

ASERS

# Journal of Environmental Management and Tourism

Quarterly

Volume XIV

Issue 7(71)

Winter 2023

ISSN 2068 – 7729

Journal DOI

<https://doi.org/10.14505/jemt>

ASERS  
Publishing



Editor in Chief:

**Ramona Pirvu,**  
University of Craiova, Romania

Co-Editor:

**Cristina Mihaela Barbu,**  
Spiru Haret University, Romania

**Editorial Advisory Board:**

**Omran Abdelnaser,** University Sains  
Malaysia, Malaysia

**Huong Ha,** Singapore University of Social  
Sciences, Singapore

**Harjeet Kaur,** HELP University College,  
Malaysia

**Janusz Grabara,** Czestochowa University of  
Technology, Poland

**Vicky Katsoni,** Technological Educational  
Institute of Athens, Greece

**Sebastian Kot,** Czestochowa University of  
Technology, The Institute of Logistics and  
International Management, Poland

**Andreea Marin-Pantelescu,** Academy of  
Economic Studies Bucharest, Romania

**Piotr Misztal,** The Jan Kochanowski  
University in Kielce, Faculty of Management  
and Administration, Poland

**Agnieszka Mroziak,** Faculty of Biology and  
Environmental Protection, University of  
Silesia, Katowice, Poland

**Chuen-Chee Pek,** Nottingham University  
Business School, Malaysia

**Roberta De Santis,** LUISS University, Italy

**Fabio Gaetano Santeramo,** University of  
Foggia, Italy

**Dan Selişteanu,** University of Craiova,  
Romania

**Lesia Kucher,** Lviv Polytechnic National  
University, Ukraine

**Lóránt Dénes Dávid,** Eötvös Loránd  
University, Hungary

**Laura Ungureanu,** Spiru Haret University,  
Romania

**Sergey Evgenievich Barykin,** Peter the  
Great St. Petersburg Polytechnic University,  
Russian Federation

**Omar Abedalla Alananzeh,** Faculty of  
Tourism and Hotel Management, Yarmouk  
University, Jordan

**Marco Martins,** Polytechnic Institute of  
Tomar, Portugal

**Konstantinos Antoniadis,** University of  
Macedonia Thessaloniki, Greece

ASERS Publishing

<http://www.asers.eu/asers-publishing>

ISSN 2068 – 7729

Journal DOI: <https://doi.org/10.14505/ijemt>

## Table of Contents:

	<b>Promising Directions of Increasing Energy Efficiency and Development of Green Energy in the Household Sector of Ukraine</b>	2821
1	Olha PROKOPENKO, Oleksandr TELIZHENKO, Yevhen KOVALENKO, Svitlana LYTVYENENKO, Tetiana NYCH, Andriy KOVALSKY	
	<b>Implementation of Green Banking In the Largest Polish and Romanian Commercial Banks – An Analysis of Progress, Strengths and Weaknesses</b>	2835
2	Błażej LEPCZYŃSKI, Małgorzata SIEMIONEK-RUSKAN, Mina FANEA-IVANOVICI	
	<b>Innovative and Marketing Features of Agri-Food Supply Chain Development</b>	2844
3	Ilona YASNOLOB, Nataliia DEMIANENKO, Oleg GORB, Yurii TIUTIUNNYK, Svitlana TIUTIUNNYK, Lyudmyla SHULGA, Tetiana DUGAR, Olena MAIBORODA, Svitlana PYSARENKO, Yuliia POMAZ	
	<b>Impact of the Perceived Quality of Traditional Villages' Cultural Landscapes on Tourists' Loyalty</b>	2853
4	Huaheng SHEN, Nor Fadzila AZIZ, Menglan HUANG, Lingyun YU	
	<b>Influence of Digital Technologies on Transition to a Circular Economy in Tourism: Values and Barriers</b>	2871
5	Samalgui NASSANBEKOVA, Gaukhar YESHENKULOVA, Nurkhat IBADILDIN	
	<b>Quality of Environmental Impact Assessment Reports for Lodge Developments in Protected Areas: The Okavango Delta Case, Botswana</b>	2880
6	Leungo Boikanyo L. LEEPILE, Claudine ROOS, Francois Pieter RETIEF, Hans Jurie MOOLMAN, Reece Cronje ALBERTS, Dirk Petrus CILLIERS	
	<b>Mitigating Pollution at the Source and Textile Waste Minimization in Poland: Findings from In-House Research</b>	2894
7	Dagmara SKURPEL	
	<b>Assessment and Forecast of Atmospheric Air Quality at the Regional Level. Example of Central Kazakhstan</b>	2904
8	Raikhan BEISENOVA, Bektemir ZHUMASHEV, Rumiya TAZITDINOVA, Zhanar RAKHYMZHAN, Symbat TULEGENOVA, Zhanat ZHAZNAYEVA	
	<b>Sustainable Energy Systems and Green Hotel Practices in Hotels in Tamale Metropolis, Ghana</b>	2915
9	Patricia Animah APPIAH, Raymond ADONGO, Abdul-Rafiw SAFO	
	<b>The Legal Framework Governing the Offence of Environmental Pollution in Jordan and the Sultanate of Oman</b>	2935
10	Ashraf Mohamad GHARIBEH, Mohammed Rashid Ahmed Al MAKHMARI, Radwan Ahmad Al HAF, Mohammad Njim Ibrahim ELAYAT, Ahmad Hussein ALSHARQAWI	
	<b>Exploring Ecological Justice in the Regulatory Framework of Land Ownership, Utilization, Control, and Inventory in Indonesia</b>	2944
11	Agung BASUKI, Lego KARJOKO, I Gusti Ayu Ketut Rahmi HANDAYANI	
	<b>Cultural Aspects of Waste Management in Poland and China</b>	2954
12	Kalina Maria TACZKOWSKA, Maciej BORKOWSKI	
	<b>Task-Based Budgeting In Environmental Projects Planning: A Case Study of A Manufacturing Company In Poland</b>	2968
13	Anna SIEMIONEK-LEPCZYŃSKA, Michał CHALASTRA	

# Call for Papers Spring Issues 2024 Journal of Environmental Management and Tourism

**Journal of Environmental Management and Tourism** is an open access, peer-reviewed interdisciplinary research journal, aimed to publish articles and original research papers that contribute to the development of both experimental and theoretical nature in the field of Environmental Management and Tourism Sciences. The Journal publishes original research and seeks to cover a wide range of topics regarding environmental management and engineering, environmental management and health, environmental chemistry, environmental protection technologies (water, air, soil), pollution reduction at source and waste minimization, energy and environment, modelling, simulation and optimization for environmental protection; environmental biotechnology, environmental education and sustainable development, environmental strategies and policies.

Authors are encouraged to submit high quality, original works that discuss the latest developments in environmental management research and application with the certain scope to share experiences and research findings and to stimulate more ideas and useful insights regarding current best-practices and future directions in Environmental Management.

Also, this journal is committed to a broad range of topics regarding Tourism and Travel Management, leisure and recreation studies and the emerging field of event management. It contains both theoretical and applied research papers and encourages obtaining results through collaboration between researchers and those working in the tourism industry.

The journal takes an interdisciplinary approach and includes planning and policy aspects of international, national and regional tourism as well as specific management studies. Case studies are welcomed when the authors indicate the wider applications of their insights or techniques, emphasizing the global perspective of the problem they address.

**Journal of Environmental Management and Tourism** is indexed in SCOPUS, RePEc, CEEOL, ProQuest, EBSCO and Cabell Directory databases.

Details regarding the publication in this journal are here: <https://journals.aserspublishing.eu/jemt/about>

**Deadline for submission:** 15<sup>st</sup> February 2024

**Expected publication date:** March 2024

**Website:** <https://journals.aserspublishing.eu/jemt>

**E-mail:** [jemt@aserspublishing.eu](mailto:jemt@aserspublishing.eu)



DOI: [https://doi.org/10.14505/jemt.v14.7\(71\).09](https://doi.org/10.14505/jemt.v14.7(71).09)

## Sustainable Energy Systems and Green Hotel Practices in Hotels in Tamale Metropolis, Ghana

Patricia Animah APPIAH

Department of Ecotourism and Hospitality Management  
Faculty of Natural Resources and Environment  
University for Development Studies (UDS), Ghana  
[appaihpatrisha@gmail.com](mailto:appaihpatrisha@gmail.com)

Raymond ADONGO (PhD)

Department of Environment and Sustainability Sciences  
Faculty of Environment and Natural Resources  
University for Development Studies (UDS), Ghana  
[radongo@uds.edu.gh](mailto:radongo@uds.edu.gh)

Abdul-Rafiw SAFO

Department of Geography and Rural Development,  
Kwame Nkrumah University of Science and Technology (KNUST), Ghana  
[saforafiu505@gmail.com](mailto:saforafiu505@gmail.com)

**Article info:** Received 3 September 2023; Received in revised form 21 September 2023; Accepted for publication 29 October 2023; Published 08 December 2023. Copyright© 2023 The Author(s). Published by ASERS Publishing 2023. This is an open access article distributed under the terms of CC-BY 4.0 license.

**Abstract:** The hotel sector, along with numerous other tourism-related industries, significantly poses a threat to the environment through its extensive consumption of resources like water, energy, and non-durable items. The hotel industry is also well known for its large-scale discharge of raw and solid waste in varying proportions. As a result, numerous hotels have begun implementing innovative approaches to enhance the sustainability of their operations in efforts to alleviate their environmental impact while also addressing the increasing environmental concerns expressed by customers. Employing a cross-sectional design and quantitative approach and using both descriptive and inferential analysis, we assess sustainable energy systems and green hotel practices in the Tamale metropolis, Ghana. We find that majority of hotels in the Tamale metropolis have written green management policy. We also find that cost and customers understanding of green policies are the main challenges hindering their adaptation and implementation of sustainable energy systems. The study establishes a significant relationship between level of education and use of green energy practices. Again, the study finds staff strength to be highly inter-linked with the existence of green management policy. To this end, we recommend that operators should implement training programs for staff, replace fossil fuels with renewable energy sources and educating the citizens to foster increased awareness and trust in renewable energy systems, as well as to provide proper training for their effective utilization.

**Keywords:** green hotel practices; hospitality industry; tourism industry; sustainable energy systems.

**JEL Classification:** L83; Q40; Z32.

### Introduction

The hospitality industry is one of the fastest and rapidly growing industries globally, with the hotel industry being one of its most dynamic and valuable sub-sectors (Ozturkoglu, Sari, and Saygili 2021, 39; Pandey, Sahu, and Joshi 2022, 1). The hotel industry, for instance, generates income, employment and business opportunities which accounts for a significant portion of both national and local income worldwide (Dimitrić, Tomas Žiković, and Arbula Blečić 2019). In an attempt to provide levels of luxury, entertainment, attraction, comfort and varieties of desired products and services, the hospitality industry consumes (and wastes) large amounts of energy (Bohdanowicz, Churie-Kallhauge, and Martinac 2001, 2). Globally, the largest proportion of the energy used in the hospitality industry is based on fossil fuels (Rauf *et al.* 2021). This leads to excessive emission of greenhouse gases (GHG)

as well as other pollutants that significantly contribute to local, national and even global environmental degradation (Shen *et al.* 2020).

