

HORECA WASTE MANAGEMENT – A CASE STUDY

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Abstract: In an era of growing environmental awareness, the HoReCa industry faces significant challenges in waste management. This paper explores the complexity of this issue and analyses the solutions proposed by experts to transform this industry into an agent of sustainability. Issues such as abundant food waste, single-use packaging, and inadequate recycling are discussed, highlighting the increased pressure on resources in the digital age. Despite these challenges, opportunities for innovation in practices, packaging, and community collaborations are emphasized.

Keywords: management, waste, research.

1. Introduction

The paper highlights the importance of awareness and education among industry stakeholders. Solutions such as reducing food waste, adopting sustainable packaging, and promoting proper recycling practices are discussed within the context of a holistic approach. Close collaboration between industry stakeholders, communities, and local authorities becomes essential to embrace a future where exceptional culinary experiences coexist harmoniously with environmental responsibility.

This analysis aims to provide a comprehensive perspective on the challenges and solutions in waste management within the HoReCa industry, contributing to the development of a sustainable and responsible model for the future.

The Decision on the Deposit-Return System (DRS) brings forth an innovative approach to managing waste from packaging, with the potential to influence practices in the HORECA industry. According to this decision, businesses that sell packaged products are required to retain a deposit of 50 cents for each packaged product. This amount is to be returned to customers through various methods, including special machines placed in stores.

This initiative aligns with European legislation on packaging, which imposes direct responsibility on manufacturers for managing waste from their own products. This suggests a significant shift in the perspective of responsibility and involvement of manufacturers in the entire life cycle of products, thus encouraging sustainable practices.

Although initially scheduled for implementation on October 1 of this year, the DRS has been postponed until November 30, 2023. This delay may provide businesses with more time to prepare and adapt to the new requirements and integrate these changes into HORECA industry activities.

In a broader context, this decision indicates a growing trend toward the accountability and more active

involvement of businesses in addressing the waste issue, which can have a significant impact on practices in the food and hospitality industry.

In the context of a society increasingly concerned about environmental issues and the need for sustainable development, the HoReCa industry (Hotels, Restaurants, Catering) faces a distinct set of challenges regarding waste management. Today, as gastronomy and hospitality are expanding, it is essential to shed light on the often underestimated impact of this industry on the environment.

Food waste, single-use packaging, inadequate recycling, and the growing pressure on electronic resources are just a few complex aspects of this issue. While the HoReCa industry offers memorable culinary experiences and a vibrant social setting, it is becoming increasingly clear that innovative solutions and effective strategies are needed to responsibly manage the generated waste.

This paper explores the depth of these challenges and analyses how specialists and industry professionals address this pressing issue. In light of this analysis, we will also explore a series of sustainable solutions and best practices that can transform the HoReCa industry into a model of sustainability. From adopting waste reduction practices to innovating in packaging and closely collaborating with local communities, our goal is to shape a green future for this dynamic industry.

Waste management in the HoReCa industry is essential for the sustainability and social responsibility of businesses in this sector. This practice involves the proper management of all types of waste generated in hotel, restaurant, and catering activities.

One key aspect is the environmental impact. Pollution-generating waste, such as food remnants and packaging, can negatively affect ecosystems, soil, and air quality. Improper management can lead to painful impacts on biodiversity and ecological balance.

Another important dimension is the social responsibility of HoReCa businesses. Through

responsible waste management, they can contribute to the well-being of the local community. Reducing food waste and participating in donation or charity projects are concrete ways in which businesses in this sector can serve the communities in which they operate.

There is also a financial component to waste management. By optimizing processes and recycling materials, businesses can achieve significant savings, reducing costs associated with waste disposal. This aspect is crucial for the economic efficiency and long-term sustainability of HoReCa businesses.

Legal compliance is also a major concern. Adherence to waste management norms and regulations is essential to avoid negative legal consequences. Compliance not only ensures the smooth operation of the business but also contributes to building a positive reputation in the community.

The public image of HoReCa businesses is also shaped by their approach to waste management. In an era where consumers are increasingly interested in sustainable practices, a proactive attitude in this regard can attract customers and strengthen the business's public image.

2. Theoretical Considerations

According to the Romanian Dictionary (DEX), waste is defined as "the remainder of a material resulting from a technological process of creating a certain product, which can no longer be directly valorised for the production of that specific product."

