

Eating Out Sustainably – A Review on “Sustainability in Gastronomy” in the Academic Literature

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Abstract

While gastronomy may contribute to a more sustainable food system, what sustainability in gastronomy means is still unclear. This literature analysis aims to identify what the scientific discourses on “sustainability in gastronomy” regard as important. The study further identifies several actor groups relevant to sustainability in gastronomy. By using a system approach, it deduces practically and theoretically relevant sustainability topics and trade-offs between sustainability dimensions.

Resource management, such as the reduction of food waste, responsible sourcing of ingredients, and a shift towards vegetal diets are frequently targeted sustainability outcomes in the ecologic realm. Economically, cost cutting and financial planning are the most important topics, whereas health-related issues and community aspects, as well as traditions dominate the sociocultural dimension. Consumer demand for more sustainable restaurants is a recurring topic in all three dimensions.

But trade-offs often exist between dimensions, such as between environmental and cost factors. Also, economic and social goals differ. Consumer demand for more sustainable restaurant models is portrayed as promising, while other studies show a limited trend. We therefore contribute to the discussion on what is important to gastronomic sustainability and encourage a deliberation of important sustainability outcomes.

Keywords: gastronomy, sustainability, sustainable restaurants, system analysis, actor groups

1. Background

The United Nations Food Systems Summit 2021 recently underlined food system challenges' importance in the context of the sustainable development goals. "The world is off course to meet many global nutrition targets" (Loken 2022, 983). Therefore, academics have been discussing sustainable food systems (see Mann and Arghiroiu 2023 for a dynamic analysis), reviews on the farming sector (Chopin et al. 2021), the food industry (Prasanna and Bodh 2024), food retailing (Chkanikova and Mont 2015), and food consumers (Aguirre Sánchez et al. 2021). It is further acknowledged that "all actors in the food system must collectively work toward change" (Richardson 2022, 260) (Speck et al. 2021; Willett et al. 2019; van den Akker et al. 2024). However, when it comes to gastronomy as a part of the food system, "the role of gastronomy and food service is generally omitted from major policy reports, such as the European Commission's expert report on the "Transition towards a sustainable food system," or the United Nations' "Pathways to sustainable food systems" (Richardson 2022, 261). Even more so, "little is known of how staff work together with sustainability in their daily practices or how these are affected by unforeseen circumstances" (Carrillo Ocampo et al. 2021). While it is generally acknowledged that gastronomy makes up for an important share of consumption (FAO et al. 2023), there is no academic consensus what sustainability may mean in the sector, neither a political consensus which goals gastronomy should fulfil. For example, Higgins-Desbiolles et al. (2017, 1551) explain: "the majority of the literature only engages with parts of sustainability, particularly ecological, rather than holistic sustainability. This matters because it may mean we fail in our attempts to achieve more sustainable restaurant operations."

This article's objective therefore is to review and synthesize the existing academic literature. We aim to show what academics consider to be "sustainability" in gastronomy. In particular, we examine what gastronomy should contribute to sustainability (sustainability outcomes), and who should take on the challenges (sustainability actors). We therefore contribute to the academic discourse on defining "sustainability" in gastronomy. While sustainability is a broad

multidisciplinary field, only with a somewhat clear understanding what “sustainable gastronomy” should entail, practitioners can take on the challenge to work towards more sustainability.

2. Theory: Sustainability and Gastronomy

Gastronomy is commonly defined as “the art and science of food preparation and consumption” (Mishra 2023). Gastronomic institutions are highly diverse—small or temporary food stands, pubs, canteens, lunch and evening restaurants, and cafes, just to name a few. On a theoretical level, gastronomy entails multiple system levels: some research focuses on the ingredients, on food being served, the restaurant (Östergren et al. 2023), the way of food preparation, or the sociocultural context (Mishra 2023), as well as food consumption (Speck et al. 2021).

Sustainability is an equally complex topic. “Sustainable development” has been a major goal of the international political debate since 1987 (WCED 1987), of which “sustainability” itself can be considered as the desired final state. The concept has since included diverse social, ecologic, and economic aspects: these dimensions are the so-called “triple bottom line” (Holden et al. 2016). While the role of international politics is “to popularize and solve development issues through the normative framework of sustainable development” (Janker et al. 2018), the science of sustainability should consist of facts, theories, and methods to enhance societies’ abilities to act towards the normative goal (Fernandes and Philippi 2017).

