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Article

Food, Responsibility and Sustainability: Integrating CFS-RAI Principles to Humanize Food System

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Abstract

The food system plays a crucial role in tackling global challenges such as health and well-being, environmental sustainability, and social equity. This article examines the intersection of Corporate Social Responsibility (CSR) and circular economy principles within food system, proposing a framework for fostering more resilient and equitable food systems. The study specifically focuses on an international perspective to ensure clarity regarding its application context. Traditional food practices rooted in ecological balance have been increasingly disrupted by industrialisation and globalisation, leading to resource-intensive production, food waste, and social inequalities. By integrating CSR practices—such as ethical sourcing, corporate responsibility, fair labour standards, and environmental stewardship—with circular economy strategies that minimise waste and regenerate natural resources, the food system can contribute effectively to achieving the Sustainable Development Goals (SDGs). Additionally, this study highlights the significance of preserving culinary heritage, promoting biodiversity, and fostering cultural diversity while adopting innovative approaches to enhance sustainability and support consumers' efforts to improve their eating habits. Through the implementation of the Principles for Responsible Investment in Agriculture and Food Systems (CFS-RAI) and multi-stakeholder collaboration, the food system can reposition itself as a key driver of sustainable development. This comprehensive framework ensures a balance between tradition, innovation, and responsible decision-making in contemporary food systems, with particular attention to social, economic, and psychological dimensions.

Keywords: food security; sustainable agriculture; resource efficiency; sustainable food production

1. Introduction

Perhaps making decisions regarding food (obtaining food, distribution, processing or cooking, and consumption) is the main responsibility of any human being. Both the physical survival of the individual and the development and sustainability of the producing communities depend on correct performance in these processes of the food system.

Food system includes all the elements and activities involved in producing, processing, distributing, consuming, and disposing of food, from farm to fork to landfill. It encompasses the entire chain, including the environment, population, resources, and institutions, and considers the impacts on nutrition, health, and environmental sustainability.

Food system, in its traditional and ancient forms, was intrinsically linked to the natural rhythms of the environment and the needs of local communities. Historically, food systems were rooted in sustainability, with practices such as seasonal eating, minimal waste, and local sourcing forming the backbone of culinary traditions. These approaches reflected a deep understanding of ecological balance and cultural identity, ensuring that food production and consumption were harmonious with

the surrounding ecosystems. Closely linked to Food System is the concept of Gastronomy. We can consider Gastronomy (from the Greek γαστρονομία [gastronomy], from the prefix gastro = 'stomach' and from the suffix -nomy = 'norm, rule') as the discipline that studies the relationship between human beings and their food and their environmental and social environment, that is, the discipline whose field of study and research is food systems. Gastronomy, as a practice of satisfying the most basic human needs, must help people develop a more just world that is respectful of its environment. The study and gastronomic research of food systems contributes to the humanization of social and economic activities by targeting the well-being and health of individuals and communities. However, as industrialisation, urbanisation, and globalisation reshaped societies, gastronomic practices in the food system began to diverge from these sustainable roots [1].

The emergence of modern, industrialised food systems brought unprecedented changes. Mass production techniques prioritised efficiency and scale over environmental and social considerations. Supply chains grew longer and more fragmented, disconnecting consumers from the origins of their food. Convenience, cost reduction, and profit maximisation became central drivers, often at the expense of sustainability. This shift introduced a host of challenges, turning feeding into a contributor to pressing global issues such as climate change [2–4], biodiversity loss due to e.g. land use [5,6] and water use [7], and social inequity [8,9].

One of the most visible consequences of this transition is the staggering amount of food waste generated by modern food systems [10–12]. What was once a resource to be maximised became a byproduct to be discarded. Today, food waste is not merely a logistical or economic failure; it is a moral dilemma [13]. The United Nations Food and Agriculture Organization (FAO) in 2023 estimated that roughly one-third of all food produced for human consumption, approximately 1.3 billion tonnes annually, is lost or wasted [14]. This wastage spans the entire supply chain, from agricultural fields to household kitchens, exacerbating global hunger and wasting resources.

Equally concerning is the environmental impact of resource-intensive agricultural practices. The increasing reliance on high-impact ingredients, particularly animal-based products, has made food systems one of the largest contributors to greenhouse gas emissions. The livestock sector alone accounts for approximately 14.5% of anthropogenic greenhouse gas emissions [15]. Long and energy-intensive supply chains further amplify these impacts, increasing the carbon footprint of food while eroding the connection between people and the sources of their sustenance.

Beyond environmental concerns, the industrialisation of food system has deepened social inequalities. Exploitative labour practices [16], inequitable access to resources [17], and the prioritisation of profit over human and ecological well-being have created systemic challenges. Agricultural workers and those in the hospitality sector often face precarious conditions, low wages, and limited opportunities, reflecting the broader inequities embedded in modern food systems.

Despite these challenges, there is a growing recognition of the need to return to sustainable principles while leveraging modern innovations. The concepts of Corporate Social Responsibility and the circular economy (CE) offer promising frameworks to reimagine food system for the 21st century.

Corporate Social Responsibility has emerged as a fundamental pillar of modern business strategy, reflecting an organisation's commitment to achieving positive social and environmental impacts alongside financial success. By 2024, CSR has evolved beyond traditional ethical obligations to become an integral component of core business operations and stakeholder engagement [18]. The principles underpinning CSR transparency, ethics, respect for human rights, environmental stewardship, and community engagement that have broadened their application to encompass diverse areas such as environmental sustainability, fair labour practices, community empowerment, and ethical governance.

Businesses today implement CSR through a range of innovative and impactful initiatives. These include reducing carbon footprints, adopting circular economy models, supporting fair trade practices, and leveraging technology to address social challenges. The growing importance of CSR is evident in its measurable benefits. Companies that adopt CSR practices report enhanced reputations, increased customer loyalty, and improved ability to attract and retain top talent. Moreover, CSR

mitigates risks by aligning business practices with societal expectations. Key CSR trends include a heightened focus on environmental sustainability. Additionally, businesses are intensifying their efforts to advance diversity, equity, and inclusion while integrating artificial intelligence ethically [19] into their CSR initiatives.

Stakeholders increasingly demand greater transparency and accountability, prompting businesses to quantify and report on their social and environmental contributions. Many organisations now incorporate detailed community impact metrics into their annual reports. Meanwhile, evolving regulatory landscapes, such as the European Union's Green Deal [20], are driving companies to prioritise sustainability across their supply chains. These developments highlight the convergence of compliance and proactive CSR, compelling businesses to adopt more holistic approaches to accountability. Nowadays, CSR embodies this shift, integrating societal and environmental considerations into the fabric of corporate activities.