The concept of waste, generally difficult to define, includes a vast category of products, variable over time and space, which, at least in relation to intention and current degree of valorisation, does not have significant economic value, raising general issues of separation, storage, and eventual revalorization.

Food waste is defined as "any by-product or waste from the production, processing, distribution, and consumption of food" [1].

Dijkema et al. highlighted that wastes can be defined as materials that individuals would prefer to discard, even if they have to pay for their proper disposal [2]. While waste is an inevitable by-product of human endeavors, it is also a consequence of inefficient production methods. The ongoing creation of waste represents a significant depletion of crucial resources [3]. In essence, the generation of waste not only reflects the natural outcome of human activities but also signifies a loss of valuable resources due to inefficient production processes.

Waste management, also known as waste disposal, refers to education regarding the monitoring, production, collection, transportation, treatment, recycling, and storage of waste. Usually, the term refers to materials resulting from human activities and reducing their impact on human health, the environment, or the appearance of a habitat. Waste management also aims to

save natural resources by reusing recoverable parts. Managed waste can be solid, liquid, or gaseous, with various properties (e.g., radioactive), requiring specific treatment methods for each.

Demirbas characterizes waste management as a systematic procedure involving the collection, transportation, and processing of wastes with the ultimate goal of disposing of any remaining residues. In essence, waste management encompasses the organized handling of waste materials from their initial collection through various stages of processing, ensuring the proper and efficient disposal of the remaining residues [4].

Waste generated from the hospitality industry can be divided into two distinct categories: hazardous waste and non-hazardous waste. According to the definition provided by Pirani and Arafat in 2014, hazardous waste generated in the hotel sector mainly includes frying oils and minerals, paint and solvent residues, flammable materials, fertilizers and chemicals, cleaning chemicals, batteries, fluorescent lights, and other electrical and electronic materials [5].

In contrast, non-hazardous waste usually includes food waste, cardboard, paper, plastics, metal, glass, fabrics, wood, and other organic waste. The management of non-hazardous waste is usually the responsibility of municipal authorities, with the caveat that some regulations may explicitly exclude these types of waste from general municipal waste streams. It is essential to adopt specific practices and policies for each waste category, ensuring proper management and compliance with current regulations.

Plastic waste represents one of the greatest threats to the environment. Plastics can persist in the environment for hundreds of years, polluting water, affecting marine and terrestrial fauna, and contributing to the destruction of natural habitats.

Electronic waste (e-waste) contains hazardous chemicals such as mercury, lead, and cadmium. Improper processing of these wastes can lead to soil and water pollution, affecting the quality of natural resources.

The decomposition of food waste generates greenhouse gas emissions, and their landfilling can produce harmful gases, such as methane. Additionally, these wastes contribute to resource depletion and soil pollution.

Radioactive waste generally originates from nuclear activities. It can cause soil and water contamination, endangering human health and ecosystems.

Agricultural waste, such as pesticides and chemical fertilizers, can cause soil and water pollution, affecting soil quality and ecosystem health.

Construction and demolition waste may contain hazardous substances such as asbestos, as well as large quantities of concrete, wood, and metal. Incorrect processing can lead to soil pollution and the destruction of natural habitats.

Regarding waste management, the focus should be on the full implementation of waste diversion goals, in accordance with the Waste Deposits Directive, and other provisions of the directive regarding proper and safe storage of residues from stabilized biological waste. Certain EU member states, which have already adopted adequate national measures, have managed to completely eliminate the landfilling of untreated waste and implement a high-quality biological treatment process. The Commission strongly recommends that all member states aim for the complete elimination of landfilling of untreated biological waste as soon as possible, in accordance with the provisions of the Waste Framework Directive [6].

The transformation of the energy sector through the reduction of carbon emissions represents one of the main challenges for the European Union. Biological waste can be efficiently converted into electricity, thermal energy, or transportation fuels with relatively low costs, thereby limiting the use of fossil fuels and enhancing energy supply security. In formulating measures to achieve the mandatory national target for renewable energy, member states should consider this opportunity in accordance with the provisions of the Renewable Energy Directive. This directive particularly recognizes the advantages of using waste in the production of transportation fuels, emphasizing that they make a dual contribution to achieving the 10% target for the transportation fuels sector [7].

The reduction, recycling, and proper management of waste are essential for minimizing environmental impact and protecting natural resources. Education and public awareness play a crucial role in promoting sustainable practices and addressing issues related to waste management.

