

On: 02 October 2014, At: 09:38

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



## Journal of Sustainable Tourism

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/rsus20>

### The importance of water management in hotels: a framework for sustainability through innovation

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Published online: 16 Jan 2014.

To cite this article: Azilah Kasim, Dogan Gursoy, Fevzi Okumus & Anthony Wong (2014) The importance of water management in hotels: a framework for sustainability through innovation, *Journal of Sustainable Tourism*, 22:7, 1090-1107, DOI: [10.1080/09669582.2013.873444](https://doi.org/10.1080/09669582.2013.873444)

To link to this article: <http://dx.doi.org/10.1080/09669582.2013.873444>

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## The importance of water management in hotels: a framework for sustainability through innovation

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(Received 30 December 2012; accepted 24 November 2013)

This paper highlights the global phenomenon of the crisis in the quality and quantity of water supplies and how tourism generally and hotels specifically may have contributed to the situation. The major internal and external barriers for Small Medium Enterprises adopting Environmental Management Systems, including water, are listed. The paper proposes a water management framework for hotels and other types of accommodation that leverages on the concept of innovation. Taking into account the various levels of knowledge and technological capabilities in water management, the framework is developed based on the commonly known 3R approach in environmental management, with the addition of another R (Reaching). It is proposed that hotels can innovate and enhance their water management approaches under these 4Rs: Innovative Reducing, Innovative Reusing, Innovative Reaching and Innovative Recycling. The framework offers examples and strategies about how hotels of different sizes, with differing financial, technical, knowledge and managerial capacities could address the challenge of implementing water management and obtain commercial benefit. A detailed case study is provided of a gray and black water recycling system in a Malaysian resort. Other examples of a range of water management methods are also discussed.

**Keywords:** corporate environmentalism; responsible tourism; hotel management

### Introduction

To many people, especially those living in North America or the tropics where water is abundant, water management may seem a trivial issue. Constant reliability and availability of clean water in modern daily life has led to complacency about its continuity into the future. However, availability of clean water is a major concern in many parts of the world (Eurostat, 2009; United Nation World Water Development [UNWWD], 2006), posing a serious threat to industries such as tourism and all their related key players. The UNWWD report (2003, p. 19) stresses that “the projected growth in industrial demand for water can only be met by integrating improved supply-side considerations with enhanced demand-side management at government and enterprise levels. Demand side initiatives play an important role in increasing the water efficiency of industrial processes, and lowering the pollution load of effluents discharged by industry”. In other words, businesses’ role in water management is crucial to ensure their own water supply

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sustainability. As will be shown below, tourism and especially hospitality, is linked to high levels of water consumption.

Conversely, implementing clean water and wastewater management is not an easy process. Several factors, including availability of financial resources, company size and knowledge level, tend to determine companies' ability to implement water and wastewater management practices. Ayuso (2007), in a study of the Spanish hotel industry, contends that there are high costs associated with adopting any form of environmental management systems. The author recommends that hotels be given support to overcome the practical difficulties of adopting such systems. Firm size is known to be a significant internal factor in determining hotels' social and environmental practices (Kasim, 2009). Relative size determines resource consumption levels, level of externalities (gray water, solid waste etc.) and respective capability to respond to environmental and social issues. Furthermore, firm size is likely to influence willingness to spend on environmentally friendly investments. Large companies have bigger externalities and greater impact on society (Jenkins, 2006b). They employ more people, have more products, consume more resources and produce more waste (Carlisle & Faulkner, 2004). Therefore, they may require more resources to address those externalities effectively. Additionally, large corporations have greater public visibility and are closely watched by the public (Kasim, 2006; Lepoutre & Heene, 2006). This is true even in developing countries (Erdogan & Baris, 2007; Kasim, 2006). Smaller companies, on the other hand, have fewer environmental externalities and less capital to address those externalities (Videras & Alberini, 2000). Therefore, firm size is likely to be a significant determinant of society's social and environmental responsibility expectations from hotels (Okumus, Altinay, & Chathoth, 2010).

This paper (1) highlights the hotel industry's engagement in water management and (2) proposes a framework of action that recognizes the factors and capabilities affecting hotel companies' water management practices and strategies. The paper begins by discussing the water issue at the global level. It then argues for an active role for the hospitality industry in water management practices, with hotels as a major player and water consumer. In doing so, the limitations and challenges of fully embracing this role are recognized, and a framework of innovative responses to water management issues is proposed. Finally, conclusions emerging from the paper are highlighted and future research requirements are discussed.

### **The water crisis as a global phenomenon**

Problems related to water shortage have been identified all around the globe (Choong, 2011; Pannier, 2008; Reichardt, 2007; United Nations Environmental Programme [UNEP], 2002a; UNEP, 2012a). These problems usually relate to either water quantity or water quality or both. Broadly defined, water quantity refers to the amount of clean water available for use while water quality refers to the safety and accessibility of water for human consumption.

It is important to note the complexity and variations in the water problem. In East Asia, water problems relate to accessibility. Even though the region has large rivers such as the Ganga, Yangtze and Kasumigaura and high levels of precipitation, often these abundant water sources cannot be accessed because of the lack of facilities to tap and store those sources. Frequent flooding also makes water inaccessible for consumption (UNEP, 2002a). Further south, water issues relate more to water quality and wastage. Malaysians, for example, use twice as much water as Singaporeans – a lifestyle that could

be unsustainable because of increasing problems with water availability especially during dry months, and with water quality due to pollution (Choong, 2011).

For West Asia and the Middle East, this mostly desert region lacks access to surface water and depends largely on ground water which is often polluted from agricultural runoff and human use (UNEP, 2012a). Jordan, for example, still needs to import water due to insufficient supplies of clean water (Kasim & Mahasneh, 2010). During dry seasons, many countries extract water from deep ground sources causing many non-renewable aquifers to deplete which may cause future humanitarian crises if no remedial action is taken (Lubin, 2011; Strategic Foresight Group, 2011). Richer countries resort to desalination of seawater which is a more expensive but a reliable alternative (Kasim & Mahasneh, 2010; UNEP, 2012a).

Water inaccessibility is the main issue for Central Asia and Africa. According to Pannier (2008), scattered precipitation and political conflict among countries sharing the same water body are the main issues in Central Asia. In much of Africa, sporadic rain leads to droughts, which combine with lack of technology and financing (UNEP, 2012b). For South America, lack of access to infrastructure for safe water and sanitation, inequitable water pricing favoring the rich and financial constraints at government level, deprive many people of clean water (Beeson, 2008). Deforestation reduces evaporation and therefore precipitation level in the region (Woods Hole Research Centre, 2012). Meanwhile, in Canada and the USA overuse of water (Shrubsole & Draper, 2007) is rampant due to the abundance of low cost water (UNEP, 2002c). However, water availability is not a certainty because weather conditions may disrupt water supply. In Europe, densely populated cities, dry weather conditions in some countries and the growth of tourism in the Mediterranean region impact on water supply (Eurostat, 2009). Many governments in Europe are now searching for solutions to getting enough water (UNEP, 2002b, 2002c). Retreating glaciers in the Swiss Alps, deemed the “water tower of Europe”, may add to the region’s water problem as it could severely affect the hydrology of major rivers in Europe (*The Guardian*, 2011).

From the above, it is foreseeable that ignoring sustainable water management strategies could lead to catastrophic situations. Many international organizations agree that water and not energy will be the problem of the twenty-first century, bringing economic, socio-political and environmental challenges (Kasim & Mahasneh, 2010). The problems outlined are set to be exacerbated by climate change.