The tourism industry is multifaceted and multidisciplinary with far-reaching impacts in terms of sustainable development (Kuklina *et al.* 2021, 8042). The number of international tourist arrivals has surged from 25 million in 1950 to approximately 1.5 billion in 2019 (UNWTO 2019, 23). Moreover, there is an anticipation of annual growth in arrivals at a rate of 3.3% from 2010 to 2030, with a projected total reaching 1.8 billion as per the long-term forecast by UNWTO (UNWTO 2019). These trends in terms of tourist arrivals raise concerns about energy efficiency and clean energy demand.

Sustainable tourism in recent years has been advanced as a concept focused on reducing the adverse impacts of tourism on the environment. According to the UNWTO, sustainable tourism is defined as tourism that comprehensively considers its present and future economic, social, and environmental consequences, while also addressing the needs of tourists, the tourism industry, the environment, and local communities (Jorba 2021). The hospitality industry has the potential to become one of the most effective drivers for sustainable development. Many developing countries promote tourism because it serves as a platform for job creation, increasing community income and maximizing both government revenues and foreign exchange earnings (Havi and Enu 2013).

The hospitality industry was once considered to be a lot safer and less environmentally harmful as compared to other industries such as mining and manufacturing industries (Khan *et al.* 2020). But this idea is currently far from the truth as the hospitality industry generates more adverse environmental impact than most industries (Schoffstall 2013). The hospitality industry consumes an enormous amount of energy and water and also emit a very large amount of carbon dioxide contributing to global warming (Bohdanowicz 2006, 663). Research has shown that whilst energy demand and consumption in the hospitality industry is significantly increasing, a large chunk of it is mostly wasted (Adedoyin and Bekun 2020). For instance, about 42% of the energy used to heat and cool spaces in hotels is typically wasted. The primary sources of this wastage are malfunctioning or ineffective systems, along with the behavior and actions of both guests and staff members (Petrevska, Cingoski, and Serafimova 2016; Ishmael Mensah 2013). Also, it has been revealed that guests waste energy by leaving the television, lights, fans and air conditions on when leaving their rooms (Vaidya, Chatterjee, and Bhopatkar 2022).

The energy-saving potential in the tourism and hospitality industry is very significant (Parpairi 2017). To satisfy the goals outlined in the Paris Climate Agreement, the hotel industry must reduce its annual greenhouse gas emissions per room by 66% by 2030 and by 90% by 2050 (HOTREC 2018). Globally, countries are taking and adopting measures to advance sustainable tourism. The EU directives regarding the energy efficiency of buildings have established a requirement for all newly constructed buildings, including hotels, to achieve Nearly Zero Energy Building (NZEB) status by the year 2020 (HOTREC 2018). It is paramount for the hospitality industry to adopt energy-saving practices to minimize the emissions of GHG's.

A study by Kuuder *et al.* (2013, 2), revealed that the hospitality industry, especially hotels use a vast amount of electrical energy (electricity) and energy from fossil fuels in its diverse departments. Due to this, energy saving has been deemed very significant in the hotel industry as a way of minimizing environmental impact and improving environmental management. According McLeish (2007), United State Environmental Protection Agency indicated in their report that, minimizing the use of energy by ten per cent (10%) across the hospitality sector would save approximately \$285 million. Another study carried out by Bohdanowicz (2006) revealed that green practices have a promising potential for energy saving in the accommodation and hospitality sector. The study further indicated that green practices such as the replacement of light bulbs with energy saving bulbs or energy efficient bulb, depending on the size and age of the firm, would save up to ten to twenty-five percent (10-25%) energy. As indicated by Deraman *et al.* (2017), green practices that the hospitality industry could adopt to save energy and minimize pollution includes, the implementation of renewable energy systems and programs that are sustainable. Examples are, wind power, solar power, adoption of energy control systems, power from river run-offs, employing the use of thermostat that are digital to regulate guestroom energy consumption, energy-efficient laundry equipment installation, installing sensors that automatically turns of lights when the guest goes out of the room, implementing smoke-free policies in order to reduce air circulating equipment, installing a triple-glazed windows or even more effectively, using reflective glass can result in energy savings that can be allocated to heating and cooling needs. The hospitality industry predominantly expends energy on space heating, ventilation, cooling, hot water, laundry, lighting, recreational facilities, kitchen operations, and various other purposes.

Energy consumption of the hospitality industry varies across the globe (Thommandru *et al.* 2023). This means that, energy consumption patterns may vary significantly depending on some factors such as location and



available energy. The hospitality industry in Europe, particularly hotels, consumes approximately, 39 billion kilowatts of energy annually, mostly in the form of electrical energy (Dascalaki and Balaras 2004). New Zealand uses about 75% of electricity as their energy source, although there are other energy sources such as coal, Liquefied Petroleum Gas (LPG), petroleum fuel and other natural gas and wood (Grové 2017). The use various energy forms in the hospitality industry have led to the emission of toxic gases such as carbon dioxide (CO<sub>2</sub>) into the atmosphere which results in the enhancement of air pollution and even global warming (Bohdanowicz 2006). Analyzing the various patterns of energy consumption, it is evident that, the hospitality industry, including hotels, restaurants, bars and tourism destinations can bring about a vast and significant contribution to environmental safety and health by putting in place, measures and practices (green practices) to minimize energy consumption (and waste).

Kapiki (2010), opines that innovative energy management systems that are new and optimal could reduce emissions and energy costs by 65%. It was indicated in the study by Kapiki (2010) that, most of the five (5) star rated hospitality firms as compared to four (4) star hospitality firms, implemented green practices and installed energy saving systems and appliances as well as had obtained green certification. However, such initiatives are hardly implemented in developing countries. This may be as a result of low awareness on the impacts of not adopting green practices as well as inability to incur the cost associated with the implementation of sustainable energy systems such as solar energy and other clean renewable energies.

Globally, the importance of energy efficiency, especially in the tourism and hospitality sectors has been extensively researched. However, in countries like Ghana, there is a seeming lack of evidenced based data on the current state of sustainable energy systems, operational and technological innovations being adopted in the tourism and hospitality industry. Literature is clear on green practices and sustainable energy systems installation by hotels in North America, Europe and Asia (Ishmael Mensah 2013). Also, similar number of studies has been done in other developing parts of world like country as indicated in a study done by Dief and Font (2010). However, green energy practices and efficient sustainable energy systems by the hospitality industry in Ghana, have not been given research attention. Hence it is prudent to ascertain the extent to which the hospitality firms in Tamale metropolis are installing efficient sustainable energy systems and implementing green energy practices to mitigate negative impacts of their doings on the environment, and how these systems contribute to or hinder productivity and profitability.

This study's distinctive contribution lies in examining green initiatives within hotels to support environmental sustainability, particularly in economically disadvantaged regions. With limited empirical research on how green hotel practices affect Sustainable Development Goals (SDGs), especially in economically challenged nations, our study addresses this gap. We investigate how hotels contribute to goals such as clean water and sanitation (SDG 6), clean energy (SDG 7), responsible consumption and production (SDG 12), and climate action (SDG 13). By shedding light on the practical efforts and outcomes of green practices in the hospitality sector within the Tamale Metropolis, our research provides valuable insights for the global conversation on sustainable development and the role of businesses in advancing these critical goals. Specifically, the study seeks to firstly, assess the efficient sustainable energy policies of hospitality sector operators in the Tamale Metropolis. Second, to identify energy conservation practices (green practices) adopted by the hospitality firms in the Tamale Metropolis, thirdly to assess the challenges in adopting efficient sustainable energy systems by the hospitality industry operators in Tamale Metropolis, and finally, to examine the relationship between categories of operators and the adoption of sustainable energy systems.

## 1. Literature Review

### 1.1. Conceptualizing and Defining Sustainable Energy Systems and Green Hotel Practices

Essentially, green hotels refer to hotels that strive to enhance their energy efficiency, water, and materials without it having a negative effect on the quality of service provided (Prakash *et al.* 2023). The many benefits that hoteliers stand to reap from implementing green practices are already known. These advantages encompass enhanced brand value, fostering a positive guest perception, cost and liability reduction, and an augmentation of profits. Moreover, numerous hotels have initiated Corporate Social Responsibility (CSR) initiatives and adopted social programs. Hotel proprietors recognize their role in contributing to environmental harm and feel a moral obligation to make amend (Im, Chung, and Qin 2023). In 2008, the Intercontinental Hotel Group (IHG) pioneered the concept of eco-friendly hotels and became the world's inaugural one hundred percent environmentally-conscious hotel (Deraman *et al.* 2017). Their eco-friendly initiatives encompassed charitable donations of non-perishable food, rooftop installation of solar panels, a rainwater harvesting system for toilet water supply, wind power-generated electricity, and the utilization of recycled materials for windows, furniture, and fixtures.

## 1.2. Cost and Energy Use in the Hospitality Sector

In an average hotel, the costs of energy forms about 6-8% of total turnover. The energy cost of an energy friendly business is always around 2-3 % of total turnover (Abdou, Hassan, and El Dief 2020). Given their significant impact on controllable expense, operators must exercise prudence and efficiency when managing energy consumption to achieve profitability (López-Gamero *et al.* 2023). In temperate regions, a hotel's energy usage can be divided into several components: approximately 30% for heating, around 17% for water heating, roughly 15% for cooling, 12% for lighting, and about 5% for cooking (Borowski *et al.* 2020). The overall energy profile is still influenced by various factors, including hotel size, the number of rooms and buildings, classification, restaurant capacity, wellness area size, target clientele (business or leisure), location (urban or rural), climate zone, occupancy rates, and the range of services and amenities offered in guest rooms (Koščak and O'Rourke 2023).

Furthermore, it is also important to notice the most important areas where the use of energy is intense. Hotels can be categorized into three distinct zones, each serving unique functions: the guest room area (comprising bedrooms and bathrooms), the public area (encompassing the reception area, lobby, bars, restaurants, wellness facilities, meeting rooms, floors, and elevators), and the service area (encompassing the kitchen, offices, laundry, staff facilities, and technical sector). Due to the considerable disparity in energy dynamics within these three primary zones, hotels must establish transparency in cost tracking and remain vigilant about managing energy expenses in a manner that aligns with the specific energy needs of each area. The guest room area operates with varying energy demands, contingent upon factors such as room layout, including extensive glazing, for instance. Conversely, the service area typically consumes a substantial amount of energy, particularly for cooling, ventilation, and technical equipment heating, making it an energy-intensive zone (Koščak and O'Rourke 2023).