3. Results

This study investigates waste management practices in the HoReCa industry, with a focus on the perceptions of economic operators regarding new regulations, especially the Deposit-Return System (DRS), and their level of preparation and adaptation to these changes. In the context of a global concern for environmental impact, the HoReCa industry plays an essential role in promoting sustainable practices.

The study highlights the awareness level of economic operators regarding waste management, analyzes current practices, and provides a deep understanding of how new regulations influence waste management strategies in HoReCa establishments.

The results of this study will contribute to developing a clear picture of how the HoReCa industry perceives and integrates new legislative initiatives, also providing relevant information for improving waste management practices within a sustainable framework.

To analyze waste management practices in the HoReCa industry, we chose to conduct a research based

on a questionnaire distributed online. The questionnaire structure consists of 13 closed-ended questions.

The research took place in September-October 2023, involving a sample of 22 companies in the HoReCa industry from Caraş-Severin county.

The evaluation of the respondents' awareness regarding the impact of waste on the environment in the HoReCa sector (hotels, restaurants, cafes) indicates that a significant proportion, approximately 77.27% of the respondents, declare themselves "very aware" of this impact. Additionally, 22.73% consider themselves "somewhat aware." There are no respondents who declare themselves "slightly aware" or "not aware at all." This distribution suggests that the majority of participants are well-informed and conscious of the impact of waste in the HoReCa industry, with only a small portion identifying themselves as being aware to a lesser extent. The absence of those declaring themselves "slightly aware" or "not aware at all" may reflect an overall increased awareness among the respondent sample.

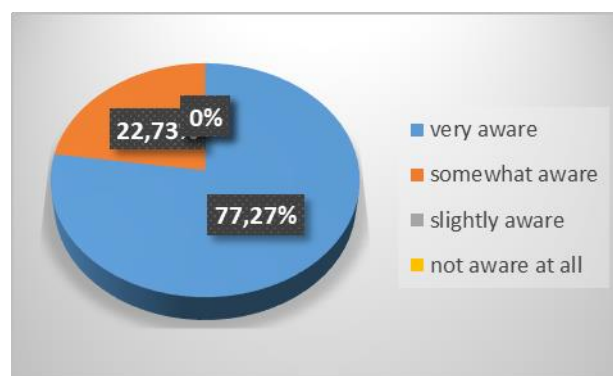


Fig. 1. The impact of waste on the environment in the HoReCa sector

Regarding the professional experience of the respondents in the HoReCa sector (hotels, restaurants, cafes), the results indicate diversity in terms of the time spent in this industry. A percentage of 18.18% of respondents have worked in HoReCa for less than a year, indicating a relatively new presence in the field. Those with experience ranging from 1 to 5 years represent the largest proportion, at 40.91%, suggesting a significant presence of those with moderate experience in the industry. The category of 5-10 years represents 22.73%, indicating a considerable presence of those with longer experience. Respondents with over 10 years of experience also constitute 18.18%, suggesting a significant contribution from those with extensive experience in the HoReCa field. This diversity in the timeframe reflects a wide range of experiences and accumulated knowledge within the industry.

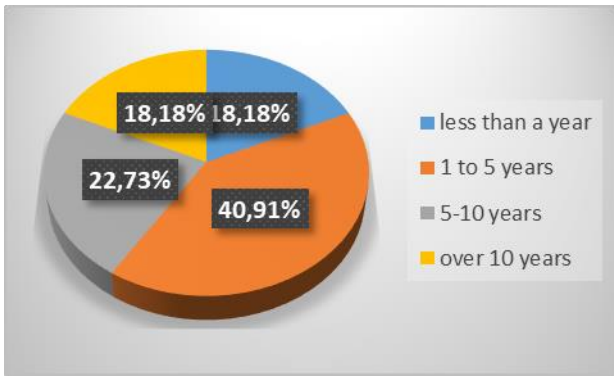


Fig. 2. The professional experience of the respondents in the HoReCa sector

Regarding the perceptions of business operators in the HoReCa industry regarding new regulations, especially the Deposit-Return System (DRS) and waste management, the results indicate significant support from business operators for the new regulations, with 68.18% of respondents declaring themselves "very favourable." This suggests that a significant proportion of the HoReCa industry considers the new measures to be beneficial and effective in waste management.