Within the food industry, CSR has particular significance due to its direct relationship with health, culture, and the environment. Companies in this sector adopt CSR practices that include responsible ingredient sourcing, adherence to fair labour standards, and efforts to reduce the ecological footprint of their operations. Beyond regulatory compliance, CSR initiatives in the food industry seek to create tangible societal benefits. Examples include supporting local communities [21], investing in sustainable farming technologies [22], and promoting environmentally friendly agricultural and production practices [23].

Transparency and traceability across the supply chain are crucial components of CSR in the food sector, ensuring consumers can trust that the products they purchase are ethically and sustainably produced [24,25]. These practices not only strengthen consumer trust but also enhance corporate reputations, fostering customer loyalty and providing a competitive market advantage. CSR initiatives also contribute to building a fairer, more equitable food system that benefits both producers and consumers, addressing challenges such as food security and sustainability.

Moreover, social responsibility in food system extends beyond serving ethically sourced meals, it encompasses a commitment by chefs, restaurateurs, and food businesses to act as catalysts for change within their communities and beyond. Renowned chef Dan Barber exemplifies this approach with his "seed-to-farm-to-waste-to-table" philosophy. By collaborating directly with plant breeders and farmers, Barber promotes biodiversity, advances sustainable agricultural practices, and reshapes consumer perceptions of food [26]. His work demonstrates its potential to influence broader systemic changes in food production and consumption. Improving consumer decision-making regarding the responsible use and sustainable consumption of food should be considered at the same level as improving the dining experience.

Complementing CSR, the concept of a circular economy has gained significant prominence as a sustainable alternative to the traditional linear economic model. Popularised by environmental economist Walter Stahel [27] and developed further by the Ellen MacArthur Foundation [28], the circular economy redefines growth by emphasising positive, society-wide benefits. Its primary aim is to decouple economic activity from the consumption of finite resources while eliminating waste and pollution. At its core, the circular economy operates on three foundational principles: eliminating waste and pollution, keeping products and materials in use at their highest value, and regenerating natural systems. This regenerative framework challenges the prevailing "take-make-waste" industrial paradigm by advocating for a closed-loop system that prioritises resource efficiency and sustainability [29]. Also, companies are embracing circular economy principles through strategies like designing products for durability and repairability, transitioning to product-as-a-service models, and establishing closed-loop supply chains [30]. The benefits of transitioning to a circular economy are manifold. Environmentally, it reduces greenhouse gas emissions, preserves natural resources, and minimises waste. Economically, it creates opportunities for innovative business models, enhances resource efficiency, and generates significant cost savings. According to a joint report by the Ellen MacArthur Foundation [31], adopting circular principles could yield a net economic benefit of USD 10.5 trillion annually by 2050. Nevertheless, although circular economy presents a promising

framework for sustainable food systems, its implementation is not without challenges [32]. Transforming entrenched consumer habits, such as preferences for out of season produce or the overuse of packaging, requires substantial education and incentivisation. Adapting supply chains to support circular practices involves significant investments in infrastructure, technology, and coordination. Small scale producers and businesses may face difficulties transitioning to circular models without adequate support. For that reason, policy interventions are crucial for overcoming these barriers. Governments can provide financial incentives for adopting sustainable practices [33], establish regulations to reduce food waste, and promote education campaigns to shift consumer behaviours. Behavioral Economics and Economic Psychology, with their study of the biases that influence decision making, should be considered as a basis for improving consumer behavior [34]. Similarly, fostering public-private partnerships can facilitate the development of circular infrastructure and create collaborative opportunities across sectors [36].

Another critical challenge is the skills gap within the food sector. Many culinary professionals are trained in traditional methods that may not prioritise sustainability or waste reduction. Addressing this requires a reimagining of culinary education, integrating principles of circularity, resource efficiency, and regenerative practices into training programmes. Nevertheless, despite these challenges, the opportunities for sustainable system food underpinned by circular economy principles are immense. Innovative chefs and food entrepreneurs are leading the way, demonstrating that sustainable practices can coexist with culinary excellence and business success.

In addition to the well-established frameworks of CSR and the CE, a complementary set of principles has been developed to address the unique challenges and opportunities within agriculture and food systems. These principles, designed Principles of Responsible Investment in Agriculture and Food Systems CFS-RAI, provide a comprehensive framework for promoting sustainable, equitable, and resilient agricultural practices, and help producers and consumers make more responsible decisions. We understand the CFS-RAI Principles as a complementary framework to the SDGs, which emphasizes the way in which consumers, producers and creators proactively intervene to improve people's health and well-being through food. These principles (Table 1) are designed to address the interconnected challenges of food security, climate change, and social inequality by guiding investments and practices toward sustainability. By integrating CFS-RAI principles into food systems, stakeholders can align their operations with broader global sustainability goals, including the United Nations Sustainable Development Goals.

Table 1. CFS-RAI Principles for Responsible Investment in Agriculture and Food Systems [37].

Principle	Description
1	Contribute to food security and nutrition.
2	Promote sustainable and inclusive economic development and eradicate poverty.
3	Foster gender equality and women's empowerment.
4	Enhance youth participation and empowerment.
5	Respect land, fisheries, and forest tenure, as well as access to water.
6	Conserve and sustainably manage natural resources, increase resilience, and reduce disaster risk.
7	Respect cultural heritage and traditional knowledge while supporting diversity and innovation.
8	Promote safe and healthy agricultural and food systems.
9	Incorporate inclusive and transparent governance structures, processes, and grievance mechanisms.
10	Assess and address impacts while promoting accountability.

¹ Food and Agriculture Organization of the United Nations (FAO). (2014). Principles for Responsible Investment in Agriculture and Food Systems. Retrieved from <https://www.fao.org>.

This study aims to investigate how the CFS-RAI principles can be seamlessly integrated into the food system to enhance its contributions to sustainability, equity, and cultural preservation. Through

a focus on innovative practices and systemic transformations, the research seeks to reveal actionable strategies for addressing the sector's most pressing environmental, social, and economic challenges. By aligning feeding with these principles, the study aspires to position the sector as a key driver of sustainable development, fostering a future where food systems harmonise tradition, innovation, and responsibility.

