

Waste management in the hospitality industry in Astana. A comparison of three companies and recommendations to maintain ecologically responsible business

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Bachelor of Service Management In Tourism

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School of Liberal Arts

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DECLARATION

We, the undersigned

Kairatkyzy Nursuale and Kozhakova Dilnaz grant to M. Narikbayev KAZGUU University the right to store and distribute my submission in print and electronic format.

We confirm that We are the sole authors of this senior project, and that it does not infringe any copyright. This senior project is the result of our own original work, except where due acknowledgement has been made.

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We hereby accept the terms of the above Declaration.

Kairatkyzy Nursuale



Kozhakova Dilnaz



Date

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«APPROVED»

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Candidate of
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« » 2022.

**TECHNICAL ASSIGNMENT
For Senior Project**

«Waste management in hospitality industry in Astana, comparison of 3 companies and recommendations to maintain ecologically responsible business»

I. Justification of the relevance, originality and novelty of the project.

Waste management in hospitality industry is very relevant theme nowadays. Having poor waste management practices can result in a variety of adverse effects, including health issues and environmental problems. The International Hotel Environmental Initiative (IHEI) (2002), as well as, Zorpas et al., (2014) indicated that per guest generates up to 1 kg of waste per night in hospitality industry all over the world. This is translating into millions of tons of waste being generated worldwide. As a result, hotels need a valuable back-of-house place where those waste will be stored and sorted. The importance of correct waste management in hotels is constantly increasing due to waste becoming an ongoing challenge within the industry. Correct waste management also makes good business sense and increases customers' loyalty to the hotel. Safe and clean policy makes it easy to sell the business.

II. Project object

The main object of the research is finding the best methods to improve waste management system in Astana. According to statistics, average Kazakhstani annually produces about 300 kilograms of various waste products. Thus, the number of top hotels and their restaurants in Astana will be observed and discovered within each waste management system and environmental concerns. The strategy starts in a practical and eco-friendly way when planning to manage waste, and it will be rooted and focused on sustainability and will consider the ways to reduce the environmental damage.

Additionally, the research work will be directed on creating regulations for conducting environmental business and to prove the right approach to attract customers to create an eco-culture. Customer engagement can contribute to the implementation of sustainable practices that cover all business operations.

III. Scope, order and terms of work performance.

- Stage 1. Conducting an analysis of the existing literature on the selected topic.
- Stage 2. Description of the research methodology, justification for the choice of method (quantitative, qualitative).
- Stage 3. Description of the means of data collection (interviewing, document analysis, survey).
- Stage 4. Description of the results of the study.
- Stage 5. Description of the conclusion, recommendations.

IV. Project quality indicators.

- a) The use of relevant regulatory documents and literature at the time of writing the senior project;

- b) Writing a graduation project in accordance with the Guidelines for writing a senior project;
 c) Compliance by members of the Scrum Team with the requirements of the Academic Integrity Policy regarding anti-plagiarism is implied.

V. Composition of the group.

Scientific adviser: Mukatova Rabiga Askarovna

Students: Dilnaz Kozhakova , Nursaule Kairatkyzy

Representative of the customer (employer): Daniyel Serzhanuly

The responsibility matrix of group members

project name: «Waste management in hospitality industry in Astana, comparison of 3 companies and recommendations to maintain ecologically responsible business»

Stages	Mukatova Rabiga Askarovna	Dilnaz Kozhakova	Nursaule Kairatkyzy
<p><i>Stage 1. Conducting an analysis of the existing literature on the selected topic. Visiting library</i></p> <p><i>1.1 Visiting the library; start to search appropriate information and also we have to search electronic database through Google scholar, FedEX, Statista, etc from 10.11.2022 to 24.11.2022</i></p> <p><i>1.2 Analysis of information collected from 10.12.2022 to 14.12.2022</i></p> <p><i>1.3 Writing the literature review from 16.12.2022 to 30.12.2022</i></p>	Supervising, consulting	Research in National Academic Library to collect appropriate information and try to find some sort of information about potential solutions	Collecting appropriate information and conducting analysis
<p><i>Stage 2. Description of the research methodology, justification for the choice of method (quantitative, qualitative). We are planning to use qualitative research.</i></p> <p><i>2.1 Description of the methodological approach from 05.01.2022 to 10.01.2023.</i></p> <p><i>2.2 To create survey questions and doing some corrections from 11.01.2022 to 20.01.2023</i></p> <p><i>2.3 Description of limitations from 29.01.2022 to 14.02.2023</i></p>	Supervising, consulting	Analyzing limitations. Create qualitative research and compare all results	Analyzing limitations. Creating qualitative research and comparison all results
<p><i>Stage 3. Description of the means of data collection (interviewing, document analysis, survey).</i></p> <p><i>3.1 Description of specific approach and methods of electronic data and paper-based information collection from 16.02.2023 to 25.02.2023</i></p> <p><i>3.2 To launch our survey through hotels and restaurants management staff from 25.01.2023 to 30.02.2023</i></p>	Supervising, consulting	Making interviewing. Interviewing at least 5 experts in hotel management.	Making interviewing. Interviewing at least 5 experts in restaurant management

<p><i>Stage 4. Description of the results of the study.</i> <i>4.1 Analyzing interview results from 30.02.2023-02.03.2023</i> <i>4.20 Findings from 02.03.2023 to 06.03.2023</i> <i>4.3 Analyzing the limitations of the research from 07.03.2023 to 13.03.2023</i></p>	<p>Supervising, consulting</p>	<p>Collecting and analyzing all the results of research and survey.</p>	<p>Results of interview and limitations of the study</p>
<p><i>Stage 5. Description of the conclusion, recommendations</i> <i>5.1 Writing description of the conclusion, recommendations from 13.03.2023 to 10.04.2023</i></p>	<p>Supervising, consulting</p>	<p>Give recommendations</p>	<p>To write conclusion referring to our research project, give recommendations</p>

Explanation of abbreviations:
 S - Supervisor
 C1 - Contractor 1
 C2 - Contractor 2
 C3 - Contractor 3
 C4 - Contractor 4
 C - Client
 N/A - Not Applicable

VI. Project Completion Form.

Project Completion Form:

1) (write recommendations or conduct further research)

We, the undersigned, agree to use this terms of reference as an agreement on the creation and use of a work of science, concluded between the members of the Scrum team and KAZGUU University, according to which the members of the Scrum team undertake to transfer to KAZGUU University the exclusive property right to the created work of science, as well as the exclusive right to use the work at its own discretion in any form and under any name in any country in the world, including the right to reproduce the work; distribution of the original or copies of the work through sale or other transfer of ownership; import of copies of the work; public display of the original or copy of the work; other communication of the work to the public; translation of the work into another language; processing and / or other alteration of the work and any other types of use not prohibited by the legislation of the Republic of Kazakhstan.

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Students:
 Dilnaz Kozhakova
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Client: Daniyel Serzhanuly, Managing Director, Kazakh Tourism National Company JSC



Abstract

The hospitality sector produces significant quantities of waste that may have adverse environmental effects, increase costs and damage reputation if it is not managed effectively.

The objective of the project: to compare the waste management practices of three hotels in Astana: Rixos President Hotel Astana, the St Regis Hotel Astana and the Radisson Hotel

Astana. Relevance of the project: in order to reduce negative environmental effects, improve hotel reputation and ensure sustainable tourism development, the management of waste is crucial in the hospitality sector. While in the hospitality sector waste management has been extensively investigated, there is still a lack of research into hotel waste management practices in Kazakhstan.