Approximately 18.18% of respondents chose the "favourable" option, indicating approval but with some reservations regarding the implementation and impact on business. This group provides a more balanced perspective, recognizing the benefits but expressing caution.

The "neutral" category represents 13.64% of total respondents. This segment reflects a diversity of opinions and may indicate uncertainties or a lack of information regarding the new regulations.

In conclusion, the majority of business operators in the HoReCa industry seem to support the new regulations, but there is also a segment that has reservations or has not positioned itself clearly. These findings can serve as a basis for additional communication and training efforts to ensure an efficient and well-understood implementation of the new measures.

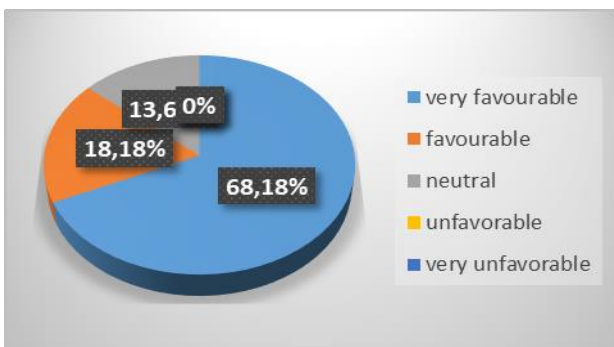


Fig. 3. The perceptions of business operators in the HoReCa industry regarding new regulations (DRS) and waste management

Regarding training or guidance on waste management in their professional activities in HoReCa, the results show that approximately 68.18% of respondents have received such training, indicating a significant level of involvement in providing resources and information related to waste management in the HoReCa industry. On the other hand, approximately 31.82% of respondents have not received such training or guidance, suggesting an opportunity for improvements in providing knowledge and guidance in this regard for a portion of the sample. This information can be used to assess the need and effectiveness of waste management training programs within activities in the HoReCa industry.

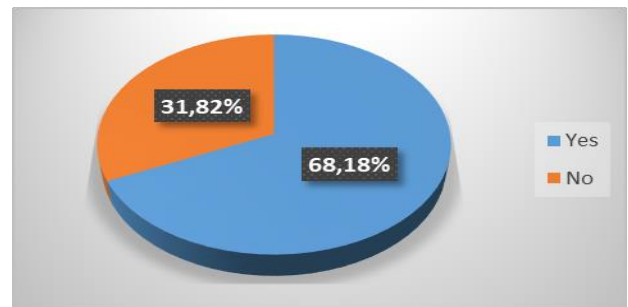


Fig. 4. Training or guidance on waste management

As for the existence of a program or initiative dedicated to waste management within the companies of the respondents, the results show that approximately 81.82% of respondents state that their company has a program or initiative dedicated to waste management. This significant figure suggests that a considerable portion of the organizations in the sample aims to implement or manage specific activities to address and solve waste-related issues sustainably.

On the other hand, approximately 18.18% of respondents declare that their company does not have a program or initiative dedicated to waste management. This percentage may indicate opportunities for improvements in adopting sustainable practices and implementing waste management programs in organizations that do not already have such initiatives.

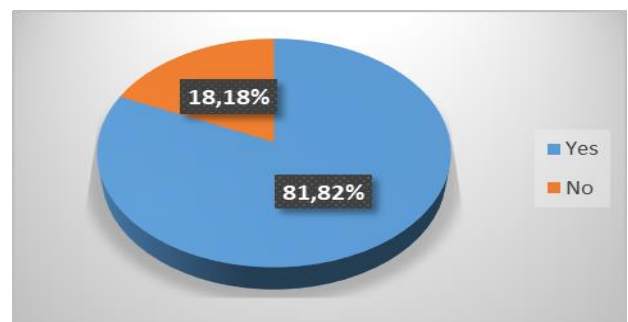


Fig. 5. The existence of a program or initiative dedicated to waste management

Regarding the perception of respondents regarding the level of support from management and authorities regarding the implementation of waste minimization practices in the HoReCa industry, the results indicate a fairly balanced distribution of opinions.

Approximately 59.09% of respondents believe that there is sufficient support from management and authorities for the implementation of waste minimization practices. This positive perception suggests that a large portion of respondents feels that there is support and interest from management and authorities in adopting more sustainable practices in the HoReCa industry.