It is believed by many hotel operators that are adopting green practices and sustainable energy systems often perceive it as a significant hindrance due to the associated extra expenses. This belief aligns with previous environmental studies conducted on lodging, small enterprises, and corporate entities, all of which identified a need for increased expenditure (Khatter *et al.* 2021). Earlier studies by Martínez Ceseña, Good, and Mancarella (2015) revealed that most business wanted to receive a payback within the shortest possible time. Huq and Stevenson (2020) believe that some cost related factors are part of the reasons why some managers are reluctant in implementing green practices. The other factors include environmental auditing, certification fees and facilities improvement (Deraman *et al.* 2017).

On the contrary, Tanveer, Yusliza, and Fawehinmi (2023) reported that as much as hotel managers see green practices as a burden, it is not, but indeed, transitioning into an eco-conscious enterprise can lead to lowered operational expenses and heightened revenue generation. Yusof and Jamaludin (2013) report that, many hotel managers in Malaysia are hesitant to adopt green practices due to their assertion that such implementations come with high costs. However, the research findings indicate that chain-affiliated hotels typically benefit from robust financial backing from their parent companies, in contrast to non-chain-affiliated resorts. This financial discrepancy leaves the latter with limited capital capacity, leading to their reluctance to pursue energy-efficient initiatives.

## 1.3. State of Sustainability in the Hotel Industry

Many hospitality firms are currently on the pursuit of sustainability which is currently deemed crucial for the development of hospitality firms (Shen *et al.* 2020). The growth of the hotel sector makes a substantial contribution to environmental harm on a global scale, primarily due to energy and water-intensive processes like heating, cooling, and lighting, which have adverse environmental repercussions. Some hotels have chosen to implement measures that seek to protect the environment while improving on the lives of people (Abdel-Maksoud, Kamel, and Elbanna 2016; Dimara, Manganari, and Skuras 2017)

In an attempt to address the issues of sustainability in the hospitality industry from different perspectives, studies such as Kapera (2018), Han *et al.* (2018) and Jauhari (2014) have assessed the hotel industry's capacity for putting sustainable development principles into action, examining the hurdles and current status of their implementation, exploring the impact of guest perceptions on water conservation and waste reduction practices, and how this shapes guest willingness to engage in eco-friendly initiatives and build loyalty. Additionally, investigating the design strategies for eco-conscious hotels, strategies for lowering energy consumption, and the role of modern technology in advancing sustainability efforts. Eugenia Ruiz-Molina, Gil-Saura, and Šerić (2013) demonstrated that the utilization of information and communication technologies has the potential to lower energy consumption. Various research studies have also illustrated that the adoption of environmentally-friendly practices

in hotels can result in decreased operational expenditures and enhanced profitability. Simultaneously, these practices improve guest satisfaction, foster loyalty, support environmental preservation, and confer a competitive edge (Alipour, Safaeimanesh, and Soosan 2019; Prakash *et al.* 2023; Barakagira and Paapa 2023). However, there has been limited empirical research into how green hotel practices contribute to the attainment of sustainable development objectives, particularly in economically disadvantaged nations. Consequently, the recent study seeks to investigate the eco-friendly initiatives implemented by hotels to support environmental sustainability goals, specifically those associated with access to clean water and sanitation (SDG 6), affordable and clean energy (SDG 7), responsible consumption and production (SDG 12), and climate action (SDG 13).

From a tourism industry standpoint, various initiatives are underway to address inconsistencies in benchmarking energy efficiency. The International Tourism Partnership (ITP) and the World Travel and Tourism Council (WTTC) are working to coordinate the endeavors of hotel companies in measuring carbon emissions and conveying this data using a standardized methodology based on GHG protocol standards. This standardization aims to facilitate better comparisons of energy efficiency across the industry. Additionally, sustainability reporting standards have seen enhancements through the Global Reporting Initiative (GRI), which encompasses a standardized reporting framework for hotel organizations. This framework covers social, environmental, economic, and governance aspects. It is crucial to take decisive steps toward the disclosure of sustainability information, as it holds hotel organizations accountable for their actions (Martínez García de Leaniz, Herrero Crespo, and Gómez López 2018).

#### **1.4. Green Energy Initiatives and Conservation Practices in the Hotel Industry**

Green energy endeavors encompass projects involving renewable energy sources and energy conservation practices (Liu *et al.* 2022). In essence, renewable energy technology provides a solution that uses energy from nature (that is, the sun, wind, etc. in the broadest sense) to generate energy and reduce its reliance on fossil fuels. On the other hand, energy-saving measures, including energy-efficient technologies, reduce energy consumption (Abdou, Hassan, and El Dief 2020). Abdou, Hassan, and El Dief (2020) revealed in their study that green hotel practices encompass energy conservation, effective water management, and efficient waste management.

Efforts related to water management and conservation are frequently employed as a vital strategy for environmentally conscious management in the hotel industry (Wyngaard and de Lange 2013; Gabarda-Mallorquí *et al.* 2021). The hotel uses a large amount of water in its daily work (Cruz-Pérez *et al.* 2022). The volume of water utilized in the hotel sector is contingent upon factors such as the hotel's size, capacity, occupancy rates, and the range and quality of services and amenities provided (Zhang *et al.* 2023). Water-saving measures adopted in the hotel sector include the installation of water-saving devices and equipment (for example, early morning and late-night plants, reclaimed water (from washing vegetables and fruits) to limit evaporation (Abdou, Hassan, and El Dief 2020). Others include monitoring grass irrigation and water usage in order to avoid water wastage (H. Han *et al.* 2018). Regarding waste management, the hospitality sector generates a significant quantity of both organic waste, which includes items like garden waste, food waste, and cooking oil waste, as well as non-organic waste, which includes materials such as linen, paper, and other solid waste (Tansel, Yeshenkulova, and Nurmanova 2021). Hotel operator's separate hotel waste by collecting recyclable items using clearly labelled trash cans and colored containers, purchase recycled content products, and effective collection of organic kitchen waste (Tansel, Yeshenkulova, and Nurmanova 2021). Hotel operators can use a variety of practices aimed at reducing hotel waste, such as collecting individual garbage, buy bulk foods and cleaning agents that doesn't have toxic substances, adopts a donation programs, where food and linen are given to charitable organizations, and the repurposing of leftover guest soaps as laundry detergent, are among the sustainable practices employed (Han *et al.* 2018).

#### **1.5. Landscape of the Tourism and Hospitality Industry in Ghana**

The hospitality sector plays a pivotal role in Ghana's economy (Thams *et al.* 2020). This sector in Ghana comprises a diverse range of fields, including restaurants, transportation, lodging, hotels, guest houses, and various others (Ampofo 2020). Among these, the hotel and accommodation sector stand out as one of the most significant and indispensable components of the hospitality industry. This prominence is attributed to the fact that a substantial portion of hospitality services, as mentioned earlier, is primarily offered by standard hotels, rendering it the most vital sector within Ghana's hospitality industry (Ampofo 2020). To foster the growth of the hospitality industry in Ghana, the Ministry of Tourism Arts and Culture was established in 1993, underscoring the government's dedication to the hotel sector (Amoako *et al.* 2019).



As noted by Kuuder *et al.* (2013), several factors, including investor confidence, a remarkable political stability when compared to neighboring countries, and recent oil discoveries, offer a more detailed explanation for the recent upswing in Ghana's hospitality sector. Moreover, Mensah and Blankson (2014) have suggested that the hospitality industry is currently experiencing substantial growth, driven by government efforts to encourage investment and a consistent influx of tourists. Furthermore, the implementation of the Ghana Investment Promotion Centre Act (Law 478) in 1994, which offered incentives such as tax refunds, profit reimbursements, import exemptions, and other attractive investment perks, played a significant role in attracting foreign investment into the hotel industry (Teye 2008). The hospitality sector accounts for approximately 5.9% of all domestic employment opportunities and stands as the fourth most significant contributor to foreign currency earnings, following cocoa, gold, and foreign exchange (Mensah-Ansah, Martin, and Egan 2011; Havi and Enu 2013). In 2020, the hospitality industry in Ghana made a contribution of roughly 3.9 billion Ghanaian Cedis (GHS) (Ragasa, Amewu, and Asante 2021). The growth of tourists coming into the country is projected to increase rapidly and therefore require more hotels (Geoffrey Deladem *et al.* 2021). Interestingly, the distribution of hotels across the region was not uniform (Ishmael Mensah 2007). Greater Accra has about 40% of all registered hotels (Ishmael Mensah and Blankson 2014). A hotel has more than 10 rooms and the guest house has 4-9 rooms. Hotels in Ghana are rated on a star basis (according to international standards), depending on the facilities and services provided. Budget hotels and hotels without ratings do not meet international standards. The number of hotels and licensed accommodation in Ghana as of 2017 were 2,723 which increased to 3,538 in 2020 (Doris 2022).

### 1.6. Forms of Energy Consumption Systems in the Hospitality Industry in Ghana

Energy ranks as the second most substantial expenditure category for hotels, trailing only employment costs. It typically accounts for approximately 3 to 6% of a hotel's operating expenses and contributes to around 60% of its overall carbon dioxide (CO<sub>2</sub>) emissions (Koiwanit and Filimonau 2021). The consumption of energy within hotels is subject to a complex interplay of technical, architectural, local, and managerial factors. These factors can lead to substantial variations in energy usage, making it challenging to establish and predict energy targets within the hospitality sector, given the unique characteristics of each hotel (Strielkowski *et al.* 2021). Hotels typically allocate their energy consumption to various purposes, including ventilation systems, water heating, kitchen operations, space heating, cooling, lighting, laundry, recreational facilities, and other miscellaneous uses (Kuuder *et al.* 2013).

## 2. Materials and Methods

The study was conducted in the Tamale Metropolis, Northern Region of Ghana, known as the fourth-largest city and capital of the region. The vibrant hospitality industry in Tamale Metropolis comprises 123 registered establishments, including 22 hotels, 13 restaurants, 40 guest houses, 32 lodges, and 16 miscellaneous firms. The study employed a quantitative research approach with a cross-sectional design, utilizing well-structured paper-based questionnaires for data collection. The study population consisted of managers and owners of registered hospitality firms under the Ghana Tourism Authority (GTA), totalling 123 registered accommodation outlets in the metropolis. Non-probability sampling was used, with all registered hotels considered, and a list of outlets obtained from the GTA Regional Office. Primary data, collected through questionnaires, was supplemented with secondary information from GTA reports, online databases, and Ghana Statistical Service reports. Data underwent cleaning and error-checking in Microsoft Excel, followed by statistical analysis in SPSS version 20, encompassing descriptive and inferential methods. Descriptive analyses included examining respondents' characteristics, while cross tabulations and statistical tests were used to explore relationships between the existence of a green policy and various facility attributes, all at a 5% significance level. These methods aimed to provide a clear and precise presentation of data and establish significant relationships within the dataset (Moore, Notz, and Fligner 2013).

