THE FOOD-LOOP: TACKLING SUSTAINABILITY ISSUES THROUGH A NORMATIVE APPROACH. A BREAKFAST-BUFFET CASE STUDY

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Abstract

The paper reviews the impact of food waste in hotels and describes the results of a study which could impact the sustainable management of it. This subject represents a big concern in the hospitality industry, especially in the food and beverage operations where plate-waste is a real problem. Here, we aim to study how much food-waste comes from the plate when hotels use the buffet service. This type of service has the advantage of catering to large groups with limited personnel, but it could drive the plate-waste based on its arrangement and abundance. The authors conducted a study in a 3-star hotel to determine the quantity and cost of plate-waste at the breakfast buffet, to evaluate the effectiveness of normative messages on consumption behavior, to determine if some demographic variables such as gender affect the food waste behavior, and to identify the main causes of food waste. The authors conducted an interview with the hotel manager, used observation, and organized an experiment with hotel guests attending the breakfast buffet service. The study revealed that average waste per person during breakfast time is 20 grams, normative messages affect consumption behavior by reducing plate-waste, and there is a correlation between duration spent at breakfast, return for refill and gender, men having a greater occurrence of returning to the buffet and women spending more time at the table. Last but not least, the customer was seemed to be the main reason why waste exists because of its mindset and "ignorant" behavior.

Keywords

Food waste, plate-waste, tourism, sustainability, normative messages, hotel

JEL Classification

L83, Z32

Introduction

As different factors contribute to the environmental damage, ranging from building construction, transportation to globalization, one cannot neglect nor dismiss that tourism has

its own impact with some special consideration, in regards to food-waste from hotels and F&B. Past studies found that these two produce significant amounts of food-waste both from the consumer side as well as the service-units. Managing the waste from their units is much easier for hotels than managing the waste generated by their guests. Therefore, the biggest challenge lies within the guest behavior. Further research is needed to assess this issue and its possible solutions.

Through the perspective of a 3-star hotel, this paper seeks to find to what extent the waste affects the sustainability of tourism and hotel's operations, what costs are involved, and the barriers stakeholders encounter in adopting eco-practices. We assume that buffet services are more wasteful than other menu types as a result of consumers' behavior. Thus waste from leftovers (i.e. plate-waste) will be considered the major problem. We hypothesize that plate-waste behavior can be reduced through normative messages.

Literature review

The idea behind a sustainable tourism development (Sharpley, 2009) is that it needs to deal properly with the growth of tourism while minimizing its adverse effects. Without a sustainable development in the future, if not preserved and protected, landscapes, natural attractions will no longer represent a motive for traveling and as a result the tourism industry will slowly cease. Therefore, it is vital for shareholders to acknowledge and take responsibility for the damage the touristic activities have on the surroundings as they may have an important role to play in sustaining tourism's operation.

Nonetheless, they aren't eager to it. One reason that could prevent hospitality actors to fully engage in sustainable development is the increase in operating costs (Selin, 2018). Implementing sustainable programs means more costs and the common misconception is that some may think the return on investment takes too much time therefore not being profitable (Sloan et al, 2009). Additionally, Jauhari (2014) noted that tourism sector isn't just a constant eater of resources, especially limited ones but also shows little concern regarding food – waste, a worldwide issue more common than actually thought. Waste can occur in households, supermarket, production and harvesting phases as well as in the hospitality sector and food and beverages services.

Every year, globally an amount of 23-billions tons of food is produced. Accordingly an estimate of 1.3 billion tones or 30-40% of food is either wasted or lost with an economic value of around $1.2 trillion (Food and Agriculture Organization, 2011). These numbers can be translated into increased scarcity level of food supply and gas emissions. In the food-service sector the situation is no different, where it accounts for 11 million tones and there is considerable uncertainty around that estimate, compared to all the others, with the number possibly being higher (Waste and Resources Action Programme, 2013). People traveled a lot and that gave them the opportunity to taste different cuisine and assess difference, they understand what a quality meal is and how much of important role it plays their touristic experience (Davis, 2016). In F&B services food waste can happen in four ways: **pre-consumer** (waste occurring in the kitchen during preparation, such as spoiled and never reach the consumer plate), **packing**, **storage** and lastly the **post-consumer** known also as plate-waste *(*Sloan et al, 2009).