In contrast, approximately 40.91% of respondents believe that there is not enough support from management and authorities in this regard. This perspective may indicate the need to intensify efforts to gain more sustained support and address possible obstacles in promoting waste minimization practices in this industry. The absence of a response from some respondents may indicate uncertainties or a lack of a clear opinion in this regard.

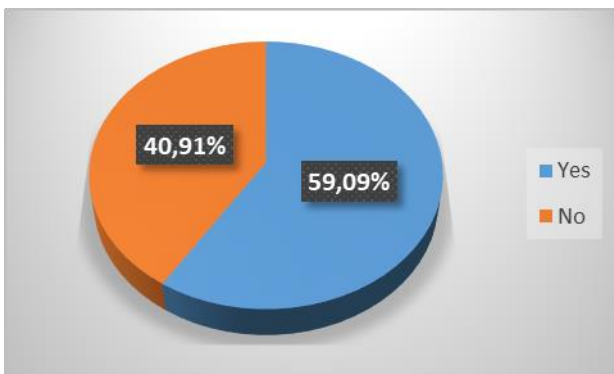


Fig. 6. The level of support from management and authorities

Regarding how waste collection and separation are managed within the companies of the respondents, the results show a diversity of practices in these organizations.

For 36.36% of respondents, waste is collected and selectively separated. This indicates a more detailed and responsible approach to waste management, with a concern for recycling and reducing environmental impact.

On the other hand, for approximately 63.64% of respondents, waste collection is common or undifferentiated. This may mean that, in these organizations, waste is collected without being separated into categories such as paper, plastic, or glass. This pattern may indicate a lower emphasis on waste management practices aimed at reducing environmental impact.

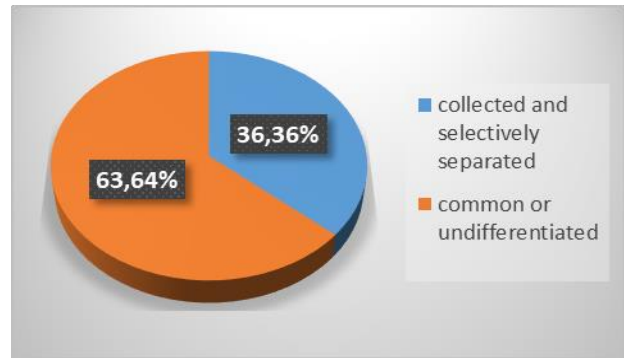


Fig. 7. Waste collection and separation

Regarding the implementation of recycling or material reuse programs in their daily activities, the results indicate a variety of approaches in the organizations under study.

For approximately 36.36% of respondents, recycling or material reuse programs are implemented in their daily activities. This suggests active engagement in adopting sustainable practices, with a focus on responsible resource management and reducing environmental impact.

On the other hand, approximately 45.45% of respondents state that they have not implemented such programs. This percentage may indicate an opportunity for these organizations to explore and implement more sustainable strategies regarding material and waste management.

A percentage of 18.19% mentions that such programs are in the process of implementation. This indicates an active and conscious movement towards adopting more responsible practices in the future. It may be a sign of increased awareness and a step towards integrating more robust environmental policies into their current activities.

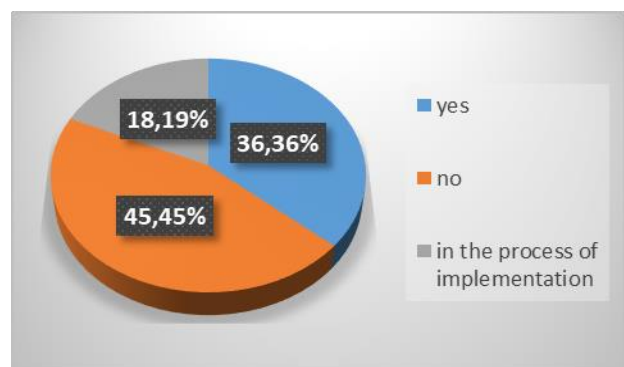


Fig. 8. Implementation of recycling or material reuse programs

Regarding how food waste is managed in the restaurant or unit where respondents are involved, the results indicate a variety of practices in this regard.

For approximately 9.1% of respondents, food waste is eliminated through composting. This indicates an eco-friendly approach, where organic materials are

transformed into compost, thereby supporting sustainable practices and reducing environmental impact.