Аңдатпа

Қонақжайлылық индустриясы қалдықтардың көп мөлшерін шығарады, егер олар тиімсіз басқарылуы , қоршаған ортаға теріс әсер етіп, шығындарды көбеюіне әкеліп қонақ үйдің беделіне нұқсан келтіруі мүмкін. Талдау әр қонақүйдегі қалдықтарды басқару тәжірибесіне назар аударады және олардың қалдықтарды азайту, қайта өңдеу саласындағы күшті және әлсіз жақтарын анықтайды. Бұл жобаның мақсаты: Астанадағы келесі үш қонақ үйдің қалдықтарымен жасау тәжірибесін салыстыру болып табылады: Rixos President Hotel Astana, The St. Regis Astana және Radisson Hotel Astana және бір тиімді шешім шығару. Жобаның өзектілігі: бұл жобаның жаңалығы Астананың үш ірі қонақ үй желісінің қалдықтарымен жұмыс істеу тәжірибесін салыстыруға ерекше назар аударады. Қонақжайлылық индустриясында қалдықтармен жұмыс істеу бойынша жүргізілген зерттеуге байланысты тамақ қалдықтарын және жалпы басқада қалдық түрлерін азайту жолдары табылды.

Аннотация

Индустрия гостеприимства генерирует значительное количество отходов, которые при неэффективном управлении могут оказывать негативное воздействие на окружающую среду, увеличивать затраты и наносить ущерб репутации компании. Анализ будет сосредоточен на практике управления отходами в зарубежных отелях, а также отелях Астаны, выявляя их сильные и слабые стороны в области сокращения отходов. Целью этого проекта: является сравнение практики управления с отходами трех отелей Астаны: Rixos President Hotel Astana, The St. Regis Astana и Radisson Hotel Astana. Актуальность проекта: Управление отходами в индустрии гостеприимства имеет решающее значение для снижения негативного воздействия на окружающую среду, улучшения репутации отелей и обеспечения устойчивого развития туризма. Несмотря на существующие исследования по управлению отходами в мировой индустрии гостеприимства, было проведено мало исследований в отелях Казахстана.

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INTRODUCTION

The hospitality sector is an important contributor to the global economy, and plays a fundamental role in tourism. However, with the increasing number of hotels and resorts worldwide, the industry also generates a substantial amount of waste, which, if not managed effectively, can have significant environmental impacts. In the hospitality sector, waste management is an essential part of sustainable tourism. Effective waste management practices can reduce the environmental footprint of hotels, save costs, and improve reputation.

In Astana, several hotel chains operate in the city, and this paper aims to compare the waste management practices of three hotel chains: Rixos President Hotel Astana, The St. Regis Astana, and Radisson Hotel Astana. These hotels refer to three huge international companies, which have distinctive eco-friendly policies and diverse methods and vision of waste management. The paper will evaluate the waste reduction, recycling, and donation practices of hotels and assess the effectiveness of their waste management programs. By examining the waste management practices of these hotels, this paper aims to provide insights into the practices in waste management in the hospitality industry, promote sustainable tourism, and support the implementation of effective waste management practices in Kazakhstan's hospitality sector.

1. THEORY OF WASTE MANAGEMENT IN THE HOSPITALITY INDUSTRY AND ECO-RESPONSIBLE BUSINESS

1.1. Essence of waste management in the hospitality industry

Waste pollution usually is concerned with human-made waste which includes plastic bags, bottles, cigarette butts, organic and food waste. In order to reduce the harmful effects of waste pollution on human health and the environment, as well as for aesthetic reasons, waste management measures are necessary. To be more comprehensible, waste shall be classified as substances or objects formed during economic and human activities that do not have specific purpose at the place where their creation takes place but are fully or partially lost in consumer value. In other words, waste cannot be used in the same process in which they were formed due to any reasons, circumstances.

Furthermore, The European Council Waste Directive states: waste management means the collection, transportation, recovery and disposal of waste. Moreover, waste refers to those products which can be reused and recycled (Sarah, et al., 2022)

Waste is one of the biggest problems which can be faced in the way to sustainability, and it has a tremendous impact on different sectors of our life: environment, public health, business revenue. According to Statista (2023), one of the biggest sources of waste itself is food waste. The term “food waste” does not have a universal definition. Different authors defined this term in a variety of ways. As an example, Chi (2023) stated that food waste is “any by-product or waste product from the production, processing, distribution, and consumption of food”. According to the UNEP Food Waste Index 2021 report, the world population generated approximately 931 million tons of food waste in 2019. This represents approximately 17% of the total of food served. Household food waste was the largest source of food waste that year,

accounting for 61% of the total. It turns out that food loss is increasing dangerous gas emissions, and waste of water, and soil. It then harms biodiversity (UNEP, 2021). The second major source of food waste was the food service sector. Food waste is generated in various stages of the food supply chain, such as households, restaurants, cafes, canteens, hotels.

The food service industry includes cafes, restaurants, airports, hotels and motels, hospitals and retirement centers, carryout operations, cinemas and theaters, and school dining rooms. As McAdams (2019) illustrates, the food waste category of the Hotel and Food Service - "HaFS" area reflects both preparations. Stage 1 (unavoidable loss) the part of the food that can never be eaten (bone or shell) and stage 2 (avoidable loss) food as it should be produced for consumption but can no longer be consumed, become useless (McAdams et al., 2019).

Several research articles (Hayta, 2016), (Pankaj, et al., 2022) demonstrate that there are many categories of waste. It is necessary to take into account that hotel enterprises are producing different sorts of waste, such as organic, plastic, chemical, solid, hazardous, non-hazardous, liquid (Hayta, 2016). On this occasion, waste can be divided into two certain types: hazardous waste and non-hazardous waste.

Thus, hazardous waste are:

- Cleaning chemicals- Waste of dry cleaning of clothing, textile and fur products with the use of chlorine-containing organic Solvents (solvent content not more than 2.5%)
- Fertilizers- insecticides, fungicides, herbicides
- Batteries

Non-hazardous waste are:

- Household waste - packaging made of paper and/or cardboard in a mixture, unpolluted, cartridges of printing devices with a toner content of less than 7% used.
- Plastic waste- food containers, plastic spoon, knives, forks, bottles, straws, etc.

- Metal – tin cans, can lids, metal boxes
- Wood materials- wood bottles, wine corks, trays, etc.
- Textile- tablecloths, tissues, bed linen
- Organic waste- fruits and vegetables, flowers, grasses.

Non-hazardous waste generated in hotels can be managed through various waste reduction strategies, such as recycling, composting, and waste-to-energy conversion. Recycling programs can be implemented to collect materials such as paper, cardboard, plastic, and glass. Food waste can be composted, which can be used as fertilizer for landscaping or gardening. Waste-to-energy programs can also be implemented to convert non-recyclable waste into energy. As one of the examples can be Accor Company, which implements Planet 21 program in all hotels. The main purpose of this program is plastic commitment, to avoid using plastic in hotels and it gives good results. By the end 2022, it was possible to eliminate all single used plastic items in hotel's outlets (Planet, 2022).

According to Aleksandrova (2022), over the past ten years, the demand for environmentally responsible hotels and enterprises has sharply increased among hotel companies. There is also an increase in consumption and interest in eco-branded goods and services. Undoubtedly, eco-hotels will be in great demand among others, due to the new formation of consumer behavior, aimed at taking care of the environment, their own health and lifestyle (Koop, S., et al, 2017).

Food waste is vital for many enterprises of the restaurant and hotel business today, as it is of great importance for the development of competitive strategies between enterprises and the introduction of environmental practices. In the hospitality industry, the disposal of food waste in restaurants and hotels plays an important role, as hotels and restaurants must contribute to reducing the amount of food waste. Reducing food waste is one of the most important

environmental problems and global challenges of our time (Inglezakis et al., 2018).