### **Water consumption in tourism**

There are several reasons why the tourism industry should engage in effective water management practices. First, tourism takes place in all regions of the world albeit to varying degrees, and is now the largest and fastest growing industry in the world (World Travel and Tourism Council [WTTC], 2011) with measurable economic, socio-cultural and ecological impacts. According to the United Nation World Tourism Organization (UNWTO) (2012a), the rising numbers of international tourists will continue. As shown in Table 1, Asia, Africa and Middle East have been experiencing a steady tourism growth. UNWTO’s Tourism 2020 Vision (UNWTO, 2012b) predicts that there will be 1.6 billion tourism arrivals in 2020, concentrating on Europe (717 million tourists), East Asia and the Pacific (397 million) and the Americas (289 million). This robust forecast indicates future needs for more tourism support systems that would inevitably exert pressure on water usage and water availability.

Table 1. International tourist arrivals (rounded to the nearest million) by region.

| Region/Year          | 2000  | 2005  | 2007  | 2008  | 2009  | 2010  | 2011  |
|----------------------|-------|-------|-------|-------|-------|-------|-------|
| Europe               | 392.4 | 441.6 | 488   | 488.5 | 461.7 | 474.7 | 504   |
| Asia and The Pacific | 109.3 | 154.7 | 185.4 | 188.3 | 181.1 | 204.4 | 217   |
| Americas             | 128.2 | 133.4 | 142.5 | 147.6 | 141.7 | 150.7 | 156.6 |
| Africa               | 27.9  | 37.3  | 44.9  | 46.9  | 45.9  | 49.7  | 50.2  |
| Middle East          | 24.4  | 37.8  | 47.5  | 52.9  | 52.8  | 60.3  | 55.4  |
| World                | 682   | 805   | 908   | 924   | 883   | 940   | 983   |

Source: WTO (2009) and UNWTO (2012a).

Second, with the exception of Asia and the Americas, tourism growth has occurred in places already experiencing water shortage (UNWWD, 2006). Tourism causes water use to shift from water-rich countries (such as Canada) to water-poor areas (such as Mexico) on a large scale (Gössling, 2005), placing significant pressure on already water-deprived areas. A recent study by Tourism Concern Action for Ethical Tourism (2012) has shown that even Asian tourism destinations such as Bali, Goa and Kerala are now facing negative impact from tourism on their freshwater quality, availability and accessibility to the local community. Bali, for example, where tourism uses 65% of the local water (Merit, 2010, cited by Cole, 2012), has been projected to experience a major water crisis by 2025 due to tourism growth as well as the island's population (Cole, 2012). Meanwhile, water consumption by the tourism sector in Barbados is predicted to increase even further from the 12% consumption in 2009 (Caribbean Community Climate Change Centre, 2009) due to substantial government-assisted growth in the number of facilities and refurbishment of the destination's accommodation sector.

Growth in tourist arrivals to destinations implies a concurrent growth in tourism amenities such as hotels, restaurants, resorts, golf courses, spas and water-related recreation facilities, each of which demands water. Golf tourism requires enormous water resources – about 2.3 million liters a day for one 18-hole golf course (UNWWD, 2006). Catering for heightened industry demand can result in negative effects on the rights and well-being of the local people. This is evident in the context of Bali, Indonesia (see Cole, 2012) and Naxos, Greece (see Epp, Dercas, Tondy, Capaccioli, & Ribiero, n.d.). In both cases, competition between tourist facilities and farms for the same water sources has created conflict, which, if allowed to persist, could result in job losses and economic decline.

Third, water availability is no longer guaranteed. Even in Asia, with its high precipitation rates, water availability is a problem in the dry season due to lack of ability to store rainwater effectively, and lack of comprehensive action to address pollution of surface ground water sources and the water wasting habits of the people (Choong, 2011). In Malaysia, for example, 33% of the country's rivers are medium or heavily polluted. During periods of water shortage, frequent water disruptions or rationing can severely affect tourism businesses in the long term.

Lastly, growing tourist flows require a proactive approach to water issues through water management. Clearly, mitigating measures by key tourism players are needed now to prevent future problems.

### Water consumption in hotels

Hotels are major water consumers because people tend to use more water when they stay at hotels than they do at home (Charalambous, Bruggeman, & Lange, 2012; Eurostat,

2009; Gössling, 2005; Gössling et al., 2012; UNWWD, 2006). Gössling (2005) estimated that water consumption in accommodation establishments at the international level to be 1.3 km<sup>3</sup> per year. Charara, Cashman, Bonnell, and Gehr's (2011) work on Barbados showed that the destination's hotels consume high level of water (in terms of liters per guest night [L/GN]) when compared with international benchmark figures. They also found a steady increase of consumption trend from 1998 to 2008 despite a severe water crisis affecting the country. Cole's (2012) study on Bali linked the rise of hotel numbers to many environmental problems in the island including water demand. The author's political ecology approach to water problems uncovered a number of linked environmental and political factors including: land use conflicts, awareness issues, social power and cultural issues, politics and regulatory issues as well as the condition of local water supply itself.

One of the main reasons for high water consumption in the hotel sector is guest behavior. Hotel guests tend to have a "pleasure approach" to shower or bath, using more water than they normally would at home (Eurostat, 2009). This is especially evident in the Mediterranean countries. In Spain, tourists use double the amount of water compared to locals. Hotel guests in Israel are thought to contribute to the drying up of the Dead Sea while tourists in Grenada, Spain, are reported to use seven times more water than local people (UNWWD, 2006). Tourists in Cyprus use over 200% more water than local people (Charalambous et al., 2012). Similar observations can be made when comparing water use in tourism and in agriculture. In Naxos, Greece the 75 hotels on the island require 4,607,100 cubic meters of water per year – only slightly less than the 5,057,100 cubic meters needed to irrigate 1270 hectares of agricultural land on the island (Epp et al., n.d.).

Tortella and Tirado's (2011) study indicates that water demands depend on the type of lodging and tourists activities during their stay, with larger resort style hotels typically consuming more water than campsites. Hamele and Eckardt's (2006) survey of European accommodation shows that five star hotels are the biggest water consumers because they typically have big swimming pools, cafes and bars, golf courses, irrigated landscapes, kitchens and en suite bathrooms. Seasonal factors are important, with summer registering highest usage but lower water availability (Eurostat, 2009). Geographical locations and climates (Bohdanowicz & Martinac, 2007; Gössling, 2005; UNWWD, 2003) may further dictate water needs, with an elevated water use per capita of up to 3400 liters per day (Gössling et al., 2012). Additionally, tourists' length of stay and meal arrangement choice (full board, half board etc.) can also influence the level of water demand. These imply that hotel size may not really matter in relation to water needs. Rather it is tourists' water usage patterns and factors such as seasons and climate which are more important. The implication of this is that water management is the responsibility of hotels of all sizes.

Gössling et al. (2012) note that, on a bigger picture, tourism contributes approximately only one percent of total water use compared to other industries. Their point parallels the Eurostat (2009) report, which found Malta hotels to use only four and half percent of the country's water, while hotels in Greece use only two percent. Despite these discoveries, a passive response to the world's water issue is unjustified. Insufficient water supply or poor water quality can affect the smooth running of hotels. Water availability for hotels is just as vulnerable as for other users because the water essentially comes from the same centralized system. Small islands, with their limited catchment areas, are at special risk.

