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Review

Solid waste management in the hospitality industry: A review



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ABSTRACT

Solid waste management is a key aspect of the environmental management of establishments belonging to the hospitality sector. In this study, we reviewed literature in this area, examining the current status of waste management for the hospitality sector, in general, with a focus on food waste management in particular. We specifically examined the for-profit subdivision of the hospitality sector, comprising primarily of hotels and restaurants. An account is given of the causes of the different types of waste encountered in this sector and what strategies may be used to reduce them. These strategies are further highlighted in terms of initiatives and practices which are already being implemented around the world to facilitate sustainable waste management. We also recommended a general waste management procedure to be followed by properties of the hospitality sector and described how waste mapping, an innovative yet simple strategy, can significantly reduce the waste generation of a hotel. Generally, we found that not many scholarly publications are available in this area of research. More studies need to be carried out on the implementation of sustainable waste management for the hospitality industry in different parts of the world and the challenges and opportunities involved.

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1. Introduction

The hospitality industry in many parts of the world is expected to see significant rates of growth in the next few years. For example, Revenue Per Available Room (RevPAR) is expected to grow by 6% in 2014 in the United States (Berman, 2014) and by up to 5% in some European cities during 2014 and 2015 (Milburn and Hall, 2014). In the Middle East, the Gulf Cooperation Council (GCC) countries are expected to see a boom in hotel revenue by 2016, which implies a Compound Annual Growth Rate (CAGR) of 6.93% (MeetMiddleEast, 2013). Indeed, while exploring the various literature concerning the global outlook for the hospitality industry, it is clear that, in most parts of the world, this sector is recovering from its financial losses after the 2008 global economic crisis and “a positive outlook and favorable transaction climate are anticipated in 2014 for the global lodging industry” (Fishbin, 2014).

This expansion in hospitality sector operations is complemented by an expansion in its waste management operations. More waste usually translates into a greater environmental footprint and therefore more harm to the ecosystem. For example, a hotel guest is estimated to generate up to 1 kg of waste per day on average

(International Hotel Environmental Initiative, 2002), and this amounts to millions of tons of waste being generated worldwide annually. Therefore, the importance of studying the hospitality sector in order to facilitate more efficient waste management procedures cannot be overemphasized.

In the late 1990s, generally speaking, establishments of the hospitality industry were not very concerned with their environmental impact and a sustainable way of dealing with their waste was not given much priority (Radwan et al., 2010). However, the current situation is very different. There is much more environmental awareness, which is clear from the booming number of ecolabels that are being used as a means of certification for many hospitality sector properties around the world. Most of these properties are getting certified voluntarily. This is also an indication of the heightened interest of guests/visitors in environmental issues. As a result, waste management processes adopted by many hotels and restaurants have changed from what they were 15 years ago and various waste reduction strategies are being implemented, including those which address food waste. In fact, with effective waste management, a mid-size hotel can produce one-fourth the waste generated by a similar hotel which is not implementing the same waste management strategies (WWF-UK and International Business Leaders Forum (IBLF), 2005).

For a hospitality business, the cost of solid waste management includes various factors such as the disposal and transport of waste,

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as well as associated labor costs (Todd and Hawkins, 2003). Therefore, more efficient waste management can help lead to significant savings for the business depending on where the business is located and the waste management regulations in that area. Other benefits of ecofriendly waste management include an improved business image, reduced carbon emissions from the decreased transportation of waste, reduced costs due to smaller order requirements from suppliers, improved relations with stakeholders, reduced risks and liabilities, and health and safety benefits (Ball and Abou Taleb, 2010).

Not much literature is available on waste management in the hospitality industry. For example, a 2012 review of environment-related research articles published in major hospitality journals accounted for only 58 articles in the period from 2000 to 2010 (Myung et al., 2012). These articles were not only exclusively focused on waste management, but also discussed other types of environment-related research. Likewise, a 2013 review paper which accounted for publications from all over the world on food waste prevention in the food supply chain mentioned only one publication about cafeterias in Brazil, two publications about the hospitality sector in general (one with reference to the UK and the other with reference to the Nordic countries), and one publication about hotel restaurants in Norway (Schneider, 2013). When resources can be found which discuss environmental management in the hospitality sector, they tend to lack the focus on the waste management aspect of environmental management. And when these resources do discuss waste management in detail, they tend to be in the form of reports which express strategies as recommendations; with few having shown the effects of carrying out such strategies. Moreover, reports concerning waste in the hospitality industry tend to lack data specifically on food waste (Marthinsen et al., 2012).