Concerned with this issue some researchers have conveyed some studies to see how much the food-waste comes from the plate as well. In a study lead by Ling-en Wang et al (2017) in 4 cities from China at different restaurants it was found that the average plate-waste for tourists amounts 103 grams/person. Other study (Eriksson et al, 2017) applied on a sample of 30 food and beverages units in Sweden revealed that an estimate of 25 grams of food waste comes from plate. While the research in this area is restrictive (Silvennoinen, 2015) these studies indicated that plate-waste signifies indeed a problem.

While already stated that food waste from plate is concerning, the remaining question is which type menu is more wasteful, buffets or à la carte? Unsurprisingly, buffets meals are very well appreciated by the consumers because of the freedom of choice and low-risk, being an easy way of enjoying different foods without much effort and consideration. Unlike à la carte menu, where the guest is being served by the personnel, the buffet is considered to be self-service, where customers serve themselves and carry it to the table, this can attend large groups with limited personnel (Davis, 2016). However, the downside is that buffets pose as potential drivers of the plate-waste because of their food display of abundance; it enhances the guest senses and in a way or another it gives him the false ability of taking as much food as he can without any consequence.

Scholars Pirani and Arafat (2015) conducted a study in a hotel chain form UAE and discovered that the plate-waste which comes from buffet service accounts 14% of the total hotel food waste in comparison with the a la carte menu, where only 4% of waste comes from the plate out of the total food waste. Another significant study run by Selin (2018) at a Swedish hotel concluded that the guest wasted on average 20 grams of food at breakfast buffet.

In order to combat this issue, in one of his studies, Parfitt et al. (2010) suggested that behavioral approaches pose a great potential in managing the food-waste caused by tourists. Cialdini (1991) introduces the focus theory of normative conduct which governs two types of norms, (1) injunctive and (3) descriptive, each one has the ability to alter behavior based on how salient is the norm. Descriptive norms represents the result of group behavior, more specifically how people generally behave in a situation and influence action of one individual through social information, stimulating imitation of other's actions. Goldstein, Cialdini, and Griskevicius (2008) showed that using descriptive norms (through messages) can have an impact on guests' behavior. They reached this conclusion when they implemented a towel-reuse program experiment where approximately 75 per cent of hotel's tourist had reused the towels when the descriptive messages were displayed.

The literature showed that food-waste is a concerning problem, its impact being both environmental and economical with hotel and F&B services producing significant amount of waste. Scholars and researchers stated that buffet services are potential drivers of waste and implied that guests have a play in it and a solution for preventing is through a behavioral approach, using descriptive messages or sign.

Research methodology

Food waste is a global challenge at every industry level and hospitality sector makes no exception. The overall purpose of this study was determining the plate-waste, from the buffet, situation at a 3-stars hotel located in Bucharest, Romania. Therefore the paper's research objectives were the following: (1) to determine the quantity and cost of plate-waste at the breakfast buffet, (2) to evaluate the effectiveness of normative messages on consumption behavior, (3) to ascertain what is the relation between duration spent breakfast-table based, return to the buffet based on one demographic variable, that of gender and lastly (4) to identify the food-waste situation and its causes in the hospitality industry through the perspective of a 3-stars hotel.

In this research the population was comprised of the guests, women and men, which stayed at the 3-stars hotel and took part in the breakfast buffet. For the observation guide a convenience sample ($N_{female}=38$ and $N_{males}=40$; $N_{total}=78$) was utilized and for experiment a random sample (N= 140 – control group, N= 132 – treatment ; $N_{total} = 172$) was used. For the interview, a sample of one person was used, the hotel's manager. In regards with the instruments, three types were used: a before and after experiment questionnaire, an interview guide and an observation guide. The interview guide was a semi-structured one, where 8 questions were conveyed based on the research's objective. The interview was a one-o-one conducted on 16.04.19 with the manager of the hotel and lasted around 30 minutes.

The experiment was a pre and post one, which means that two randomized groups were analyzed and on one of them a treatment was to be applied. The premise was that any changes in the dependent's variable is somewhat (explained) caused by the changes made in the independent variable. The time-frame of this study was on a 4 day period (12-15.04.2019). The amount of plate-waste was weighted by the breakfast personnel and the treatment was applied in the last 2-days where a normative message was created and displayed at the buffet (appendix no. 1).