To the best of our knowledge, there is no consensus what “sustainable gastronomy” or “sustainability in gastronomy” means in the academic literature. A definition by the Food and Agricultural Organization of the United Nations is most often cited: “Sustainable gastronomy [...] means cuisine that takes into account where the ingredients are from, how the food is grown and how it gets to our markets and eventually to our plates” (FAO 2025). In scientific research, many articles do not define gastronomic sustainability. Some comprehensive definitions are given, such as by Richardson (2022, 261), who notes that “sustainable gastronomy takes into account how it can be incorporated in a manner that is beneficial for the planet and society.” Similarly, Rinaldi (2017) finds that “food and gastronomy (F&G) might contribute to the economic, social and environmental sustainability of places.” Speck et al. (2021) agree that the three dimensions of the “triple bottom line”—ecology, economy, social issues / health—need to be considered while choosing ingredients and preparing food. Yilmaz and Yalcin (2024) find that “sustainability in gastronomy aims to carry local food production and consumption into the future by taking into account the environmental, social and economic dimensions of local food culture. [...] ensuring the continuity of production of local, organic and authentic foods, preserving traditional cooking techniques and transferring them to future generations, and keeping the original local culinary culture alive”.

They thereby underline the importance of the triple bottom line and add a time and a space dimension to the sustainability concept. Other authors, such as Speck et al. (2021, 9), find that several stakeholders are to be included when it comes to addressing sustainability issues

in the gastronomic sector: “players at upstream stages of the supply chain, e.g. farmers, whole-sellers and retailers, also need to be addressed and brought on board.”

While these definitions provide important starting points for discussing what sustainability means in gastronomy, they leave ample room for interpretation by practitioners. With political aims being in place to move to more sustainability, we find it important to dive deeper into the literature. A system approach is chosen in our research to more comprehensively identify (1) the different aspects of gastronomic practices from ingredients choice over food preparation to serving and consuming food and (2) the multidisciplinary of sustainability by utilizing the triple bottom line as an analytical lens.

There have been reviews on what sustainability in gastronomy might look like, e.g., on sustainable practices in gastronomy (Mishra 2023), best hospitality industry practices (Sloan et al. 2022), expert opinions on eco-friendly or sustainable development practices (Abuelkassem and AbouElezz 2020; Baltescu et al. 2022), and more. These studies often regard a small sample of studies or a limited geographic scope. We therefore find it important to not only address sustainable practices themselves but to take a step back and identify which “outcomes” researchers address as relevant to sustainability and which actors should contribute to “sustainable gastronomy”. We thereby contribute to a better understanding and synthesize the academic knowledge on sustainability in gastronomy.

3. Methodical Approach

“The system approach offers significant advantages for the implementation of mitigating measures by recognizing the connections between consumer demand, dietary choices and production through integrating a wider set of actors and actions” (Richardson 2022, 261). As argued in the introduction, a system approach can be valuable for analysing the scientific literature on sustainability in gastronomy because of the complexity of the issue at hand. However, there is a need for defining the system that we analyse. With one of our main questions focusing on actors around sustainability issues, we see our system as a network. We start by the main actors in a restaurant, the chefs who prepare the food, the staff around the chefs, e.g., kitchen staff and waiters, the management and/or owners, and finally the customers. Because we consider food—or cuisine—as the centre of gastronomy, we also include food producers, processing companies, and logistics as important actors in the restaurant system. During the research, some articles mentioned that restaurants have an impact on the local community. Therefore, we also included this actor group.

The two questions are how these actors are supposed to act sustainably and which normative outcomes are seen as important in the scientific discourse surrounding “gastronomy and sustainability.” We agree with Richardson (2022) and therefore structure our analysis into two major categories that are analysed interdependently: 1) actors and 2) outcomes. Further we divide the results of our analysis in order to derive meaningful categories. For this, we use the overall accepted “triple bottom line.” Leaning on authors such as Higgins-Desbiolles et al. (2017), we separate the scientific literature into activities or practices that primarily

consider the ecologic, the economic, or the sociocultural dimension of sustainability.

Before the analysis, we explicitly refrained from defining too narrowly what sustainability means for us. If we predefine “sustainability”, we cannot be open to other understandings and therefore cannot adequately answer the question what the academic literature portrays as “sustainability”. However, we lean of the definition of the Brundtland Commission “meeting the needs of the present without compromising the ability of future generations to meet their own needs” (WCED 1987, 24f.). Also, we see there is a difference between the processes of “sustainable development” and the end goal of “sustainability” – represented in our categories of “activities/practices” and “outcomes”. Finally, to simplify coding, we use the commonly accepted “triple bottom line”, or the three dimensions of sustainability as framework to cluster the findings.