Summing up, as mentioned in World Economy Forum (2022), the tourism and hospitality sector is 8% of global greenhouse gasses and it is crucial to constantly support sustainability strategies in the hospitality sphere. According to the World Economy forum (2022), there are only certain ways which can be beneficial in supporting sustainability in hotels. There are: 1)Waste management, 2) Responsible procurement, 3) To set principles, 4) Staff and working conditions, 5) Catering, 6) Safety and Health, 7) Efficient resources. Waste management is one of the biggest problems on the way to sustainability. According to Reconomy (2018), hotels around the world produce considerable waste 289,700 tons per year, and 79,000 tones were food waste. Moreover, there are different sorts of waste in the industry. Therefore, it is crucial to differentiate two certain types of waste: hazardous and non-hazardous waste. Human health or the environment can be at risk from hazardous waste. No harm is caused by the nonhazardous waste and can be recycled effectively. Over the decade, interest in eco-friendly lifestyle and businesses has dramatically increased. Along with that, the demand for environmentally responsible hotels is steadily growing. The most important problem in the hospitality businesses is food waste management. Most hotel chains are starting to implement effective strategies to decrease food loss and waste issues. Economically developed countries started to raise environmental awareness between people. By adopting environmental policies and introducing best practices in the hospitality sector, international hotel companies began to reduce food waste.

1.2. International experience in waste management in hospitality

The management of hotel waste is an important subject, as resources are capable of having a positive effect on revenue and enhancing brand image at the same time. The effective management of waste has a positive impact on time, money and hotel resources. Furthermore,

it is important for hotels to comply with the legislation on this topic and to work with authorized contractors. Hotels around the world produce a lot of waste every day. Reducing waste is the one of the key elements to improve responsible attitude to the environment.

The purpose of waste management is to monitor waste disposal activities to conserve natural resources, protect health and the environment. To achieve this goal and be able to develop the most appropriate waste management system, the different types of waste and how they relate to each other need to be understood.

- Waste management is to prevent waste from harming people and the environment.
- The main goal is to save resources.
- Waste management should cover the goal of turning waste into non-waste.

Moreover, many economically developed countries have begun to raise the issue of environmental safety of enterprises, both in the industrial sector and in the service sector, for quite a long time, thanks to which they have achieved very impressive results to date (Turkyilmaz, A. et al, 2019).

There are many effective waste management practices implemented in International Countries. Some examples are:

The one of the most visited tourist destinations is Hurgada, located in the Red Sea region, Egypt. According to data, which derived from Trip Adviser, there are 29 all-inclusive hotels rated as five-star. It is apparent that most all-inclusive hotels are providing different types of amenities, food and beverages to guests. Thus, food waste reduction became one of the main responsibilities. Nevertheless, only few hotels could implement FW reduction strategies, which conclude 5 main stages:

1. **Menu planning**- there are multiple factors that should be taken under control during menu planning: food cost, selling price, food items in the menu, portion

size, food seasonality and menu design. As noted by one of the executive chefs in Hurgada hotel, proper menu design is playing a crucial role in the food waste reduction process in all – inclusive hotels. One of the reasons is the buffet menu produces a large amount of waste but an a la carte menu is quite manageable because there is a chance to create similar food items in different outlets.

2. **Food procurement** – there are 3 main factors for purchasing lower cost, high quality and fast delivery services. Chefs prefer to buy all necessary food items to avoid a lack of food during the high tourist season.
3. **Receiving and storage**- It is necessary to use some basic principles: FIFO (first come- first served), electronic storage stock, following stock control practices.
4. **Food production** – according to Filimonau and De Coteau bulk cooking and pre-cooking are one of the common methods of reducing food leftovers, labor cost, and saving the time.
5. **Food service**- FW can happen in “buffet” style of service rather than in “a la carte”.

Italian food waste management experience started in 1989 within the framework of the Banco Alimentare project, which was implemented, by Italian Government law 467/ 1997 and 133/ 1999. In addition, it is important to note that in Italy all leftovers were being recycled, reused or were donated, it accounts for 90 000 t. (Banco Alimentare, 2019). Just in 2016, the Italian government decided to implement sustainable food consumption Legge Gadda which meant hotels can donate unused food to people or give it away to farms to feed animals. In terms of food waste reduction, Italian hotel managers are controlling and coordinating all the process of food preparation and administrative process. They focus on the difference between eatable food (for doing donations) and uneatable food (for feeding animals).

According to recent exploratory research, one of the European countries which implemented food legislation is Romania. The main purpose of this law is mitigation of food and encouraging people to donate food. Romania's government created an online platform "Waste Romania" to mitigate food and most hotels get benefits from taxes. This hotel is a four-star which is located in the city center of Buzau, in Romania. All employees, such as the executive chef, F&B managers, waiters, food service staff, customers of Italian and Romanian hotels have been interviewed by the authors of this article. According to this research paper's results, most of the leftovers from the buffet are donated to staff, and leftovers from guest's plates have to be separated manually. On the other hand, Romanian managers prefer to reuse edible food if it is possible and inedible foods are the best option to do organic compost.

Serving meals buffet-style provides more food waste, this fact was analyzed by the number of guests, their nationalities and food preferences. For example, English and German people prefer to eat eggs and bacon, croissants will not be needed. Tastes vary by nationality. If English and German people like salty food at the same time Italians like foods with more dry-cured meats, cheeses, tomatoes, and basil. Also, guest behaviors vary by nationalities and age too. As an example, most tourists do not care about food loss and food waste because they are driven by themes like "try everything because I paid for all-inclusive service". To be more clear, Egyptian, Arabs, and Russians tend to try everything in the buffet while European guests are less food wasteful, more restrained. When it comes to age, Women and older men always take the food consciously and more carefully in comparison with youngsters and men.

According to a survey, every building and area in the Netherlands has a systematic way of separating waste for paper, plastic, glasses and food waste. Since 2009 the local food marts have had boxes for passing glass bottles with cash awards in return. Further, received glass bottles are being recycled. It was discovered from the survey, mentioned method helped with

awarding local people, supporting the community and raising awareness for being environmentally responsible human beings.

The government of UAE provides a list where the hotel or other organization can donate food left to the people being in need, poverty. Primary, informing and receiving the permission with signature from the guests to use food left from the event. According to a survey, it is one of the most mentioned effective methods to reduce food wastage after big events. Nevertheless, the donation of unused food is not in practice in Kazakhstan.

Additionally, there are waste management strategies from worldwide international hotel companies, which are developing and monitoring as a goal for related to those companies' hotels:

Marriott International: A platform of sustainability and social impact- "Serve 360: Doing good in all directions", has been implemented by the hotel chain. The environment and the communities in which its hotels are situated shall be improved by its commitment to Responsible and Sustainable Business Practices. According to Serve 360, one of the goals of Marriott International is reduce environmental footprint from 15% to 50% across its hotels by 2025, including reducing food waste by 50%.

In addition, the roll out is under way in guest bathroom showers with large pump top bottles replacing small, single use toiletry bath bottles. It is estimated that, once fully implemented around the world, approximately over 500 million small individual-use toilet bottles will be prevented every year from ending up in landfills due to Marriott's expanded residential amenity program. A cloud based document "My Digital Office" is used by Marriott Hotels. According to *Sustain Responsible Operations Serve360* (n.d.) in 2001 it prevented above 8,000 trees from being harvested for paper production.

Hilton Worldwide: The company's goal is to reduce its environmental footprint by 50%

by 2030. As part of this goal, Hilton has implemented a waste reduction program that includes waste reduction, recycling, and food up cycling, composting, waste-to-energy incineration and donation of leftover food to local charities. Hilton has adopted a strategy of recycling, recovering, prevention across its hotels in the America and Europe, Middle East, Africa regions, and has also started the program in Asia Pacific. Hilton hotels utilize the Hotel Kitchen Toolkit, developed by the World Wildlife Fund (WWF), which helps to reduce food waste. They do prevent waste and food loss before it emerges through thoughtful menu planning and recovering wholesome. Additionally, it is supported by LightStay data tracking. According to HILTON ESG REPORT (2023), in 2022, together with the World Resources Institute Cool Food program, Hilton laid the groundwork to discover options for more plant-rich menus, reduce climate - environmental impact and food waste.