It is also possible that countries will sacrifice agricultural and household needs for the sake of industries such as tourism to ensure inward investors are happy. Cases in Bali, Kerala, Goa and Zanzibar have demonstrated this to varying degrees (see Tourism Concern Action for Ethical Tourism, 2012). However, in the long term, any problem

affecting the water system – low precipitation, pollution, etc. – can still adversely affect the industry. Reichardt (2007), for example, shows that hotels in some parts of the USA are affected by rate increases during hot seasons, and other regulatory restrictions. These could influence a hotel's bottom line and service quality too. Thus, hoteliers should search for ways to reduce water consumption. In addition, hoteliers also need to address the issue of wastewater generated from daily activities in the kitchen, laundry room and bathroom sinks. Wastewater, also known as “gray water” can affect the aesthetic of hotels as well as the local water body if not properly treated and disposed of.

Another important reason for why hotels should play active role in water issues is the issue of accumulative impacts. Kirk (1995) and Kasim (2009) stress that while the hotel sector may not be major consumers or polluters compared to other industries, the continuously increasing size of the industry means that they could have big accumulative impacts. However, low water tariffs for industry/commercial use can be seen as a deterrent for a more water friendly management approach. In Penang, Malaysia, for example, industry/commercial entities only pay approximately USD 0.40 for water exceeding the amount of 200 cubic meters (see Malaysian Investment Development Authority [MIDA], 2012). This is despite the fact that the island depends heavily on water supplied from Kedah – its neighboring, largely agricultural-based state. This dependency creates an unsustainable condition for water availability in Penang. Charara et al. (2011) note a similar low price disincentive in Barbados, despite its water supply problems.

### **CSR in hotel water management: concepts and challenges**

Corporate social responsibility (CSR) is a complex and multi-dimensional concept encompassing terms including corporate citizenry, corporate sustainability, corporate responsibility or responsible business or any other terms to describe positive impact of business to society and the environment (Bohdanowicz, Zientara, & Novotna, 2011; Holcomb, Upchurch, & Okumus, 2007). Elkington (2001) proposes the Triple Bottom Line concept to get business to think of the environment as one of their business bottom lines. Porter and van der Linde (1995), the authors who first proposed the “win-win” approach between business and environment, argue that constantly innovating to address environmental issues is the key to efficient and productive use of resources that provides high value products to consumers. These two concepts advocate that businesses can play a bigger role to balance environmental protection and economic gains. In developing countries, where environmental leadership and political support may be lacking, hotels can play a bigger role to lead in environmental management (Kasim, 2006). In this role, they can seek balance between their hotels objectives and environmental sustainability, and be more considerate of their operational impacts on the environment.

There is ample evidence that big businesses are paying serious attention to CSR and taking necessary measures to reduce their externalities (Holcomb et al., 2007; Hsieh, 2012). Primary drivers for this include company image, visibility, their desire to appear legitimate in the eyes of society and the search for a competitive edge (DiPietro, Cao, & Partlow, 2013; Kasim, 2006; Millar, Mayer, & Baloglu, 2012; Nyahunzvi, 2013). Many big hotels (four/five star rating) now implement environmental management practices (Holcomb et al., 2007; Hsieh, 2012). They have strong capability to implement such measures, and use a good environmental image as a way of achieving market differentiation (Farsari, 2012). A noteworthy example of a large hotel water management initiative is the innovative wetland water recycling and purification system used by Frangipani Langkawi Hotel Resort and Spa in Malaysia. The wetland area is approximately



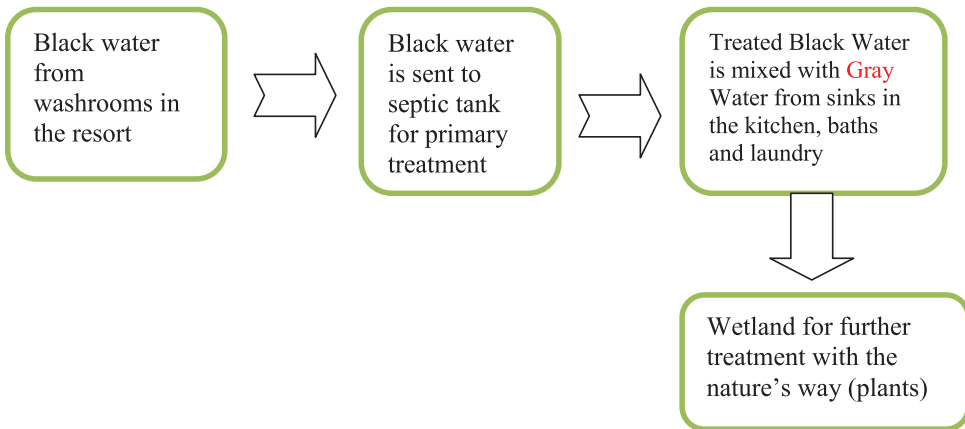


Figure 1. Flow sequence of black and gray water from facility to wetland. Source: Frangipani Langkawi Hotel Resort and Spa (2011).

0.5855 acre (2.369 m<sup>2</sup>) with maximum depth of 1.2–1.7 m depending on season and is the first of its kind to be utilized in a Malaysian resort. The wetland water is monitored with help from a local public university and private laboratories to ensure acceptable water quality to the Malaysian standard. Figures 1 and 2 demonstrate the recycling process of black water (sewage) and gray water in the resort.

Table 2 demonstrates the function of each plant used in the wetland system. While purifying polluted water, wetland also provides habitation to fauna. Multiple types of macro and micro invertebrates can shelter in the submerged portions of all the aquatic plants. Dying and decomposing aquatic plants provides food called “detritus” for many aquatic invertebrates. In turn, those invertebrates are food sources for fish and other wild-life species (e.g. amphibians, reptiles, ducks, etc.). Unfortunately, water recycling using wetland is only suitable for resorts and hotels that have suitable compound space: city

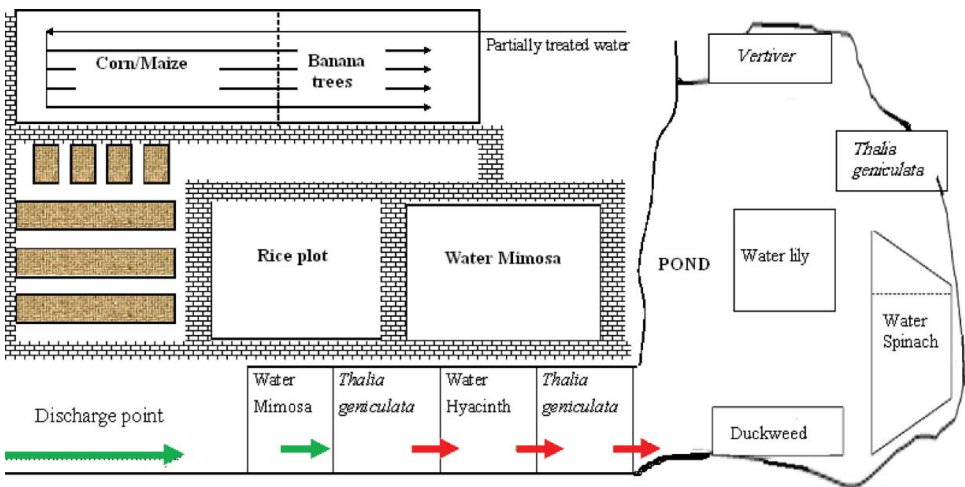


Figure 2. Sequence of plants used to recycle gray water. Source: Frangipanni Langkawi Resort Hotel and Spa (2011).