How did we proceed with the literature analysis? (cf. *fig. 1*)

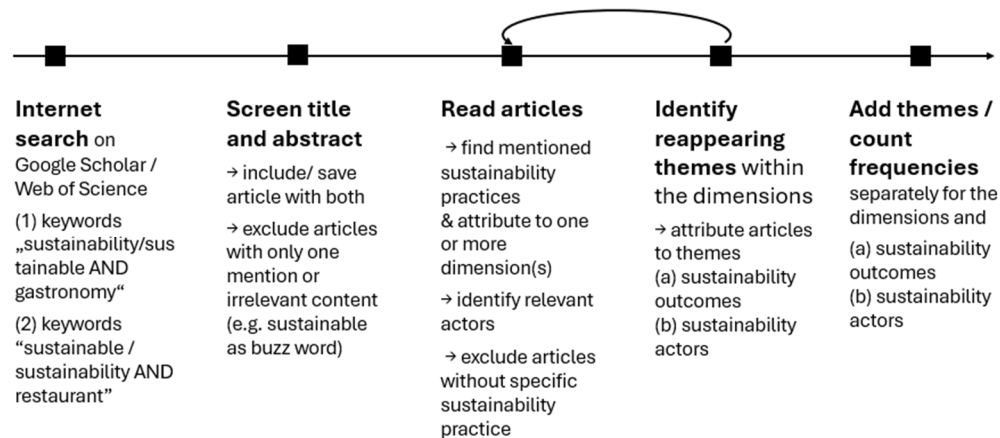


Figure 1. Methodological Proceedings

Based on the research method of qualitative content analysis (Mayring 2010), we performed a search for scientific articles, books, and reports on Google Scholar and Web of Science as described in *fig. 1*. The aim was to find articles that contain information what sustainability means in gastronomy. The keywords were “sustainable / sustainability AND gastronomy” as well as “sustainable / sustainability AND restaurant”. While we planned to also use the keywords “sustainability AND hospitality,” the results tended to be more specific to hotels. Because our focus was on restaurants, we cancelled the keyword search. The inclusion criterion was that both terms were mentioned in the title and/or abstract. In a first screening round, articles were excluded that mentioned both words but did not go in depth with both of the terms in the article. For example, some articles mentioned “sustainability” in the title or abstract but then did not refer to the term anymore through the rest of the article. Articles were also included if they did use the terms “sustainable cuisine” (or similar), “sustainable practices / operations / behaviour / indicators,” as long as they focused on gastronomy /

restaurants. The data acquisition was concluded after no new articles could be acquired from the databases and the articles kept reappearing, or they did not meet the keyword requirements anymore. This indicated the exhaust of the search results. We did not limit the geographic scope and the publication years. We acknowledge that the internet search in English language likely impacted the geographic range, as well as the date of the publications. Also, it most likely influenced the type of publication, with books not always being available online.

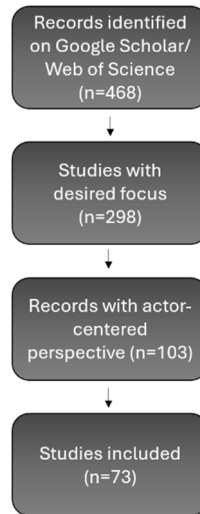


Figure 2. Selection Flow

After the search and exclusion of articles (cf. *fig. 2*), they were read and analysed according to qualitative content analysis methodology (Mayring 2010) and sorted as in *fig. 3*. Every sustainability related practice in gastronomy was recorded and attributed to one or more of the three sustainability dimensions. In a second step, the actors who were responsible for these practices were identified. Either they were mentioned anyways, or they were identified from the practices at hand. For example, dishwashing was attributed to the actor group “restaurant staff”. At the same time, the normative goals for sustainability in gastronomy were recorded as “outcomes” and attributed to one or more of the three sustainability dimensions.

Article	Actors	Practices	Outcomes
1	chef	save energy for cooking	energy resource management
2			
3			
4			

Figure 3. Example of Result Recording for the Ecologic Dimension of Sustainability

Many articles contained practices or outcomes relevant to several dimensions, or more than one practice or outcome. Therefore, the total number of results in each dimension does not equate to the total number of articles.

Secondly, categories were generated inductively for “actors” and “outcomes” (Mayring 2010), meaning that the categories were grouped according to how similar their contents were. For example, different practices of waste management, e.g. recycling and composting were condensed into the category “waste management”. The actor groups were equally categorized. The quantitative analysis was then possible for (1) actors / practices and (2) outcomes, but only within each sustainability dimension. A comparison of the different dimension is only possible in relative terms – for example, how many articles mentioned which dimension. The actor groups were easier to cluster because relatively few articles mentioned specific actors in the restaurant besides chefs and managers. Our system focused on the restaurant; therefore, we could group value chain actors directly related to the food or the business. It is not meaningful to compare single categories beyond dimensions and we did not record which articles mentioned several dimensions. Also, we cannot compare outcomes and actors directly because the relations between the categories “actors” and “outcomes” was not recorded.

Reflecting on potential shortcomings, the sample of scientific articles was randomly acquired from internet research. The results do not claim to be statistically representative. Through the qualitative content analysis, we find clusters of information/content qualitatively. While an AI search could also have been useful, the outcomes would have been different. AI tools often compress information, thereby potentially neglecting qualitative information. Also, retraceability cannot be ensured with such a research method – which is one major quality criteria of qualitative research processes (Flick 2022). We used the four eyes principle to validate the coding/categorization.