For approximately 22.73% of respondents, food waste is separately collected for recycling. This suggests attention to sorting food waste to facilitate the recycling process and waste reduction.

A significant percentage of 68.18% mentions "Other methods." This shows a diversity of practices, but exact details are not included in this general summary. This category may include various waste management strategies, such as food donation, energy transformation, or other specific methods established by each unit.

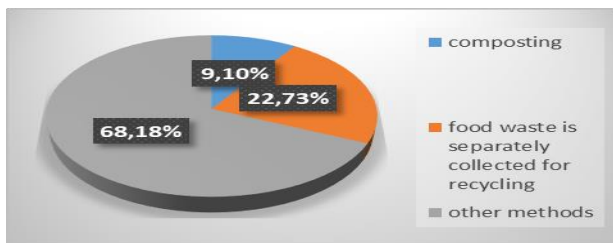


Fig. 9. How food waste is managed in the restaurant

Regarding the perception of respondents regarding the involvement of employees or colleagues in waste minimization practices, the results indicate a significant level of engagement in adopting sustainable practices.

For approximately 72.73% of respondents, employees or colleagues are perceived as "Very involved." This perspective indicates active engagement and enthusiasm within the team regarding the implementation of waste minimization practices. This high level of involvement may reflect an organizational culture around social responsibility and environmental concern.

A percentage of 18.18% considers that employees or colleagues are "Moderately involved." This suggests solid participation but possibly with room for improvement or expansion of efforts in terms of waste minimization practices.

For 9.09% of respondents, employees or colleagues are perceived as "Slightly involved." This may indicate an opportunity to stimulate awareness and involvement within the team regarding waste management practices.

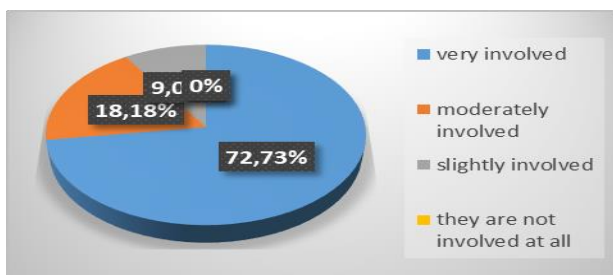


Fig.10. The involvement of employees or colleagues in waste minimization practices

Regarding the level of sensitivity of customers in the HoReCa industry to the units' efforts in efficient waste management, the results indicate significant consensus regarding the perception of this sensitivity.

Approximately 77.27% of respondents believe that customers in the HoReCa industry are sensitive to the efforts of units to manage waste efficiently. This majority of opinions suggests a general understanding that consumers pay attention to and value efforts made for responsible waste management within HoReCa units. This may reflect an increased demand for sustainable practices and business opportunities for units adopting such approaches.

For approximately 22.73% of respondents, there is a perception that customers in the HoReCa industry are not sensitive to these efforts. This may indicate either a perception that customers' concerns are directed towards other aspects or an opportunity for more effective communication to highlight waste management practices and increase awareness among consumers.

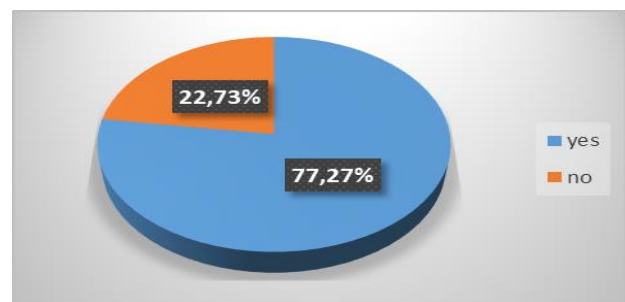


Fig. 11. The level of sensitivity of customers in the HoReCa industry to the units' efforts in efficient waste management

Regarding changes in customer preferences due to waste management practices implemented in their business, the results indicate a certain awareness of the impact that waste management practices can have on customer preferences.

Approximately 63.64% of respondents claim to have noticed changes in customer preferences as a result of waste management practices in their business. This majority suggests that implementing such practices can have a positive impact on attracting and retaining customers. This may mean that consumers are becoming increasingly aware and interested in businesses' sustainable approaches to waste management.

A percentage of 22.73% states that they have not observed such changes in customer preferences. This may suggest either that the changes are subtle and not evident to these respondents or that current waste management practices have not yet had a significant impact on customer preferences in their business.

