SUSTAINABILITY TRENDS IN FINE DINING RESTAURANTS: A COMPLEX SYSTEMS APPROACH

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Changing societal attitudes and increasing governmental requirements towards environmental protection and maintaining a holistic approach to all participants in production and consumption areas encourage the catering sector to develop and implement sustainability practices. In the case of fine dining restaurants, such realia encourage the search for solutions or their variations to maintain both sustainability and business resilience. Taking into account the scarcity of scientific literature regarding sustainability development and its complexity in fine dining restaurant practices, this paper aims to analyze and to define sustainability trends in the case of fine dining restaurants through the lenses of complexity theory. A Lithuanian context was chosen as a small market and it revealed the following primary trends: to find various ways to decrease the production costs and product prices; efforts and expectations to have stronger connections with local farmers in the future; a wish to educate the customers more about sustainability and ecological products; to increase the application of the zero waste strategy; to increase the balance of workflow to the employees; to work on a systematic development and implementation of sustainability strategy.

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1 Introduction

The enterprises of the catering sector are experiencing even growing requirements to be managed in a sustainable way in order to contribute to environmental protection (Huang, Hall & Chen, 2023). Thus, so called green restaurants, which make efforts to reduce their negative impact on the environment by implementing green practices, such as recycling, utilizing renewable energy, implementing responsible waste management strategy and serving organic foods, become more common (Joshua, Jin, Ogunmokun & Ikhide, 2023). In the case of fine dining restaurants, implementing sustainability practices in coherence with "unique theme, high-quality expensive food, exceptional service, and a formal ambience" (Ma & Hsiao, 2020, p. 113) and at the same time to be profitable and successful would meet even more challenges. These challenges emerge from current contemporary economical, political and other major phenomena, including COVID-19 pandemic, post-pandemic challenges and war conflicts in Europe and outside it. There are quite many examples of worldly famous fine dining restaurants, which had to announce their closing, including "Noma" restaurant (Denmark), which is about to close in 2024 (Crispin, 2023). The main challenges for such restaurants include growing costs and customer demands and at the same time to maintain a particular level of sustainability including a sustainable human resource management in the face of exhausting work processes and a necessity to attract and retain high level specialists.

Even more challenges occur in the case of fine dining restaurants that operate in relatively small markets. These challenges naturally create various obstacles to maintain a holistic approach to all the organizational aspects - at the same time to be sustainable and meet customer needs.

In the scientific literature on fine dining restaurants and their sustainable practices, still more emphasis is put on the context of economically developed countries or countries that have more potential for sustainable practices (USA, United Kingdom, France, China, Australia, etc.). Thus, *a problematic question* could be formulated as follows: what are sustainability trends in fine dining restaurants in small markets? One should emphasize that the scientific solution in order to answer this question requires *a complex system's approach* in order to reveal the overall picture regarding the main challenges towards the implementation of sustainable practices and their solutions based on a particular context.

Thus, **the aim** of this paper is to define sustainability trends in the case of fine dining restaurants through a complex system's approach.

In the theoretical part of the paper the concept of fine dining restaurant and its sustainable management is presented through the lenses of a complex systems approach.

In the methodology part, the research methods are revealed.

Finally, in the Results and Discussion part, the realia and main challenges in order to reveal sustainability trends of fine dining restaurants in the context of a small market.

2 Theoretical Background / Literature Review

A fine dining restaurant as a complex adaptive system. Complexity theory, which emerged at the Santa Fe Institute in USA in the eight decade of XX century (Schneider & Somers, 2006) primarily from biological and physical sciences, such as math, physics and chemistry, was adapted to social sciences too, thus it allows all social systems and various social phenomena to be viewed as complex adaptive systems too (Johnson, 2009). The complex adaptive system can be defined as a network of interacting agents-actors, whose bottom-up based interactions without centralized control create a new order (Anderson, 1999). Complex adaptive systems are fluctuating from the edge of chaos (Lewin, 1999) through positive feedback and to the stabilization stage through negative feedback (Uhl-Bien, 2021). Such a system has particular simple rules, values and behavioral norms, which act as so called attractors — the spheres, to which the system returns after experiencing some fluctuation (Cîndea, 2006). Being as close as possible to the edge of chaos, the system reaches the highest level of creativity and innovativeness (Boal & Schultz, 2007).