In summary, we identified a total number of sustainability outcomes:

- 221 for the ecologic dimension
- 90 for the economic dimension
- 133 for the sociocultural dimension

The following actor groups could be summarized from the articles:

Table 1. Summary of Actor Groups and Dimensions

Actor group	Environmental dimension No. mentioned (total n = 144)	Economic dimension No. mentioned (total n = 79)	Sociocultural dimension No. mentioned (total n = 125)
Employees	76	35	44
Chefs	51	8	19
Service	1	0	5
Managers	15	20	7
Employees	4	7	13
Owners	5	0	0
Restaurant	35	22	28
Gastronomy	2	0	2
Restaurant	15	13	13
Kitchen	18	9	3
Suppliers	18	5	5
Farmers	14	4	5
Suppliers	2	1	0
Food industry	2	0	0
Local community incl. consumers	7	10	54
Consumers	7	9	28
Local community	0	1	16
Region	0	0	10
n.a.	8	6	4

4. Results

The following results are presented as conceptualized in *fig. 4*. First, we present the desired sustainability outcomes, as elaborated in the methods section. In the second result section, we describe who should contribute to these outcomes and how. In the subsequent discussion section, we emphasize some practical implications as well as trade-offs.

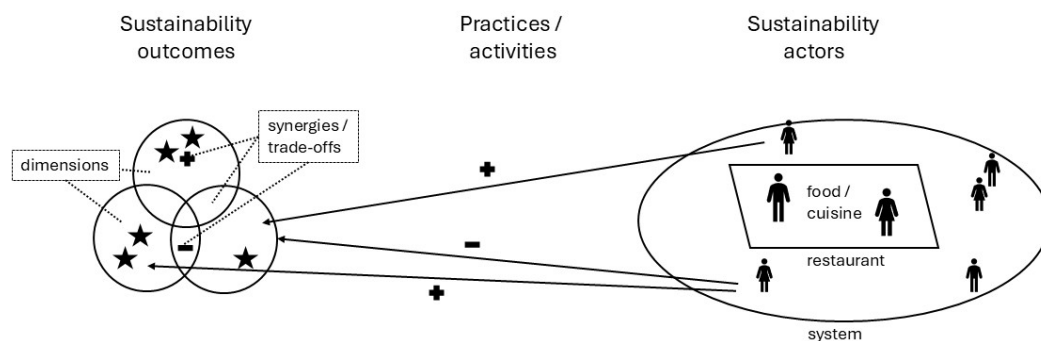


Figure 4. Conceptual Model of Actor Groups, Sustainability Outcomes, and Trade-Offs

4.1 Sustainability Outcomes from the Theoretical Debate

The following results represent what the academic discourse describes as the most important normative goals in terms of “sustainable gastronomy.” The following chapter summarizes

the most frequently mentioned outcomes only. While other outcomes are mentioned in a few articles, our goal is to see where the main discourses agree or contradict each other.

In the ecologic dimension, we find that a major share of the articles target resource management, in the restaurant in general (70 mentions) or during food preparation (56 mentions). The majority of these articles explore concrete ways to increase environmental efficiency, sometimes overall and sometimes with a focus on a particular resource such as water and energy use, or types of waste management. In many cases, authors then suggest pathways how to improve. Cardoso da Silva et al. (2022), for example, introduce a method that helps for the disposal of burnt cooking oil and for the reduction of food waste. At the same time, reducing food waste and resource input, such as energy and water, is portrayed as a means to reduce costs and create synergies. An example of a more general article is the survey results by Cantele and Cassia (2020), who find that costs and an aversion against strict environmental laws are barriers to improve the environmental balance of restaurants.

Another important environmental sustainability outcome in the literature is the environmental footprint at several stages of the value chain (19 mentions). Many authors consider farming as a major potential location for reducing the environmental footprint of food eaten at the restaurant. Mishra (2023) calls this a “responsible sourcing of ingredients” and emphasizes the importance of plant-based diets in the restaurant. Others, often from urban studies, put their focus on low-distance transport and regional food delivery to create trade flows with low emissions and congestions (14 mentions). Azofeifa (2014), for example, shows that this is particularly relevant for tourist hotspots.

For the economic pillar, the most important sustainability outcome is costs (30 mentions). The articles indicate how costs can be cut on two levels, on the infrastructure of the restaurant, and on inputs purchased. Environmentally friendly products are often described as more expensive and therefore challenge the economic situation of the restaurants (Mulenga 2015). At the same time, resource efficiency and food saving, as Iaquinto (2014) notes, are described as beneficial for the economic situation of a restaurant.