The "I don't know" response from 13.63% of respondents indicates uncertainty regarding the impact of waste management practices on customer preferences.

This may reflect a lack of information or specific monitoring in this regard and may indicate opportunities for further evaluation and communication of this relationship.

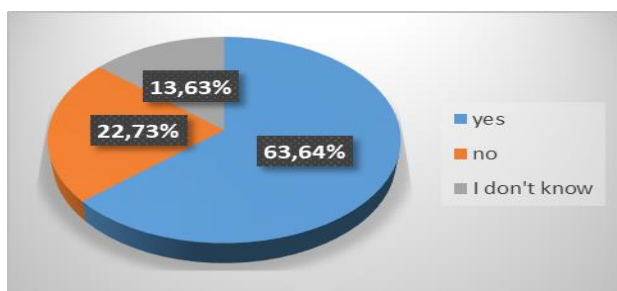


Fig. 12. Changes in customer preferences due to waste management practices implemented

In the context of researching waste management in the HoReCa industry, recent proposals from the European Commission seem to have significant implications. Starting from January 1, 2023, there has been a proposed increase in standards for the quantities of packaging to be recycled and valorised. This change indicates a clear direction towards promoting more sustainable practices throughout the industry.

Also, it is noted that Romania still ranks at the bottom of the European ranking in terms of recycling and waste management. This aspect may suggest an acute need to adapt to new standards and intensify efforts to bring the country in line with European requirements.

In light of the new directives from the European Council and legislative changes imposed by the Romanian Government, it is evident that there is a recognition of the importance of sustainable waste management. This may further influence how HoReCa units in Romania address this issue and how they adapt to the new legislative requirements. These changes may generate increased interest and awareness among employees and customers, thus influencing their preferences and behaviour regarding waste management practices.

4. Conclusions

In conclusion, transforming the HoReCa industry into a sustainability model requires a comprehensive approach and deep commitment to adopting sustainable solutions and implementing best practices. Analysing specific challenges such as food waste, single-use packaging, inadequate recycling, and the impact of electronic equipment, key strategies have been identified

to address these issues and create a more sustainable environment.

Reducing food waste through optimizing the supply chain and promoting responsible consumption is an essential strategy. Adopting sustainable packaging and recycling systems in restaurants can significantly reduce the plastic footprint and contribute to more sustainable product life cycles.

Investing in energy-efficient equipment and responsible electronic waste management reflects a commitment to technological advancement and reducing the negative impact on the environment in a digital era.

Collaborating with local communities by supporting local producers and engaging in social responsibility projects strengthens the ties between the industry and the community.

Education and awareness, both among staff and customers, are fundamental to the successful implementation of these changes. Additionally, transparency and periodic reporting of progress contribute to building trust and demonstrating real commitment to sustainability.

Transforming the HoReCa industry into a sustainability model is not just a necessity but also an opportunity to influence and inspire positive changes in business and consumer behaviour. By implementing these strategies and continuing constant efforts, the HoReCa industry can significantly contribute to building a greener and more equitable future.

5. References

- [1] Okazaki W.K. et al.: „Characterization of food waste generators: a Hawaii case study”, *Waste Management*, Volume 28, Issue 12, December 2008, Pages 2483-2494
- [2] Dijkema G.P.J., Reuter M.A., Verhoef E.V.: „A new paradigm for waste management”, *Waste Management*, 20(8), 633-638, 2000.
[https://doi.org/10.1016/S0956-053X\(00\)00052-0](https://doi.org/10.1016/S0956-053X(00)00052-0)
- [3] Cheremisinoff N.P.: “Handbook of solid waste management and waste minimization technologies”, [electronic resource], Oxford, Butterworth-Heinemann, 2003.
- [4] Demirbas A.: “Waste Management, Waste Resource Facilities and Waste Conversion Processes”, *Energy Conversion and Management*, 52, 1280-1287, 2011.
<https://doi.org/10.1016/j.enconman.2010.09.025>
- [5] Pirani S.I., Arafat H.A.: “Solid Waste Management in the Hospitality Industry: A Review”, *Journal of Environmental Management*, 146 (2014), pp. 320 – 336.
- [6] ***: “On Future Steps in Bio-Waste Management in the European Union”, Eur-Lux, 2010.
- [7] Directive 2009/28/CE