2. Methodology

This study employs a qualitative approach, integrating a comprehensive literature review with case study analysis to explore the role of CSR, CE, and CFS-RAI principles in advancing sustainable system food. The methodology is structured into three key phases:

2.1. Literature Review

A systematic review of scholarly articles, industry reports, and policy documents was conducted to identify the current challenges and opportunities in sustainable gastronomy. Key sources included peer-reviewed journals, databases such as Scopus and Web of Science, and reports from organisations like FAO and the Ellen MacArthur Foundation. The review focused on:

CSR practices in the feeding sector from 2010 onwards.

Circular economy applications within food systems.

Integration of CFS-RAI principles into food system and their alignment with SDGs.

Case studies showcasing innovative sustainable practices in feeding.

2.2. Case Study Analysis

Case studies were selected to illustrate successful implementation of sustainable food management practices across different contexts. Criteria for selection included geographic diversity, scalability, and alignment with the principles of CSR and the circular economy. Unless otherwise indicated, none of the authors or the reviewing experts have intervened in design, planning or implementation of the cases. The cases have an international scope. Whenever possible, we have tried to present cases of sustainable food management practices in the Hispanic area. Examples included restaurants implementing zero-waste strategies; projects repurposing food byproducts into new products; initiatives promoting biodiversity and local sourcing in menus. The case studies chosen are those extracted from publications and referenced with the following numbers: [4,37,39,40,42,45,46,56,58–64,74–79,81–87,90–94,101–103,107,109,110,112–116,118,120–124].

2.3. Analytical Framework

An analytical framework based on the CFS-RAI principles was developed to evaluate how feeding management initiatives address critical sustainability dimensions. The framework included contribution to food security and nutrition; promotion of inclusive economic development and poverty alleviation; conservation of natural resources and reduction of disaster risk; respect for cultural heritage and traditional knowledge; advancement of equitable governance and accountability.

2.4. Validation Through Expert Consultation

To ensure the methodological robustness of the study, the findings were validated through consultations with experts in sustainable food, agriculture, gastronomy, circular economy, and environmental science. Several specialists from renowned institutions were selected: the Chair of Corporate Social Responsibility and Circular Economy at the Polytechnic University of Cartagena (Murcia), the Chair of Circular Economy and Social Responsibility at the Catholic University of Murcia, the Gastronomy Degree at the same university and the Academy of Gastronomy of the Region of Murcia (Spain).

Each expert classified the case studies into ten categories, corresponding to the Principles for Responsible Investment in Agriculture and Food Systems (CFS-RAI). Subsequently, a group meeting was held to compare individual classifications and reach a consensus on a final categorization. In cases of discrepancies, the majority decision was applied to resolve them. Finally, the consolidated list underwent a final group review and was approved by the majority.

The feedback and suggestions derived from this process were incorporated to refine the analysis and strengthen the study's recommendations, ensuring coherence and validity in the findings.

2.5. Limitations

This study acknowledges potential limitations, including the geographic bias of available case studies and the reliance on secondary data sources. Future research could benefit from longitudinal studies and primary data collection to deepen the understanding of sustainable feeding's impact.

3. Results and Discussion

The CFS-RAI principles provide a detailed and adaptable framework for addressing the critical challenges faced by modern food systems; these principles also allow us to understand the role that the agents involved in the food process (producers, distributors, cooks, consumers...) must play to achieve the purpose of a citizenry more committed to healthy eating and less depleting of common resources. While existing sustainability frameworks, such as CSR and the CE, have laid the groundwork for more ethical and environmentally sound practices, CFS-RAI principles take these efforts further. They encompass a holistic perspective that integrates environmental stewardship, social equity, and economic resilience into a cohesive strategy. Below, these principles are examined in detail, focusing on their application within the key domains of sustainable food systems.

3.1. Contribute to Food Security and Nutrition

Food security and nutrition form the backbone of a sustainable food system. The global challenge of ensuring access to safe, nutritious, and sufficient food for all is compounded by significant food loss and waste. According to the FAO [14], approximately 1.3 billion tonnes of food, nearly one third of the total food produced annually, are lost or wasted. This wastage represents a major inefficiency in the food supply chain and a moral failing in the face of persistent global hunger [39,40]. Gastronomy, as both an art and an industry, holds the potential to bridge this gap through innovative practices and responsible sourcing. One immediate way this discipline can contribute to food security is by directly tackling food waste. This involves rethinking the design and preparation of meals to maximise the use of ingredients and reduce discards; that is, following the maxim "less is more" [41]. Restaurants such as Toast Ale, which brews beer using surplus bread, demonstrate how surplus food can be creatively repurposed into valuable products [42]. Similarly, the culinary philosophy at Blue Hill at Stone Barns in the United States revolves around designing menus that incorporate underutilised produce, imperfect vegetables, and food that might otherwise be discarded [43]. These practices align with the broader principles of the circular economy, which emphasise minimising waste and maximising resource efficiency [37,62]. In addition to addressing waste, gastronomy can enhance food security by promoting the inclusion of climate-resilient and nutrient-dense ingredients. Crops such as millet, sorghum, and pulses are not only well-suited to withstand challenging climatic conditions but are also rich in essential nutrients, making them ideal for combating malnutrition [45,46].

Gastronomy also has the power to influence dietary behaviours and promote healthier eating patterns. The use of indirect incentives ("nudges") that induce a direction in behavior, but do not force the subject to follow it, is a very interesting option: menus with the healthiest dishes first, healthiest foods in the first line of sight on supermarket shelves, smaller portions on smaller plates, ... are very simple measures that help the consumer improve their diet without forcing them to do so [34]. The EAT-Lancet Commission advocates for a global dietary shift towards plant-based foods to

ensure planetary health [45]. This recommendation aligns with the growing consumer interest in sustainable, nutrient-rich diets. Restaurants that prioritise these dietary principles can position themselves as leaders in the movement towards healthy and sustainable eating. Menus that highlight plant-based options, seasonal produce, and locally sourced ingredients not only contribute to improved nutrition but also reduce the environmental footprint of food systems [39,40].

It is important to consider the social aspects that determine eating patterns. Wansink [35] has investigated how group pressure induces people to eat more than is desirable, being one of the causes of the current obesity epidemic: people eat more with others than alone, and people tend to eat what others eat. Consumer education is necessary so that each person freely decides what they want to eat and how they want to do it, without the influence of the group determining the individual's final decision.