Because of low profit margins in the food sector, sound financial planning (13 mentions) and general management are seen as important by articles, such as Bondoc et al. (2024), who stress the thrive for competitiveness in the restaurant industry. The satisfaction of consumers and market demand are also important (19 mentions). Costa et al. (2023), for example, emphasize the need for a thorough quality management, particularly for restaurants in the high-price segment. Other authors emphasize excellence (Nascimento 2023) and innovation (Mishra 2023) as key components of a quality strategy. Affirmatively, consumer demand for those restaurants that can stand out in the market in terms of environmental sustainability is reported (Sarmiento and El Hanandeh 2018).

Lastly, economic sustainability is repeatedly mentioned in the context of localities or “regional economies” (23 mentions). Often in context with the tourism sector, local products and dishes are described as an opportunity to strengthen local markets. For example,

Fontefrancesco (2023) proposes that as restaurants buy from local suppliers, they generate value in their region. The use of local food products in return may serve as a marketing argument for customers aiming for a locally grounded experience (Malinowska et al. 2024).

In the sociocultural dimension, the most important sustainability outcome (51 mentions) is consumer health (Yoon et al. 2020). Particularly, extending the share of vegetal food per meal is described as beneficial. The goal of “sustainable nutrition” is mentioned several times (Langen et al. 2017), which means that restaurants should target both environmental and human health. A broader approach is taken by Singh (2024), who links the restaurant menu to lifestyle choices and the avoidance of chronic diseases.

The second important outcome (23 mentions) is that education should be part of a sustainable restaurant. This means, for example, informing customers about the produce and its origins, the way of preparation, health aspects, food waste, and more. Bondoc et al. (2024) recall the different communication channels for such an endeavor, whereas Mancheva-Ali and Lilov (2018) provide an example for the content of such a communication: it is good for the environment and yourself if you take home the leftovers of your meal.

Another large outcome category (17 mentions) in the sociocultural dimension is cultural heritage. The idea is, where local ingredients and recipes take center stage of a restaurant, regional cultural heritage is maintained. There is a strong link between the realm of tourism mentioned in the previous subsection and this heritage, because what many tourists desire is a unique and location-dependent experience that includes the culinary aspect. Güneş (2019) goes as far as calling ecotourism a frame for culturally and geographically embedded eating activities. Beyond the traditional aspects of meal preparation and eating, restaurants are described as social spaces, spaces for people to meet and for social interaction—which in turn should benefit the local community (Higgins-Desbiolles et al. 2013).

4.2 Implications for Actors and Gastronomy Practice

With the desirable sustainability outcomes presented, the following chapter describes the more practical responsibilities ascribed to specific or broader actor groups. Some sustainability-relevant practices in the articles can be attributed to more than one actor group. Also, some articles include activities relevant for several actor groups. Activities not explicitly attributed to one actor group are aggregated in the group “the restaurant,” except for cases in which the practice could be easily attributed to a specific actor group, e.g., “cooking” to “kitchen staff.”

To start with the ecologic dimension, a major part of the identified activities focuses on the restaurant staff (76), with the most mentioned single actor being the chef (51). In the context of the restaurant, the kitchen (18) and the chefs (51) are mostly considered responsible for using environmentally friendly products in a sustainable restaurant. Local or regional food are described as environmentally superior to food from abroad (Azofeifa 2014), due to the reduced need for transport and the possibility to verify the production conditions. Organic

produce is described as superior to conventional food (Huang et al. 2023). Some articles deal with the chef's role regarding the environmental impact of food waste reduction, such as Liaquat et al. (2024), who recommend chefs using sheep bones for enriching potato wedges nutritionally. Food waste is the most important topic for articles that do not specify an actor group explicitly, e.g., by categorizing avoidable and unavoidable food waste (Beretta et al. 2013).

Restaurant managers are the second most often mentioned actor group (15) in the ecologic dimension, in their responsibility to source local and organic food. Another responsibility for this group is energy and water management (Legrand et al. 2010). Karagiannis and Andrinou (2021) go even further and emphasize green design of buildings and eco-friendly materials for the restaurant landscape in Athens.

In comparison to the chefs, farmers' responsibilities for an improved environmental footprint of food, e.g., by using extensive production methods, reduced chemical inputs, and biodiversity, are only mentioned 14 times.

Consumers (7) are portrayed as a more passive group regarding environmental sustainability in gastronomy. Restaurants should nudge their customers towards more eco-friendly choices like vegan meals (Demir and Bertan 2023), thereby reducing the environmental footprint. Alternatively, they should provide the opportunity for customers to choose more environmentally friendly options (Singh 2024).

While chefs are also mentioned regarding economic practices towards sustainability (8), restaurant managers are the most mentioned specific actor group (20) for economically sustainable activities. Responsibilities include cost-cutting for financial viability, thereby referring to reducing food waste and improving the efficient use of inputs or simplifying distribution channels. Further, managers are described as responsible for strategic decision-making, financial planning, marketing, leadership, and creating attractive labor conditions, as well as job creation and support for the local economy (e.g., Malinowska et al. 2024).