Table 2. Functions of aquatic plants used in water recycling wetland.

| Plant name                                     | Plant function in water recycling   |
|--|---|
| <i>Neptuniaspp</i> (water mimosa)              | <ul style="list-style-type: none"> <li>- is used first in water treatment as its spongy fibrous stems are able to reduce total nitrogen and phosphorus's value.</li> <li>- absorbs organic compounds and suspended solids.</li> <li>- has the potential to restrict water flow in creeks and channels, so all the suspended solid can settle down slowly.</li> <li>- an edible plant species and has been traditionally collected as a source of food.</li> </ul>   |
| <i>Thalia Genuculata</i> (Bent Alligator-Flag) | <ul style="list-style-type: none"> <li>- absorbs nutrients and stabilizes the suspended solids.</li> </ul>  |
| <i>Eichhorniacrassipes</i> (water hyacinth)    | <ul style="list-style-type: none"> <li>- properly tended <i>Eichhorniacrassipes</i> can be very efficient in removing suspended materials, BOD, nutrients like nitrogen and phosphorus to organic matter.</li> <li>- can take up heavy metals like lead, chrome, cadmium, copper, aluminum, nickel, mercury and pathogens. This is an important attribute of this specie as a natural water recycler.</li> </ul>  |
| <i>Lemna minor</i>                             | <ul style="list-style-type: none"> <li>- absorbs nutrients from the water making it highly useful in controlling the growth of algae.</li> <li>- removes nutrients and acts as lid to cover the water surface thereby cooling water surface and minimize water loss.</li> <li>- algal bloom must be controlled as it can severely affect aquatic life by reducing oxygen levels.</li> <li>- is an important food for wild waterfowl and fish as it is a source of food for small creatures that are in turn eaten by those birds and fish.</li> </ul> |
| <i>Veteveriazanioides</i>                      | <ul style="list-style-type: none"> <li>- helps to regulate the amount of water. Its hard and erect stems can withstand high velocity water flows thereby increasing detention time.</li> <li>- its thick growth forms living porous barrier that can effectively filter both fine and coarse sediments, as well as sediment-bound contaminants such as heavy metals and some pesticides residues.</li> </ul>  |
| The <i>Nymphaea</i> 's                         | <ul style="list-style-type: none"> <li>- efficient in providing hiding places for small aquatic creatures.</li> <li>- removes cadmium in the water, helps reduce algae growth in ponds and adds oxygen to the wetland.</li> </ul>   |
| <i>Ipomoea aquatic Forsskal</i>                | <ul style="list-style-type: none"> <li>- roots hang down thereby providing a large surface area for the growth of beneficial micro-organisms that can enhance nitrogen removal. As they float, the specie is forced to take nutrients and heavy metals from the water rather than from the sediments.</li> </ul>  |

Source: Developed by the authors based on Frangipani Langkawi Hotel Resort and Spa (2011).

hotels may not be able to utilize this approach because of the space needed. However, city hotels can strive to make water recycling more feasible by innovating new ways to reduce chemical pollution in their gray water.

However, it is important to recognize that not all businesses are created equal. They exist in various sizes and therefore varying capabilities to respond to an issue (Zouganeli, Trihas, Antonaki, & Kladou, 2012). For example, Hillary (1999) was one of the earlier authors who highlighted the challenges facing small and medium businesses in responding to environmental management issues. The author argues that small and medium businesses tend to lack knowledge (awareness and understanding) about environmental issues, lack knowledge and human resources to implement environmental management and are often not convinced of the benefit of environmental management. In addition, they also have to cope with external barriers as listed in Table 3.

Table 3. Major internal and external barriers for small medium enterprises adoption of environmental management system.

| Internal barriers  | External barriers  |
|--|--|
| Lack of time, financial and human resources  | Subjective and costly certification and verifications systems  |
| View EMS as an insignificant, interruptive and an interruptible process                    | Uncertain value of certification and verification systems in changing economy  |
| Problem with practical EMS implementation  | Insufficient motivation and framework to adopt environmental management system   |
| Lack of awareness and knowledge on environmental management support system and legislation | Lack of evidence on the financial benefit of environmental management efforts such as saving water especially where water costs are minimal<br>Lack of sector-specific environmentally friendly materials tailored to guide companies of different sizes |

Source: Developed by authors based on Hillary (1999).

Utting (2000) argues that playing an active role in environmental issues such as water management is likely to mainly benefit large hotel companies because it is likely to forward their agenda. Since small and medium enterprises (SMEs) cannot afford it, it may leave them vulnerable to competition, especially in the international arena. Supposing Utting is correct, it would then be difficult to convince hotel companies in developing countries, comprising many SMEs, to embrace environmental management. This poses a challenge – how to convince all hotels to play an active role in water management. Additionally, there is evidence that hotels' responses may be dictated by the environment they operate in. For example, Charalambous et al. (2012) who investigated water use and supply under climate change in Cyprus indicate that 28 out of 36 hotels in Cyprus have experienced negative impacts of water scarcity during the drought periods of 15 years, yet hoteliers do not foresee water shortages and extreme weather to be causing problems to future tourist arrival. This signifies lack of awareness about the grave impacts of global water issues to the industry. The lack of plan beyond encouraging water saving (Charalambous et al., 2012) shows lack of urgency. Similar lack of awareness is also observed in Bali (see Cole, 2012), and in Barbados (see Charara et al., 2011).

Bartis and Baldies (2009) who studied smaller accommodation properties in South Africa discovered a lack of awareness and knowledge on how to engage operators in responsible behaviors as listed in the Responsible Tourism Handbook 2002 developed for them. On the other hand, a study by Kasim and Mahasneh (2010) found that hotel managers in Jordan consider water consumption rationing to be a beneficial practice. The underlying reasons for this response include the realization that hotels in Jordan are operating in a dry climate, that their actions are monitored by the local authority (a limited liability water company, the Aqaba Water Company, jointly established by Jordan's Ministry of Water and Aqaba Economic Zone) and the benefits water rationing has on their operational costs. The study concluded that businesses are likely to demonstrate reactive response in environmental management when pushed by "survival instinct" and regulatory mandate.

Recognizing the fact that water issue awareness among hoteliers may still be sporadic and circumstantial, elevating hoteliers' awareness and engagement in water issues emerges as a primary concern. While local authorities could drive hoteliers to be more

engaged in water management, hotels come in various sizes and impacts. As Charara et al. (2011, p. 242) contend, hotel water consumption is determined by various factors including “the facilities provided, their age, number, efficiency and configuration, the multiplicity of water-using appliances and the practices and behaviour of both guests and staff. No two hotels, even if they are classified together, will therefore be the same”. Therefore, it is important for society to recognize and accept the fact that capabilities of hotels in addressing water management issues are likely to be influenced by their respective characteristics.

Cashman and Moore (2012) who studied the hotel industry in Barbados have proposed a commendable framework for water management in the hospitality industry, i.e. by introducing the concept of tradable permits that could be used to manage and encourage water use efficiency. However, these authors acknowledged that this framework would only work if barriers such as technical difficulties (ensuring efficiency and accuracy of water meters), administrative difficulties (arranging for the trading of the permits) and social difficulties (hotel managers’ motivation to get involved) are first removed from the equation. Clearly, there is a need for a water management framework that encourages *all* types of hotels to start managing their water use. Such a framework needs to encourage voluntarism, be flexible, and allow for creative and innovative means. The following section explains the framework proposed in this paper.