## 3. Research Methodology

### 3.1. Survey Design

A research design is a general approach a researcher takes to combine different parameters of the research into a meaningful and coherent way to address the research problem. It involves the collection, measurement and analysis of data (Palinkas *et al.* 2011). A quantitative research approach was chosen using a cross-sectional study design. This study design was chosen because, it is less costly, less time consuming and very effective for analyzing data from a population at a single point in time (Setia 2016). Well-structured paper-based questionnaires were administered to collect primary data.

### 3.2 Sampling

The study population were managers and or owners of the registered hospitality firms (accommodation and restaurant) under Ghana Tourism Authority (GTA) in Tamale Metropolis. Thus, a total of one hundred and twenty-three (123) registered accommodation outlets under GTA were considered for the study. A non-probability sampling technique was adopted for the study since all registered hotels in the Metropolis were considered. A list of all registered outlets was obtained from the Regional Office of the Ghana Tourism Authority.

### 2.4 Data Collection

Primary data collection was done by administering a well-structured questionnaire to the operators of the registered hospitality firms in the Tamale metropolis. A total of 110 questionnaires were returned and deemed fit for analysis. Secondary information was collected from reports from the Ghana Tourism Authority (GTA) and articles from online databases and reports from Ghana statistical service.

### 2.5 Data Analysis

The collected data underwent a process of cleaning and error-checking within Microsoft Excel.

## 5. Research Results

This section presents results from the analysis on data gathered from hotel managers and or operators within the Tamale metropolis.

### 5.1. Profile of Respondents

Table 1. Profile of the Respondents

Biodata	Frequency (f)	Percentage (%)
<b>Age</b>		
18-25	10	9.1
26-30	19	17.3
31-39	41	37.3
40-49	32	9.1
50-50	5	4.5
60+	3	2.7
<b>Sex</b>		
Male	87	79.1
Female	23	20.9
<b>Education Level</b>		
JHS/GCE O LEVEL	4	3.6
SHS/GCE A LEVEL	27	24.5
Diploma	27	24.5
Degree	48	43.6
Post Graduate	4	3.6
<b>Years of Work at the Facility</b>		
1-5	55	50.0
6-10	41	37.0
11-15	9	8.2
21-25	2	1.8
26-30	2	1.8
30+	1	0.9
<b>Age of Facility</b>		
5 or less	30	27.3
6-10	44	40.0
11-15	10	9.1
16+	26	23.6
<b>Ratings of Accommodation Facility</b>		
Guest House	12	10.9
Budget Hotel	73	66.4
1-star	10	9.1
2-star	15	13.6
<b>Total</b>	<b>110</b>	<b>100.0</b>

Source: Field Survey, 2022

Subsequently, statistical analyses were conducted using SPSS version 20, encompassing both descriptive and inferential methods. Descriptive analyses involved examining the frequencies of respondents' characteristics, such as gender, age, education level, tenure at the hospitality or accommodation facility, age of the facility, facility rating, and other demographic attributes. These descriptive analyses were employed to facilitate the presentation and visualization of the acquired data in a manner that enhances its clarity and precision, thereby simplifying and improving the interpretation of the data.

Cross tabulations were used to determine a relationship between the existence of a green policy against (age of facility, category of facility, rating, staff strength against management/ownership). Also, statistical associations were tested using correlations and Chi-square test to establish a relationship between the existence of a green policy and age of hotel, rating, management/ownership, category of facility, staff strength).

A significant level at 5% (two-tailed test) was used. Cross-tabulation analysis serves to minimize potential errors and unveils more insightful insights from the gathered data by examining relationships between variables, identifying frequencies of observations that exhibit multiple characteristics. Additionally, the Chi-square test was utilized to ascertain the statistical significance and relationships between the observed and expected data (Moore, Notz, and Fligner 2013).

A total of 110 managers and or owners from the Tamale metropolis took part in the questionnaire survey of which about 79% were males and 21% females. Out of this, 37% representing majority belonged to the age group of 31-39 years. A larger number of the respondents (44%) were degree holders with few (4%) holding post graduate degrees. About 50%, representing majority of the respondents have worked from 1-5 years in their facilities, 37.3% have worked from 6-10 years while just a few worked for 30 years and above. Considering the age of the facility, majority (40%) are 6-10 years old. Majority (66%) indicated budget hotel as the rating to their accommodation facility (see Table 1).

## 5.2 Green Management Policy/Rules

Table 2. Existence of Green Management Policy

Variable	Frequency (f)	Percentage (%)
Do you have a written Green organizational management policy/rule?		
Yes	98	89.1
No	12	10.9
Total	110	100.0

Source: Field Survey, 2022

Respondents were probed whether they have a written policy for green organizational management that outlines responsibilities and sequences of tasks or activities required to achieve both environmental sustainability and effective service delivery. As depicted on table 2, majority (89.1%) chose 'Yes', implying that they have written green management policies in their respective facilities. A few (10.9%) of participants on the other hand, chose 'No' indicating they have no written green management policies in their respective accommodation facilities.

Table 3. Respondents feedback on main focus of Green Policy in Accommodation facilities

Aim	Frequency (f)	Percentage (%)
Reduce costs of environment hazards.	33	33.7
Sustain the environment	6	6.1
Quality service in a clean environment	23	23.5
Clean and fresh vegetation	3	3.1
Safe and healthy environment	8	8.2
Clean environment/ sanitation	24	24.5
Avoid pollution	1	1.0
<b>Total</b>	<b>98</b>	<b>100.0</b>

Source: Field Survey, 2022

Respondents were further asked what the main focus of their Green Policy was. Out of the 110 respondents, majority (33.7%) highlighted that the main focus of their green management policy is to reduce costs of environmental hazards. About 25% suggested that maintaining a clean environment/sanitation is the main focus of the green management policy. Again, 24% held the position that quality service in a clear environment is the main focus of the green management policies in their facilities. Safe and healthy environment was also identified by 8% of respondents as the focus of green policy. About 6% indicated that green policy focus is to sustain the environment. While 3% highlighted clean and fresh vegetation as the focus of green policy, only 1 respondent posited avoidance of pollution as the focus of green policy. Each factor above was analysed individually with respect to the 110 responses. This is because each respondent was allowed to choose more than one option (see Table 3).

### 5.3 Energy Conservation Practices (Green Practices) Adopted by the Hospitality Firms

Respondents were asked to demonstrate the extent to which they implement or use common green conservation practices in their hotels, based on a four-point Likert scale; Always, Sometimes, Never and Yet to Start (Table 4).

Table 4. Respondents feedback on the efficient Conservation Practices adopted

Statements	Always (%)	Sometimes (%)	Yet to Start (%)	Never (%)	M	SD
Implements and depends largely on renewable energy programmes (e.g., use of wind or solar power) than the national grid	5 (4.5%)	9 (8.2%)	17 (15.5%)	79 (71.8%)	<b>3.02</b>	<b>0.60</b>
Reduces general lighting during daytime and makes sure that exterior lighting is switched on only at night	97 (88.2%)	6 (5.5%)	0 (0%)	7 (6.4%)	<b>1.15</b>	<b>0.48</b>
Install energy-efficient light bulbs with a lifespan 12 times greater than that of common incandescent bulbs'	96 (87.3%)	5 (4.5%)	3 (2.7%)	6 (5.5%)	<b>1.26</b>	<b>0.71</b>
Repairs or replaces faulty equipment's with more efficient and economical alternatives	47 (42.7%)	31 (28.2%)	2 (1.8%)	30 (27.3%)	<b>1.97</b>	<b>0.89</b>
Installs occupancy sensors or key card control systems in guest rooms to reduce in-room energy consumption	15 (13.6%)	2 (1.8%)	14 (12.7%)	79 (71.8%)	<b>2.87</b>	<b>0.81</b>
Uses solar panels to heat water for the guest rooms	4 (3.6%)	2 (1.8%)	12 (10.9%)	92 (83.6%)	<b>3.05</b>	<b>0.48</b>
Harvest the heat generated by the refrigeration units in order to heat the water for guest rooms or the laundry	0 (0%)	3 (2.7%)	1 (0.9%)	106 (96.4%)	<b>2.99</b>	<b>0.17</b>
Chooses thermostats that allow you to programme maximum and minimum temperatures (and so prevent guests excessively heating or cooling their rooms)	1 (0.9%)	5 (4.5%)	3 (2.7%)	101 (91.8%)	<b>2.98</b>	<b>0.30</b>
Installs shade windows that limit sunrays hence limiting air conditioning demands (by means of awnings, curtains, blinds, screens, heat-reflecting sheets, etc.)	71 (64.5%)	3 (2.7%)	5 (4.5%)	31 (28.2%)	<b>1.78</b>	<b>1.03</b>
Invests in high-performance cooking units when replacing equipment	18 (16.4%)	16 (14.5%)	7 (6.4%)	69 (62.7%)	<b>2.63</b>	<b>0.83</b>
Defrosts refrigerators and clean the door seals monthly	22 (20.0%)	37 (33.6%)	1 (0.9%)	50 (45.4%)	<b>2.34</b>	<b>0.78</b>

Statements	Always (%)	Sometimes (%)	Yet to Start (%)	Never (%)	M	SD
Uses equipment's during periods of low consumption (off-peak hours)	24 (21.8%)	33 (30.0%)	1 (0.9%)	52 (47.3%)	2.31	0.81
Makes sure the lights are switched off in unoccupied rooms (magnetic cards automatically turn off the room's power when the guest leaves the room)	71 (64.5%)	5 (4.5%)	1 (0.9%)	33 (30.0%)	1.70	0.95
Installs an air conditioning system that automatically switches off when the windows are open	2 (1.8%)	5 (4.5%)	12 (10.9%)	91 (82.7%)	3.04	0.47
Avoids leaving computers switched on when taking breaks longer than 30 minutes	39 (35.5%)	22 (20.0%)	3 (2.7%)	46 (41.8%)	2.14	0.92
Train staff to do the right things, and invite guests to get involved	67 (60.9%)	25 (22.7%)	1 (0.9%)	17 (15.5%)	1.56	0.77
Distribute brochures and flyers, or paste stickers and posters, inviting guests to save energy	31 (28.2%)	21 (19.1%)	13 (11.8%)	45 (40.9%)	2.40	1.03

Source: Field Survey, 2022

M = Mean and SD = Standard Deviation

Responding to the statements about energy efficiency and economy, as shown in table 4, majority (71.8%) noted that they do not implement and depend largely on renewable energy programmes. Only a few indicated they either use or implement renewable energy always, sometimes and some are yet to start its usage. Again, 88.2% mentioned that they reduce the use of general lighting during the daytime and ensure that exterior lighting is only active during nighttime. 87% of participants also reported that they consistently employ energy-efficient light bulbs with a lifespan twelve times longer than standard incandescent bulbs as part of their green practices within their facilities. Another green practice is the repair or replacement of faulty equipment with more efficient and cost-effective alternatives, with majority (42.7%) stating they always practice. However, a fair proportion (28.2%) of respondents also maintained that they sometimes practice or implements this procedure, 27.3% noted they never practice it whereas only few (1.8%) noted they are yet to start practicing it. A significant proportion of participants again indicated installation of shade windows as a green practice they use or implement in their facilities. Also, 64.5% constituting majority stated that they ensure that lights are turned off in vacant rooms, with magnetic cards automatically cutting off the room's power when guests exit the room. Furthermore, staff training and guests' invitation to get involved in green practices was as well highlighted by majority of respondents as a green practice implemented and utilized in their facilities.

