statistically significant relationship between the two variables. That is to say, obtaining Green Fins certification by safari yacht operators supports Coral Reef Protection Practices and Ecological Footprint Mitigation.

To determine the strength of the relationship between the two variables, Spearman's rho correlation coefficient test was employed.

Table (12) the relationship between Coral Reef Protection Practices and Ecological Footprint Mitigation and obtaining the Green Fins certification

			Obtaining the Green Fins certification	Coral Reef Protection Practices and Ecological Footprint Mitigation
Spearman's rho	Obtaining the Green Fins certification	Correlation	1.000	0.225+
		Sig	.	.001
	Coral Reef Protection Practices and Ecological Footprint Mitigation	Correlation	0.225	1.000
		Sig.	.001	.

As Table (12) illustrates, the Sig. value is less than 5% (0.05), which indicates a statistically significant relationship between the two variables. Furthermore, the Correlation Coefficient value is .225*, signifying a weak relationship. Consequently, a relationship exists between Obtaining the Green Fins certification and Coral Reef Protection Practices and Ecological Footprint Mitigation.

The Third Hypothesis: There is a relationship between Environmental training to crew members and obtaining the Green Fins certification.

To test the hypothesis, both the Chi-square test and Spearman's rho correlation coefficient test were employed.

Table (13) Chi-square

	Obtaining the Green Fins certification	Environmental training to crew members
Chi-Square	18.241[a]	2.310[b]
Asymp. Sig.	.000	.011

As Table (13) illustrates, the Asymp. Sig. value is (0.00), which is less than 5% (0.05). This indicates a statistically significant relationship between the two variables. That is to say, obtaining Green Fins certification by safari yacht operators supports implementing environmental training for yacht staff.

To determine the strength of the relationship between the two variables, Spearman's rho correlation coefficient test was employed.

Table (14) the relationship between and Environmental training to crew members and obtaining the Green Fins certification

			Obtaining the Green Fins certification	Environmental training to crew members
Spearman's rho	Obtaining the Green Fins certification	Correlation	1.000	.652
		Sig.	.	.021
	Environmental training to crew members	Correlation	.625	1.000
		Sig.	.024	.

As Table (14) illustrates, the Sig. value is less than 5% (0.05), which indicates that the relationship between the two variables is statistically insignificant. However, the Correlation Coefficient value is .652*, signifying a strong relationship. Consequently, a relationship exists between safari yachts obtaining Green Fins certification and implementing environmental training for yacht staff.

The Fourth Hypothesis: There is a relationship between increased awareness of responsible tourism and obtaining the Green Fins certification.

To test the hypothesis, both the Chi-square test and Spearman's rho correlation coefficient test were employed.

Table (15) Chi-square

	Obtaining the Green Fins certification	increasing awareness of responsible tourism
Chi-Square	18.241[a]	6.172[b]
df	1	3
Asymp. Sig.	.000	.004

As Table (15) illustrates, the Asymp. Sig. value is (0.00), which is less than 5% (0.05). This indicates a statistically significant relationship between the two variables. That is to say, obtaining Green Fins certification supports increasing awareness of responsible tourism.

To determine the strength of the relationship between the two variables, Spearman's rho correlation coefficient test was employed.

Table (16) the relationship between increased awareness of responsible tourism and obtaining the Green Fins certification.

			Obtaining the Green Fins certification	increasing awareness of responsible tourism
Spearman's rho	Obtaining the Green Fins certification	Correlation	1.000	.585
		Sig. (2-tailed)	.	.021
	practices to protect coral reefs	Correlation	.585	1.000
		Sig. (2-tailed)	.021	.

As Table (16) illustrates, the Sig. value is less than 5% (0.05), which indicates a statistically significant relationship between the two variables. Furthermore, the Correlation Coefficient value is .603*, signifying a strong relationship. Consequently,

a relationship exists between safari yachts obtaining Green Fins certification and increasing awareness of responsible tourism.

Discussion

The study findings revealed a correlation between obtaining Green Fins certification and water conservation practices, along with reduced leakage among safari yacht operators in the Red Sea, including Quseir, Hurghada, and Marsa Alam. This aligns with the findings of Wong & Lai (2024), which indicated that green certifications had a positive effect on water-saving behaviors among hotel guests. Furthermore, Slocum & Curtis (2016) affirmed the importance of consumption reduction and resource conservation.

The study also found a positive relationship between obtaining Green Fins certification and practices for coral reef protection and ecological footprint mitigation. This is consistent with the results of Hunt et al. (2013) and Roche et al. (2016), which emphasize that implementing the Green Fins approach enhances compliance with environmental standards and can significantly reduce the diving industry's impact on the marine environment. In contrast, Klein & Dodds (2018) view environmental certifications more as a tourism promotion tool than an environmental management or ecological footprint reduction tool, while Homan & Witabora (2022) consider Green Fins certification an important approach to environmental conservation management.

Moreover, the study established a relationship between obtaining Green Fins certification and the focus on training safari yacht staff in environmental practices. This aligns with Walker's (2016) study, which confirms that environmental certifications drive operators to train staff to achieve good environmental indicators and thus retain environmental certifications. Meanwhile, Seraphin & Maingi (2023) suggest that the results of yacht staff training, along with their ability for green communication and green innovations, can reverse unsustainable environmental trends and achieve sustainability.

The study also identified a significant relationship between obtaining Green Fins certifications and fostering environmental awareness among tourists, as well as adopting a responsible tourism approach. This is consistent with Medina's (2005) study, which emphasizes the importance of environmental certifications as a means to distinguish legitimate ecotourism from counterfeit 'greenwashed' products, in addition to the necessity of ensuring community benefits within environmental certification. Furthermore, studies by Wong & Lai (2024) and Cristiana (2008) affirm that environmental certifications attract customers as a marketing tool, as obtaining them assures tourists that the tourism products and services they purchase align with sustainable development policies and principles.

The study revealed that the benefits of Green Fins certifications include supporting environmental compliance for safari yachts, improving the ecological footprint, reducing consumption, attracting customers, and building a good reputation for yacht operators. This is corroborated by Dias et al. (2024), who concluded that the drivers for implementing certification programs include improving a company's image and customer-based brand equity, strengthening competitiveness, achieving eco-efficiency, cost reduction, and competitive advantage.

Finally, the study found that the most prominent challenges facing safari yacht operators and hindering them from obtaining Green Fins certifications are a lack of resources or time (34%), in addition to their perception that certification costs may be high, a lack of knowledge and guidance, and resistance to change. This aligns with Dias et al. (2024), who identified obstacles to obtaining environmental certifications as difficulties in meeting certification criteria, adapting working methods, high costs, and reduced price competitiveness.

Recommendations

- The Ministry of Tourism, the Ministry of Environment, and the Chamber of Diving and Water Sports should implement intensive and continuous awareness programs regarding the importance and requirements of environmental certifications.
- Standardizing and simplifying the procedures for obtaining certifications is essential, while ensuring transparency in the evaluation process.
- Relevant authorities responsible for tourism promotion campaigns must emphasize the importance of choosing tour operators who hold environmental certifications.

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