### **The proposed water management framework**

The framework proposed here is different because it encourages voluntarism and puts the power of decision-making over to the hotel managers. It is a water management framework that leverages on the concept of innovation using existing knowledge and technological capabilities. It is developed based on the commonly known 3R approach in environmental management, with the addition of another R (Reaching). Hotels and other lodging firms can develop and implement water management practices utilizing these 4Rs – “Innovative Reducing (IR1)”, “Innovative Reusing (IR2)”, “Innovative Reaching (IR3)” and “Innovative Recycling (IR4)”. The framework has two dimensions of innovative water management – knowledge and technology, as presented in Figure 3. IR4 requires intensive technology as well as intensive knowledge. This approach is highly suited for large hotel firms that have high capability to respond actively to their high water consumption. At the other end of the spectrum is IR1, which requires little of technology or knowledge. Thus, this approach is well suited for smaller hotel firms and other lodging types with limited resources. IR2 is technology intensive, but requires minimal knowledge on how to reuse water effectively whereas IR3 requires minimal technology but intensive knowledge before hotels can reach out to the community on water issues (Figure 3). In the discussion that follows, examples of innovations that fall under each quadrant are provided to illustrate the framework.

The bottom left segment of the framework (Innovative Reducing [IR1]) depicts a business situation where a hotel may have low knowledge and low technological capability to deal with water management issues. The IR1 is the least knowledge and technology intensive approach but requires close monitoring of operational activities to reduce water consumption. It involves behavioral change in better implementing and monitoring of day-to-day operational activities. For this approach to work, hotel employees at all levels must play a role. Examples of behavioral change include changes such as being more vigilant for leaks in and around the hotel and immediate fixing to reduce water loss. Hotel cleaners can be more vigilant about leakages in guestrooms and common areas. Staff

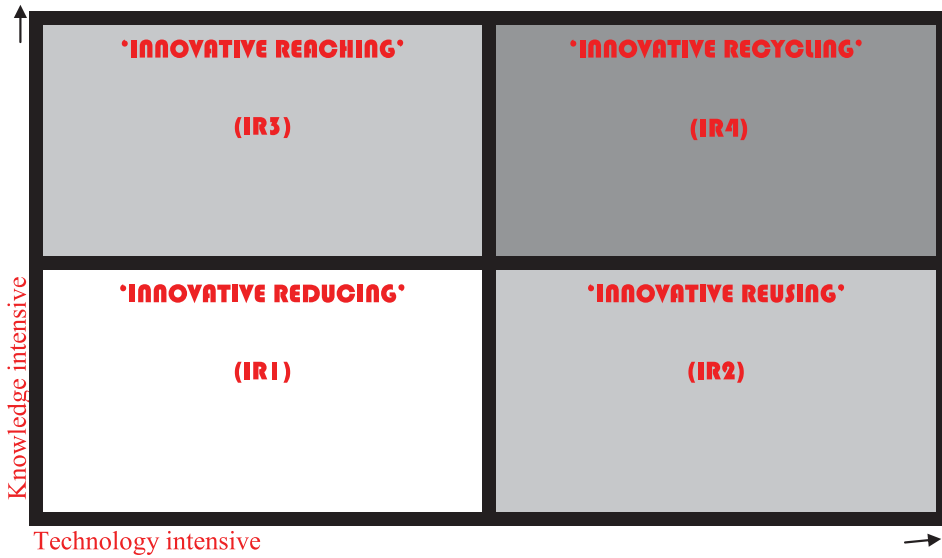


Figure 3. Framework for innovative water management in hotels. Source: Developed by the authors.

should not use running tap water to defrost food, keep trash from toilets and wash dishes or laundry only on full machine loads are other reduction behavior changes. Kitchen and laundry attendants can be trained to control temperature and water flow of dishwashers and washing machines. Waiters and servers can use easy to clean, reusable place mats in place of tablecloths to save water in laundry. Guest notices can tactfully request guests to be careful with water.

As it is often expensive to develop and maintain technology intensive water management and wastewater management systems, this option should make small hotel operators feel less burdened and more motivated to address water management issues. IR1 is also an approach suitable for motels, hostels, homestay and bed and breakfast operators. Through innovative human resource management strategies, and consistent motivation from management, this approach can be widely adopted and help small hotel operators. As small hotels often exist in large numbers compared to other hotel sizes, their actions will provide accumulative positive impact on local water conditions. For example, according to McGinnis and McGinnis (2010), one dripping tap can waste 7500 liters of water a year while a leaky toilet can waste about 270,000 liters a year. By simply training employees to be more vigilant of leaks, those small properties can save billions of liters of water collectively if they get those leaks fixed immediately.

The bottom right segment of the framework (Innovative Reusing [IR2]) depicts a business situation where a hotel may have low knowledge on water management, but high technological capability to deal with it. This type of hotel can concentrate on water reuse as its water management strategy. Hotels produce gray water from many different sources: laundry room, kitchen, sinks and showers. Hotels that do not have an environmental management policy would simply allow this gray water to flow into the municipal sewerage system, which may end up polluting local waterways (Frangipani Hotel Resort and Spa, 2011). However, with adequate facilities to channel and purify gray water, it can be reused for other activities such as watering gardens, doing outdoor cleaning and flush water for toilets.

Hotels can also reduce water consumption by modifying the way they operate. For example, Tortella and Tirado (2011) suggest designing landscape that consists of local hardy, drought tolerant plants to reduce the water needed for landscape watering. They also refer to the importance of efficient irrigation systems and avoidance of large swimming pools in hotel design. A good example of efficient irrigation system use is the innovative “drip” and moisture irrigation system used by Holiday Inn Airport San Antonio, Texas, USA to replace traditional sprinkler systems. These innovative “drip” and moisture irrigation systems allow hotel to collect air conditioning (AC) condensate, pool backwash and chilling tower blow-down water for use in their landscape (InterContinental Hotel Groups Innovation Hotel, 2012).

Hotels can lower their impact on local water sources by managing rainwater and/or melting snow. Depending on the atmospheric quality of the location, rainwater is relatively clean and chemical free. Water can be collected and stored for usage during dry seasons when pipe water supply could become inconsistent or low. This approach requires hotels to innovate ways to collect, store and filter rainwater and/or melting snow. According to the InterContinental Hotel Group, harvesting rainwater can reduce up to 55% of potable water demand when supported by ultra low flow fixtures. Rainwater harvesting using roof or underground tanks is suitable for regions with high precipitation level and is a low cost, effective way to reduce dependency on local water supply.

The top left segment of the framework (Innovative Reaching [IR3]) depicts a business situation where a hotel may have high knowledge about water management, but low technological capability to implement it. This type of hotel can still contribute to water management by innovatively reaching to its stakeholders. “Reaching” entails connecting with others to promote sustainable water management. Hotels can connect with other hotels, with their own employees and even with their customers. Ecological (2003) stresses that instigating environmental management systems (EMS) into a hotel’s work culture should involve guests, local communities and vendors. Mutual understanding and common goals can ease the change process.

IR3 can be accomplished by hotels of all sizes through education, collaboration and compensation (see Hospitality Upgrade, 2011). It is knowledge intensive, as it requires hotel management to “teach” and influence stakeholders to support the hotel’s goal of minimizing water consumption. For example, a leading green hotel can provide workshops to train other hoteliers on how to save water. It can conduct in-house training for its employees to nurture awareness as well as environmentally friendly attitudes and culture within the organization. Employees can be encouraged to take more active roles within their communities such as talking about water issues in schools and other community events. Hotels can also indirectly educate their customers through their policies, operational standards and building design to inform customers of their environmentally friendly management philosophy. Clearly, there are endless initiatives that a hotel can take to educate others. The current lack of documented hotel outreach programs related to water and wastewater management opens doors to the possibility of developing such innovative programs for hotel companies.