While employing these features, a complex adaptive system - a fine dining restaurant as well - is able to co-evolve internally and externally and adapt to the external environment; to develop its identity, viability and responsible behavior (Anderson, 1999; Mason, 2007; Parsons, 2007; Uhl-Bien, Marion & McKelvey, 2007). In other words, during individual and organizational learning while performing their activities and interacting with other actors in a localized space, fine dining restaurants change

their internal and external environment to increase the adaptation through continuous development of human and social capital, and emergence of innovations. In addition, fine dining restaurants as complex adaptive systems are characterized by particular values and behavioral norms through which they are recognized in an external environment. Taking into account the significance of sustainability, system's members act as a community without breaking defined behavioral standards and thus solving challenges in meeting those standards. However, especially in the case of various external perturbations, the fine dining restaurants need to find a way to solve the dilemma between exploration (creativity, innovation) and exploitation (planning, control) (Uhl-Bien & Arena, 2018). This dilemma quite often is very vivid in the case of employing sustainable practices in the restaurants.

The complexity of the concept of sustainable management. Today's restaurant industry is rapidly evolving and is increasingly seeking to integrate sustainability principles into its operations, especially in fine dining restaurants where customers are more willing to pay for the high-quality experience that sustainable management provides.

In the case of catering sector, including fine dining restaurants, a significant area of sustainable management practices covers practices supporting food sustainability, such as usage of local and organic products, developing sustainable menus, reducing, recycling and using food waste, and implementing energy and water saving practices as well (Pinard, Byker, Serrano & Harmon, 2014; Huang, Hall & Chen, 2023).

In general, the food producing processes in the restaurants should be analyzed by adapting system thinking, seeing these processes as *the food systems* consisting of different interacting actors, processes and institutions, which shape how the "food is grown, produced, processed, transported, and consumed" (Zanella, 2020).

Moreover, the scientific literature emphasizes the importance of sustainable management processes that are directed to human resource management and community outreach, by encouraging sustainable behavior in the local community (Gössling & Hall, 2022). For example, as Kim & Hall (2020) stated, it is important not only to implement sustainable practices in the restaurant but also encourage restaurant customers to participate in the restaurant's sustainable activities and learn more about sustainability.

The same would be applicable to the restaurant employees too. For example, scientists present the concept of *green psychological climate*, which describes the perception of employees regarding organizational attributes and behavioral norms, related to environmental sustainability (Joshua, Jin, Ogunmokun & Ikhide, 2023). Bhutto, Farooq, Talwar, Awan & Dhir (2021) stated that there is a mediation effect of green psychological climate and green work engagement between green inclusive leadership and green creativity in the organizations. In other words, such inclusive leaders in the organization show their accessibility to the employees, share creative and innovative ideas, provide the necessary resources, promote the emergence and implementation of creative ideas in the area of sustainability, thus initiating the sustainable behavior in the employees. One should emphasize that a sustainable management in general should provide adequate working conditions and satisfactory salaries, continuous learning and development.

In overall, sustainability should cover all the areas of fine dining restaurant processes - financial, social and environmental performance (Higgins-Desbiolles & Wijesinghe, 2019). For example, in the case of financial performance, it means not only seeking for profit but for responsible financial management, which includes ethical behavior, transparency and accountability towards all stakeholders, including employees, customers, suppliers and the community.

However, in reality finding the balance between different organizational areas is not an easy task, especially in small markets, which additionally are being affected by various external negative phenomena.

3 Methodology

The aim of the empirical exploratory research was to define the trends behind the sustainable fine dining restaurant management in a small market.

The objectives were as follows:

- To reveal sustainable management practices in the case of usage of local and seasonal products;
- To reveal waste reducing management practices in fine dining restaurants;

- To define sustainable human resource management practices;
- To reveal the cohesion between financial matters and the implementation of sustainability practices.