Education plays a crucial role in enhancing food security. Culinary schools, such as the University of Gastronomic Sciences, are integrating sustainability into their curricula, equipping future chefs and food professionals with the knowledge to design nutritionally balanced and environmentally conscious menus. These programmes often emphasise the importance of reducing waste, sourcing responsibly, and utilising local and seasonal produce [56]. Furthermore, public awareness campaigns, often led by chefs, can educate consumers about the nutritional and environmental impacts of their food choices, encouraging them to adopt more sustainable eating habits [39,40]. Gastronomy also intersects with food security at a systemic level by supporting local food systems. The farm-to-table movement, for example, strengthens the connection between consumers and local producers, creating a direct link that enhances the resilience of food supply chains. The direct relationship between producers and consumers also has other social implications, such as improving the profit margins of small producers, the survival of the small local communities where they live, and the maintenance of traditional and respectful forms of intervention in the environment. This model reduces dependency on large-scale industrial agriculture, which is often resource-intensive and less adaptable to local environmental challenges. Local sourcing not only supports small-scale farmers but also ensures fresher, more nutritious food reaches consumers, contributing to both food security and better health outcomes [39,40]. Initiatives focused on providing affordable and accessible healthy meals, often through community-based programmes, have shown promise in tackling both malnutrition and food insecurity. These efforts align with the findings of Lambek [44], who emphasises the role of gastronomy tourism in improving economic and social conditions in regions where food security remains a pressing concern.

Chefs and restaurants can also collaborate with policymakers and non-governmental organisations to scale up efforts aimed at improving food security. Partnerships with food banks and community kitchens can help redistribute surplus food to those in need, ensuring that no food goes to waste while addressing hunger in vulnerable populations. This aligns with the principles of the CFS-RAI, which promote the development of equitable food systems that prioritise access for all [37].

The intersection of food security, gastronomy, and sustainability also opens opportunities for innovation. Emerging technologies, such as blockchain, can improve traceability in the food supply chain, ensuring that high-quality, nutritious food is distributed equitably. Additionally, Life Cycle Assessments (LCA) can help food businesses evaluate their environmental and nutritional impacts, enabling informed decision-making that prioritises both health and sustainability [46].

Finally, the relationship between individual responsibility, nutrition and the individual's physical health status is essential to consider [47]. Personality, especially its less plastic and more permanent components such as agreeableness, conscientiousness, and neuroticism [48], has been found to predict overall health and well-being [49]. Thus, subjects evaluated as more responsible are characterized with better physical health: healthier weight [50], lower risk of obesity [51], lower body mass index [52] and better cardiovascular outcomes [53]. Likewise, the persons evaluated more responsible have more healthy behaviors and habits [54]. As weight, obesity and body mass are indicators of an individual's eating habits, promoting individual responsibility helps to have a more satisfactory relationship with food, enjoying without to affect negatively their state of physical well-

being. Helping people make responsible decisions regarding their diet should be a purpose of all public health policy, since responsible people are more concerned about eating better.

3.2. *Promote Sustainable and Inclusive Economic Development and Eradicate Poverty*

Sustainable and inclusive economic development is a cornerstone of equitable food systems. The integration of responsible investment practices, local sourcing, and community empowerment can enable the food system to foster economic growth that benefits small-scale producers, rural communities, and marginalised groups. As Cabral et al. [57] argue, equitable food systems have the potential to not only alleviate poverty but also build resilient local economies by addressing systemic inequities in value distribution.

Local sourcing represents one of the most direct ways food system can contribute to inclusive economic development. By forming partnerships with small-scale farmers, fishers, and artisans, restaurants can create stable demand for regionally produced goods, allowing producers to plan for consistent income. Cooperativism also allows for the democratization of production and distribution decisions, which has important local and international political implications. For instance, the Basque cooperative model in Spain showcases how collective resource sharing and equitable profit distribution enable small-scale farmers to thrive [58,59]. These cooperatives pool resources such as machinery and labour, making it more feasible for members to participate in regional and international food supply chains. In India, the farm-to-table movement has similarly empowered rural producers by connecting them directly to urban markets. Roy et al. [60] highlights the economic benefits of such initiatives in West Bengal, where sustainable food tourism has been instrumental in reducing rural poverty and fostering community resilience. By celebrating traditional food cultures and creating demand for local specialties, restaurants in the region not only boost producer incomes but also attract tourism, creating a multiplier effect that benefits entire communities.

Many challenges in food system stem from unequal value distribution across the supply chain. These differences in the contribution of value can also have implications for the healthiness of food, since the most powerful agents in these chains can impose decisions that prioritize profit maximization over the quality of life of producers and the food quality of the products. Small-scale producers often receive disproportionately low returns compared to intermediaries and retailers [61]. Addressing this requires systemic change, such as adopting transparent pricing mechanisms and supporting producer cooperatives. Richardson and Fernqvist [62] highlight the role of chefs as advocates for fair trade, using their platforms to demand ethical practices from suppliers and intermediaries. Again, digital tools like blockchain can enhance transparency, ensuring producers receive fair compensation for their work. Blockchain not only tracks the journey of ingredients from farm to table but also allows consumers to make informed choices [63], supporting establishments that prioritise equitable sourcing.

Education plays a pivotal role in fostering economic empowerment within g. Entrepreneurship-focused training programmes, such as those described by Yarime et al. [64], equip small-scale producers and aspiring restaurateurs with the skills to innovate and diversify their income streams. For instance, the Faculty of Gastronomic Sciences of Mondragon University, better known as the Basque Culinary Center (BCC) offers courses that combine sustainability with entrepreneurship, empowering students to create business models [65]. Community-based culinary training programmes have also proven effective in reducing poverty. These initiatives, often supported by NGOs or government agencies, provide marginalised individuals with the skills to participate in the feeding industry. For example, culinary schools in Peru integrate the CFS-RAI principles to train young chefs in sustainable sourcing and local food systems, ensuring their practices benefit both people and the planet [37].

Tourism creates additional opportunities for inclusive economic growth. It is essential to promote a Sustainable Tourism that considers the knowledge and appreciation of local gastronomy as a world heritage to preserve. Tourists must become standard bearers of gastronomic diversity. Respect for gastronomic tradition also becomes respect for the local communities that have created

that tradition. Destinations that highlight local culinary traditions often attract tourists interested in authentic experiences, creating income for small businesses, artisans, and hospitality workers. Roy and Roy [60] note that this model has revitalised economies in rural West Bengal by drawing attention to local gastronomy and culture. In Italy, the Slow Food movement has turned traditional food production into a global attraction, connecting small-scale producers to international markets [58].