Accor Hotels: The hotel group has launched a program called Planet 21, which aims to reduce its environmental impact across its properties. Initiatives such as waste reduction, increased recycling and energy saving are part of the program. It was established in 1994 and until today, it made great results. As an example, it should be analyzed that by the end of 2020 the number of guests who engaged in sustainable tourism and zero waste increased, ten steps in mandatory actions were done by almost 100% of their hotel. In addition, according to *Accor Teams Say No To Food Waste* (2022) by 2022, enormous works were done, for instance: this program could get rid of all-guest related plastic items for single use such as toiletry bottles, individual packaging, and other types of plastics from different outlets of hotels.

Hyatt Hotels Corporation: Similar to Hilton Worldwide, in comparison to 2019, the Hyatt hotel chain targets a 50% reduction in food waste per square meter across managed hotels by 2030. It implemented a waste management program that includes implementing composting streams, recycling, and donating excess food. Additionally, according to *A call to action on US*

Food Loss & Waste Policy (n.d), Hyatt has eliminated the use of single-use plastics in its properties worldwide. Food waste prevention is the most impactful step. Working with the WWF and the American Hotel & Lodging Association (AHLA) Hyatt has contributed to the development of training materials for the hospitality sector. In addition, it has joined a call for action to advance the United States' Food Loss and Waste Action Plan. According to *Waste & Circularity* (n.d), one of the greatest results through the PLEDGE™ on Food Waste Certification, by saving 10,000 kg of food and rescuing 21,000 meals, the Grand Hyatt Singapore has achieved a carbon reduction.

InterContinental Hotels Group (IHG): In order to reduce the use and production and at the same time making it a resource of benefit for others, the Hotel Group is active in its efforts. IHG has implemented a waste management program that includes: eliminating single use, moving to reusability or recyclable items throughout the guest stay, limiting food wastage through a plan of prevention, donation and diversion; collaboration in achieving circular solutions for major hotel commodities. In collaboration with WRAP pilot, it launched a special menu “conscious consumption” in the UK, which reduced food waste. According to the report *On a journey towards a better future* (2021), in order to encourage better waste management in all IHG hotels worldwide, the development of a global training module for food and beverage staff will be carried out.

These examples show that waste management practices in the hospitality industry can be effective when implemented as part of a broader sustainability program. Key components of effective waste management programs in the hospitality industry include reducing waste generation, recycling, composting, and donating leftover food to local charities.

Waste management's a process which begins with product and preparation planning, progresses through the combination of purchasing policies, inventory controls and production

plans that are generally applicable to all stages of operations. Good planning of this process not only provides hotel enterprises with reducing the amount of waste, but also saves materials, resources, energy and money. Hotel enterprises create a lot of waste in different types of glass, paper, plastic, cloth, metal, wood, hazardous waste, organic waste, oil waste. The tables (see in appendix A and appendix B shows the non- hazardous and hazardous waste and its sources in hotels. The tables show that the departments which generate the highest waste levels are food and beverage, cleaning and technical services.

To conclude, waste management is a crucial aspect of sustainable tourism in the hospitality industry. The industry generates a significant amount of waste, which, if not managed effectively, can have negative environmental impacts, increase costs, and damage reputation. Rich international experience of worldwide global chain companies demonstrates best practices were introduced. In an active way like Kazakhstan's waste management system could benefit from adopting effective waste management strategies and practices borrowed from successful international models such as Marriott International, Hilton Worldwide and on the example of Egypt, Romania, Italia countries. One of the main strategies are: reducing waste generation, recycling, donating food, conducting waste audits, employee training, and establishing partnerships. Hotels and resorts can minimize their environmental footprint, proper handling and disposal of hazardous waste, save costs, enhance reputation, comply with regulations, and fulfill their social responsibility to the local community. One of the most appropriate key components of effective waste management strategies, could be implemented in the hospitality industry are reducing waste generation, recycling, composting, and donating leftover food.

2. ANALYSIS OF WASTE MANAGEMENT IN ASTANA. CURRENT CONDITIONS IN THE HOSPITALITY INDUSTRY IN ASTANA

2.1 Statistics of waste in Kazakhstan

Waste management in Kazakhstan is a growing concern, but the government has recognized the importance of sustainable waste management practices and has taken steps to improve the infrastructure and promote awareness among citizens. According to data given in egov National Portal: Information about waste reduction, recycling, by 2030 the share of waste processing should be increased to 40%, by 2050 - up to 50%. A total of 4.5 million tons of municipal solid waste (MSW) are generated annually in Kazakhstan. MSW is sorted and processed at factories in the cities of Astana, Shymkent and Zhanaozen. The processing and disposal of MSW for the third quarter of 2020 represented a share of 15.8%.

According to Beisen (2022), in 2021, a new Environmental Code came into force, the main goal of which was the introduction of progressive environmental regulation mechanisms, a rational and careful attitude to the urban ecosystem.

However, more investment and efforts are needed to ensure proper waste management and reduce the environmental and health impacts of waste. Currently, Kazakhstan is stuck at the first stage of the concept of waste removal - that is, the garbage is simply collected and taken to the landfill. There is practically no practice of holding the population accountable for the formation of spontaneous landfills. Consider the waste management statistics given in Table 1.

Based on the statistical data on waste management in Kazakhstan, it can be analyzed that while the country has made some progress in managing solid waste.

One positive aspect is that the total amount of solid waste generated in the country

decreased by 3.3% in 2020 compared to the previous year. Additionally, 75% of the solid waste generated was collected and processed, indicating that the country has the necessary infrastructure and resources to manage waste properly.

Table 1
Statistical data on waste in the Republic of Kazakhstan

waste types	2017	2018	2019	2020	2021	The difference of the value in % (2017-2021)	The difference of the value in % (2020-2021)
Plastic, polyethylene-terephthalate packaging	68 260	99 400	100 304	136 632	158 174	131,72%	8%
Waste paper, cardboard	85 910	94 024	105 699	111 968	152 770	77,83%	1,5%
Cullet	55 610	60 120	70 540	83 051	83 809	50,71%	1,8%
Food waste	6 702	8 505	10 950	18 166	35 949	436,39%	2%
Tree, leaves	5 031	7 602	10 540	16 513	29 335	483,08%	2,4%
Scrap of non-ferrous and ferrous metals	21 850	20 310	28 693	34 923	21 284	-2,59%	1,6%
Clothing, textiles	1 045	2 245	4 300	5 890	5 502	426,51%	3%
Tires	510	753	907	1889	1 906	273,73%	1,2%
Electronic equipment	87	213	453	710	118	35,63%	1,8%
Other waste	510 340	690 103	700 420	705 055	702 843	37,72%	8%
Total	951 020	1 004 060	1 009 450	1 114 797	1 191 690	25,31%	5%

Source: Bureau of National Statistics ASPR RK

Note. The table presents the statistics of waste among variety waste types in comparison between 2017 to 2021 year.

Nevertheless, concerns arise as to the lack of proper waste management resulting in 25%

being dumped into landfills or illegal dumping sites. This shows that stricter enforcement of waste management regulations, as well as better systems for collecting and transporting waste, is needed.

Due to the high amount of waste, there is a growing number of people opposed to sorting out garbage which has negative effects on our environment. Additionally, hotels seek out more effective waste management methods, typically from the perspective of economic sustainability rather than from the perspective of environmentally and socially sustainable development, which mostly results in cost-cutting measures (Ilyassova, G. et al, 2021).