Reaching innovatively also means collaborating with appropriate and important stakeholders (Harrington & Ottenbacher, 2011; Lo, 2013). This means hotels without adequate financial resources can still raise awareness about water issues i.e. by instigating a work culture that focuses on environmental and social mindedness of employees in day-to-day operation. Incentives for employees that show environmental and social mindedness beyond their call of duties could also be an innovative approach. Collective effort from both management and employees will provide strong foundation for ethical practices

such as minimizing resource consumption and enhancing social responsiveness. However, the full involvement of hotel employees at all levels is needed to ensure success. One successful case study was that of the three-year *we care!* program by Hilton hotels in continental Europe. The program motivated over 16,000 of Hilton's employees to actively assist local communities and to participate in world green events such as "Clean up the world" actions or "Earth Hour". The employees were trained and enrolled in eco-learning courses, thereby inculcating stronger environmental and social mindedness (see Bohdanowicz et al., 2011).

Innovative collaboration also applies to other relationships. Frangipani Langkawi Resort and Spa, for example, developed a community outreach program that aims to educate the public (guests, students, other hotel operators) on the concept of hotel greening. Frangipani provides a one and half to two hours' eco-walk every day that shows all the practices from Green design for energy conservation to wetland and organic farm.

Another, perhaps slightly different way of reaching innovatively is by compensating. Compensation is different from incentives because it does not motivate potential recipients. Rather it provides a feel good factor for a previous (negative) action on the part of the hotel. Planting trees in the local community to compensate for clearing out an area to build a hotel (thereby possibly reducing a rainwater collection area) and compensating workers' time for managing water by organizing family days more than once a year are just examples. The possibilities for innovatively reaching to stakeholders are endless.

The top right segment of the framework (Innovative Recycling [IR4]) depicts a business situation where a hotel is both knowledgeable and has the technological capability to engage in water management. Innovative "recycling" is both knowledge and technology intensive because it involves turning very dirty and polluted water to clean drinkable water. Thus, this approach is most feasible for large corporations with high environmental management budgets. Increasing availability and accessibility of information on firm performance and social activities of publicly traded, large-scale corporations (Thompson & Smith, 1991) made larger firms more open to public scrutiny in the area of CSR (Fox, 2005). Thus, it is in the interest of big hotel firms to "go big" in their water management and adopt innovative recycling approaches as such activities can also enhance their image as an environmentally friendly corporation.

## Conclusions and recommendations

This paper highlighted the importance of water management practices in hotel companies and proposes a practical water management framework for hotels. The framework proposed provides strategies and examples about how hotels of different sizes can address the challenge of implementing water management. The framework also allows hotels to find innovative ways forward according to their knowledge level and technological (and therefore capital/cost) capabilities. Hotels can choose to respond using the least technology and knowledge intensive innovation, or highest technology and knowledge intensive innovation or something in between.

Larger hotels can opt to use knowledge and technology intensive options because they usually have the most access to capital. In addition, their size implies big externalities, and visibility to public scrutiny. The media and civic movements generally have greater expectations for big firms to become leaders in environmental protection because they could have greater externalities as well as the resources to lead other firms to be environmentally responsible (King & Lenox, 2000). Therefore, responsible hotels can innovate

using the technology and knowledge intensive dimension (IR4) to address their externalities and/or show leadership in environmental management.

There are, however, several foreseeable water management challenges in hotels. The first is lack of awareness among hotels about the size and urgency of the water situation at the global and local level. Lack of awareness, compounded by generally low water tariffs in many places may lead to apathy and a tendency to do business as usual. Therefore, the government agencies and trade associations in each country need to play a role in enhancing awareness on water issues among local properties. They can perhaps form partnerships to tackle water issues. This is in accordance with the call from the United Nations Educational, Scientific and Cultural Organization (2006) that governments should be open to innovative ways to improve water supply quality and quantity. In addition, the partnerships should focus on education about not only local water conditions, but also that at the global level. Tourism service providers should be able to “see the big picture” and be more aware of their water consumption.

Another challenge is changing public or consumer perception. It has been established that people tend to use the pleasure behavior approach (Eurostat, 2009) when using water in hotels. Therefore, some innovations, for example, using gray water for landscape or toilets, may run counter to the expected general aesthetics of being in a hotel. Gray water can be unsightly, smelly and perceived to be full of germs. Therefore, hotels should find creative ways to either reduce the unpleasant characteristics of gray water, or find discreet means to use it. For example, in the case of the Frangipani Langkawi Hotel’s wetland system, it was observed during the investigation that gray water recycling was not noticeable as there was no bad odor or unsightly things floating around. Instead, the wetland was pleasant looking and was a natural habitat for some species.

Governments have an important role to make the implementation of water and wastewater management among hotels successful. As empirically proven in the context of Jordan, appropriate regulation and policy from the government can make hotels more engaged in water management issues. Admittedly, the dry conditions of Jordan may also be a strong influence for their engagement. However, proper communication that encourages hotels to be aware of water problems worldwide can convince more hotels to be vigilant about the issue. Worsening water crises can affect hotels’ core products, and the tourist experience, which can easily turn negative over situations such as lack of water and polluted water bodies. Efficient water management can help sustain the attractiveness of both the hotels and the destination. It also means that hotels are fulfilling their roles as good corporate citizens. In short, innovative water management can benefit hotels (and other lodging types) in many ways.

This study contributes to the literature by showing that hotel business of all sizes, including the small and medium businesses, can engage in, and benefit from the triple bottom line (Elkington, 2001) and “win-win” (Porter & Van de Linde, 1995) business approaches despite their internal and external challenges (Hillary, 1999; Utting, 2000). Via the framework of action proposed, the study demonstrates that given the flexibility of options, small and medium size hotels can engage actively in water management. With adequate awareness of the issue and knowledge on the affordable innovative options available to them, supported by a strong regulatory environment, small and medium businesses can join bigger companies in innovating their ways to water management.

This paper suggests that instigating an innovative approach in a hotel’s water management can have a positive effect on all involved. It does not take into account the possible inverted relationship a hotel’s innovative environmental and social mindedness may have on tourists’ perception of service quality. Therefore, future research may investigate



whether innovatively integrating water management strategies might have direct negative impacts on tourists' perceived experience. Future studies may also investigate the macro environmental factors affecting hotel water management to understand what drivers and barriers specific to water management issues affect the hotel sector in a particular destination. Cross-comparative studies in multiple destinations may yield better understanding on the variability of these drivers and barriers in different environments, using both quantitative and qualitative data, especially by managerial focus groups (O'Neil, 2012). Delphi techniques (Paraskevas & Saunders, 2012) may be another option to collect empirical data from water management experts and hotels managers to find better and innovative water management practices.

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### References

- Ayuso, S. (2007). Comparing voluntary policy instruments for sustainable tourism: The experience of the Spanish hotel sector. *Journal of Sustainable Tourism*, 15(2), 144–159.
- Bartis, H., & Baldies, C. (2009). Responsible tourism practices in the non-hotel accommodation (NHA) sector in Port Elizabeth, South Africa. *International Institute for Peace Through Tourism*. Retrieved January 12, 2012, from <http://www.iipt.org/IIPT%20Book/articles/Hugh%20Bartis.Non-Hotel%20Sector.pdf>
- Beeson, B. (2008). Latin America: Why there's a water crisis in the most water-rich region. *AlterNet*. Retrieved September 13, 2012, from [http://www.alternet.org/story/84145/latin\\_america%3A\\_why\\_there's\\_a\\_watercrisis\\_in\\_the\\_most\\_water-rich\\_region](http://www.alternet.org/story/84145/latin_america%3A_why_there's_a_watercrisis_in_the_most_water-rich_region)
- Bohdanowicz, P., & Martinac, I. (2007). Determinants and benchmarking of resource consumption in hotels – case study of Hilton International and Scandic in Europe. *Energy and Buildings*, 39, 82–95.
- Bohdanowicz, P., Zientara, P., & Novotna, E. (2011). International hotel chains and environmental protection: An analysis of Hilton's we care! programme (Europe, 2006–2008). *Journal of Sustainable Tourism*, 19(7), 797–816.
- Caribbean Community Climate Change Centre. (2009). *National adaptation strategy to address climate change in the tourism sector in Barbados: Synthesis of the technical reports*. Belmopan, Belize: Author.
- Carlisle, Y.M., & Faulkner, D.O. (2004). Corporate social responsibility: A stages framework. *European Business Journal*, 16(4), 143–151.
- Cashman, A., & Moore, W. (2012). A market based proposal for encouraging water use efficiency in a tourism-based economy. *International Journal of Hospitality Management*, 31(2012), 286–294.

