Water Management in Hospitality Industry: Managerial Perspectives

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Abstract

Due to the importance of water and increasing water consumption besides growing tourist numbers also hospitality industry consumes large quantities of water and the worldwide wonder of the crisis in the quality and amount of water supplies and how tourism for the most part and hotels explicitly may have added to the circumstance. Although all of these important issues little are concerned about water management as a major matter in the hospitality industry while it needs more effort and concentration. Therefore, the purpose of this qualitative research was to explore hotel managers' attitude regarding water management in an attempt to identify whether their attitudes influence their utilization of water in their hotels. Thirteen in-depth interviews were conducted with managers in Greater Cairo hotels to analyze their use of water and their techniques to conserve water. The results of this research indicated that managers overall have positive attitudes towards water consumption. The results of this study offer manager with practical of using water management techniques that can help to increase the effectiveness of their water management methods, the main challenges that face water management in Egyptian hotels, other issues of water management are also discussed where water is a necessary resource for the tourism industry and many other sectors.

Keywords: Environmental Practices; Water Management; Managerial Perspectives; Hospitality Industry.

Introduction

The hospitality industry is a major; energy and water consumption sector; subsequently,they consume a massive

quantity of resources in their daily operations, such as water, energy, and many one-use products, which havemade an excessive challenge to the environment (Bohdanowicz, 2005; Verma& Chandra, 2017). Han *et al*. (2009) indicate that lately, public concern about environmental issues has been growing and customers are more environmentally aware than in the past. Chen & Chang (2012); Juvan&Dolnicar (2017) showed that a lot of guests prefer green consumption and concern about it as a real way to guard the environment.

Yadav&Pathak (2016) mention that numerous hotels tacked the initiative in adopting green practices and developing ecological programs for greening their hotels, resulting in so-called green hotels, to attract consumers and gain a competitive market position. According to the Green Hotel Association (GHA) (2015), green hotels are labeled with an eco-friendly label for saving water, saving energy, reducing solid waste, recycling, and reusing durable service items, all practices which aim to protect the earth (Lee *et al*., 2010; Kushwaha& Sharma, 2016). Green hotels are the future trend for guests to decrease pollution emissions in the tourism and hospitality industry (Siti*et al*., 2014).

Water is an essential and often scarce resource in tourism (Hadjikakou*et al*., 2013). With increasing awareness that a worldwide water crisis is coming and hastening under situations of climate change (Vorosmarty*et al*. 2000), so hotels established rising care to water management to evade or decrease water consumption (Hanjra&Qureshi, 2010; Gosling &Arnell, 2016). In the hospitality industry, this has for example included the outline of new technologies, policies seeking to optimize staff routines, and normative appeals to raise

behavioral change on the side of guests (Gossling*et al*., 2015).

Efforts to moderate water consumption in the leisure industry have observant to food, irrigation, and in-room water use (Gossling*et al*., 2015). Many researchers have wanted to know how guests can be committed based on the environment,green actions to reuse towels and bed linen, and reduce water consumption during their stays (Mair& Bergin, 2010; Shang *et al*., 2010; Goldstein *et al*., 2011; Baca *et al*., 2013; Dolnicar*et al*., 2017). Guests generate considerable amounts of laundry; this is hundreds of thousands of units per year in medium-sized hotels, or several kilograms per guest night (Gossling*et al*., 2015). Although laundry of these items only accounts for a small share of water use in hotels (Gossling*et al*., 2015), laundry is too energy-intensive and needs more water, but a towel and bed linen replacement is time-intensive. Both features signify extra cost causes, i.e. energy and water costs besides staff working time. Several hotels have procedures to exchange towels and bed linen daily and in some circumstances even twice each day. Guests can be committed to using their linen for two days rather than one, water consumption can be reduced by more percent in some hotels, on behalf of a large potential to support environmental and economic benefits (Gossling*et al*., 2015).