2.2. Description of waste management in three hotels of Astana

Having an effective waste management system in hotels is essential for the hospitality industry, as it becomes more and more difficult to dispose of waste. Analyzing the waste management in the hotels of Astana is one of the main steps to help to reduce waste disposal from the hotel industry.

According to Shatskaya (2019), a study conducted by Property Assessment LLP's analytical service, there are 261 hotels in Astana with a total of 9,521 rooms in various categories.

It is necessary to make an analysis of the development of waste management on the example of three hotels in Astana, from the different hotel chain companies that have distinctive methods of managing waste. These hotels have implemented sustainability practices such as reducing the number of single-use plastics, promoting recycling, separating waste, and training staff on proper waste management.

The 3 chosen hotels are:

1. Rixos President Hotel Astana;
2. The St. Regis Astana;
3. Radisson Hotel Astana.

Table 2 consists of a brief comparison of the main hotel brands of Astana.

Table 2
Comparison of Astana hotels

Rixos President Hotel Astana	The St. Regis Astana	Radisson Hotel Astana	Ritz Carlton Astana	Sheraton Astana Hotel
This 5 star hotel is a part of Accor Worldwide Hotel Company. Opened in 2010. Has 184 rooms. The minimum cost of the room: 108,000 KZT for 1 night in a Deluxe Room (32 sq.m.).	This luxury 5 star hotel is a part of Marriott International Inc. Opened in 2017. Has 120 rooms. The minimum cost of the room: 99,900 KZT for 1 night in a Deluxe Room (68 sq.m.).	This 5 star hotel is a part of Radisson Hotel Group. Opened in 2013. Has 181 rooms. The minimum cost of the room: 63,504 KZT for 1 night in a Standard Room (27 sq.m.).	This luxury 5 star hotel is a part of Marriott International Inc. Opened in 2017. Has 157 rooms. The minimum cost of the room: 114,240 KZT for 1 night in a Deluxe Room (40 sq.m.).	This 5 star hotel is a part of Marriott International Inc. Opened in 2019. Has 291 rooms. The minimum cost of the room: 64,512 KZT for 1 night in a Deluxe Room (30 sq.m.).

Source: created by the authors

Note. This table shows brief comparison and information of most recognized and known hotels, located in Astana.

Rixos President Astana Hotel is a five-star all-inclusive hotel, which is located in Astana city. It was built in 2005, and renovated in 2012. It has 8 floors and 184 rooms. Rixos provides a multitude of F&B concepts of Turkish, local, and international cuisine.

It is important to mention, Rixos was one of the favorite choices in TripAdvisor, Forbes, World travel Awards, Luxury Lifestyle. According to the survey, there may be up to 50 events

in a month. It was also discovered, Rixos produces 500 kg of waste every day. These 500 kg of garbage are sorted into hazardous and non-hazardous, and then, according to lesser criteria to recycle according to the rules of recycling. Rixos President Hotel Astana adopted various waste management practices, such as implementing recycling programs, reducing single-use plastics, composting food waste, and reducing overall waste generation.

The St. Regis Astana is one of the main luxury hotels of Astana which constantly welcomes loyal guests every day from all over the world. It opened in 2017 and has a guest room stock of 120 rooms. The Hotel is part of Marriott International Inc. It has two restaurants, one bar, day and night in room dining service. As was discovered from the survey, the hotel provides over 200 events yearly. To reduce waste, the hotel plans its menus purposefully, provides training for employees, separates and audits the waste, and creates a vegetable stock. Vegetable stock is about the waste generated from peels of vegetables used to create particular dishes that the hotel has in a menu.

Radisson Astana Hotel is a five-star chain hotel, located in the center of Astana on the Coast of Ishim River. It has 181 rooms. It is the first hotel awarded the “Green Key” certificates in Kazakhstan along with Park Inn. Green Key is the international ecolabel for hotels. The certificate of Green Key is the award of leading standards in the environmental friendly and sustainable operation. The survey revealed, the Radisson Hotel has a job position directed to environment responsible operation of the Hotel, it is a Coordinator of Responsible Business. In addition, through the means of informing in the Responsible Business WhatsApp chat, responsible managers bring new programs organized with the head office. The Hotel provides training, separates waste to glass, plastic, paper and food waste, cross-use ingredients and purchase local products to extend their life.

The commitments of International Chain Companies help to increase environment awareness of its employees. However, the specific details of their waste management practices would require further investigation and research. Both Rixos and St. Regis Hotels are monitoring the amount of waste they produce. These two Hotels constantly improve their waste management practices, increasing employees and guest's environment awareness. For instance, "Earth Hour" which was provided on March 25 in The St. Regis Astana is taking a step towards a greener future. Radisson Hotel Astana used to be the greenest hotel of the capital in 2014. However, currently, the hotel does not- monitor the waste produced as well as does not control overproduction of food on the events. All three hotels agree: there is no possibility to implement a zero-waste system in Kazakhstan currently. Overall, it is important for hotels to prioritize sustainable waste management practices to contribute to a cleaner and healthier future, and minimize their environmental impact.

2.3. Results and discussion

According to the Bureau of National Statistics ASPIR RK, hotels annually produce 300-400 kilograms of various household waste.

The problem of the buildup of a massive amount of trash in the hotel industry, both in production and consumption, many of which are inflicting great harm to the environment and public health, is currently one of the primary issues unique to the industry of the Republic of Kazakhstan.

In connection with the data above, it is necessary to make an analysis based on the survey with participation of the leaders of the hotels and responsible for development of waste management the hotel produces with questions presented in Appendix C and Appendix D.

Rixos Hotel Astana's best practice is they have one special room with a fan for saving

and selecting waste (food, plastic, hazardous, etc.). They do separate waste on a daily routine. It should be mentioned that, as most hotels are using plastic straws, Rixos hotel is in the way to stop using plastic straws at all. For instance, instead of plastic straws they are purchasing those are made from bamboo. However, according to respondent of the survey presented in Appendix E there are barriers for this practice, such as:

“The problem is that organic straws are very expensive and for hotels, it is not beneficial. If it comes to guests, most of the younger generation do respect green rules of hotels and think very positively about reducing food waste. At the same time, the older generation do not even know about this concept.”

The St. Regis Hotel constantly provides training between employees, increasing their environment awareness. The kitchen staff with the executive chef sharing the results of waste the department faces on a monthly basis. Provided information allows to monitor the dynamic of waste per month. The St. Regis Astana gives to the guests an option to donate the excess food from large events at this moment, F&B Director of the Hotel in Appendix E, stating:

“We do understand the donation of food is a part of charity and good will. However, one of the reasons to consider is the health of the person who is going to consume this food. The largest amount of food cooked for Kazakh events.”

Radisson Hotel Astana provides corporate training of Responsible Business - "Living Responsible Business" for chiefs and supervisors held for new personnel of all departments. Hotel face were investigated from the survey with employees, shown in Appendix E:

“Separation of garbage into different tanks. Difficulties arise in the storage of various garbage, because. Takes up a lot of space and for the frequent shipment of glass, plastic, etc. separately, it turns out not to be done regularly. Since it is not profitable for contractors to take a small volume. Moreover, according to fire safety, it does not allow storing large volumes on our

territory.”

The survey has detailed audio record of respondents of the survey, presented in Appendix F. The SWOT analysis in Table 3 was presented considering the state of the hotel business in waste management in Kazakhstan, identifying the following strengths and weaknesses, opportunities and threats to the development of the industry.