The circular economy complements inclusive development by reducing resource dependency and creating new value streams. For example, restaurants that invest in composting systems and biodigesters can generate organic fertiliser, which can be supplied to local farmers at minimal cost, closing resource loops and reducing input expenses for producers. Additionally, urban farming initiatives like Gro Spiseri in Denmark [66] provide employment opportunities for marginalised communities while reducing food miles and enhancing urban food security. Didinger and Thompson [67] advocate for the integration of pulses and other low-cost, nutrient-dense crops into feeding to support low-income consumers and producers. These crops, which require minimal inputs to grow, align with both economic and environmental sustainability goals.

Nevertheless, beyond individual initiatives, systemic approaches are necessary to address poverty at scale. This includes policy frameworks that incentivise local sourcing, protect small-scale producers, and support cooperatives. The European Union's Green Deal, for instance, encourages the adoption of sustainable practices throughout the food value chain, ensuring that economic benefits reach rural and marginalised communities. Collaborative governance models, which involve multiple stakeholders such as producers, chefs, policymakers, and NGOs, can amplify the impact of feeding on economic development. Several authors [59,62] emphasises the importance of food democracy in creating systems that are both inclusive and transparent.

3.3. Foster Gender Equality and Women's Empowerment

Gender equality and women's empowerment remain pivotal challenges in food systems globally, despite women's significant contributions to agriculture and food production. The food system and gastronomy sector, often male-dominated in leadership roles, presents both challenges and opportunities for fostering gender equity (Table 2). Richardson and Fernqvist [62] emphasise the critical role chefs and food professionals play in promoting food democracy and advancing gender equality within the industry. Achieving this requires deliberate interventions, including transparent practices, educational initiatives, and supportive networks that prioritise women's inclusion at all levels of the food system. We must not forget that the survival of gastronomic traditions has occurred especially thanks to women, who with their role as housewives have become guardians of traditions in many cultures. This role, often despised, must be valued in its entirety. Without them, food system would have neither past nor future.

Table 2. Female Participation in the Gastronomy Sector. Retrieved from [68].

Role	Percentage of Women (%)
Operational Roles	68
Mid-Level Management	45
Senior Management	22
Executive Chefs	15
Restaurant Owners	10

Women represent a substantial portion of the global food workforce, particularly in agriculture, small-scale food production, and hospitality. However, their representation diminishes significantly in leadership positions, particularly in high-profile sectors such as fine dining. This disparity reflects entrenched structural barriers, including unequal pay, limited access to capital, and cultural biases

[69,70]. Such inequalities are not only unjust but also economically detrimental, as they limit the diverse perspectives and innovative solutions women can bring to the table [71].

One effective strategy is implementing transparent hiring and promotion practices, ensuring women are evaluated fairly and given equal opportunities for advancement. Initiatives such as anonymised hiring processes have successfully mitigated unconscious biases, focusing on candidates' skills rather than gender [72]. Moreover, leadership training programmes tailored to women, like those pioneered by institutions such as the MEG [73], Stella Pure Gold and Gastromotiva's [74], the LEE Initiative's Women Culinary and Spirits Program [75], ICEX Spanish Gastronomy Training Program [76], Maxwell Leadership's Training for Women [77], Center for Creative Leadership (CCL) [78], equip women with the skills needed to bridge the gender gap in management roles. Several restaurants worldwide are actively promoting women's leadership and culinary talents like Darjeeling Express (London, UK; Fi'lia (Dubai, UAE); TATE Dining Room (Hong Kong); Cantine Copine (Bruges, Belgium); Rosetta (Mexico City, Mexico).

Yarime et al., [64] highlight the importance of interdisciplinary education in addressing systemic inequalities. Programmes that integrate sustainability, entrepreneurship, and culinary arts equip women with the tools to create innovative business models that challenge traditional norms. For instance, culinary schools that incorporate sustainability and circular economy principles empower women to lead transformative changes in their communities.

Grassroots movements and professional networks amplify women's voices and foster gender equity. Platforms like the Parabere Forum provide opportunities for women leaders in gastronomy to advocate for policy changes and share experiences. International alliances, such as the International Women's Culinary Alliance, offer mentorship and resources to women navigating the challenges of male dominated [79]. Promoting gender equality in food system involves celebrating women-led culinary traditions and their cultural significance. Highlighting traditional recipes created by women in restaurant menus preserves and honours their contributions. Initiatives like Mujeres del Vino showcase how cultural representation enhances both visibility and respect for women's roles in food production [79].

Women's empowerment extends to entrepreneurship, overcoming barriers such as limited access to capital. Microfinance initiatives aligned with the CFS-RAI principles support women in launching and scaling food businesses. Women-led cooperatives offer collective resources and market access, significantly improving livelihoods and promoting community resilience [71]. Gender diversity fosters creativity and innovation in collaborative environments. Women chefs and managers often lead sustainability-oriented projects, demonstrating that inclusivity enhances both feeding innovation and environmental stewardship [69,79]. From co-responsibility, we must understand Food as the heritage of both women and men. Therefore, it is important that gastronomic training programs create teams equally composed of men and women, without there being gender discrimination between management responsibilities ("chefs") and technical functions of food preparation.

3.4. Enhance Youth Participation and Empowerment

Empowering youth to participate in sustainable food management is essential for ensuring the resilience and adaptability of food systems in the face of evolving challenges. As the next generation of leaders, innovators, and advocates, young people possess the creativity and drive needed to transform traditional practices into models that prioritise sustainability, equity, and innovation. By investing in youth education, mentorship, and opportunities for practical engagement, the sector can cultivate a skilled workforce equipped to address pressing issues such as food security, environmental degradation, and cultural preservation [71,79]. Engaging youth in sustainable food management is about more than preparing future chefs and culinary professionals; it involves fostering a deep understanding of the interconnectedness of food systems, environmental sustainability, and cultural heritage. Singh [80] emphasises that educational initiatives that bridge generational knowledge gaps can inspire young people to adopt innovative approaches while

respecting traditional practices. This dual emphasis ensures that the lessons of the past inform the innovations of the future. Education is a cornerstone of youth empowerment in sustainable food management. Interdisciplinary programmes combining practical training with theoretical knowledge prepare young professionals to tackle complex challenges in food systems [81]. Institutions such as the Culinary Institute of America (CIA), USA; Le Cordon Bleu, France; Culinary Arts Academy, Switzerland; University of Gastronomic Sciences in Italy; Basque Culinary Center (España), GastroLab Hermanos Roca of the Universidad Católica de Murcia (España) exemplify this approach by offering courses that integrate sustainability, entrepreneurship, and cultural studies, equipping students with the tools to innovate responsibly within the feeding sector. Moreover, scholarships and financial aid initiatives targeting youth from underrepresented or marginalised communities ensure inclusivity. These programmes not only broaden access but also enrich the sector with diverse perspectives, fostering creativity and innovation [82].