An observational study means that information about a phenomenon is observed and the data is recorded. The observation method was applied during the treatment period at the breakfast where time spent at a table and how many returns a guest will do was observed. The data regarding the gender was provided by the hotel through a sheet of breakfast participants each morning.

Data analysis for the experiment and the observation guide results has been made using the software SPSS (SpSS, 2018), for each, a different statistical test was performed. For the experiment, the independent t-test was used testing whatever there is or is not a significant difference in averages of plate and cost waste between the treatment and control groups. Observation's guide analysis was done by comparing the means using crosstabulation and Pearson's Chi Square test of independence. By comparing the observed values against the expected ones it was determined if variables are independent or dependent of each other. This test uses categorical values and the following ones have been tested: gender (independent), duration at the table and frequency of return to the buffet (dependent).

The data for the interview was analyzed using a general inductive approach through coding using the software NVivoPlus12 (Nvivo, 2019). Through coding the interview's transcript 3 final categories emerged with some other smaller categories or sub-group. Segments of transcript were coded using "In-Vivo" and "Initial" codes in the first cycle of coding, serving as an exploratory phase. Later on, in the second cycle "Pattern" and "Focused" coding processes were employed.

Results and discussion

For the experiment it can be seen (table no.1) that the difference in the sample mean plate-waste/person between control group and treatment group was 6.45 grams, with a 95% confidence interval from 5.88 to 7.01 grams. T-test statistic was 22.7, with 172.2 degrees of freedom and an associated p-value of $p<0.001$. For the cost of waste/person, the recorded difference between the sample mean in control and treatment group was 0.19 Lei and with a 95% confidence interval from 0.17 to 0.20 Lei. The value of t-test statistic was 22.48 with 176 degrees of freedom and the corresponding p-value<0.001.

Table no.1 Independent T-Test for before and after experiment

	t-test	Degrees of freedom	Sig	Mean difference	Lower	Upper
Plate-Waste	22.70	172.20	.000	6.45	5.88	7.01
Cost of Waste	22.48	176.17	.000	0.19	0.17	0.20

Source: Authors' own work

Regarding the plate-waste per person the following alternative hypothesis has been tested: *(H₁) Normative messages affect consumption behavior by reducing plate-waste*. Since our p < .001 is less than the significance level α = 0.05, we will reject the null hypothesis and accept the alternative hypothesis concluding that (a) there was a significant difference in mean plate-

waste/person between control group and treatment group (t = 22.705, p < .001) and (b) the average plate-waste per person for control group was 6.45 grams higher than the average plate-waste/person for treatment group.

The alternative hypothesis concerning the cost-waste/person was: *(H₁) Cost of waste will be reduced if the plate-waste is*. As our p < .001 is lower than significance level α = 0.05, the null hypothesis will be rejected and the alternative hypothesis will be accepted, therefore stating that: (a) There was a significant difference in cost-waste/person between control group and treatment group (t = 22.48, p < .001). (b) The average cost-waste per person for control group was 0.19 Lei higher than the average cost- waste/person for treatment group

Table no. 2 Chi-Square for Gender * Return and Gender * Duration

	Variables	Asymptotic Significance
Pearson Chi-Square	Gender * Duration	.003
	Gender * Retrun	.001

Source: Authors' own work

For the observation guide, the null hypothesis assumed that *(H₀) Duration and return is independent of gender.* Results regarding the relationship between gender and duration (table no. 2) based on the Pearson Chi-Square, shows that "Asymptotic Significance" = .003 and if it is less than α= .05 then it means that residuals vary as a function of the independent variable. Second variables tested (table no. 2) gender and return, shows that "Asymptotic Significance" = .001 and if it is less than α= .05 then it means that residuals vary as a function of the independent variable. Therefore, the chi-square is significant thus H₀ will be rejected and accepted the hypothesis that both duration and return are related to the gender. Concluding that, there is a relationship between the variables. More specifically men had a greater occurrence of returning to the buffet and women spend more time at the table.