Table 3
SWOT - analysis on waste management in the hotel business in Kazakhstan

<i>Strengths</i>	<i>Weaknesses</i>
Increasing awareness among hoteliers about sustainable practices, including waste management Opportunities to improve brand image and reputation through eco-friendly initiatives Availability of various waste management technologies and services to reduce waste and maximize recycling Potential to reduce operating costs by implementing waste reduction and recycling programs Possibility of generating revenue through recycling programs	Lack of education and training among hotel staff about waste management practices Limited space for waste storage and disposal in urban areas High costs associated with waste management technologies and services Lack of awareness among hotel guests about their role in waste reduction and recycling efforts Resistance to change and reluctance to invest in waste management initiatives No government support
<i>Opportunities</i>	<i>Threats</i>
Collaboration with waste management companies and suppliers to implement sustainable waste management practices Saving money and improving sustainability by implementing waste reduction and recycling programs Development of partnerships with local communities to improve waste management practices Opportunity to educate guests about waste reduction and recycling efforts and engage them in sustainable practices Potential to implement innovative waste management technologies to improve efficiency and reduce costs	Regulatory changes and increasing fees associated with waste disposal Limited availability of recycling and waste management infrastructure in some regions Consumer perceptions that eco-friendly practices may result in higher prices Difficulty in measuring the effectiveness of waste management initiatives and their impact on the environment Potential negative impact on customer experience if waste management practices are not implemented effectively.

Source: created by the authors

Note. This table demonstrates SWOT analysis of waste management in hotels of Kazakhstan.

A program to modernize the MSW management system was approved by the Government of Kazakhstan in 2014. However, it was repealed by a decree of the government of Kazakhstan No. 484 on 29 August 2016. The MSW management system has been proposed to be improved in order to increase the efficiency, reliability, environmental and social adoptability of a complex of services. It covers collecting, transporting, dumping, recycling and disposal. Modernizing this sector through modern technologies and management practices, coupled with the strict observance of Kazakhstan's environment law requirements, was a major task.

Kazakhstan, like any other country, generates a significant amount of solid waste on a daily basis. According to the Ministry of Energy of the Republic of Kazakhstan, in 2020, the total amount of solid waste generated in the country was 13.9 million tons.

Hotels in Kazakhstan, like in most countries, generate significant amounts of solid waste on a daily basis from their various operations, including food waste, paper waste, plastic waste, and other non-biodegradable materials. The amount of waste generated depends on several factors such as the size of the hotel, the number of guests, the type of hotel, and the hotel's waste management practices. Such measures may cover waste segregation, recycling, traineeship for staff, reduction in food waste and the use of environmentally responsible products.

According to industry standards, a typical hotel guest produces between one and two kilograms of waste per day. Therefore, a hotel with 100 guests could generate around 100 to 200 kilograms of waste per day.

The target indicators that have been set for specific categories of trash by this program by 2030. The percentage of collected biodegradable waste is 30%. The percentage of collected packaging, paper, and glass is 50%. The percentage of collected household waste is 70%. The percentage of collected hazardous household waste is 65%. The percentage of collected hazardous household waste is 85%. The percentage of collected used cars is 50%, and the percentage of collected used car tires is 80%.

To date, the share of waste collection and recycling in the hotel sector in Kazakhstan is less than 5% of the total amount of education. However, due to the new political course of the country, Kazakhstan's transition to a green economy, as well as the adopted bills, the share of separately collected waste will grow.

3. RECOMMENDATIONS TO MAINTAIN ECOLOGICAL RESPONSIBLE BUSINESSES AND IMPROVE WASTE MANAGEMENT IN HOSPITALITY INDUSTRY IN ASTANA

3.1. Recommendations to improve waste management in hotel business

This section contains some solutions and practices to improve waste management in the hospitality industry in Astana based on a survey and best international practices observed. The survey revealed that one of the most preventable ways of food waste and waste management in general, is improving recruiting strategies. According to the survey and research of waste management practices, below recommendations for the hotels were recommended to implement:

Reducing food waste requires a person who knows the job perfectly. Finding the perfect candidate for the kitchen has never been easy and takes a very long time for a recruiter, and for this the hotel always needs to have spare co-workers who have already passed all the training, and of course a tough selection among the participants. Like football, teams that have spare players for a match.

Moreover, hotels should have a stock of waiters, cook assistants, chefs themselves, restaurant managers. Since at the peak of the tourist season, as it has already been said in many scientific papers that many hotels consider employees without experience and due to lack of time for training, managers cannot train all staff during and for this, it is suggested to stock up employees who have already passed the training. In order not to lose loyal guests and reduce ratings, the first training should be held on guest service and on the topic of food waste disposal for each employee, due to every solution to this problem must first start from within the hotel, which means first to reduce waste from employees. To implement such strategies, it is needed

to be able to motivate employees to follow these principles. A good example: reward the winning employees who were able to work without waste for a month, or if more realistically they were able to meet all the requirements for the disposal of food waste. Create rewarding challenges among the staff and choose one winner as an “Employee of the month”. Who can minimize the food waste or any type of waste in the hotel.

In addition, another effective solution is to arrange frequent brainstorming sessions among different departments. As they say, “Two heads are better than one” due to working and knowing all the cons and pros and all the problems of the hotel, it can help to improve all the sectors of the hotel in general. Moreover, brainstorming is a way to rest from an operating routine, improve relationships with colleagues, and function the brain.

Such an extensive problem as food waste cannot be limited only with training for hotel staff. It is necessary to take into account all practices on the world stage. International experience in food waste management. Best practices, in order to involve all citizens of the country, it is necessary to legalize this case so that citizens know that non-compliance with the rules on food waste is punishable by the law of the Republic of Kazakhstan.

3.2 Regulations to develop waste management in hospitality industry in Astana

Working under the understanding that in 2023 the perfect solution does not exist; governments and industries have to choose what is the best solution that they can implement that moves them one or more steps forward towards a more desirable and sustainable alternative that they are using now. There is a special landfill, which is designed for isolation and disposal of solid household waste, which is called “ECO- POLYGON”, and here more than 800,000 tons of garbage are processed. All the waste disposal companies as Clean City NC, QAZ WASTE, and TAZA ALEM with all collected waste ends up here. In Astana, 23 organizations provide garbage collection and recycling services, and according to survey, companies collecting hotel

garbage do not sort garbage by type. They collect all the sorted garbage cans into one big truck. It turns out that everyone engaged in self-deception and create only an illusion and then a very big question arises: why then do hotels sort garbage if they end up in one truck anyway. During the research, it discovered that in South Korea and over developed countries, all kinds of garbage are disposed of. They have long begun to practice the use of Anaerobic Digester. The analysis presented that much deeper than what this big machine is capable of first, all kinds of garbage, starting with agriculture and ending with chemical garbage.

Government's restrictions play an important role in influencing waste management. Following the example of effective methods implemented by South Korea. According to the survey, General Manager of the biggest and most recognized vegan restaurant of South Korea and environmental activist, few practices that South Korea implemented in order to lead a more sustainable operation were discovered. Firstly, seven companies of the most popular drink "soju" made an agreement with each other to manufacture soju in green bottles so they can easily be reused. In addition, unused soju bottles can be collected and taken back to producers, gaining from 30 to 100 WON a bottle. Secondly, people in South Korea are obligated to throw out waste in three types of waste bags. For instance, yellow colored bags are used for food waste, blue bags are for recyclable waste (plastic, glass, can) and white bags are for general waste. In addition, it must be a specific bag distributed by the government. The cost for the bag covers its garbage disposal service. In case of violation of government rules citizens are strictly fined. Hence, it is suggested to implement a solid system of waste distribution rules with penalties according to South Korea's example.

An additional waste management strategies that hotels can implement to reduce their environmental impact is presented in Table 4.