In this context, the main objective of this research is to explore hotel managers' attitude regarding water management, analyze and detect hotel managers' use of water and their techniques to conserve water. To achieve the research objective, the following research questions are designed: (i) do the hotel managers have positive attitudes towards water in Egyptian hotels? (ii) What are the water conservation

techniques adopted by Egyptian hotels? (iii) What are the main challenges that face water management in Egyptian Hotels

Review of Literature

Environmental Management System (EMS)

Chan (2008) defined environmental management system as a managing method that contains administrative arrangement, design doings, duties, applies, techniques, processes, and resources for increasing, applying, accomplishing, and revising, and preserving the policy of environment in harmony with the standards of International Organization for Standardization (ISO)'s. Besides Chan & Ho (2006); Candrea&Bratucu (2012) founded that the greatest operatives and extensively used tools for dealing and improving sustainable performance are environmental management systems (EMS). Hendry &Vesilind (2005); Persic&Blazevic (2010) assumed that adopting practices of environment sustainable are mainly for commercial objects, while Bonilla *et al*. (2011) suggested that the focal motive for adopting this practices is to support an acceptable establishment image, encouraging and meeting contribution to environmental management standards, for instance, ISO 14001, the Eco-management and Audit Scheme, the Coalition for Environmentally Responsible Economies and the Global Reporting Initiative (GRI).

In addition to the environmental management system (EMS) that was establishedas a managerial instrument to efficiently handle environmental issues coming from processes of business operations, different regulations of the government that enforce exterior requests on establishments, EMS rises from in business, and contains an unpaid assembling self-efforts (Coglianese& Nash, 2001). Also, EMS is a method a business assumes to keep, improve, or decrease its effect on the environment by set aims, measuring objects, rising programs and actions, auditing, inspecting, and valuation (Faulk, 2000). Because of the launch of ISO 14000 EMS standard in 1997, EMS has seemed like an issue of importance. An EMS formal system for hotels was established to help the application of environmental policies (Chan & Wong, 2006). On the other hand, the study of these systems is necessary because a growing number of lodging houses have completed EMS certifications for instance Green Globe 21 and ISO 14001, and they are probable to outcome in many merits, from financial incomes to promoting advantages.

Environmental Management Practices in Hotels

The hotel industry does not basis stark ecological poverty compared to the industrial business and it is described via an enormous quantity of actions, and therefore consuming a huge amount of water, energy, and non-renewed produces to sustain daily procedures (Deng & Burnett, 2002; Erdogan&Baris, 2007; Chan *et al*., 2014). Some of the important environmental matters include water preservation, energy efficiency, waste management, climate change, environmental management systems, and recycling and sustainable procurement practices (Bohdanowicz*et al*., 2011; Jayawardena, *et al*., 2013; Hsiao *et al*., 2014; Pirani& Arafat, 2016).

Goeldner& Ritchie (2006) & Holcomb *et al*. (2007) indicated that the developed countries for ten years have observed the environmental problem in the hospitality

industry and endeavor to join EMS into their daily operations to reduce the harmful effects of their hotels on the environment. In addition to the implementation of environmental management processes, that is considered one of the most important; activities in the hotel sector (Garcia *et al.*, 2013). Besides, some common environmental practices in hotels include the reduction of negative impacts on (people, land, and economy) through the use of eco-labeling and related local programs through partnerships (Lebe&Vrecko, 2015; Bohdanowicz&Zientara, 2016). Some hotels also provide their environmental information online to please their guests (Rosalind &Karanikola, 2014).

Jayawardena*et al.* (2013) discussed sustainable developments in the tourism and hospitality sector and described a variety of strategies for the possible improvement of social, financial, and ecological efficiency. Sanjeev (2016) analyzed key developments in the hospitality industry and confirmed that the hotel industry has accomplished improved market results through improvements in customer support, cost control, food management, sales management, and technology management.

Benefits of environmental practices

Mensah (2006); Manaktola&Jauhari (2007); Levy & Park (2011) indicated that the two common inducements for adopting environmental practices are cost savings and showing a good business image. Besides other business benefits that include greater working efficiencies, Improving long-term financial stability, and increased income and valuation of properties (Bader, 2005; Guet al., 2009; Anuwichanont et al., 2011).