The multiple qualitative case study research strategy was applied (Stake, 1995).

Three Lithuanian fine dining restaurants were chosen as case studies. Lithuanian catering sector is growing steadily by year, however, with less than three million inhabitants in Lithuania, tourist flows, affected by various negative phenomena (COVID-19 pandemic, war of Ukraine, etc.), growing prices, increasing the value added tax (VAT) since 2024, this sector yearly experiences various turbulence and challenges related to both business resilience and the implementation of sustainable practices.

All these restaurants operate in the two biggest Lithuanian cities - Vilnius and Kaunas. In this research study, these restaurants are simply called Restaurant A, Restaurant B and Restaurant C.

Restaurant A was established in 2018 in Vilnius. It was established with a purpose to offer more sustainably grown food to the customers and to develop Lithuanian food traditions. The restaurant has its own farm, from where local seasonal products were used to prepare the dishes. In 2019 this restaurant was the first time selected among the best 30 Lithuanian restaurants.

Restaurant B was established in 2017 in Kaunas and implements the vision of Nordic food. This restaurant is increasingly seeking to implement sustainable practices, including using local and seasonal products and avoiding chemical ingredients in food production and preparation. The restaurant was selected among the best 30 Lithuanian restaurants three times.

Restaurant C, which is based on European kitchen traditions, was established in 2014 in Vilnius. This restaurant was also selected among the best 30 Lithuanian restaurants three times.

The head chefs of the restaurants were interviewed in order to get the overall view of sustainable restaurant practices in each restaurant.

The interview questions were divided in different sections, as follows:

- General questions about sustainability. How is your vision and mission related to sustainability? What sustainability practices are you implementing at your restaurant?
- Using local products that are grown organically or based on sustainable agricultural practices. How do you create a menu, taking into account local products, seasonal products, traditions and customer expectations? To what extent do you use organic / ecological products in your restaurant? Are there any challenges you face in going more organic?
- Waste management strategies. What methods do you use to reduce food waste? What do you think it takes for a restaurant to adopt a zero-waste strategy? Does your restaurant use special techniques and measures to save energy and water? If so, what kind?
- Sustainability and finances. How does your restaurant deal with rising food prices and how does it affect your menu creation? How does your restaurant adapt to rising energy prices? How does your restaurant deal with logistics and transport costs? How do sustainability activities affect a restaurant's finances? How do you combine financial management with implementing sustainability practices? Are there any challenges? If so, how do you address them?
- Sustainable human resource management (especially in the case of training towards sustainability and providing appropriate work conditions). How do you help ensure good working conditions (working environment, workload) for your employees? Are you facing any challenges? If so, how do you address them? How often is your restaurant staff trained in sustainability issues? If such training takes place, what sustainability topics are used? How does this help employees run the restaurant more sustainably? How does your restaurant encourage its employees to apply sustainability principles, such as reducing waste?

4 Results

General attitudes towards sustainability. In general, all restaurants more or less adopt sustainability practices. Restaurant A emphasized sustainability as "the foundation of a modern restaurant management". The restaurants B and C stated that

sustainable practices help to reduce waste and costs, and to regulate the flows of goods properly. As Restaurant A stated, "Without a sustainable approach to this business, it is impossible to create something lasting and bringing not only profit, but also added value to the market.".

Using local products that are grown organically. Usage of seasonal products is applied but not at the full extent. For example, Restaurant C stated that although the seasonality has a big impact towards creating the menu, however, it is hard to maintain the seasonality in 100 percent, especially if there is an insufficient supply of local products: "Growers/producers of seasonal products are rarely able to offer a constant supply, a constant desired quality, so seasonal products usually occupy about 60% percent of all menu choices". In general, the usage of seasonal products depends on particular periods of time: "If local products appear in the market like vegetables, fish or meat when the season starts, we choose local products" (Restaurant B). Restaurant A even mentions a particular season: "In the months of May-October, we use the products that are growing at that time". However, in general the main attitude regarding seasonal products is reflected in the statement of Restaurant B: "If we were to stick with a seasonal menu, we would be pushing ourselves too hard".