Articles that address the entire restaurant (22) reinforce the importance of revenues and profitability of the business, and often promote food quality and higher price segment strategies (Sanggramasari et al. 2024). Iaquinto (2014), for example, collects arguments for and against a connection between sustainability and profitability of restaurant businesses. Several articles describe that food sustainability is also what the market demands (9), and therefore low environmental and social footprints of the menu are advisable from an economic perspective (Montesdeoca Calderon et al. 2024).

In the sociocultural pillar, restaurant staff (44) is mentioned particularly in terms of sustainable labor conditions, such as training for employees, fair remunerations, and safety measures (Malinowska et al. 2024). Work satisfaction and well-being are presented as important. But the restaurant is also important to the local community, as mentioned 15 times. This is where restaurants recruit their staff and contribute to work. In return, the restaurant is

where important social gatherings take place that strengthen the social capital of local communities and where social relationships are created (Farrer 2022). Some articles call for local partnerships between farmers and restaurants, therefore creating synergies such as a constant demand for a high-quality produce and empowerment of local communities (Marquez Garat 2022; Sanggramasari et al. 2024).

Another important group in the sociocultural dimension is the consumers (28 mentions). Restaurants are often described as responsible for the customers' nutritional health (Godin and Sahakian 2018) and satisfaction (Finkler et al. 2021), similar to the ecologic dimension. For the cultural significance of restaurants, it is both important to build a gastronomic identity, as suggested by Paunic et al. (2024), but also to take into account the values of the local community and the traditional aspects of local ingredients, recipes, and therefore local food culture (Binz and De Conto 2019).

5. Discussion: Trade-offs and Synergies

The comprehensive review of the scientific literature shows a variety of topics relevant to sustainability in gastronomy. They vary in depth from environmental responsible resource management and a responsibility towards better nutrition to more practical issues such as economic viability, business management and friendly practices towards staff and customers. With complex phenomena like sustainability, this seems inherent. We are now turning towards practical implications, particularly for the actor groups. Finally, we show trade-offs between the academic discourses and point at issues to be studied further by academia, in order to reach a better consensus in the future what sustainability means in gastronomy.

5.1 Sustainability in Restaurant Practice – Practical Implications and Limitations

Summarizing the findings from above, a sustainable restaurant should center around an environmentally conscious and highly educated chef, who chooses environmentally friendly products produced nearby the restaurant. Food waste should be avoided, not only to improve waste management but also to reduce the costs of economic input. The menu should be mostly plant-based and healthy to ensure customers' and the earth's health. The staff should be well-trained and capable of educating the customers, and they should have an adequate salary and good working conditions. The management should be well versed in financial planning and resource management, both human resources but also infrastructure resources, such as energy, water, etc. Furthermore, managers should have good financial knowledge, to ensure the economic longevity of the restaurant. The local community should be welcome in the restaurant and have place for social gatherings. Some articles even see the restaurant staff volunteering in local initiatives.

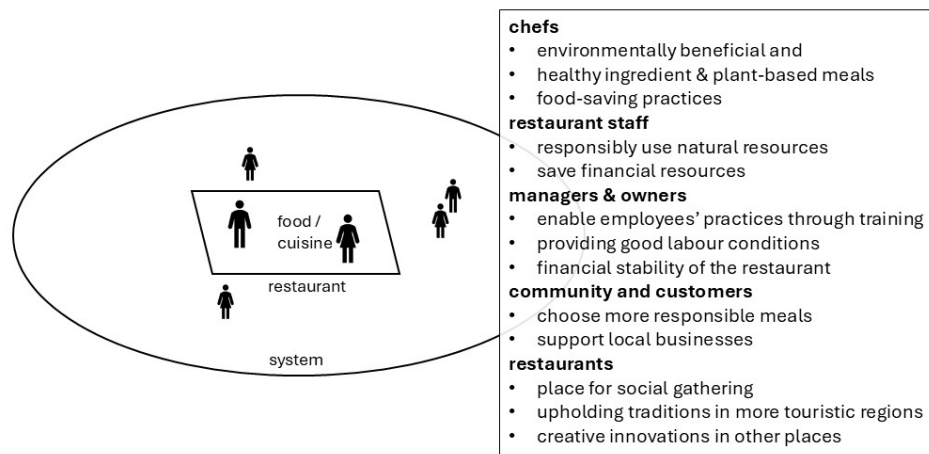


Figure 5. Summary of Actors and Associated Sustainability Goals

There are some practical challenges to this sustainable restaurant. Firstly, while chefs are trained in preparing food and recognizing produce quality, this does not mean they are experts in avoiding food waste or recognizing the best agricultural practices. While food labels such as organic produce are increasingly available, restaurants often purchase from intermediaries or wholesalers due to financial pressures of the competitive business sector and to reduce complex logistics. This complicates knowledge on the actual products and where they are from. Further, chefs are more often interested in taste and cooking qualities, as, for example, a study from the United States suggests (Curtis and Cowee 2009).