Capriotti& Moreno (2007); Sztruten*et al.* (2010); Djajadikerta&Trireksani (2012)

Insured that consumers, manufacturers, and corporate clients are increasingly opting to perform their business with other green business companies based on positive thinking and enhancement of their reputation by being tied specifically to other environmentally-conscious firms. Furthermore, These activities often impact workers at a personal level -employees, such as the fact that they work with environmentally conscious companies, and these will often lead to the productivity of their employees (Goodman, 2000; Gu*et al.*, 2009; Bonilla *et al.*, 2011; Levy & Park, 2011), job retention, personal wellbeing (Butler, 2008; Persic&Blazevic, 2010), and personal career growth, based on how well they work effectively and how the individual employee has managed the hotel's sustainability (Ren, 2012).

Challenges of environmental practices

Increasing staff interest in these issues will also lead to a higher level of service to hotel customers, improved guest loyalty, and a more efficient and profitable hotel through good word-of-mouth and repeated business (Levy & Park, 2011; Santos, 2011; Searcy, 2012). Irrespective of increased understanding of environmentally friendly practices, the pace at which these practices are adopted in hotels is inactive. (Butler, 2008; Higgins, 2009; Alonso & Ogle, 2010) since the paybacks of sustainable practices are not familiar (Bader, 2005; Katsioloudes&Brodtkorb, 2007; Bonilla *et al.*, 2011; Searcy, 2012).Because of the lack of information at the executive level or the corporate structure (Gu*et al.*, 2009; Persic&Blazevic, 2010). Since the potential cost of introducing such activities is substantial, the long-standing challenge is to show financial feasibility (Goodman, 2000&Butler, 2008).

An additional difficulty is that there is little necessity in some countries, that the cost of power was smaller than in others so that businesses cannot justify spending in practice to reduce the cost of anything that does not significantly impact them (Chan *et al*., 2008). Persic&Blazevic (2010) showed that the degree and usability of eco-products is also a problem for hotels. Some scholars (Hobson & Essex, 2001; Mensah, 2006; Dittrich, 2007; Butler, 2008; Halbe& Parker, 2012) pointed that struggle of guest convenience and elegance in hotels may cause a concern when the danger is that by relying on being ecologically responsible (e.g. having dispensers of soaps instead of individual bottles), the experience of visitors may be negatively impacted.

Water Conservation in the Hospitality Industry

According to Goldstein (2009); Singh *et al*. (2014); Wyngaard& Lange (2013) water conservation has broadly been employed as a vital green managing policy in the worldwide hospitality industry. Water is a vital natural source in hospitality and tourism business operations, mainly in lodging (Gabarda*et al*., 2017). Consumption of water for occupied rooms is of position as the consumption quantity is not incurable and upturns in a stable method (Chan & Lam, 2001). Certainly, in most cases, the use of water by hotel visitors is related to things such as changing clothes, taking a bath, replacing bed linen and covers, cleaning the toilet, brushing teeth, and other washcloths (Page *et al*., 2014).

Hotels' actions can decrease the amount of water through operative water preservation management, considerably decreasing the harmful effect on the environment (Millar &Baloglu, 2011; Mensah, 2013; Baker *et*

al., 2014). Towel and linen reuse programs, low volume bathtubs, showers, drains, and water-efficient cleaning practices can be indications of such water management. While water is one of the essential elements of life in the use of groundwater in the hotel industry, it reveals that only five percent is used for drinking or eating, and the major use is for washing or cooking food (Webster, 2000).

Bohdanowicz (2005) argues that water use can vary based on the type, norm, scale, services, and facilities of the hotel. Kasim (2007) observed that water use is also relevant to tourism events, such as tennis, swimming pool, and laundry and spa activities. The volume of water intake varies. e.g., water usage in luxury hotels will be between 1,000 and 1,400 m^3 of water per day (Kasim, 2007). According to Alexander (2002), the total volume of water used in luxurious and daily hotels in developed countries is 396 gallons per day. This volume of water will benefit 14 residents. Bohdanowicz (2005) found that the average water consumption in hotels is between 170 and 475 liters of water per night to every bed. In comparison, Kasim (2007) maintains that the amount of use of water by visitors is 0.8 m^3 a day. If water use is regulated and managed, the amount of water consumed will rise and potentially contribute to a lack of water. Kasim (2007) claimed that the intense water used by hotels has been alleged to lead to water use disputes around the world. Water management can also become one of the sustainability systems used in hotels to manage and reduce pollution even after the use of a water conservation program; the hotel will conserve 180,000 gallons of water yearly.