- Charalambous, K., Bruggeman, A., & Lange, M.A. (2012). The impact of climate change on water use in the tourism sector of Cyprus. *The Cyprus Institute*. Retrieved September 12, 2012, from [http://www.cyi.ac.cy/system/files/CyprusInstitute2012\\_tourism\\_water\\_survey\\_report.pdf](http://www.cyi.ac.cy/system/files/CyprusInstitute2012_tourism_water_survey_report.pdf)
- Charara, N., Cashman, A., Bonnell, R., & Gehr, R. (2011). Water use efficiency in the hotel sector of Barbados. *Journal of Sustainable Tourism*, 19(2), 231–245.
- Choong, M.Y. (2011). Malaysia faces looming water crisis. *The Star*. Retrieved April 15, 2012, from <http://thestar.com.my/lifestyle/story.asp?file=/2011/3/22/lifefocus/8192017&sec=lifefocus>
- Cole, S. (2012). A political ecology of water equity and tourism: A case study from Bali. *Annals of Tourism Research*, 39(2), 1221–1241.
- DiPietro, R., Cao, Y., & Partlow, C. (2013). Green practices in upscale foodservice operations: Customer perceptions and purchase intentions. *International Journal of Contemporary Hospitality Management*, 25 (5), 779–796.
- Ecological. (2003). Developing an environmental management system. *EcoLodgical*. Retrieved November 22, 2012, from [http://ecological.yourhomeplanet.com/index\\_ems.php](http://ecological.yourhomeplanet.com/index_ems.php)
- Elkington, J. (2001). The triple bottom line for 21st century business. In R. Welford & R. Starkey (Eds.), *Business and sustainable development* (pp. 20–43). London: Earthscan.
- Epp, C., Dercas, N., Tondy, G., Capaccioli, S., & Ribiero, J.F. (n.d.). *Policy initiative to overcome water competition between agriculture and tourism*. Retrieved from [www.medwater.de/pdf/Crete\\_Conference\\_abstract.pdf](http://www.medwater.de/pdf/Crete_Conference_abstract.pdf)
- Erdogan, N., & Baris, E. (2007). Environmental protection: Programmes and environmental practices among hotels in Ankara, Turkey. *Tourism Management*, 28(2), 604–614.
- Eurostat. (2009). Medstat II: Water and tourism Pilot Study. *Eurostar, European Commission*. Retrieved July 12, 2012, from [http://epp.eurostat.ec.europa.eu/cache/ITY\\_OFFPUB/KS-78-09-699/EN/KS-78-09-699-EN.PDF](http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-78-09-699/EN/KS-78-09-699-EN.PDF)
- Farsari, I. (2012). The development of a conceptual model to support sustainable tourism policy in north Mediterranean destinations. *Journal of Hospitality Marketing & Management*, 21(7), 710–738.
- Fox, T. (2005). *Small and medium-sized enterprises (SMEs) and corporate social responsibility: A discussion paper*. London: IIED.
- Frangipani Hotel Resort and Spa. (2011). *The Wetland concept*. Unpublished document. Langkawi, Malaysia.
- Gössling, S. (2005). Tourism's contribution to global environmental change: Space, energy, disease and water. In C.M. Hall & J. Higham (Eds.), *Tourism recreation and climate change: International perspectives* (pp. 286–300). Clevedon: Channel View Publications.
- Gössling, S., Peeters, P., Hall, C.M., Ceron, J.-P., Dubois, G., Lehmann, L.V., & Scott, D. (2012). Tourism and water use: Supply, demand, and security. An international review. *Tourism Management*, 33(1), 1–15.
- Hamele, H., & Eckardt, S. (2006). *Environmental initiatives by European tourism businesses: Instruments, indicators and practical examples - A contribution to the development of sustainable tourism in Europe*. Saarbrücken: SUTOUT, TourBench, DBU, ECOTRANS.
- Harrington, R., & Ottenbacher, M. (2011). Strategic management: An analysis of its representation and focus in recent hospitality research. *International Journal of Contemporary Hospitality Management*, 23(4), 439–462.
- Hillary, R. (1999). *Evaluation of study reports on the barriers, opportunities and drivers for small and medium size enterprises in the adoption of EMS, network for environmental management and auditing*. London: Crown.
- Holcomb, J., Upchurch, R., & Okumus, F. (2007). Corporate social responsibility: What are top hotel companies reporting? *International Journal of Contemporary Hospitality Management*, 19(6), 461–475.
- Hospitality Upgrade. (2011). *AH&LA honours hotels with national awards*. Retrieved July 19, 2012, from Hospitality Upgrade website: [http://www.hospitalityupgrade.com/\\_news/showNewsDetail-docID-4928.asp](http://www.hospitalityupgrade.com/_news/showNewsDetail-docID-4928.asp)
- Hsieh, J. (2012). Hotel companies' environmental policies and practices: A content analysis of their web pages. *International Journal of Contemporary Hospitality Management*, 24(1), 97–121.
- Intercontinental Hotel Group Innovation Hotel. (2012). Efficient landscaping reduces water use at the Holiday Inn Airport San Antonio. *Intercontinental Group*. Retrieved July 18, 2012, from <http://innovation.ihgplc.com/>