The interview assessed the research objective of identifying the state of food-waste and its causes from the perspective of a 3-stars hotel. Challenges faced in developing sustainable practices are mostly related to *"money"* because these projects come at a cost*, "human resources"* since staff comes and goes and the design of "*the system itself" (*i.e. government and public authorities) is made in such way that it offers no help nor guidelines. Even though, it was revealed that waste management is well maintained by the hotel and food waste from preparation is at low levels, that is because of a proper management therefore waste is not an issue in the *"kitchen […] as staff pays attention"*. For the hospitality's food-waste situation in Romania, the main drivers are *"both the hotel and customer"*. The **customer** especially due of their **mindset** towards buffet services, where guests tend to waste more because the food is available at a lower price whereas *" if it's a la carte, the customer orders depending on how much money he has"* and displays an *"ignorant behavior"*.

The **waste** in Romania is described as *"a complex matter"*. The problems lies at the **buffet** services since *"every buffet is going to generate waste at some point"*, as a result of mass preparation of food. In *"the a la carte the food comes in smaller quantities"* compared with the self-service stands and guests have at their disposal to take as much food as they want without suffer any consequence.

Discussion. Study resulted data revealed that average waste per person during breakfast time is 20 grams. These data findings were somewhat consistent with previous research which found (Eriksson et al, 2017) that an estimate of 25 grams of food waste comes from the plate, however the numbers differ from the studies of Ling-en Wang et al (2017) and Silvennoinen (2015) in which the amounts were 103 grams / person and 153 grams per portion thus higher. The findings from the pre and post test were statistically significant (p-value < .005) in order

to support the alternative hypothesis. Success of normative messages are based on the theory of social norms where Cialdinin (1991) offers a plausible explanation, that is a descriptive normative message acts as a model in showcasing what is the best course of action for people to behave in a situation.

The observation guide was used to answer if there is a relation between duration spent at breakfast and gender as well as the relation between the return to the buffet for refill and gender. Findings showed there is a correlation between duration, return and gender. The p-value from the Chi-Square was > .005, which allowed for both the null hypothesis to be rejected and concluded that both variables are to some extent depended on the gender. Scholars Bell and Pliner (2003) proceeded to say that people who spent more time at a table in social constructs tend to consume more food thus more waste.

The theme "drivers and implications of food-waste" emerged from the coding process through the inductive approach. The customer was seemed to be the main reason why waste even occurs, because of its mindset and "ignorant" behavior. This assumption of an irresponsible behavior is sustained in a study conducted by Dolincar and Grun (2016), it was revealed that travelers generally don't want to bother with any sorts of responsibilities and just want to relax. Nevertheless, the situation at the hotel was described as being under control thanks to the personnel, who have the task of not wasting. Sloan et al (2009) have described the personnel as the most important tool in preventing waste. And in the same way it was described by Selin (2018), that most of the hotels don't engage in sustainable practices because of operating costs, so did the manager revealed that money are a barrier and such projects are expensive.

Limitations

In regards with the limitations, the research can be considered limited as it mainly focuses on one specific hotel from one particular region. The limitation of it translates that the results obtained cannot be generalized to the whole population since it is limited at a single study case. Additionally, another limitation is the fact that the data collected from the experiment was on a short period of time two days for pre and post-test each, and for more accurate results a longer period would have been required. Participating in any form of a direct observation, there will always be the high-level risk of potential some sort of error either observer's subjectivity or narrow perspective. Lastly, this paper serves as a point in time and as well as place of understanding some events and challenges, but it could be used as a starting line here for a future research. The findings of this interview have the limitations of only understanding the challenge through a single perspective, further research can be expanded to assess the opinions of other F&B and hotels managers or employees.

Conclusions

The scope was to understand the extent of food-waste situation in the hospitality sector and its causes. The paper assumed that buffet services are more wasteful consumers' irresponsible behavior thus waste from leftovers (i.e. plate) will be considered the major problem. Although this study had its limitations and weakness, it successfully responded to all of the research objectives stated, thus the scope of determining the situation of plate-waste was attained. At the 3-stars hotel the waste comes from the consumers and in a smaller proportion from management. These issues can be resolved with the display of a message sign at the buffet. Nevertheless, it is recommended that the future investigations should extent their period as well sample size, for accuracy and credibility purposes.

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Appendix no. 1 Normative message at the breakfast buffet