Controlling water supply with adequate regard for environmental conditions,

productive facilities and the expense of continued human growth is one of today's main challenges. Water management efforts have recently been encouraged and activated (Lee *et al*., 2013). Governments should introduce strategies for the conservation of water by implementing new requirements for the flow of toilet technology, showerheads, and other water-consuming appliances. Besides, high-profile promotions of content, such as "turn off the tap" promoting more water flow of mind when brushing teeth or planting, have expanded over communities (Coomes*et al*., 2010). Water consumption seems to have been extremely approachable to at least some of the social, high-tech, and operational changes resulting from enterprises.

Although the texts on water management typically concentrate on the impact of top-down mechanical and existing influences on water use, such as water-saving devices (House *et al*., 2010), fewer attempts were made to introduce realistic interventions that contribute to preservation results, such as how people are inspired by policy or knowledge of water conservation concerns and how they are relevant behaviors or patterns of water usage change accordingly (Sauri, 2013; Chang, 2016). Moreover, from a realistic point of view, human proactive conservation behaviors (effectiveness, value, etc.) are required to address obstacles to conscientious conservation habits that decrease consumption and waste. It may be argued that the mechanism of water management results. In conclusion, the protection of water is considered to be the core component of environmentally friendly management in hospitality (Wyngaard& Lange, 2013; Singh *et al*., 2014). However, few studieshave looked at the managerial viewpoints of the hotel's water management

activities. Additionally, an actual role in hotel practices of water management.

Methodology In-Depth Interviews

Fontana & Frey (2005) indicate that face to face interviews are considered one of the bestcollective and powerful methods in which equally quality and quantity academicsincline to rely on as the elementary method of data collecting. Langos (2014) stated that use personal interviews offer many advantages such as flexibility and generation of conclusions. Also, the face-to-face data collection method provides more accurate screening and it can offer many advantages (Zolnoki& Hoffmann, 2013). Langos (2014) noted that an interview is an important qualitative research method in which the researcher collects data directly from the participants and interviews are constantly goal-oriented. In that sense, May (2001) definite interviews as the technique of keeping and making discussions with people on a particularissue ora variety of focuses and the clarifications which communal researchers make of theresulting data, create the details of interviews and interviewing.

Parveen (2017) specified that in-depth interviews are one of the best operative approaches of gathering primary data.

Additionally, an in-depth interview is conducted with intent of finding in-depth details of the interviewee's experience, knowledge and perspective on a subject. Moreover, in-depth interviews are sources of evidence that signify a importantfeature of this research as they were used to attain the research object by gaining rich insights into the participants, experiences, opinions, and attitudes. In this research, the researchers wanted to data gathering more flexibility so the researchers decided to

conduct a face-to-face data collection by face-to-face interviews. It was too difficult to study all hotels and resorts because of time, cost, and data. Therefore, the researchers were conducted on samples of the Greater Cairo,they interviewed thirteen managers in thirteen different five-star hotels chain; see Table 1.

Table 1: List of Interviews with The Maintenance Managers

No.	Investigated Hotels	Interviewee's Position
1.	Cairo Marriott Hotel & Omar Khayyam Casino	Director of Engineering
2.	Conrad Cairo Hotel & Casino	Director of Engineering
3.	Fairmont Nile City	Engineering Manager
4.	Four Seasons Cairo At The First Residence	Mechanical Maintenance Engineer
5.	Four Seasons Hotel Cairo at Nile Plaza	Maintenance Manager
6.	Intercontinental Cairo Citystars	Maintenance Engineer
7.	Intercontinental Cairo Semiramis	Maintenance Manager
8.	Kempinski Nile Hotel	Maintenance Manager
9.	Le Méridien Pyramids Hotel & Spa	Duty Engineer
10.	Marriott Mena House, Cairo	Shift Engineer
11.	Ramses Hilton Hotel & Casino	Assistant Chief Engineer
12.	Sheraton Cairo Hotel & Casino	Director of Engineering
13.	The Nile Ritz-Carlton	Maintenance Manager

The Analysis of Personal Interviews

Interviews are known to be one of the principal sources of data reflecting a central component of this study since they have been used to accomplish the research's aim. In this research, personal interviews were used as a qualitative method with maintenance and engineering managers and their assistants. The interviews were conducted with Thirteen Managers in a different position in thirteen different hotel chains. The interviews aim to identify the attitudes of managers concerning water management in Egyptian hotels, the procedures, challenges faced and practices used to manage this important source, and their recommendations to enhance these practices in the Egyptian hospitality industry.