Table 4
Ways to improve waste management

Steps	Meaning
Conduct a waste audit	A waste audit can help hotels understand the types and quantities of waste they generate and identify opportunities for waste reduction and recycling.
Implement a waste reduction plan	The hotels may develop a waste reduction plan which lays down specific strategies to reduce waste, on the basis of the results of the waste audit, such as using digital communication instead of paper, providing guests with refillable water bottles, and offering bulk dispensers for toiletries instead of single-use plastic bottles.
Segregate and recycle waste	Hotels can segregate waste into different categories, such as recyclables, non-recyclables, and hazardous waste. They can then work with local waste management companies to recycle materials such as paper, cardboard, plastic, and glass.
Compost food waste	Food waste generated in the hotel can be composted and used as fertilizer for landscaping or gardening. Hotels can work with local composting facilities or start their own composting program.
Properly dispose of hazardous waste	Hotels should have a clear procedure for handling and disposing of hazardous waste, such as chemicals and batteries.
Use eco-friendly products	Hotels can reduce their environmental impact by using eco-friendly products such as biodegradable cleaning supplies, recycled paper products, and energy-efficient appliances.
Educate staff and guests	Staff and guests should be educated on proper waste management practices, such as segregating waste correctly and disposing of waste properly.

Source: created by the authors

Note. The table contains steps towards improving waste management and the meaning of each step.

In conclusion, proper waste management practices are essential for hotels to reduce their environmental impact, save costs, comply with regulations, and protect the health and safety of employees and guests. By implementing these waste management strategies, hotels can reduce their environmental impact and contribute to sustainability. It is important for hotels to follow all relevant regulations for waste management and to regularly review and update their waste management plans to ensure continued progress towards waste reduction goals.

CONCLUSION

In its operations, the hospitality industry generates a large amount of waste including foodstuffs, paper products, plastics and chemicals. This is due to a high number of guests, the need for frequent cleaning and replacement of facilities as well as large quantities of food and beverages produced in restaurants and catering services.

Waste arising from the production of products such as paper and plastics may have significant environmental impact, including greenhouse gas emissions associated with food waste in landfills, pollution caused by hazardous waste disposal or depletion of natural resources used to manufacture these products.

The importance of managing waste and implementing sustainable practices to reduce its impact on the environment is, however, becoming increasingly apparent in the hospitality sector. Strategies such as reduction of waste at source, recycling and manure management or giving unused foodstuffs to charities in the area are being implemented by a number of hotels and other hospitality businesses. Some hotels even introduce closed loop systems that turn waste into energy or products such as the use of food waste for biogas production or recycling materials to create new services.

There is a considerable opportunity to reduce waste and improve its environmental performance within the hospitality sector. It can both reduce the environmental impact and build a positive reputation for the brand as a responsible and sustainable business, by adopting environmentally friendly strategies and working with the guests, staff and partners on waste reduction issues.

In order to identify the type and quantity of waste generated by a business, conducting waste audits is a major task. The development of waste reduction strategies and goals may include introduction of recycling programs, providing excess food to local charities, and using

recycled or biodegradable materials. Provide training of proper waste management practices, such as: collection, recycling, and composting. Collaborating with suppliers and partners who focus on prioritizing sustainability. Monitoring waste reduction progress and identifying areas of improvement, celebrating achievements. Overall, proper waste management of businesses in the hospitality sector can improve and help those businesses reduce their environmental impact and save money on disposal charges, when creating a positive image of sustainability.

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Appendix A

Non-Hazardous Waste

Type of Waste	The Type of Waste Components	Source
Household	Food, kitchen waste or trash paper and wrapping	Different departments of the hotel
Cartons	Packaging	Management, finance, guest rooms, f&b
Paper	Written materials, brochures, maps, menus, magazines, newspapers	Restaurants, bars, guest rooms, offices, front offices
Plastic	Cans, bottles without dangerous substances, household products, all kinds of serving material for different products	Kitchens, restaurants, bars, guest rooms
Metal	Cans, food containers, mayonnaise, ketchup, tomato cans, jam lids, aluminum packages	Kitchens, restaurants, bars, guest rooms
Textile	Tablecloths, bedspreads, napkins, things, shabby items	Guest rooms, housekeeping
Wood	Wooden packages, pallets	Kitchen, restaurants, bars, guest rooms, gardens
Organic wastes	Fruit and vegetable peels, plants and flowers, herbs, branches and leaves	Kitchen, guest rooms

Source: created by the authors

Appendix B

Hazardous Waste

Components	Source
Frying oils	Kitchen
Mineral oils	Technical service
Solvent residues	Technical service, housekeeping
Flammable materials (gas and petroleum derivatives)	Kitchen, Garden, technical service
Cleaning chemicals	Housekeeping, technical service
Ink cartridges	Management, offices, technical service
Floppy Disks and CDs	Guest rooms, IT offices
Batteries	Technical service, offices, guest rooms
Cleaning chemicals, solvent used in dry cleaning	Housekeeping

Source: created by the authors

Appendix C

Survey questions of food waste management

1. What was your occupancy last year, last month?	(Rady, A)
2. What are hotels' efforts in monitoring their generated Waste?	(Rady, A)
3. What are the applied policies for managing Waste in your hotel? What are the barriers that your hotel faces while managing Waste?	(Rady, A)
4. What do you think are the underlying reasons for the current food waste?	(Yangyang Liang, Qingbin Song)
5. Are there any ecological responsible guests, who care and require an eco-friendly stay ?	(Rady, A)
6. Does your hotel utilize any of the following strategies to prevent food waste?	(Rady, A)
7. Do you practice any of the following sourcing strategies to prevent food waste?	(Yangyang Liang, Qingbin Song)
8. Do kitchen staff receive training or reinforcement on any of the following topics?	(Rady, A)
9. What barriers does your hotel face in implementing food waste prevention practices?	(Rady, A)
10. Which best describes your hotel's donation strategy for unused food?	(Rady, A)

11. Does your hotel utilize any of the following strategies to divert food waste from landfills?	(Rady,A)
12. Are you aware of any local regulations or guidelines for disposal of food waste? If so, please list them here.	(Yangyang Liang, Qingbin Song)
13. How do you track and/or monitor overall food waste generation at your hotel?	(Rady,A)
14. Please provide an estimate of how much food waste on average your hotel generates per day in kilogram.	(Rady,A)
15. How many large events does your hotel typically organize each year?	(Rady,A)
16. Do you track food overproduction/waste from events?	(Yangyang Liang , Qingbin Song)
17. If yes, how do you track it?	(Yangyang Liang , Qingbin Song)
18. What is the average food overproduction percentage built into your Banquet Event Order (BEO) for large events?	(Rady,A)
19. Do you give customers an option to donate excess food from a large event?	(Yangyang Liang , Qingbin Song)
20. Which measure do you think is the most effective way to reduce waste?	(Yangyang Liang , Qingbin Song)

Source: created by the authors

Note. The list of questions and its authors used during authors' conduction interview with respondents.

Appendix D

Survey questions, used during conduction interview

2. SURVEY QUESTIONS

1. What was your occupancy last year, last month?
2. What are hotels' efforts in monitoring their generated Waste? (Rady,A)
3. What are the applied policies for managing Waste in your hotel? (Rady,A) What are the barriers that your hotel faces while managing Waste? (Rady,A)
4. What do you think are the underlying reasons for the current food waste?
(Yangyang Liang a, Qingbin Song b)
5. Are there any ecological responsible guests, who care and require an eco-friendly stay ?
6. Does your hotel utilize any of the following strategies to prevent food waste?
(select all that apply)

We separate food waste from other waste streams in our food service operation(s).

We plan menus purposefully to limit portions and cross-utilize ingredients

We store food that can be used later and review our stores frequently

We use plating techniques that combat overconsumption and wastage

We use occupancy rates to forecast food production for the day

We review disposed food and/or consumption data to inform future production

We use software to track wasted food

We do not utilize any strategies to prevent food waste

Other (Please Specify)

7. Do you practice any of the following sourcing strategies to prevent food waste?

(select all that apply)

We use reusable bottles or bulk condiments instead of single-use condiment packets

We buy “ugly” or “seconds” produce when possible

We conduct regular inventory audits

We buy local foods to extend shelf life

We talk to our suppliers about food waste policies

We compare purchasing inventory with customer ordering

We do not utilize any sourcing strategies to prevent food waste

Other (Please Specify)

8. Do kitchen staff receive training or reinforcement on any of the following topics?

(select all that apply)

Proper waste separation

Preventing contamination in organic waste bins (utensils, glass, plastic, etc.)