Practical experience is crucial for empowering youth to implement sustainable feeding principles. Internships and apprenticeships provide young professionals with opportunities to apply their knowledge in real-world settings, bridging the gap between theory and practice. For example, a Wales case, that offers apprenticeships that focus on implementing circular economy principles, such as reducing food waste, rethinking ingredient use, and creating closed-loop systems [83]. These experiences expose participants to cutting-edge sustainability practices while fostering creativity and problem-solving skills. It is important to highlight that gastronomic practice allows many young learners a daily creation experience that provides immediate satisfaction to consumers, which helps many young people satisfy their need for social and personal recognition. Similarly, other initiatives offer field-based learning opportunities where young professionals work directly with local producers, chefs, and community organisations [84]. These immersive experiences encourage collaboration and innovation, empowering participants to become advocates for sustainable practices within their communities and helps them learn about other social and personal realities different from their own. Gastronomy fosters empathy.

Young people are uniquely positioned to drive innovation in food system. Their adaptability to new technologies and openness to novel ideas make them ideal leaders for implementing practices that address contemporary challenges. For instance, youth-led projects in urban farming and hydroponics have demonstrated the potential of integrating technology with sustainability. Singh [80] notes that such initiatives not only promote environmental stewardship but also inspire a new generation of consumers to adopt more sustainable lifestyles. Also, start-up incubators and mentorship programmes designed specifically for young entrepreneurs are also gaining traction. These platforms provide resources, guidance, and networking opportunities to help young innovators turn their ideas into impactful ventures [85].

A critical aspect of youth empowerment involves fostering intergenerational collaboration. Traditional culinary practices, often passed down orally, hold valuable lessons about resource efficiency, biodiversity, and cultural preservation. However, these practices risk being lost as younger generations increasingly adopt modern techniques. Educational programmes that facilitate dialogue between older and younger generations can bridge this gap, ensuring that traditional knowledge is preserved while being adapted to contemporary contexts. For example, mentorship initiatives in rural areas pair experienced farmers and chefs with young apprentices, creating opportunities for skill-sharing and cultural exchange [86]. Also, empowering youth to take on leadership roles within the feeding sector amplifies their impact and ensures their voices shape the future of food systems. Organisations such as Slow Food provide platforms for young people to advocate sustainability, biodiversity, and food justice [87]. Social media and digital platforms offer powerful tools for young advocates to raise awareness about sustainable feeding. Many young chefs and food entrepreneurs have leveraged these platforms to share their innovations, inspire others, and build communities around sustainable practices.

3.5. *Respect Land, Fisheries, and Forest Tenure, as Well as Access to Water*

Respecting land, fisheries, and forest tenure, along with ensuring equitable access to water, is a fundamental principle for building sustainable and just food systems [88]. Secure tenure and access to natural resources empower producers, sustain livelihoods, and protect ecosystems, fostering long-term food security and resilience. Supporting practices that uphold these rights and prioritising sustainable resource management can transform the sector into a force for equitable and environmental progress. Access to land, fisheries, and water is not only essential for agricultural production but also a cornerstone of community well-being. When these resources are mismanaged or controlled inequitably, the impacts ripple across entire food systems, exacerbating poverty, environmental degradation, and social inequality. Varzakas and Antoniadou [89] emphasize that ethical approaches to resource tenure are integral to fostering systemic health, as they align the interests of producers, consumers, and ecosystems. Insecure land and resource tenure often disproportionately affect small-scale farmers, fishers, and forest-dependent communities, limiting their ability to invest in sustainable practices. Feeding businesses, as significant players in food value chains, have a unique opportunity to advocate for and invest in practices that protect these rights.

Practices such as regenerative agriculture offers a pathway for respecting land tenure while restoring soil health and enhancing ecosystem resilience [90]. Feeding businesses can support producers adopting these methods by prioritising locally sourced ingredients grown through regenerative practices. These methods include crop rotation, cover cropping, and agroforestry, all of which enhance soil fertility, reduce erosion, and promote biodiversity. Restaurants like Blue Hill at Stone Barns [43] exemplify this approach by sourcing ingredients exclusively from farms committed to regenerative practices [91]. By creating stable demand for these products, feeding establishments not only support farmers but also contribute to the health of local ecosystems. Furthermore, partnerships with agroecological initiatives can help promote fair land use policies that protect smallholders' access to farmland. Respecting fisheries tenure is equally crucial, as overfishing and habitat destruction threaten the livelihoods of millions of small-scale fishers [92]. Feeding businesses can advocate for sustainable fishing practices by sourcing seafood from certified fisheries that prioritise ecological balance and fair access. Initiatives such as the Marine Stewardship Council (MSC) certification provide frameworks for ensuring that seafood is harvested responsibly [93]. Urban aquaponics projects, like Gro Spiseri in Denmark, offer innovative solutions for addressing resource scarcity while connecting consumers to sustainable practices [94]. These systems integrate fish farming with hydroponic plant cultivation, creating closed-loop ecosystems that optimise water use and reduce waste [95]. Agroforestry, which integrates trees into agricultural landscapes, is another promising approach. This practice not only enhances land productivity but also sequesters carbon and supports biodiversity. Projects in regions like the Amazon and Southeast Asia have demonstrated the economic and environmental benefits of agroforestry, where gastronomy businesses collaborate with indigenous communities to source sustainably produced ingredients [96]. Water is perhaps the most critical resource for food production, yet its scarcity poses a growing threat to global food security [97]. Feeding businesses can play a significant role in water stewardship by adopting practices that minimise water use and promote efficient resource management. Also, by recycling water between fish tanks and plant cultivation, these systems use up to 90% less water than traditional farming methods [98].