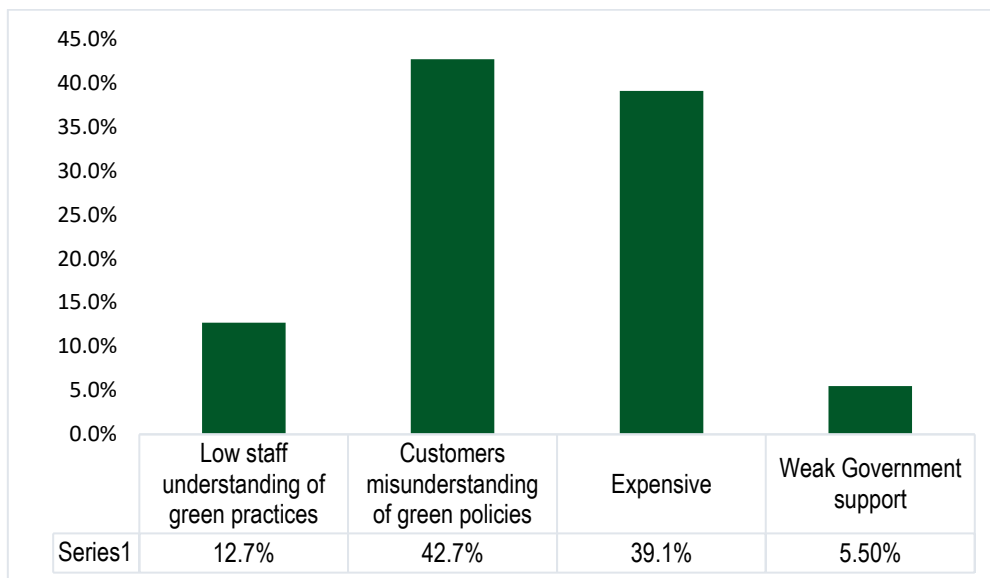
Albeit the fact that respondents highlighted the use and implementation of some green practices in their facilities, it was apparent from the descriptive statistics that, only implementing occupancy sensors or key card control systems in guest rooms, utilizing solar panels to heat water for guest rooms, capturing heat generated by refrigeration units to warm water for guest rooms or laundry, utilizing thermostats, investing in high-efficiency cooking equipment, performing regular defrosting of refrigerators and monthly cleaning of door seals, installing automatic air conditioning systems that deactivate when windows are open, and disseminating brochures, flyers, or affixing stickers and posters to encourage guests to conserve energy. Contrary to this, a significant proportion of the majority indicated not using these green practices whereas some stated they are yet to start using these green energy practices in their facilities (See Table 4).

#### 5.4 Challenges in Adopting Efficient Sustainable Energy Systems by the Hospitality Industry Operators

The respondents were asked to highlight the challenges they confront when trying to implement green/environmentally friendly management practices in their respective hotels (See Figure 1).



Figure 1. Operators' feedback on the challenges in adopting efficient sustainable energy systems



Source: Field Survey, 2022

Forty-three (43%) of the 110 operators surveyed indicated that customers misunderstanding of green policies is a challenge. Also, 39% of the respondents indicated that it is expensive adopting and implementing sustainable energy systems, 13% maintained a low staff understanding of green practices is challenge. Moreover, 6% noted that weak government support to operators in adopting and implementing green practices as a challenge (Figure 1).

### 5.5 Relationship between Categories of Operators and the Adoption of Sustainable Energy Systems

To establish the relationship between categories of operators and the adoption of sustainable energy systems, a correlation between some demographic variables (ownership/management, age of facility, staff strength, educational level) and green practices was determined. The analysis focused only on strength and significance of relationship. The results are presented in Table 5.

Table 5. Correlation between ownership/management, age of facility, staff strength, educational level and green practices

		Install energy-efficient light bulbs	Makes sure the lights are switched off in unoccupied rooms
Education Level	Pearson's Corr.	-.248 <sup>a</sup>	.208 <sup>a</sup>
	Sig. (2 tailed)	.009	.030
	N	110	110
		Makes sure the lights are switched off in unoccupied rooms	Train staff to do the right things, and invite guests to get involved
Staff Strength	Pearson's Corr.	-.259 <sup>a</sup>	-.254 <sup>a</sup>
	Sig. (2 tailed)	.007	.009
	N	110	110

Source: Field Survey, 2022

With respect to the correlations between the above variables, results from the analysis indicated that there was no strong or significant relationship between age of facility, ownership and green practices adopted or implemented in hospitality firms. However, Pearson product correlation of education level and energy-efficient light bulbs as a green practice was found to be low positively/correlated and statistically significant ( $r = -.248, p < .009$ ).

Similarly, Pearson's correlation found a significant relationship ( $r = .208, p < .030$ ) between education level and the practice of switching off lights in hospitality firms by operators, as a green practice (See Table 5).

Furthermore, Pearson product correlation between staff strength and making sure the lights are switched off in unoccupied rooms was found to be negatively correlated and statistically significant ( $r = -.259, p < .007$ ).

In like manner, staff strength and training staff to do the right things, and invite guests to get involved, was found to be low positive/negatively correlated yet has a significant or strong relationship ( $r = -.254, p < .009$ ).

### 5.5.1 Relationship between the Existence of a Green Policy and Age of Facility, Rating, Staff Strength

Information gathered the existence of green management policy and some socio-demographic data (age of facility, rating of facility, staff strength) was used to establish the relationship. A step-by-step procedure in tandem with cross-tabulation were applied to clearly establish the relationship (See Table 6). Also, Chi-Square has been calculated, it is compared to the critical value from the Asymptotic Significance with degree of freedom ( $df$ ) and the level of significance selected (of which 0.05 was chosen for the study). Hence, when the critical value is less than the selected significance level (0.05), then there is a significant relationship.

Table 6. Cross tabulation between existence of green management policy and age of facility, rating of facility, Staff strength and Management/Ownership Arrangement

Characteristics	Existence of Green Management Policy	
	Yes (%)	No (%)
<b>Age of facility</b>		
5 or less	27 (24.5%)	3 (2.7%)
6-10	39 (35.5%)	5 (4.5%)
11-15	9 (8.2%)	1 (0.9%)
16+	23 (20.9%)	3 (2.7%)
<b>How is your property rated?</b>		
Guest House	12 (10.9%)	0 (0%)
Budget Hotel	64 (58.2%)	9 (8.2%)
1 Star	7 (6.4%)	3 (2.7%)
2 Star	15 (13.6%)	0 (0%)
<b>Staff Strength of the facility</b>		
1-10	81 (73.6%)	11 (10.0%)
11-20	3 (2.7%)	0 (0%)
21-30	10 (9.1%)	0 (0%)
31-40	4 (3.6%)	0 (0%)
41-50	0 (0%)	1 (0.9%)
<b>Management Ownership Arrangement</b>		
Independently owned, Self-managed	44 (40.0%)	7 (6.4%)
Limited liability company, hired management with no contract	5 (4.5%)	0 (0%)
Independently owned, managed by a management contract	45 (40.9%)	5 (4.5%)
Chain owned, managed by the chain	4 (3.6%)	0 (0%)
<b>Total</b>	<b>98 (89.1%)</b>	<b>12 (10.9%)</b>

Source: Field Survey, 2022

The results show that majority (35%) of respondents that stated they have written Green organizational management policy/rule noted that their facility has been in operations for 6-10 years, 24% indicated their facility age is 5 years or less, 21% indicated 16+ years whereas only 8% indicated 11-15 years of operation of their facilities. Contrarily, 5% representing majority of the sampled population that indicated they have no written green organizational management policy/rule however noted their facilities have been operation for 6-10 years, 3% indicated 5-10 years and 16+ years respectively while only 1% noted 11-15 years of operation. Also, 58% of respondents that stated they have a green policy noted budget hotel as the rating of their facilities, 14% noted 2-star, 11% indicated Guest House while only 6% indicated 1 star as their facility rating. On the other hand, 9% of respondents that stated they have no green policy/rule noted Budget Hostel as their facility rating while 3% indicated 1 star. Considering staff strength of the facility and existence of green policy, a greater proportion (73.6%) of the participants that indicated their facilities have written green policy indicated 1-10 people as their staff strength, 9% indicated their staff strength to be 21-30 people, 4% indicated 31-40 people whereas 3% noted 11-20 persons as their staff strength. With respect to ownership arrangement and existence of green policy, 41% constituting majority of respondents that stated they have written green policy indicated the ownership arrangement to be independently owned or managed by a management contract, 40% stated independently

owned or self-managed, 5% indicated limited liability company while 3.6% indicated chain owned as management or ownership arrangement. Contrary to this, 6% of respondents that stated they have no written green policy identified their management or ownership to be self-managed while only 5% indicated their ownership arrangement as Managed by a management contract (see table 6).

Table 7. Chi-Square Tests

	Green Policy against Age of facility	Green Policy against Property rating	Green Policy against staff strength	Green Policy against ownership
Pearson <b>Chi-Square</b>	.054 <sup>a</sup>	7.208 <sup>a</sup>	10.352 <sup>a</sup>	1.561 <sup>a</sup>
df	3	3	4	3
Asymp.sig (2 sided)	.997	.066	.035	.668

Source: Field Survey, 2022

From the summary table (Table 7), the Chi-Square test values for green policy against age; property rating; staff strength and ownership arrangement are .054<sup>a</sup>, 7.208<sup>a</sup>, 10.352<sup>a</sup>, and 1.561<sup>a</sup> respectively. Table 4.5 shows that the Asymptotic Significance values for existence of green policy against; age of facility, property rating, staff strength and ownership arrangement are (0.997, 0.066 and 0.668), which are far greater than the level of significance (0.05), thus, based on this it can be concluded that there is no significant relationship between Age of facility, Property rating, ownership arrangement and existence of green management policies.

However, the Asymptotic Significance value for existence of green management policy against staff strength is 0.035, which is lesser than the significance level (0.05). It can therefore be concluded that there is enough proof to support the claim that there exists a relationship between staff strength and the existence of green policy (see Table 7).