Secondly, chefs—or the kitchen in general—are asked to stimulate healthy eating—healthy for the environment and the customers. While kitchen hygiene is always an important topic, healthy foods are more typically addressed by dietitians compared to chefs. With fast food being widely demanded, it appears that only some consumers actually ask for local, organic, and plant-based meals. These meals are also often more expensive. A study showed “that restaurant managers were hesitant to implement sustainable practices because of a lack of evidence that such measures produce value for customers [...] and because of financial pressures that sustainable investments could have on their bottom lines” (Raab et al. 2017, 155). A recent trend towards more health-conscious and environmentally conscious consumers (Mim and Jai 2025) may exist, but to meet the sustainability goals of responsible sourcing, healthy nutrition and economic stability throughout the entire gastronomy sector requires a more drastic system change than a motivated and well-trained kitchen team. Especially because consumption behaviors—especially out of house—are often an expression of social status and voyeurism (Oh 2021).

The sustainable restaurant should have stable financial planning and sound cost calculations. From a global perspective, there are many small restaurants with few employees. Gastronomy is not a business sector with much high-skilled labor. It is therefore an open

question whether managers do have these competencies. A study from the United States (Parsa et al. 2011) confirms that particularly smaller restaurants are more likely to fail compared to larger chains. Another study from Denmark (Zhang and Enemark 2016) finds that higher education levels of restaurant staff have a positive impact on financial performance, thereby affirming the importance of skilled work and training. However, labor makes up for a large part of the costs in the entire food sector (Olsen and Zhao 2001). Highly trained labor is expensive. With low margins, many restaurants may rather attempt to keep labor costs low, or to economize on labor conditions by hourly salaries and unpaid overtime (London Economics 2002). Therefore, outreach activities and community building are often subordinate topics.

5.2 Sustainability in the Scientific Debate – Theoretical Implications

The academic literature describes several sustainability discourses around the topics, as described above:

1. environmental resource management
2. financial management and cost saving
3. community benefits
4. tourism and regional marketing
5. consumer demand

These discourses connect to each other, but there are also trade-offs. We find for example, a discrepancy between discourse 1 and discourse 2. Large-scale, conventionally grown products are often the most cost-effective option for restaurant purchasers, while not being a pro-environmental choice. Mulenga (2015) goes as far as stating that profitability is the biggest challenge to environmentally friendly practices in the restaurant business. The discourses agree on the environmental and economic benefits of food saving and increasing food efficiency. And while knowledge on food saving is increasing in practice and theory (a high number of articles mentions ways to save food), there are further cost factors that are not mentioned as much: infrastructure costs, energy and water costs. Their efficient management (Tommasetti et al. 2018) is mentioned less in the scientific debate on sustainability. In summary, keeping costs low, margins high and simultaneously saving the environment is still a challenge in gastronomy.

Discourse 1 and discourse 4 promote a restaurant that features local products and products of high quality and/or tradition. At first glance, they both describe an environmental value for these products as well as consumer demand. However, traditionally local food is not necessarily good for the environment, and organic foods are often not traditional. Further, measuring environmental impact by transport distance may not be a good indicator (Edwards-Jones et al. 2008). Reversely, tourists may want to discover local recipes and

traditions but not pay extra for organic produce. Combining organic and traditional food may be a way forward but depends strongly on the present knowledge, suppliers, and demand.

Discourse 3 sees the restaurant as an integral part of the local community as it is a place for social gatherings and knowledge exchange, as well as an employer for local people. While this certainly can be true, restaurants are not public spaces and therefore may exclude certain social groups because of their food preferences or financial means, for example. Being an employer alone does not mean that a restaurant is an integral part of the local community. If work conditions are good, adequate wages are being paid, and there is room for work-life balance, it is more likely that the restaurant is an integral part of the employees' social network. However, these benefits for staff may invertedly affect prices and therefore the openness to the community. Also, while good working conditions should be a precondition for a sustainable restaurant, gastronomy is not known for great labor benefits. Axelsson et al. (2017), for example, identify problematic work-time arrangements in Chinese restaurants in Sweden, and similar evidence has been collected in the United States (Lee 2018). The discourse on problematic labor conditions, however, is often disconnected from the debate around sustainability in gastronomy and should get more attention in this regard.