Supporting producers who practice ethical resource management is another way feeding establishments can respect tenure and access rights [99]. For instance, prioritising fair-trade and sustainably sourced products ensures that producers receive equitable compensation while adhering to environmentally sound practices. Varzakas and Antoniadou [89] highlight the ethical responsibility of businesses to advocate for systemic change, including policies that protect resource tenure and promote equitable access. Collaborations between feeding businesses and NGOs can amplify these efforts [100]. For example, partnerships with organisations focused on land rights advocacy can help secure tenure for vulnerable communities, ensuring they have the resources needed to sustain their livelihoods. Moreover, empowering local communities to manage their

resources sustainably is essential for long-term resilience. Feeding businesses can support community-led initiatives that prioritise conservation and equitable access. For instance, cooperatives that manage shared water resources or forest products allow communities to pool resources, reduce costs, and strengthen their bargaining power in markets. In West Bengal, community-based irrigation projects supported by gastronomy-linked tourism have improved water access for small-scale farmers, enhancing their productivity and income [101]. These models demonstrate how investments in resource management can create a virtuous cycle of economic and environmental benefits.

3.6. Conserve and Sustainably Manage Natural Resources, Increase Resilience, and Reduce Risk Disaster

The conservation and sustainable management of natural resources are critical to ensuring the long-term viability of food systems and mitigating the impacts of environmental challenges. These efforts not only enhance ecological balance but also increase resilience to disasters and climate change, enabling businesses and communities to adapt to an increasingly volatile environment. Through innovations like biodigesters, carbon footprint evaluations, and the promotion of underutilised species, the feeding sector can lead the way in sustainable resource management while addressing global sustainability goals.

In this sense, effective resource management lies at the heart of the circular economy, which prioritises resource efficiency and waste reduction. In the feeding sector, this translates to practices that minimise reliance on external inputs and optimise the use of available resources. For instance, biodigesters and composting systems are transforming how restaurants handle organic waste. Some restaurants have adopted biodigesters to convert food waste into biogas and nutrient-rich fertiliser, closing the loop between waste generation and agricultural production [102]. These systems not only reduce landfill contributions but also can cut operational costs by providing renewable energy sources and soil amendments. Composting systems also can offer similar benefits, turning organic kitchen waste into valuable fertiliser that supports local farms [103]. Both initiatives align closely with circular economy principles, enhancing resource efficiency and reducing dependency on chemical fertilisers that contribute to soil and water degradation.

Evaluating and reducing carbon footprints is a critical component of sustainable resource management. Mandić et al. [104] emphasise that feeding businesses must assess their carbon emissions to identify areas for improvement, from energy consumption in kitchens to the sourcing of ingredients. Energy-efficient appliances, renewable energy systems, and optimised logistics are among the strategies businesses can adopt to minimise their environmental impact. For instance, restaurants that install solar panels or transition to renewable energy sources not only reduce their carbon emissions but also decrease long-term energy costs. Similarly, adopting local sourcing practices significantly cuts the carbon footprint associated with transporting ingredients over long distances. This approach strengthens local food systems while aligning feeding businesses with global climate goals. Digital tools like Eaternity's carbon footprint calculator [105] allow restaurants to assess the environmental impact of individual menu items, empowering them to make data-driven decisions that promote sustainability. Such innovations exemplify the role of technology in advancing resource management and resilience.

Diversification is key to building resilience in food systems, particularly in the face of climate change and disaster risks. Hertel et al. [106] highlight the importance of incorporating underutilised species, such as ancient grains and neglected crop varieties, into food production. These species often exhibit greater resilience to climate stressors, such as drought and extreme temperatures, making them valuable assets for sustainable practices. The use of ancient grains like einkorn, spelt, and millet not only diversifies menus but also reduces reliance on monoculture crops that are vulnerable to pests and diseases. By sourcing and promoting these resilient crops, feeding establishments can contribute to more robust food systems while offering consumers nutritious and unique culinary experiences. Incorporating biodiversity into menus also has cultural benefits, preserving culinary traditions and supporting small-scale producers who specialise in these unique crops. For example, initiatives in

Tuscany have revitalised ancient grains for use in traditional bread and pasta, creating a niche market that benefits both farmers and restaurateurs [107].

In other hand, natural disasters pose significant risks to food systems, disrupting supply chains and endangering livelihoods. Feeding businesses can mitigate these risks by adopting practices that enhance resilience and reduce vulnerabilities. For instance, sourcing ingredients from agroecological farms that employ soil conservation techniques and water management strategies ensures a more stable supply chain during extreme weather events. Additionally, restaurants can support disaster preparedness by partnering with local communities and producers to develop contingency plans. These collaborations not only enhance resilience but also foster stronger relationships between feeding businesses and their supply chains.

Conserving ecosystems is integral to sustainable resource management in food systems. Practices such as sourcing sustainably harvested seafood, supporting agroforestry projects, and minimising food waste contribute to the health of natural systems that underpin food production [108]. For example, agroforestry, which integrates trees with crops and livestock, enhances biodiversity, improves soil health, and sequesters carbon, offering a holistic approach to resource conservation. Restaurants can actively participate in conservation efforts by partnering with organisations that protect critical habitats. For instance, sourcing seafood from Marine Stewardship Council-certified fisheries ensures that marine ecosystems are managed responsibly [109]. Similarly, initiatives like Rainforest Alliance certification for coffee and cocoa help protect tropical forests while supporting sustainable livelihoods for producers [110].

Technology plays a transformative role in advancing sustainable resource management in food systems. Beyond carbon footprint calculators, tools such as blockchain can enhance transparency in supply chains, ensuring that resources are sourced ethically and sustainably [111]. These technologies empower consumers and businesses alike to make informed choices that align with sustainability goals. The integration of artificial intelligence and data analytics into kitchen operations can also optimise resource use. Smart systems that monitor energy consumption, track inventory, and predict demand help minimise waste and improve efficiency.

3.7. Respect Cultural Heritage and Traditional Knowledge

Cultural heritage and traditional knowledge are vital for fostering biodiversity, culinary diversity, and sustainable feeding practices. They form the foundation of food systems that are resilient, inclusive, and deeply connected to local identities. Balancing the preservation of traditions with the integration of modern innovations is a cornerstone of sustainable feeding practices, ensuring that food systems evolve while staying rooted in their cultural and ecological contexts. Food is an expression of cultural identity, reflecting the histories, values, and ecosystems of the communities that produce it. De Miguel Molina [112] emphasises that gastronomy serves as both a repository and a transmitter of cultural heritage, making it a powerful tool for preserving local identities and traditions. Traditional recipes, agricultural practices, and culinary techniques are often intricately linked to the biodiversity and resources of specific regions, offering sustainable solutions honed over centuries.