Results and Discussion

Green certification

Manager- 4said that the hotel does not have a certificate for green practices, but it is contracted with a Global Service Agreement, which is an international contract for all Marriott hotels, in addition to a water treatment contract with Nalco Egypt Chemicals, whether treating swimming water, closed circuits, stations, or drinking water. Moreover, Manager- 4 added that this agreement is implemented at a rate of a hundred percent, and a monthly visit comes to follow-up also evaluation to make a report, andto ensure that everything conforms to the standards in addition to measuring the ratios. Besides, as for the point, the hotel commitment with certificate Manager-5 indicated that the hotel especially in the engineering and maintenance department everything works according to the rules and

all standards are applied, Furthermore, Manager-10 declared that the hotel has a green certificate called "Travelife" and one of the most important requirements for obtaining this certificate is the hotel's ability to reduce its water consumption and requires the presence of aerators that allow a water consumption of six liters per minute.

Water Conservation Techniques and Specific Procedures for Handling Water Management

in terms of treatments, Manager- 7 indicate that after getting water from the main network, it enters the hotel divided into two tanks, each of which has a capacity of 1000 m^3, and disinfection is done for these tanks and the network as well, and when there is any maintenance for any of these tanks, it is closed and emptied and the hotel is fed from the other one. Our tanks are equipped with ceramic coating and not tile or concrete, and it is a layer in which the tank is bound so that it is permanently free of pores and this layer does not allow water to form algae as the water, if it is found in a dark place and does not move or is ventilated, begins to form algae and bacteria, as for the ceramic coating, it does not allow the water to exist in one place and not move and the tank has four levels of withdrawal, the level of fire below and above, domestic water, which is the water that goes for the inmate's uses, followed by the level of kitchen uses, then the irrigation uses of agriculture, and the purpose of these divisions and levels is that in the event of water cuts, the tank is taken from the tank stock, so the first stock will be used for irrigation and so on. Up to the end of the domestic water and then the clouds stop, as after that is the level of the fire at the bottom point of the tank and its presence in this place as in the event of an emergency, the drawing is done from the lowest point in the tank, and maintenance

takes place once every six months in which ceramic coating and washing are done the tank with chlorine at a concentration of 65% at a rate of 10 / PPM part per million, and the company contracting with it sprayed the tank and cleaned it.

The 1000 m^3 tank is a large size and the hotel has a swimming pool with a capacity of 250 m^3, meaning that the tank is equivalent to five swimming pools. In terms of hot water, Manager- 3 added that the hotel has a device called *Brain Armstrong*, which is a device that works on hot water so that the boiler water enters the exchangers and makes a heat exchange with the water, then the water move to the device and it mixes with the hot water returning that is not used and the cold water so that its temperature reaches 37 degrees and it is a closed cycle so that the unused water is recycled again. Moreover, Manager- 2 added that the hotel's water aerators are installed either on the external line for entering the water or on the faucets, whether in guest rooms or all outlets. They are installed on hot and cold water faucets and they determine the exit of water from the faucets at a rate of 6 liters per minute.

Water Management Manager- 2 said that the hotel' swimming pool should be filtered first so that a large amount of water is not consumed if it changes and at the periodic period it is available to use the water more than once and therefore the percentage of consumption decreases and then the percentage of loss from the filter is much less than the change of water, so the hotel has to change swimming pool' water twice every year and when there is a loss as a result of filtering, the water is pumped again and compensated for this loss. Moreover, Manager- 2 added that the hotel has a device that measures the power of hydrogen (PH)

and chemicals in the water and the water is checked periodically.