- Jenkins, H. (2006b). Small business champions for corporate social responsibility. *Journal of Business Ethics*, 67(3), 241–256.
- Kasim, A. (2006). The need for environmental and social responsibility in the tourism industry. *International Journal of Hospitality and Environmental Management*, 7(1), 1–22.
- Kasim, A. (2009). Towards a wider adoption of business responsibility in the hotel sector. *International Journal of Hospitality and Tourism Administration*, 8(2), 25–49.
- Kasim, A., & Mahasneh, M. (2010). Hotel reactions to water consumption and management issue. Conference proceedings of *Asia Euro conference: Modernization and transformation of tourism, hospitality and gastronomy*. Taylor's Lakeside Campus Subang Jaya.
- King, A., & Lenox, M. (2000). Industry self-regulation without sanctions: The chemical industry responsible care programme. *Academy of Management Journal*, 43(4), 698–716.
- Kirk, D. (1995). Environmental management in hotels. *International Journal of Contemporary Hospitality Management*, 7(6), 3–8.
- Lepoutre, J., & Heene, A. (2006). Investigating the impact of firm size on small business social responsibility: A critical review. *Journal of Business Ethics*, 67(3), 257–273.
- Lo, Y. (2013). Stakeholder management in the Chinese hotel industry: The antecedents and impacts. *International Journal of Contemporary Hospitality Management*, 25(4), 470–490.
- Lubin, G. (2011). Map of the day: The world water crisis. *Business Insider*. Retrieved October 27, 2012, from <http://www.businessinsider.com/water-crisis-2011-3?Op=1#ixzz2azgjc64>
- Malaysian Investment Development Authority. (2012). *Starting a business*. Malaysian Investment Development Authority. Retrieved January 17, 2013, from <http://www.mida.gov.my/env3/index.php?page=water-rates>
- McGinnis, K., & McGinnis, M. (2010). Water conservation ideas. *Benefits of Recycling*. Retrieved July 17, 2012, from <http://www.benefits-of-recycling.com/waterconservationideas.html>
- Millar, M., Mayer, K.J., & Baloglu, S. (2012). Importance of green hotel attributes to business and leisure travelers. *Journal of Hospitality Marketing & Management*, 21(4), 395–413.
- Nyahunzvi, D.K. (2013). CSR reporting among Zimbabwe's hotel groups: A content analysis. *International Journal of Contemporary Hospitality Management*, 25(4), 595–613.
- Okumus, F., Altinay, L., & Chathoth, P. (2010). *Strategic management for hospitality and tourism*. Oxford: Elsevier, Butterworth and Heinemann.
- O'Neill, J. (2012). Using focus groups as a tool to develop a hospitality work-life research study. *International Journal of Contemporary Hospitality Management*, 24(6), 873–885.
- Pannier, B. (2008). *Central Asia: Age-old water problem brings tensions to boil*. Retrieved April 28, 2012, from Radio Free Europe website: <http://www.rferl.org/content/article/1144627.html>
- Paraskevas, P., & Saunders, M. (2012). Beyond consensus: An alternative use of Delphi enquiry in hospitality research. *International Journal of Contemporary Hospitality Management*, 24(6), 907–924.
- Porter, M.E., & Van de Linde, C. (1995). Towards a new conception of the environment-competitiveness relationships. *Journal of Economic Perspectives*, 9(4), 97–118.
- Reichardt, K. (2007). Measure your hotel's water consumption, then start saving. *4 Hoteliers*. Retrieved April 6, 2012, from [http://www.4hoteliers.com/4hots\\_fshw.php?mwi=1889](http://www.4hoteliers.com/4hots_fshw.php?mwi=1889)
- Shrubsole, D., & Draper, D. (2007). On guard for thee? Water (ab)uses and management in Canada. In K. Bakker (Ed.), *Eau Canada: The future of Canada's water* (pp. 37–54). Vancouver: UBC Press.
- Strategic Foresight Group. (2011). The blue peace: Rethinking Middle East water. *Euro-Mediterranean Information System on know-how in the Water sector*. Retrieved October 29, 2012, from <http://www.emwis.org/thematicdirs/news/2011/02/new-strategic-foresight-group-report-blue-peace-rethinking-middle-east-water>
- The Guardian*. (2011). Alpine glacier retreat pushing Europe closer to water crisis. *Guardian Environment Network*. Retrieved October 26, 2012, from <http://www.guardian.co.uk/environment/2011/jul/22/glacier-europe-water-crisis>
- Thompson, J., & Smith, H. (1991). Social responsibility and small business: Suggestions for research. *Journal of Small Business Management*, 29(1), 30–44.
- Tortella, B.D., & Tirado, D. (2011). Hotel water consumption at a seasonal mass tourist destination. The case of the island of Mallorca. *Journal of Environmental Management*, 92(10), 2568–2579.
- Tourism Concern Action for Ethical Tourism. (2012). Water equity in tourism: A human right, a global responsibility. In R. Noble, P. Smith, & P. Pattullo (Eds.), London, Tourism Concern

- (pp. 1–31). Retrieved November 23, 2012, from <http://www.tourismconcern.org.uk/uploads/Campaigns/WET%20Report.pdf>
- United Nations Educational, Scientific and Cultural Organization. (2006). *Water E-Newsletter No. 155: Water and tourism*. UNESCO. Retrieved July 16, 2012, from <http://www.unesco.org/water/news/newsletter/155.shtml>
- United Nations Environmental Programme. (2002a). *GEO: Global environment outlook*. UNEP. Retrieved November 21, 2012, from <http://www.unep.org/geo/geo3/english/286.htm>
- United Nations Environmental Programme. (2002b). Global environment outlook 3: Past, present and future perspectives. *Global Environment Outlook 3*. Retrieved November 21, 2012, from <http://www.unep.org/geo/GEO3/english/pdfs/prelims.pdf>
- United Nations Environmental Programme. (2002c). Global environment outlook. *Global Environment Outlook 3*. Retrieved November 22, 2012, from <http://www.unep.org/geo/GEO3/english/pdfs/synthesis.pdf>
- United Nations Environmental Programme. (2012a). Summary for West Asia on the eve of Rio+20. *Global Environment Outlook 5*. Retrieved November 22, 2012, from [http://www.unep.org/geo/pdfs/geo5/RS\\_WestAsia\\_en.pdf](http://www.unep.org/geo/pdfs/geo5/RS_WestAsia_en.pdf)
- United Nations Environmental Programme. (2012b). Summary for Africa on the eve of Rio+20. *Global Environment Outlook 5*. Retrieved November 22, 2012, from [http://www.unep.org/geo/pdfs/geo5/RS\\_Africa\\_en.pdf](http://www.unep.org/geo/pdfs/geo5/RS_Africa_en.pdf)
- United Nation World Tourism Organization. (2012a). *UNWTO tourism highlights*. Retrieved June 23, 2012, from [https://s3-eu-west1.amazonaws.com/storageapi/sites/all/files/docpdf/unwtohighlights12enhr\\_1.pdf](https://s3-eu-west1.amazonaws.com/storageapi/sites/all/files/docpdf/unwtohighlights12enhr_1.pdf)
- United Nation World Tourism Organization. (2012b). *Tourism 2020 vision*. United Nation World Tourism Organization. Retrieved August 12, 2012, from <http://www.unwto.org/facts/eng/vision.htm>
- United Nations World Water Development Report (2003) *Water for people, water for life*. Retrieved June 2, 2012, from United Nations Educational, Scientific and Cultural Organization website: <http://unesdoc.unesco.org/images/0012/001295/129556e.pdf>
- United Nations World Water Development Report (2006). *Water, a shared responsibility*. Retrieved July 21, 2012, from United Nations Educational, Scientific and Cultural Organization website: <http://unesdoc.unesco.org/images/0014/001444/144409e.pdf>
- Utting, P. (2000). Business responsibility for sustainable development. *Geneva 2000 Occasional Paper 2*, Geneva: UNRISD.
- Videras, J., & Alberini, A. (2000). The appeal of voluntary environmental programmes: Which firms participate and why? *Contemporary Economic Policy*, 18(4), 449–461.
- Woods Hole Research Centre. (2012). *Ecosystems studies and management: Feedback between water and deforestation in tropical South America*. UNESCO. Retrieved October 29, 2012, from [http://webcache.googleusercontent.com/search?q=cache:http://www.whrc.org/ecosystem/amazon\\_water.html](http://webcache.googleusercontent.com/search?q=cache:http://www.whrc.org/ecosystem/amazon_water.html)
- World Tourism Organization. (2009). *Confidence in tourism sector gradually picking up*. Madrid: Author.
- World Travel and Tourism Council. (2011). *Travel and tourism 2011*. Retrieved October 26, 2011, from *World Travel and Tourism Council* website: [http://www.wttc.org/site\\_media/uploads/downloads/traveltourism2011.pdf](http://www.wttc.org/site_media/uploads/downloads/traveltourism2011.pdf)
- Zouganeli, S., Trihas, N., Antonaki, M., & Kladou, S. (2012). Aspects of sustainability in the destination branding process: A bottom-up approach. *Journal of Hospitality Marketing & Management*, 21(7), 739–757.