In this work, our goal is to provide a comprehensive review and analysis of the status and practices of waste management in today's hospitality industry. Such a review will be of relevance and benefit to management in the global hospitality industry, environmental organizations seeking to help green this major economic sector and minimize its ecological footprint, as well as to decision makers and government officials desiring to benchmark the performance of their local hospitality industry. A number of subjects is covered. First, a range of definitions used in this field is elaborated. Then, the quantities of waste generated in the global hospitality industry, as well as the composition of this waste are discussed. Generally speaking, waste from the hospitality industry consists of both wet (organic/biodegradable) and dry waste. The wet waste consists primarily of food waste (Wagh, 2008), which can account for more than 50% of the hospitality waste (Curry, 2012) and up to one third of all the food served within the hospitality sector (Marthinsen et al., 2012). Therefore, food waste in the hospitality industry is given special attention in this review. Then, studies reporting on initiatives for waste reduction in the hospitality industry are reviewed and the impacts of these initiatives are assessed. Similarly, key global organizations working on minimizing food waste in the hospitality industry are reviewed and their approaches and strategies (and the success thereof) are discussed. Next, today's international ecolabeling systems for the hospitality industry are reviewed, contrasting their method of certification and regions of application. Finally, the challenges associated with implementing waste management in the hospitality industry are discussed.

2. Key definitions

The *hospitality sector*, in general, can be defined as “businesses such as hotels, bars, and restaurants that offer people food, drink, or a place to sleep” (Cambridge Dictionaries Online, 2014). The

Table 1

Types of non-hazardous waste in the hotel industry [based on the work of Zein et al., 2008].

Non-hazardous Waste Type	Components	Source
Household wastes	Food/kitchen waste, used or dirty paper and wrapping, plastic wrapping or bags, composite wrappers	Hotel's different departments
Cardboard	Packaging	Hotel's purchasing and other departments
Paper	Printed documents, brochures, menus, maps, magazines, newspaper	Administration, reception, guest rooms, restaurants
Plastic	Bags, bottles (that did not contain hazardous material), household goods, individual portion wrappers for various products	Kitchen, restaurants, bars, guest rooms, administration
Metal	Tin cans, jar lids, soda cans, food containers, mayonnaise, mustard and tomato purée tubes, aluminum packaging	Kitchen, restaurants, bars, guest rooms
Glass	Bottles, jars, flasks	Kitchen, restaurants, bars, guest rooms
Cloth	Tablecloths, bed-linen, napkins, clothes, rags	Kitchen, restaurants, bars, bathrooms, guest rooms
Wood	Wooden packaging, pallets	Purchasing department
Organic waste	Fruit and vegetable peelings, flowers and plants, branches, leaves, grass	Kitchen, restaurants, bars, guest rooms, gardens

hospitality sector may be further divided into for-profit and not-for-profit divisions (Parfitt et al., 2013). However, for the sake of this study, by hospitality sector, the establishments being referred to are the hotels, restaurants, and cafeterias which operate on a for-profit basis. They are included in the ‘Horeca’ subdivision of the hospitality sector. *Horeca* stands for ‘hotels, restaurants and cafés’ (Marthinsen et al., 2012). We have decided to consider this as the scope of this paper since the waste management practices at all of these institutions are quite similar, and collectively they account for a very significant proportion of waste generated for the hospitality industry (Parfitt et al., 2013).

Food waste is “any food that is not consumed by humans and can be generated at any level within the food chain” (Okazaki et al., 2008). For the purpose of this study, food waste is defined as any food discarded as part of operations in the hospitality sector. This could be packaged food that is thrown away as it has passed its expiration date, food preparation/processing wastes, and waste from serving dishes and guests' plates. Food waste can further be divided into *avoidable* (food that was edible before it was thrown away), *possibly avoidable* (food that is eaten by some but not by others, or a single type of food that may or may not be waste depending on how it was prepared) and *unavoidable* waste. The avoidable and possibly unavoidable waste may therefore be considered to be *edible* (Parfitt et al., 2010).

3. Characterization and quantification of waste in the hospitality industry

Waste generation is considered by some to be the most noticeable effect which the hospitality sector has on the environment, especially due to the fact that many of the establishments

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