"*We do daily monitoring of consumption and in case of increasing it, we are looking for the reason and we have an annual goal with the regional office to reduce consumption, for example, last year. We did a reduction of about 3.5% from the previous and current year*" **[Manager 4].**

Quantities and Total Cost of the hotel's Water Consumption

Not all interviewed managers say there consumption but Manager- 11 mentioned that the hotel use about 700 m^3 per day, which is equivalent to 21,000 m^3 of water monthly, Moreover, Manager-13 added that the hotel usage is according to the occupancy rate, but it is often equivalent to about 850 m^3: 1350 m^3. Also, as for the point, the cost of consumption Manager-8 indicated that the cost is calculated by the water company at an amount of 11 EGP per cubic meter, feeding and discharging, as the drainage is on the public network also for drainage. Furthermore, Manager- 6 added that the hotel is calculated at 9.36 EGP per cubic meter, including stamps, taxes, and the price of water in the basis of about 4.60, and then adding 98% of the consumption as sanitation, meaning it is 4.60 multiplied by 1.98, which is equivalent to 9 EGP. After adding taxes, the total becomes equivalent to 9.36 EGP negotiable.

Source of Water

All interviewed managers in the thirteen-hotels agreed that the hotel uses a public network. Additionally, Manager- 9 explained that water passes through what is called multimedia filters consisting of 3 large filters, and then the water moves to the tanks and from there to the hotel. Moreover, Manager- 7

added that water enters the tanks and are mixed with chemicals for disinfection, and then they are pumped through the pumps to the rooms.

Department excess water Consumption

Opinions of twelve out of thirteen interviewed managers are varied around the departments that consume more water kitchens, laundry, rooms, and swimming pools

"*I do not have an idea about the exactwaterconsumption rates, but we started installing submitters on every area, but we did not take their readings yet, but we had old counters that we monitor consumption through every month, and these counters were the swimming pool, the laundry and the rest of the hotel, but with the installation of new meters we preferred to It shall be on all areas, such as rooms, floors, and kitchens, and this is to find out the actual consumption of each area separately and try to address the deficiencies*" **[Manager 3].**

Implementing water-saving measures

Most of interviewed managers are indicates that they implement the basic water-saving measures that doesn't require major technical complexity and high economic investment.

"*We have here the so-called water savers and its idea is that it enters the ratio of air with water, which gives the same volume of water and on the other hand provides water*" **[Manager 12].**

"*We have filters installed on the water faucets so that they reduce consumption and at the same time they filter the water again*" *[Manager 5].*

Challenges that Face Water Management

There are some managers Manager- 7, Manager- 8, Manager- 10, Manager- 12, and

Manager- 13 agreed that most challenge that hotel face is the public water cuts, on one hand, Manager- 11 mentioned that one of the biggest challenges that hotel face in water management is the awareness of employees and guests, as some of them accept and others do not, also Manager- 11added that currently, some tourism companies require that the hotel have certain certificates, as some groups in certain countries require that hotel should have green practices and therefore to obtain and attract another category of guests, the requirements of these certificates must be met, which include reducing water consumption.

Guest' Awareness for Dealing with Water

Manager- 5, Manager- 7, Manager- 9, Manager- 10, and Manager- 12 agreed that their hotels do not make any awareness for the guest as the administration is convinced that since the hotel is a luxury hotel and the customer pays for the service, it is not correct to tell the guest about these matters that related to consumption. The hotel does water savers. The hotel tries to provide a service to the guest without feeling that there is a shortage of something as he pays money for this service

"There is no awareness of the guests as we are working to satisfy him"   **[Manager 7].**

Other side Manager- 11 indicated that hotel awareness of water consumption is carried out through the Planet 21 program, which is a sustainability awareness program through which employees are made aware through training programs. For inmates, awareness posters are placed to encourage inmates to conserve water and also linens as we have linens are changed daily, but the customer is reminded through posters that if he wants to participate in preserving the environment, he can postpone the change of linens for two days instead of every day.

Employees' Awareness for Dealing with Water

"We have awareness of the hotel staff when there is any change in the water consumption rate. In the Lineup or the morning meeting, they are reminded that the consumption rate in yesterday was high and we are looking for the reason and justification, such as whether the evaporation rate for the swimming pool was high, backwash was made for the filters for the swimming pool, is there high evaporation rate from air-conditioning shellers because they have so-called cooling towers, and in the summer period a high evaporation rate occurs, so we have to compensate for the water so we start by making them aware that instead of operating two shellers we only operate one and so on, has the tank been emptied to do maintenance? It was high yesterday. Are all the rooms occupied, taking into account that the consumption rate also varies according to the number of people in one room? Are there any leaks from the pipes?"[**Manager 1].**

Moreover, Manager-6 added that when the occupancy rate increases, the rate of water consumption increases because guestsneed to use more services like kitchen, laundry, and personal uses.