Reducing waste in employee dining

Menu planning to reduce waste

Ingredient and meal prep techniques to limit waste

Maintaining food safety for food that will be donated

Staff members do not receive training on these topics

Other (Please Specify)

9. What barriers does your hotel face in implementing food waste prevention practices? (select all that apply)

We rely on imports due to lack of local suppliers

We do not have adequate space or resources for storage of leftovers

We perceive that our guests desire large portions and foreign menu items

We do not have the time or resources to train staff in these practices

Our property leadership has other interests/priorities Our staff/guests are not aware of or do not understand the issue

Other (Please Specify)

10. Which best describes your hotel's donation strategy for unused food?

We maintain a donation program for edible surplus food with a food recovery community partner

We have participated in one-off donations in the past

We do not practice food donation

Other (Please Specify)

11. Does your hotel utilize any of the following strategies to divert food waste from landfills? (select all that apply)

We have a contract with a compost/organics hauler for large-scale composting or processing

We process food waste with a digester and onsite wastewater pre-treatment system, which then goes to the wastewater plant for final treatment

We practice on-site composting. We process food waste with a digester, which then goes to a water treatment plant

We use a dehydrator to reduce the volume of food waste for hauling

We transport food waste to local pig farmers or other farmers for animal feed

We give food scraps to stray animals. Food waste is hauled to an incinerator. Food waste is hauled to a landfill. Food waste is hauled to a dump

Other (Please Specify)

12. Are you aware of any local regulations or guidelines for disposal of food waste? If so, please list them here. _____

13. How do you track and/or monitor overall food waste generation at your hotel? (select all that apply)

We separate waste using bins

We use a food waste tracking sheet

We cross-reference invoices from suppliers

We track how often our dumpsters are emptied, or otherwise track how much garbage we dispose We perform inventory reports

We do not track or monitor food waste production at our property

Other (Please Specify)

14. Please provide an estimate of how much food waste on average your hotel generates per day in pounds.

0 – 250 lbs

251 – 500 lbs

501 – 1000 lbs

Over 1000 lbs

I don't know

15. How many large events does your hotel typically organize each year?

Fewer than 100

100-500

501-1000

More than 1000

Other (Please Specify)

16. Do you track food overproduction/waste from events?

Yes

No

Other (Please Specify)

17. If yes, how do you track it? (select all that apply)

We track overproduction as a percentage (%) of cost, by number of covers, or
by weight (lbs)

We monitor kitchen spoilage, food prep waste, or what comes back from
guests' plates

We do not track food overproduction or waste from events

Other (Please Specify)

18. What is the average food overproduction percentage built into your Banquet Event
Order (BEO) for large events?

None

1% overproduction built into order

3% overproduction built into order

5% overproduction built into order

10% overproduction built into order

Other (Please Specify)

19. Do you give customers an option to donate excess food from a large event?

Yes, we ask customers during our sales conversations if they would like to donate excess food to charities, when possible

We prefer reusing items, where possible, rather than donating to charities

We don't have a policy

Other (Please Specify)

20. Which measure do you think is the most effective way to reduce waste?

(Yangyang Liang a, Qingbin Song b)

Source: created by the authors

Note. These questions were asked from respondents during conducting the survey.

3. LIST OF RESPONDENTS

Himank Sharma - Director of Food and Beverage of The St. Regis Astana Hotel; (see figure 2)

Tansel Tercan (Terdzhan) - General Manager of Rixos Astana Hotel; (see figure 1)

Oreste Mancini - Executive Chef of The St. Regis Astana Hotel;

Alex (Raphael) Saghir - General Manager of the PLANT chin vegan restaurants of South Korea, environmental activist;

Kartsev Vasily - coordinator of Responsible Business of Radisson Hotel Astana; (see figure 6)

Matveyeva Linara - Food & Beverage Director of Radisson Hotel Astana; (see figure 5)

Adil Shaikhanov - senior waiter of Selfie Restaurant in the Ritz Carlton Astana; (see figure 10)

Hery Sudarmanto - Executive Sous Chef at Sheraton Astana Hotel; (see figure 8)

Gaukhar Kaikanova - F&B coordinator of The St. Regis Astana; (see figure 9)

Bekezhan Kairgaliyev - expert in food waste recycling, the founder of Recycle BSF; (see figure 7)

Appendix E

Figure 1

General Manager of Rixos President Astana, the respondent of the survey



Note. The figure A shows Tercan Tansel took during the survey provided by authors.

Source: created by the authors

Figure 2

Director of F&B Department of The St. Regis Astana Hotel, the respondent of the survey



Note. The photograph of Himank Sharma, made after participation in survey.

Source: created by the authors

Figure 3

Area of survey provided in The St. Regis Astana



Note. The photograph made during survey at The St. Regis Astana.

Source: created by the authors

Figure 4

Staff area with separating waste in The St. Regis Astana staff canteen

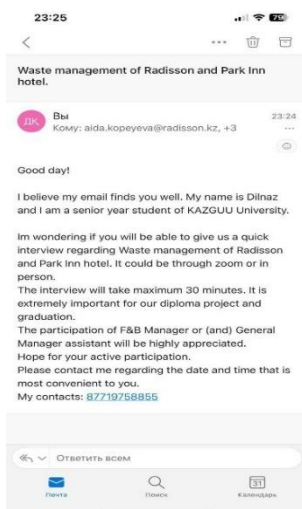


Note. The photograph shows the canteen for employees with separated waste bins. The area includes paper waste, food waste, liquid waste.

Source: created by the authors

Figure 5

The coordinator of Responsible Business of Radisson

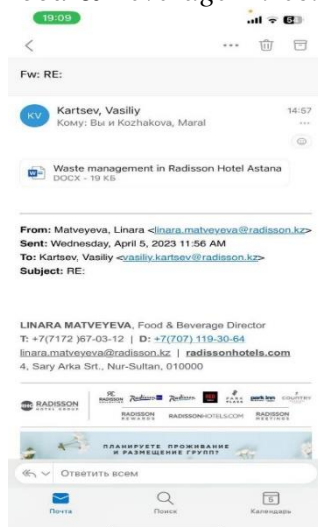


Note. Survey was conducted via email.

Source: created by the authors

Figure 6

Food & Beverage Director of Radisson Hotel Astana



Note. Online interview via corporate email.

Source: created by the authors

Figure 7

Coordinator of Responsible Business of Radisson Hotel Astana



Note. Online interviewing with Kartsev Vasily – the coordinator of Responsible Business of Radisson.

Source: created by the authors

Figure 8

Executive Sous Chef at Sheraton Astana Hotel



Note. The figure shows Hery Sudarmanto took during the survey provided by authors.

Source: created by the authors

Figure 9

F&B coordinator of The St. Regis Astana



Note. In the F&B office of The St. Regis with Gaukhar Kaikanova during the interview.

Source: created by the authors

Figure 10

Senior waiter of Selfie Restaurant in the Ritz Carlton Astana



Note. Online interview with Adil Shaikhanov senior waiter in Ritz Carlton.

Source: created by the authors

Figure 11

Expert in food waste recycling, the founder of Recycle BSF



Note. Bekezhan Kairgaliyev online interview.

Source: created by the authors

Appendix F

The link to audio-files recorded during conduction the survey

https://drive.google.com/drive/folders/1SNM4VI68r4wl4PsMqzunTh3J6wP1_Yis?usp=s

[hare link](#)

Source: created by the authors