The restaurants also preserve particular products for another season: "In the spring-summer months <...> we preserve products for the cold months when nothing will grow. In those months we use all kinds of beets and what is saved from the warmer seasons" (Restaurant A).

The restaurants cooperate with local farmers and local markets, especially in the case of Restaurant A because they have their local farm. This restaurant emphasizes that product providers should fit the following requirements: seasonal, Lithuanian, qualitative products. However, as Restaurant B mentioned, if the particular products meet the requirements of the restaurant, they get it locally, otherwise – they get it from other countries. The restrictions for a wide range usage of local products emerge, first of all, because of the size of the market - this market is small and thus expensive with a questionable quality – "a farmer putting the "organic" label forgets about the quality". However, Restaurant A expects that "that cooperation between farms and restaurants will soon become much smoother".

Restaurant C stated that the priority is to use local products, but to use ecological products "is still a dream that is hard to achieve". The main reason behind it is the high price: "Eco-friendliness greatly affects the price". Thus, the restaurants in general choose the products, if there is a balance of price and quality (Restaurants B and C).

Waste management. As the Restaurant A stated, a smooth organization of work also decreases waste, for example, by balancing work flows and guest numbers. In the case of Restaurant C, the LEAN system is adapted in order to decrease waste. However, it was said that to "reach 100% zero waste in the restaurant is the biggest obstacle because of the constant turnover of employees, because LEAN practical skills are not something that can be mastered quickly, and until all employees apply LEAN principles, it is still not possible to reduce food waste to zero".

Especially Restaurant A and Restaurant B emphasized that food that does not reach the dinner plate is consumed by the staff for lunch".

The formation of menus can also be a tool for waste management. One of the ways - to shorten the menu options: "6 appetizers, 5 main dishes and 2 desserts - thus increasing the possibility that our guests will choose almost all dishes." (Restaurant A). The same restaurant also avoids geometrical forms of dishes in the plates, while using various molds that give space to food waste.

The restaurants also reuse left-overs: "we try in one or another format to give those products another form, such as to squeeze juice from them, make broths, make chips, etc., if that is not possible, then - to use it for compost" (Restaurant A).

Training employees about sustainability. Such training still isn't organized in the analyzed restaurants. Only the Restaurant A mentioned that they seek to employ sustainably-conscious employees and talk about it. As Restaurant A stated, that the strategy of sustainability is still about to be implemented: "A lot of effort needs to be put in this direction, but as a young company we are moving step by step towards an increasingly sustainable organism". However, as it is visible from the answers, the restaurants are making efforts to create the environment for their employees:

- Nurturing new employees through knowledge sharing: "The master and apprenticeship program has been implemented in the kitchen for almost five years, where young people with no experience but who are eager and ambitious are hired, and they work all their time together with the most experienced chefs in the kitchen. If the desire and ambitions do not fade, such employees can start their career as a professional chef after 6-8 months" (Restaurant C).
- Regular communication and mutual feedback: "regular communication and listening" (Restaurant A), "We talk, communicate and try to find out the expectations from the employee, but we also emphasize what we expect from him" (Restaurant B), "Every employee's opinion is important. Even a new employee who just started working yesterday can express his observations or opinion on one or another work issue, and the managers never follow the principle of the restaurant's natural hierarchy when making decisions or giving tasks, but take the time to explain to the employee, why exactly it is done this way, and why it is not done differently." (Restaurant C).
- Maintaining work balance. Mostly it is implemented through the division of work: "the workload is not distributed to individual cooks or waiters, but to the whole team evenly, in this way the stronger ones help the weaker ones, the weaker ones learn and improve, the stronger ones gain management skills" (Restaurant C). Another aspect is creating a shorter menu, so it is easier to manage the work (Restaurant B). Finally, the reservations are managed: "We are paying attention to the number of reservations for the month ahead. We don't take all the bookings that come up, so we avoid overloading the reservation system" (Restaurant A).