## 6. Discussions

### 6.1 Existence of Green Management Policy in Accommodation Facilities

The analysis revealed that the majority of Tamale's hospitality facilities have a documented green organizational management policy or guideline that outlines roles and prioritizes duties for the implementation of a sound environmental or service delivery. However, it can be inferred that hotel owners are aware of the negative effects of their actions and are prepared to make amends, as it was previously revealed in a study by Tzschentke, Kirk, and Lynch (2008) that hotel owners believe they have caused significant environmental harm and by doing this they feel all this is the right thing to give back to nature. This may not truly be the case, as it was shown in previous research of a similar kind by Kapiki (2010) that majority of the hotels with five stars (vs. hotels with four stars) had adopted green practices, installed energy-saving systems and appliances, and attained green certification. However, underdeveloped nations like Ghana do not completely implement such efforts.

The analysis from the current study reveals that the major focus of green policy in hospitality facilities in Tamale metropolitan is on reducing expenses associated with environmental dangers, preserving quality in a clean environment, and maintaining a clean environment or sanitation. Inferentially, it should be emphasized that each goal of the green strategy these institutions have chosen aims to maximize benefits for the facilities. However, it should be mentioned that preventing pollution, maintaining the environment, creating a safe and healthy environment, and maintaining clean and fresh vegetation did not receive much attention as these may only increase operational cost but not benefiting the institution directly. This study's conclusion conflicts with that of other earlier studies by Abdel-Maksoud, Kamel, and Elbanna (2016) and Dimara, Manganari, and Skuras (2017), who found that certain hotels have made the decision to apply practices that aimed to improve people's lives while simultaneously protecting the environment. However, the results of this study show that Tamale Metropolis hoteliers' attention is mostly on maximizing profits than pursuing green policies. This is supported by research by Lanjewar (2015); hotels are already aware of the numerous advantages that come with adopting green techniques. These advantages include a rise in brand value, the development of a positive visitor experience, cost and liability reductions, and an increase in earnings, there my selecting the green policies that will favour them.

### 6.2 Energy Conservation Practices (Green Practices) Adopted by the Hospitality Firms

dimming general lighting during daylight hours and restricting the use of exterior lighting to nighttime; incorporating energy-efficient light bulbs with a lifespan 12 times longer than traditional incandescent bulbs; installing shaded windows to reduce sunlight exposure and subsequently decrease the need for air conditioning;

and restricting lighting usage to nighttime hours. This is congruent with the findings of a similar research done by Liu *et al.* (2022), who stated that green energy efforts include renewable energy projects and energy saving strategies. Furthermore, the current research's findings are corroborated by Abdou, Hassan, and El Dief (2020), who indicated in his study that green hotel practices include energy saving, effective water management, and waste management.

Additionally, although the present study emphasizes the usage and implementation of specific green practices in their facilities, it should be emphasized that respondents surveyed, indicated not using or are yet to start adopting or utilizing the following green energy practices as stated by the study. They include installing occupancy sensors or key card control systems in guest rooms for minimizing in-room energy usage; incorporating solar panels for heating guest room water; harnessing heat from refrigeration units to warm water for guest rooms or laundry; employing thermostats; opting for high-efficiency cooking units when upgrading equipment; performing monthly defrosting and door seal cleaning for refrigerators; and installing automatic air conditioning systems.

However, it should be emphasized that the use of solar panels to heat water is a sustainable kind of energy and is widely recommended for usage in the face of sustainability, despite the fact that it is not being used efficiently in Tamale city, as evidenced by this study. As demonstrated by Hoegh-Guldberg, Ove; Jacob, Daniela; Taylor (2018) Renewable energy technologies such as solar heat and solar PV outperform other technologies in terms of promoting the adoption of renewable energy sources.

### **6.3 Challenges in Adopting Efficient Sustainable Energy Systems by the Hospitality Industry Operators**

The study's analysis revealed that the expense of establishing sustainable energy systems and consumers' ignorance of green policies are the most commonly mentioned issues impeding the adoption and implementation of sustainable energy systems. The study's findings support previous literature in the field, such as the work of Vernon *et al.* (2003), Kirk (1998), and Tzschentke, Kirk, and Lynch (2008), who indicated that many hotel operators who adopted green practices and sustainable energy systems would require additional cost and seen as a major obstacle. Other considerations include environmental auditing, certification costs, and facility enhancement. All of the aforementioned characteristics are capital intensive, which would be disruptive to hoteliers, particularly during an economic crisis.

The study also mentioned that inadequate government backing and a lack of employee understanding of green policies were other difficult concerns. Government assistance is essential for the adoption and implementation of green management practices, not just financially but also legally, though not emphasized by the present study. The results of Mensah (2009) showed that the macroeconomic environment's elements have an immediate but indirect impact on the hotel industry and business settings, which in turn affect hotel revenues and profitability as a whole. As a result, business fundamentals go out of balance, which has a detrimental effect on the viability of hotel building projects.

### **6.4 Relationship between Categories of Operators and the Adoption of Sustainable Energy Systems**

The quantitative analysis of this study indicated that, being educated will lead to the adoption and implementation of sound and efficient green practice such as usage of energy-efficient light bulbs and the practice of switching off lights. Similarly, the study found that staff strength and training staff to do the right things, and invite guests to get involved are found to be effective measures in implementing green management practices efficiently and effectively. Since these will enlighten both staff and guests on the need to maintain green management practices at the facility. Education here is key as level of education to some point depicts the level of comprehension of issues and policies by individuals.

In conclusion, it can be deduced rationally from the preceding that hospitality facilities in Tamale Metropolis have some level of adherence to green management policies, as the majority of the facilities have an organizational written green management policy and have adopted some of the green management practices to their capacities. It should also be noted that the cost element and some guests' ignorance are major barriers to the adoption and implementation of green management methods. The level of knowledge, personnel strength, and quality were shown to be extremely beneficial in the adoption of green practices.

#### **6.4.1 Relationship between the Existence of a Green Policy and Age of facility, Rating, Staff Strength**

The statistical analysis of the current study found no statistically significant correlation between the age of the facility, the property rating, the ownership structure, and the presence of green management strategies. On the other hand, there is evidence of a very substantial correlation between staff size and the existence of a green

policy. These findings run counter to those of a related study which found that many hotel managers in Malaysia are not amenable to the implementation of green practices because they believe it would be very expensive. For the same reason as earlier, resort center administrators accepted the high expense of implementing green measures. However, the survey suggests that resorts that are not chain related typically receive little financial backing from their parent firm, leaving them with limited capital capability and leading them to reject the effort (Yusof and Jamaludin 2013). From the foregoing, it can be concluded that green management policies can be influenced by the kind of ownership. The fact that the facility is small (size, limited services, and simple technologies) and has fewer negative environmental effects on the environment or requires fewer resources to implement green policies may account for the significant relationship between staff strength and green management policies. Upadhyay and Vadam (2014) come to the conclusion that the larger the building, the more energy is required. The energy efficiency of a hotel will be higher than that of a collection of separate properties. Less energy will be used by a hotel with fewer amenities and services than by a hotel with many of them.

### Conclusions and Further Research

The hotel industry, among various tourism-related sectors, presents a significant environmental threat due to its extensive consumption of resources such as water, energy, and disposable items, along with its substantial discharge of raw and solid waste in diverse quantities. Multiple factors, including heightened customer awareness about the environment, the need to mitigate negative environmental impacts, brand enhancement, and financial benefits, have driven the hotel sector to adopt a more environmentally conscious approach (Verma and Chandra 2016; Han and Chan 2013).

Consequently, numerous hotels are embracing innovative strategies to enhance the eco-friendliness of their operations, aiming to alleviate environmental pressures and address customer concerns about sustainability (Manaktola and Jauhari 2007; Merli *et al.* 2019).

In this respect, the study sought to uncover the sustainable energy systems and green hotel practices in the hospitality industry. The study concludes that hospitality firms in the Tamale metropolis have a written Green organizational management policy/rule and the main driver for adopting green policy is to reduce costs of environmental hazards; maintain quality in a clean environment; and keeping a clean environment or sanitation. Regarding the common green conservation practices implemented or used in hotels, findings from the study indicate that the surveyed hotels make diverse contributions towards enhancing energy efficiency. Contrastingly, the findings of this study highlight that the utilization of renewable energy systems such as solar and wind energy remains relatively uncommon among the majority of hotels, with only a few having initiated their adoption. Overall, the study found cost of implementing sustainable energy systems and customers misunderstanding of green policies as the main challenges hindering their adoption and implementation of sustainable energy systems. The study also discovered significant relationship between level of education against use of energy efficient light bulbs and the practice of switching off lights in hospitality firms. Moreover, staff strength was found to be highly inter-linked with the existence of green management policy in hospitality firms.

Thus, operators of hospitality firms should exhibit a more robust dedication to attaining environmental sustainability. This can be accomplished through the implementation of focused training initiatives aimed at enhancing staff awareness of environmental concerns and motivating guests to actively contribute to reducing the hotel's ecological footprint. Incorporating green practices into their marketing strategies would further enhance the hotel's environmental commitment. Also, operators should prioritize the substitution of fossil fuels with renewable energy sources, particularly in light of escalating fuel costs. Extensive and intensive public education should be regularly conducted to educate the citizens to enhance their awareness of, and trust in, renewable energy systems, and provide training to ensure their proper utilization. Lastly, Government should reduce taxes on hospitality firms to support hotel operators to be more committed to sustaining natural resources.

### Acknowledgments

This study was successful through the team's exceptional efforts. Our dedication and hard work have truly made a difference.

### Credit Authorship Contribution Statement

**Patricia Animah Appiah:** The first author played a pivotal role in the research, leading conceptualization and methodology, while also actively contributing to writing the original draft and meticulously curating the data;

**Raymond Adongo:** The second author provided crucial contributions by supervising the project, validating the findings, and diligently reviewing and editing the content to enhance its quality;



**Abdul- Rafiw Safo:** The third author significantly contributed by developing and utilizing the necessary software, conducting formal analysis, and creating clear and insightful visualizations to enhance the research.

### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### References

- [1] Abdel-Maksoud, A., H. Kamel, and S. Elbanna. 2016. Investigating Relationships between Stakeholders' Pressure, Eco-Control Systems and Hotel Performance. *International Journal of Hospitality Management* 59 (October): 95–104. DOI: <https://doi.org/10.1016/j.ijhm.2016.09.006>.
- [2] Abdou, A. H., T. H. Hassan, and M. M. El Dief. 2020. A Description of Green Hotel Practices and Their Role in Achieving Sustainable Development. *Sustainability* 12 (22): 9624. DOI:<https://doi.org/10.3390/su12229624>.
- [3] Adedoyin, F. F., and F. V. Bekun. 2020. Modelling the Interaction between Tourism, Energy Consumption, Pollutant Emissions and Urbanization: Renewed Evidence from Panel VAR. *Environmental Science and Pollution Research* 27 (31): 38881–900. DOI: <https://doi.org/10.1007/s11356-020-09869-9>
- [4] Alipour, S., and Soosan. 2019. Investigating Sustainable Practices in Hotel Industry-from Employees' Perspective: Evidence from a Mediterranean Island. *Sustainability* 11 (23): 6556. DOI:<https://doi.org/10.3390/su11236556>
- [5] Amoako, G. K., S. G. Kutu-Adu, Livingstone D. C., and E. Neequaye. 2019. Relationship Marketing and Repurchase Intention in Ghana's Hospitality Industry: An Empirical Examination of Trust and Commitment. *Journal of Relationship Marketing* 18 (2): 77–107. DOI: <https://doi.org/10.1080/15332667.2018.1534059>
- [6] Ampofo, J. A. 2020. Contributions of the Hospitality Industry (Hotels) in the Development of Wa Municipality in Ghana. *International Journal of Advanced Economics* 2 (2): 21–38. DOI:<https://doi.org/10.51594/ijae.v2i2.155>
- [7] Barakagira, A., and C. Paapa. 2023. Green Practices Implementation for Environmental Sustainability by Five-Star Hotels in Kampala, Uganda. *Environment, Development and Sustainability*, March. DOI:<https://doi.org/10.1007/s10668-023-03101-7>
- [8] Bohdanowicz, P., A. Churie-Kallhauge, and I. Martinac. 2001. Energy-Efficiency and Conservation in Hotels—towards Sustainable Tourism: In *4th International Symposium on Asia Pacific Architecture, Hawaii*, 1–12. Available at: <http://www.greenthehotels.com/eng/BohdanowiczChurieKallhaugeMartinacHawaii2001.pdf>.
- [9] Bohdanowicz, P. 2006. Environmental Awareness and Initiatives in the Swedish and Polish Hotel Industries—Survey Results. *International Journal of Hospitality Management* 25 (4): 662–82. DOI:<https://doi.org/10.1016/j.ijhm.2005.06.006>
- [10] Borowski, M., P. Mazur, S. Kleszcz, and K. Zwolińska. 2020. Energy Monitoring in a Heating and Cooling System in a Building Based on the Example of the Turówka Hotel. *Energies* 13 (8): 1968. DOI:<https://doi.org/10.3390/en13081968>
- [11] Cruz-Pérez, N., *et al.* 2022. Improvements in Hotel Water Consumption: Case Study of a Five-Star Hotel (Canary Islands, Spain). *Urban Water Journal* 19 (1): 32–39. DOI:<https://doi.org/10.1080/1573062X.2021.1949480>
- [12] Dascalaki, E., and C. A. Balaras. 2004. XENIOS—a Methodology for Assessing Refurbishment Scenarios and the Potential of Application of RES and RUE in Hotels. *Energy and Buildings* 36 (11): 1091–1105. DOI:<https://doi.org/10.1016/j.enbuild.2004.03.007>
- [13] Deraman, F, N Ismail, A I M Arifin, and M I A Mostafa. 2017. Green Practices in Hotel Industry: Factors Influencing the Implementation. *Journal of Tourism, Hospitality and Culinary Arts (JTHCA)* 2017 9 (2): 305–16. Available at: <https://core.ac.uk/download/pdf/154828506.pdf%0A>
- [14] Dief, M. E., and X Font. 2010. The Determinants of Hotels' Marketing Managers' Green Marketing Behaviour. *Journal of Sustainable Tourism* 18 (2): 157–74. DOI: <https://doi.org/10.1080/09669580903464232>
- [15] Dimara, E., E. Manganari, and D. Skuras. 2017. Don't Change My Towels Please: Factors Influencing Participation in Towel Reuse Programs. *Tourism Management* 59 (April): 425–37. DOI:<https://doi.org/10.1016/j.tourman.2016.09.003>

- [16] Dimitrić, M., I. T. Žiković, and A. A. Blečić. 2019. Profitability Determinants of Hotel Companies in Selected Mediterranean Countries. *Economic Research-Ekonomska Istraživanja* 32 (1): 1977–93. DOI:<https://doi.org/10.1080/1331677X.2019.1642785>
- [17] Doris, D. S. 2022. Average Rate of Occupancy of Hotel Rooms in Ghana from 2014 to 2021, by Type. Statista. 2022. Available at: <https://www.statista.com/statistics/1250243/average-hotel-room-occupancy-rate-in-ghana/>
- [18] Ruiz-Molina, E. M., I. Gil-Saura, and M. Šerić. 2013. The Use of ICT in Established and Emerging Tourist Destinations: A Comparative Analysis in Hotels. *Journal of Hospitality and Tourism Technology* 4 (2): 96–118. DOI: <https://doi.org/10.1108/JHTT-Oct-2011-0033>
- [19] Gabarda-Mallorquí, A., X. Garcia, R. M. Fraguell, and A. Ribas. 2021. Are Hotel Stay Characteristics Influencing Guests' Environmental Behaviour? Predicting Water Conservation Habits. *Current Issues in Tourism* 24 (16): 2342–56. DOI: <https://doi.org/10.1080/13683500.2020.1829565>
- [20] Deladem, G. *et al.* 2021. Developing Sustainable Tourism through Public-Private Partnership to Alleviate Poverty in Ghana. *Tourist Studies* 21 (2): 317–43. DOI: <https://doi.org/10.1177/1468797620955250>
- [21] Grové, J. 2017. Energy Transitions in Developing Countries and the Role of Alternative Liquid Fuels in Reducing Energy Poverty: Exploring the Use of Domestically Produced Dimethyl Ether (DME) to Augment the Use of Imported Liquefied Petroleum Gas (LPG) as a Clean Cooking. The University of Queensland.
- [22] Han, Heesup, *et al.* 2018. Water Conservation and Waste Reduction Management for Increasing Guest Loyalty and Green Hotel Practices. *International Journal of Hospitality Management* 75 (September): 58–66. DOI: <https://doi.org/10.1016/j.ijhm.2018.03.012>
- [23] Han, X., and K. Chan. 2013. Perception of Green Hotels Among Tourists in Hong Kong: An Exploratory Study. *Services Marketing Quarterly* 34 (4): 339–52. DOI: <https://doi.org/10.1080/15332969.2013.827069>
- [24] Havi, E. D. K., and P. Enu. 2013. The Impact of Tourism on Economic Performance in Ghana. *European Scientific Journal* 9 (34): 242–57.
- [25] Hoegh-Guldberg, O., Jacob, D., and Taylor, M. 2018. Impacts of 1.5 C Global Warming on Natural and Human Systems." Global Warming of 1.5 C. An IPCC Special Report. *American Journal of Epidemiology* 170 (June): NP. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/19943627>
- [26] Huq, F. A., and M. Stevenson. 2020. Implementing Socially Sustainable Practices in Challenging Institutional Contexts: Building Theory from Seven Developing Country Supplier Cases. *Journal of Business Ethics* 161 (2): 415–42. DOI: <https://doi.org/10.1007/s10551-018-3951-x>
- [27] Im, J., Y. K. Chung, and D. (Daisy) Qin. 2023. Exploring Diversity, Equity, and Inclusion in Hospitality and Tourism Firms through the Organizational Justice and Stakeholder Theories. *Tourism Management* 95 (April): 104662. DOI: <https://doi.org/10.1016/j.tourman.2022.104662>
- [28] Jauhari, V. 2014. *Managing Sustainability in the Hospitality and Tourism Industry: Paradigms and Directions for the Future*. Taylor and Francis Group.
- [29] Jorba, R. 2021. Highlight 15/2021 – Sustainable Tourism: The End of Travelling as We Knew It. MEIG. 2021. Available at: <https://www.meig.ch/highlight-15-2021-sustainable-tourism-the-end-of-travelling-as-we-knew-it/>
- [30] Kapera, Z. 2018. Sustainable Development in the Hotel Industry: Between Theory and Practice in Poland. *Turyzm*, 2: 23–30. Available at: <https://www.ceeol.com/search/article-detail?id=792382>
- [31] Kapiki, S. 2010. Energy Management in Hospitality: A Study of the Thessaloniki Hotels. *Journal of Economics and Organization of Future Enterprise*, 78–97. Available at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2150571](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2150571)
- [32] Khan, N., *et al.* 2020. Factors Affecting Tourism Industry and Its Impacts on Global Economy of the World. *SSRN Electronic Journal*. DOI: <https://doi.org/10.2139/ssrn.3559353>
- [33] Khatter, A., L. White, J. Pyke, and M. McGrath. 2021. Barriers and Drivers of Environmental Sustainability: Australian Hotels. *International Journal of Contemporary Hospitality Management* 33 (5): 1830–49. DOI:<https://doi.org/10.1108/IJCHM-08-2020-0929>.
- [34] Kirk, D. 1998. Attitudes to Environmental Management Held by a Group of Hotel Managers in Edinburgh. *International Journal of Hospitality Management* 17 (1): 33–47. DOI: [https://doi.org/10.1016/S0278-4319\(98\)00005-X](https://doi.org/10.1016/S0278-4319(98)00005-X)