"As for the employees, we have all their automatic faucets, except for the lockers, and we put stickers in their bathrooms to raise awareness of the economic perspective about water consumption" [**Manager 10].**

Special Training Programs for Staff to Deal with Water

All interviewed managers did not have special training programs for staff to deal with water except Manager- 11 indicated that the hotel management company conducts awareness-raising work, whether for employees or guests, through the Planet 21 program, and the hotel post signs and posters for awareness.

Water Management suggestions in the Hospitality Industry

From my point of view, to improve consumption, we must work to solve problems quickly, especially those related to leaks, but on the other hand, in the case of an idea or device that reduces consumption, it is presented to the administration and therefore the administration sees the return on investment ROI, for example when applying the idea of investing in filters, which is it is very expensive, so the management sees what the return is when we use these filters. Will one or two meters be saved throughout the month, and the Payback period is calculated, and if this period was large then the idea is not implemented and so on"[**Manager 6].**

"From my point of view, to decrease water consumption, it is better than the laundry is directed to dry washing, as it is better for clothes and saves water consumption as well. The kitchen cuts the use of the water in removing leftovers and uses the sponge more" [**Manager 8].**

"The swimming pool should be in a covered area" [**Manager 9].**

A majority of the hotels were generally familiar with water conservation measures, but were unable to more particularly characterize water use within each department or function, or to measure cost savings associated with such measures. Since most of the interviewed engineers had not received specific water conservation training, their

hotels would benefit from receiving more specific information regarding available technology and performance parameters, distributors and cost savings associated with each conservation measure.

In particular, these hotels need more information and help to identify areas of greatest wateruse, and in using software and other tools designed to measure cost savings. These findings in turn can be used to more accurately forecast, budget and set priorities for capital investments, and communicate to managers and investors.

Recommendations

Based on theoretical and practical parts in addition to the study results, this research proposes the following recommendations that may help conserve water, improve water consumption in hotels:

- Five-star hotels should focus on water conservation systems; products and install water-saving mechanisms regardless return on investment specially when dealing with a vital source like water (e.g., toilets: choosing water-saving toilets with a dual or low flush; laundry: using the full loads capacity for a clothes washer and consider a machine with high efficiency; shower: install showerheads with water-saving, and taps aerators with low-flow; faucets and sinks: using low-flow aerator; Leaks: continuing check faucets and pipes for leaks and use water meter for checking hidden water leaks also fix it promptly …etc.).

- Five-star hotels should focus on obtaining green certifications while its practices improve dealing with sources.Moreover, it increases

competitive advantages, and guest satisfaction.

- ▪ Five-star hotels should focus on continuous staff training efficient cleaning techniques that minimize water and chemical consumption (e.g. training of staff should be offered from the first month of work and would be frequently updated. Mainly aspects of housekeeping cleaning processes are (i) usage suitable cleaning products for different tasks; (ii) usage correct dilution ratios while high ratios need more water; (iii) usage efficient techniques that minimize water and chemical consumption.

Study Limitation and Future Research

The research possesses some limitations; it explores managers' perspectives for managing water management in hotels. In that sense, it is worthwhile for further studies to focus on energy management, or waste management or it can concentrate on different sectors within the hospitality industry (for instance, restaurants, bars, cruise ships, resorts, hostels, etc.). Furthermore, this research investigated the hotel using a sample of five-star hotels in Greater Cairo, Egypt because it is enhanced in terms of cost, time, and accessibility. Thus, in further studies, it is worthwhile to focus on hotels in other regions such as red sea, or Luxor. Besides the limitations of the instrument of this study is to use a quantitative approach. Future studies can use questionnairesto enhance concepts of water management practices and to study this issue from another perspective, despite these limitations; this study has useful implications both for hospitality scholars and industry practitioners.

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