Talking about *finance and sustainability management*, the respondents were quite positive regarding the finance management and the implementation of sustainability practices, and they emphasized the ability to adapt to various circumstances: "It's not the strongest that survive - it's those that adapt" (Restaurant C).

5 Discussion

Empirical research was concentrated on the cases of fine dining restaurants that operate in a small market (Lithuania). The cases revealed particular **sustainability trends** that are adapted in these restaurants:

- To find various ways to decrease the production costs and product prices (a qualitative product is understood not always as equal to local /seasonal/ecological product). The term "high price" is emphasized in various aspects, talking about finding a balance between price and quality. It is related to the scientific research results, which reveal that restaurant managers aren't very eager to implement sustainable practices because of financial pressures and obscurity of how sustainable practice could create value to the customers (Raab, Baloglu & Chen, 2018).
- Efforts and expectations to have stronger connections with local farmers in the future (some restaurants have their own farms already).
- To not get limited to local products because of limited scope to get these products and seasonality. However, the restaurants do all the best to use local and seasonal opportunities, including the preparation for the next one (for example, fermenting the products).
- A wish to educate the customers more about sustainability and ecological products, and how sustainable practices increase the value to the customers (Raab, Baloglu & Chen, 2018) (because the customers don't ask much for ecological products and thus don't create the necessity to offer more ecological options).
- To increase the application of the zero waste strategy.
- To increase the balance of workflow to the employees.
- At the moment, sustainability in fine dining restaurants seems as quite a natural thing or "work principle, like adding salt to soup or wishing a guest "enjoy your meal" (Restaurant C), however, a systematic sustainability strategy is needed to be implemented, including the training of employees because the restaurants confirm that sustainability is an important dimension in the management of contemporary fine dining restaurants.

Research limitations. Since the research was performed in a Lithuanian context while analysing three cases of fine dining restaurants, it provides only the primary insights regarding the sustainability trends in fine dining restaurants in a small market with its limitations. Thus, the following **implications for future research** can be defined:

- to perform a comprehensive empirical research, involving a variety of fine dining restaurants in order to define different types of strategic approaches depending on the region in a particular country and different countries with similar market characteristics;
- to cover different organizational functional spheres (marketing, finance, human resource management, operations) to reveal sustainability practices and their improvement areas (for example, the scope for employee training programs, supply chain management, cultural preservation, customer education, sustainable physical environment etc.);
- to perform empirical research by combining the scientific knowledge of sociology, management and economics in analyzing the behavior of different agents in the restaurants as complex adaptive systems and their interconnections. It is important to state that the research could be performed through the lenses of different actors (customers, employees, not only the ones who have head positions in particular organizations);
- qualitative and quantitative research methods could be combined in future research;
- to perform longitudinal surveys in order to reveal the different stages behind the sustainability trends in fine dining restaurants.

6 Conclusions

- From the perspective of complexity theory, a fine dining restaurant, which has a strong focus on quality and taste, by providing food that is refined and aesthetically presented, is an open network of interacting agents (restaurant employes, customers, other stakeholders, such as business partners), where various phenomena, including sustainable behavior patterns emerge as a result of interactions and systemic fluctuations in order to increase coevolution and adaptability.

- Implementation of sustainable practices in the restaurants can be seen as a complex phenomenon, directed to financial, social and environmental performance, covering different business functional areas and relationships with customers and other stakeholders.
- Lithuania revealed that sustainability is a significant part of restaurant practices, especially in the case of fine dining. These sustainable practices are especially related to waste management and partially to use of local seasonal food. Because the market is small and the season to get fresh organic food is limited, the restaurants are dependent on other sources, including other countries, in order to get qualitative food products. The research revealed the efforts to manage the costs and to find a balance between price and quality. It also revealed that the relationships with different stakeholders should be improved: with local farmers regarding local seasonal and ecological products, with the employees regarding oriented training towards sustainability, with the customers regarding the significance of sustainability. In general, the implementation of complex sustainability strategies in fine dine restaurants is still about to be developed in the future.

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