- [35] Koiwanit, J., and V. Filimonau. 2021. "Carbon Footprint Assessment of Home-Stays in Thailand." *Resources, Conservation and Recycling* 164 (January): 105123. DOI: <https://doi.org/10.1016/j.resconrec.2020.105123>
- [36] Koščak, M., and T. O'Rourke. 2023. *Ethical and Responsible Tourism Managing Sustainability in Local Tourism Destinations*. 2nd Editio. Routledge. Available at: <https://www.routledge.com/Ethical-and-Responsible-Tourism-Managing-Sustainability-in-Local-Tourism/Koscak-ORourke/p/book/9781003358688>
- [37] Kuklina, M., et al. 2021. Prospects for the Development of Sustainable Tourism in the Okinsky District of the Republic of Buryatia. *Sustainability* 13 (14): 8042. DOI: <https://doi.org/10.3390/su13148042>
- [38] Kuuder, C.-J. W., et al. 2013. Energy, Water and Waste Management in the Accommodation Sector of Tamale Metropolis, Ghana. *American Journal of Tourism Management* 2 (A): 1–9. DOI:<https://doi.org/10.5923/s.tourism.201304.01>
- [39] Lanjewar, J. 2015. Green Initiative by Hotels. *Sai Om Journal of Commerce and Management* 2 1 (2015): 42–48.
- [40] Liu, H., et al. 2022. Impact of Green Financing, FinTech, and Financial Inclusion on Energy Efficiency. *Environmental Science and Pollution Research* 29 (13): 18955–66. DOI: <https://doi.org/10.1007/s11356-021-16949-x>
- [41] López-Gamero, M. D., J. F. Molina-Azorín, J.J. Tarí, and E. M. Pertusa-Ortega. 2023. Interaction between Sustainability Practices and the Mediating Role of Hotel Performance. *Journal of Sustainable Tourism*, April, 1–26. DOI: <https://doi.org/10.1080/09669582.2023.2198165>
- [42] Manaktola, K., and V. Jauhari. 2007. Exploring Consumer Attitude and Behaviour towards Green Practices in the Lodging Industry in India. Edited by Vinnie Jauhari. *International Journal of Contemporary Hospitality Management* 19 (5): 364–77. DOI: <https://doi.org/10.1108/09596110710757534>
- [43] Martínez Ceseña, E. A., N. Good, and P. Mancarella. 2015. Electrical Network Capacity Support from Demand Side Response: Techno-Economic Assessment of Potential Business Cases for Small Commercial and Residential End-Users. *Energy Policy* 82: 222–32. DOI: <https://doi.org/10.1016/j.enpol.2015.03.012>
- [44] Martínez García de Leaniz, P., Á. Herrero Crespo, and R. Gómez López. 2018. Customer Responses to Environmentally Certified Hotels: The Moderating Effect of Environmental Consciousness on the Formation of Behavioral Intentions. *Journal of Sustainable Tourism* 26 (7): 1160–77. DOI:<https://doi.org/10.1080/09669582.2017.1349775>
- [45] McLeish, B. 2007. Pairing Green Design with Energy Purchasing Strategies. *Hospitality* 2 (6): 52–54.
- [46] Mensah, I. 2009. *The Management of Tourism and Hospitality Services: Global Dimensions, Ghanaian Perspectives*. Accra: Woeli Publishing Services.
- [47] Mensah, I., and E.J. Blankson. 2014. Commitment to Environmental Management in Hotels in Accra. *International Journal of Hospitality and Tourism Administration* 15 (2): 150–71. DOI:<https://doi.org/10.1080/15256480.2014.901064>
- [48] Mensah, I. 2007. Environmental Management and Sustainable Tourism Development: The Case of Hotels in Greater Accra Region (GAR) of Ghana. *Journal of Retail and Leisure Property* 6 (1): 15–22. DOI:<https://doi.org/10.1057/palgrave.rlp.5100039>
- [49] Mensah-Ansah, J., E. Martin, and D. Egan. 2011. Tourism Trends in Ghana: The Accommodation Sector. *Tourism Analysis* 16 (2): 157–68. DOI: <https://doi.org/10.3727/108354211X13014081270369>
- [50] Merli, R., M. Preziosi, A. Acampora, and F. Ali. 2019. Why Should Hotels Go Green? Insights from Guests Experience in Green Hotels. *International Journal of Hospitality Management* 81 (August): 169–79. DOI:<https://doi.org/10.1016/j.ijhm.2019.04.022>
- [51] Moore, D. S., W. Notz, and M. A. Fligner. 2013. Scatterplots and Correlation. In *The Basic Practice of Statistics*, 6th ed. New York, NY: WH Freeman and Company.
- [52] Ozturkoglu, Y., F. O. Sari, and E. Saygili. 2021. A New Holistic Conceptual Framework for Sustainability Oriented Hospitality Innovation with Triple Bottom Line Perspective. *Journal of Hospitality and Tourism Technology* 12 (1): 39–57. DOI: <https://doi.org/10.1108/JHTT-02-2019-0022>
- [53] Palinkas, L. A., et al. 2011. Mixed Method Designs in Implementation Research. *Administration and Policy in Mental Health and Mental Health Services Research* 38 (1): 44–53. DOI: <https://doi.org/10.1007/s10488-010-0314-z>

- [54] Pandey, A., R. Sahu, and Y. Joshi. 2022. Kano Model Application in the Tourism Industry: A Systematic Literature Review. *Journal of Quality Assurance in Hospitality and Tourism* 23 (1): 1–31. DOI:<https://doi.org/10.1080/1528008X.2020.1839995>
- [55] Parpairi, K. 2017. Sustainability and Energy Use in Small Scale Greek Hotels: Energy Saving Strategies and Environmental Policies. *Procedia Environmental Sciences* 38: 169–77. DOI:<https://doi.org/10.1016/j.proenv.2017.03.099>
- [56] Petrevska, B., V. Cingoski, and M. Serafimova. 2016. Sustainable Tourism And Hotel Management In Macedonia Through The Use Of Renewable Energy Sources. *UTMS Journal of Economics* 7 (1): 123–32. Available at: <https://ideas.repec.org/a/ris/utmsje/0176.html>
- [57] Prakash, S., et al. 2023. Adopting Green and Sustainable Practices in the Hotel Industry Operations- an Analysis of Critical Performance Indicators for Improved Environmental Quality. *Management of Environmental Quality: An International Journal* 34 (4): 1057–76. DOI: <https://doi.org/10.1108/MEQ-03-2022-0090>
- [58] Ragasa, Catherine, Sena Amewu, and Seth Asante. 2021. Changes in Household Income, Food Consumption, and Diet Quality in Urban and Rural Areas of Ghana during the COVID-19 Crisis: Results of 2020 Phone Surveys. DOI: <https://doi.org/10.2499/p15738coll2.134731>
- [59] Rauf, A., et al. 2021. Do Tourism Development, Energy Consumption and Transportation Demolish Sustainable Environments? Evidence from Chinese Provinces. *Sustainability* 13 (22): 12361. DOI:<https://doi.org/10.3390/su132212361>.
- [60] Schoffstall, D. G. 2013. The Benefits and Challenges Hospitality Management Students Experience by Working in Conjunction with Completing Their Studies. Ames: Iowa State University, Digital Repository. DOI:<https://doi.org/10.31274/etd-180810-4448>
- [61] Setia, M.. 2016. Methodology Series Module 3: Cross-Sectional Studies. *Indian Journal of Dermatology* 61 (3): 261. DOI: <https://doi.org/10.4103/0019-5154.182410>.
- [62] Shen, M., et al. 2020. (Micro)Plastic Crisis: Un-Ignorable Contribution to Global Greenhouse Gas Emissions and Climate Change. *Journal of Cleaner Production* 254 (May): 120138. DOI:<https://doi.org/10.1016/j.jclepro.2020.120138>.
- [63] Strielkowski, W., et al. 2021. Effective Management of Energy Consumption during the COVID-19 Pandemic: The Role of ICT Solutions. *Energies* 14 (4): 893. DOI: <https://doi.org/10.3390/en14040893>
- [64] Tansel, T., G. Yeshenkulova, and U. Nurmanova. 2021. Analysing Waste Management and Recycling Practices for the Hotel Industry. *Journal of Environmental Management and Tourism* 12 (2): 382–91. DOI:[https://doi.org/10.14505/jemt.v12.2\(50\).07](https://doi.org/10.14505/jemt.v12.2(50).07)
- [65] Tanveer, M. I., M. Y. Yusliza, and O. Fawehinmi. 2023. Green HRM and Hospitality Industry: Challenges and Barriers in Adopting Environmentally Friendly Practices. *Journal of Hospitality and Tourism Insights*, February. DOI: <https://doi.org/10.1108/JHTI-08-2022-0389>
- [66] Teye, V. B. 2008. International Involvement in a Regional Development Scheme: Laying the Foundation for National Tourism Development in Ghana. *Tourism Review International* 12 (3/4): 291–301. Available at: <https://www.cabdirect.org/cabdirect/abstract/20093216098>
- [67] Thams, A., N. Zech, D. Rempel, and A. Ayia-Koi. 2020. An Initial Assessment of Economic Impacts and Operational Challenges for the Tourism and Hospitality Industry Due to COVID-19. *Hospitality, Tourism and Event from IU International University of Applied Sciences*. Available at: <https://www.econstor.eu/bitstream/10419/216762/1/1696970539.pdf>
- [68] Thommandru, A., et al. 2023. “Role of Tourism and Hospitality Business in Economic Development. *Materials Today: Proceedings* 80. DOI: <https://doi.org/10.1016/j.matpr.2021.07.059>
- [69] Tzschentke, N., D. Kirk, and P. Lynch. 2008. Ahead of Their Time? Barriers to Action in Green Tourism Firms. *The Service Industries Journal* 28 (2): 167–78. DOI: <https://doi.org/10.1080/02642060701842175>.
- [70] Upadhyay, A., and C. Vadam. 2014. The Role of Energy Consumption in Hotel Operations. *Brighton Business School*, 1–10. Available at: <https://research.brighton.ac.uk/en/publications/the-role-of-energy-consumption-in-hotel-operations>.
- [71] Vaidya, M., P. Chatterjee, and K. Bhopatkar. 2022. Energy Efficient Smart Lighting System for Rooms. In *Studies in Big Data*, 107–25. Springer, Cham. DOI: [https://doi.org/10.1007/978-3-030-77214-7\\_5](https://doi.org/10.1007/978-3-030-77214-7_5)



- [72] Verma, V., and B. Chandra. 2016. Hotel Guest's Perception and Choice Dynamics for Green Hotel Attribute: A Mix Method Approach. *Indian Journal of Science and Technology* 9 (5). DOI:<https://doi.org/10.17485/ijst/2016/v9i5/77601>.
- [73] Vernon, J., S. Essex, D. Pinder, and K. Curry. 2003. The 'Greening' Of Tourism Micro-Businesses: Outcomes of Focus Group Investigations in South East Cornwall. *Business Strategy and the Environment* 12 (1): 49–69. DOI: <https://doi.org/10.1002/bse.348>
- [74] Wyngaard, A.T., and R. de Lange. 2013. The Effectiveness of Implementing Eco Initiatives to Recycle Water and Food Waste in Selected Cape Town Hotels. *International Journal of Hospitality Management* 34 (September): 309–16. DOI: <https://doi.org/10.1016/j.ijhm.2013.04.007>
- [75] Yusof, Z. B., and M. Jamaludin. 2013. Green Approaches of Malaysian Green Hotels and Resorts." *Procedia - Social and Behavioral Sciences* 85 (September): 421–31. DOI: <https://doi.org/10.1016/j.sbspro.2013.08.371>
- [76] Zhang, F., et al. 2023. Visitors' Satisfaction towards Indoor Environmental Quality in Australian Hotels and Serviced Apartments. *Building and Environment* 244 (October): 110819. DOI:<https://doi.org/10.1016/j.buildenv.2023.110819>
- [77] HOTREC. 2018. HOTREC Sustainability Charter: Promoting The Use of Sustainable Energy and Improving Energy Efficiency in The Hospitality Sector. EU-ASE. 2018.
- [78] UNWTO. 2019. *International Tourism Highlights, 2019 Edition*. World Tourism Organization (UNWTO). DOI:<https://doi.org/10.18111/9789284421152>.



# ASERS



The logo for ASERS Publishing, featuring the word "ASERS" in a bold, orange, sans-serif font with a stylized fan-like graphic to the left, and the word "Publishing" in a smaller, orange, sans-serif font below it.

Web: [www.aserspublishing.eu](http://www.aserspublishing.eu)

URL: <http://www.journals.aserspublishing.eu/jemt>

E-mail: [jemt@aserspublishing.eu](mailto:jemt@aserspublishing.eu)

ISSN 2068 – 7729

Journal DOI: <https://doi.org/10.14505/jemt>

Journal's Issue DOI: [https://doi.org/10.14505/jemt.v14.7\(71\).00](https://doi.org/10.14505/jemt.v14.7(71).00)