Lastly, discourse 5 conflicts with several of the other discourses: While more environmental consciousness has been shown as a trend in gastronomy, this trend does not mean that price-conscious customers have disappeared. While generally demand for organic products is rising for example in Europe, this does not directly translate into demand in the gastronomy sector. In an application of the Theory of Planned Behavior, Raab et al. (2017) identify pressure from both suppliers and customers as the most important obstacles in advancing with environmental sustainability in restaurants. In discourse 1, customers are portrayed as a passive group that demand more plant-based food and chooses the healthier option. This contrasts with findings that tradition and experiences play an important role in food preferences, such as in discourse 4. Some studies show for example, that meat consumption out of home is particularly high due to these reasons (Biermann and Rau 2020; Gesteiro et al. 2022; Ritzel and Mann 2023). In order for this demand to increase, societal awareness and subsequent consumer choice have to change.

While we do not exhaustively discuss all points made in the scientific literature, our findings imply that more research is needed on the trade-offs between the discourses connected to sustainable gastronomy, such as:

- out-of-house consumption and quality vs. price behavior,
- the role of tradition, pleasure, and social norms in out-of-house consumption,
- the impact of tourism on gastronomy concepts,
- availability of suppliers and environmental quality products in gastronomy,
- cost analyses of environmental concepts in gastronomy,

- efficient resource management in restaurants, from food to electricity,
- motivations, capacities, and roles of chefs and other employees in sustainability endeavors,
- the role of restaurants in the local community and reciprocal expectations, and
- employment conditions and training in gastronomy.

In summary, resources in the gastronomy are always scarce, and every dollar spent for social sustainability (as for better payment or social security) cannot be put into environmental sustainability (like environmentally friendly organic food).

6. Conclusions

In the beginning of the article, we described the aim of discussing what sustainability means in gastronomy, examining what gastronomy should contribute to sustainability (sustainability outcomes), and who should take on the challenges (sustainability actors). We chose a systemic approach to consider (1) the different aspects of gastronomic practices from ingredients over food preparation to serving and consuming food and (2) the multidisciplinary of sustainability by utilizing the triple bottom line as an analytical lens.

The results show that many aspects of sustainability in gastronomy have been identified by the scientific community. The aspects range from (1) environmentally beneficial and (2) healthy ingredient choices to motivations of chefs to cook healthy, plant-based meals, to (3) food-saving practices. The restaurant staff is supposed to (4) responsibly use all natural resources, thereby (5) saving financial resources. Managers and owners should enable the employees to do so by, for example, (6) training and providing the frame for (7) good labour conditions and (8) financial stability of the restaurant. The community and customers should also contribute to the sustainability of gastronomy by (8) choosing more responsible meals and supporting local businesses. Reciprocally, restaurants (9) provide a place for social gathering, while (10) upholding traditions in more touristic regions and (11) generating innovation in other places.

However, the results also showed some trade-offs between desired outcomes, particularly between environmentally friendly produce and practices against cost-effectiveness and labour conditions. The touristic discourse cannot be seen as representative of the entire gastronomy sector, as not all restaurants have this customer group. Further, we question the high amount of responsibility for gastronomic sustainability on the shoulders of the chef. Rather, all staff should aim toward the same united goals. We consider training as a good way for all staff to improve their environmental footprint. Financial training sets the backbone of the economic pillar for managers, owners, and other staff. Good labour conditions are only created if financial means allow for it but they are essential for any sustainable endeavour. While we agree that gastronomy can have a positive impact on food habits and awareness of food-related issues, and can contribute to a more stable community,

the question is whether consumers are ready to pay a surcharge or whether price sensitivities are going to be the last barrier. We find that it is time for the academic discourse on “sustainability in gastronomy” to discuss these trade-offs and deliberate on a theoretical level which outcomes should be prioritized. Also, research should not only focus on chefs and managers but include the entirety of the restaurant staff, discover opportunities and challenges to out-of-house-consumption and along the value chain.

On a practical level, we recommend utilizing the identified goals to improve restaurant sustainability. This could happen by individual restaurant managers but even more so, by political parties or labelling associations. With the latter option, a more coherent understanding of “sustainability in gastronomy” would be established in the future, thereby rendering malpractice more difficult. The last years have seen a professionalization of sustainability assessments, notably supported by the United Nations’ categorization into environmental, social, and governance (ESG) aspects (Hardyment 2024). However, “exploration of ESG reporting in the hospitality context has received limited attention,” as Lee et al. (2024) write. Other tools are rather limited to provide practitioners with profound knowledge in how to manage their restaurants more sustainably. As gastronomy as an actor in the food value chain becomes increasingly important, their role in the sustainability transition is key. Our analysis shows that restaurants have the chance to become pioneers by advancing both in the selection of food and in providing sustainable working conditions. Yet, this potential has to be fully tapped.

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Author contributions

Judith Janker conceptualized the study, carried out the literature review and contributed to the writing. Stefan Mann contributed to the concept, the data analysis and the paper’s writing.

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