The Slow Food Movement exemplifies efforts to protect this heritage by safeguarding endangered ingredients, culinary practices, and small-scale producers. Initiatives such as the Ark of Taste, which catalogues traditional foods at risk of extinction, highlight the importance of preserving gastronomic heritage in the face of globalisation and homogenization [113]. In this sense, restaurants and chefs play a critical role in this preservation by incorporating local ingredients and traditional recipes into their menus, showcasing the cultural richness of diverse food systems.

Traditional knowledge embodies a deep understanding of local ecosystems and sustainable practices. Techniques such as fermentation, sun-drying, and pickling not only extend the shelf life of ingredients but also reduce reliance on energy-intensive preservation methods [114]. These time-tested practices align with modern sustainability goals, offering insights into resource efficiency and waste minimisation. For example, indigenous communities in the Andes have long practiced the

cultivation of quinoa, a highly nutritious grain adapted to harsh climates [115]. The global popularity of quinoa demonstrates how traditional crops can be reintegrated into modern food systems to address nutritional and environmental challenges. Similarly, the revival of ancient grains like spelt and einkorn by chefs and bakers in Europe connects modern consumers with historical foodways while promoting agricultural biodiversity [116].

Innovation complements tradition by enhancing sustainability through modern technologies and creative approaches. Bottinelli and Valva [117] explore how artistic and experimental gastronomy can integrate cultural heritage with contemporary practices to address environmental and social challenges. For instance, 3D food printing technologies allow chefs to transform food waste into visually stunning and palatable dishes, showcasing the potential for artistic creativity to reduce waste [118]. Restaurants like Nolla in Finland exemplify this intersection of tradition and innovation. By combining zero-waste cooking practices with local, seasonal ingredients, Nolla preserves the essence of Finnish culinary traditions while addressing modern sustainability challenges. Similarly, El Celler de Can Roca uses sous-vide techniques and other innovations to maximise flavour extraction and reduce food waste, blending culinary heritage with cutting-edge technology.

Diversity in gastronomy is essential for maintaining vibrant and resilient food systems. By celebrating a wide range of ingredients, cuisines, and techniques, the gastronomy sector can promote inclusion and cross-cultural exchange. This diversity also strengthens biodiversity, as it encourages the use of varied crops and livestock, reducing dependency on monocultures. The integration of diverse cuisines into mainstream gastronomy is one way to promote cultural exchange while supporting underrepresented food traditions. For example, the rise of Middle Eastern and Southeast Asian cuisines in Western countries has introduced ingredients like sumac and lemongrass into global culinary repertoires, fostering cross-cultural appreciation and innovation. Gastronomy provides a platform for exploring the interplay between cultural heritage and sustainability. Bottinelli and Valva [117] highlight how chefs and food artists use culinary practices to create narratives about tradition, identity, and the environment. Dishes that incorporate foraged ingredients not only evoke a connection to nature but also challenge conventional sourcing practices, encouraging consumers to rethink their relationship with food. Chefs like Dan Barber exemplify this approach by creating menus that focus on overlooked or underutilised ingredients, such as vegetable tops and fish offcuts. These dishes highlight the beauty and utility of ingredients that are often discarded, blending sustainability with culinary artistry [119]. Education is a critical tool for ensuring the continuity of traditional knowledge in gastronomy. Culinary schools and universities are increasingly incorporating modules on heritage cooking techniques, regional cuisines, and sustainable practices into their curricula. Community-based education initiatives also play a role in preserving traditional knowledge. Workshops and food festivals that celebrate local cuisines provide platforms for intergenerational knowledge transfer, ensuring that younger generations inherit and adapt these traditions to contemporary contexts. Also the Slow Food Presidia initiative demonstrates how partnerships can protect traditional food systems while promoting economic sustainability. By supporting small-scale producers and encouraging sustainable practices, these collaborations ensure that cultural heritage remains a living, evolving part of food systems. In regions like Oaxaca, Mexico, the revitalisation of traditional mole recipes has turned this iconic dish into a symbol of cultural resilience and culinary innovation. Restaurants that feature traditional dishes like mole provide economic opportunities for local producers while celebrating the cultural richness of their regions. Although innovation in gastronomy also fosters inclusion by breaking down barriers between traditional and modern practices. Bottinelli and Valva [117] argue that innovative approaches can make traditional foods more accessible to contemporary audiences without compromising their cultural integrity. For example, reimagining traditional recipes using plant-based alternatives broadens their appeal to vegetarian and vegan consumers, expanding their relevance in global food systems. Chefs and gastronomy businesses that embrace both tradition and innovation create opportunities for cross-cultural dialogue and learning. This dynamic approach ensures that culinary heritage is not only preserved but also evolves to meet the needs of diverse and changing audiences.

3.8. Promote Safe and Healthy Agricultural and Food Systems

The promotion of these systems not only protect public health but also uphold environmental standards and ensure ethical practices across the food supply chain. Feeding establishments have a unique role in fostering such systems by prioritising traceability, embracing health-focused trends, and advocating for nutrient-dense, sustainably sourced ingredients.

Food safety is a foundational aspect of public trust in food systems. Consumers increasingly demand transparency about where their food comes from, how it is produced, and whether it meets health and safety standards [24]. Blockchain technology has emerged as a transformative tool for addressing these demands, enhancing traceability and accountability across the food supply chain. By allowing each step of the food production process to be recorded and verified, blockchain ensures that consumers can access accurate information about the origins and handling of their food. Restaurants that adopt blockchain systems not only build trust with their patrons but also encourage sustainable practices among their suppliers [120]. For example, blockchain can verify that seafood is sourced from sustainable fisheries or that produce is grown without harmful pesticides. This level of transparency aligns with global sustainability goals and strengthens the integrity of food systems.

The rise of consumer demand for plant-based and minimally processed foods presents significant opportunities for the feeding sector to promote healthier and more sustainable dietary practices. Singh [80] highlights this shift as a pivotal moment for restaurants to adapt their offerings, aligning with broader trends in nutrition and sustainability. By incorporating nutrient-dense, plant-based ingredients into menus, gastronomy establishments can cater to health-conscious consumers while reducing the environmental impact of their operations. For instance, replacing meat-centric dishes with plant-forward alternatives, and smaller portions (tasting menus) not only lowers greenhouse gas emissions but also contributes to public health by reducing the risks associated with high consumption of red and processed meats. This approach is exemplified by initiatives like the EAT-Lancet Commission's planetary health diet, which recommends increased consumption of fruits, vegetables, legumes, and whole grains to support both human and environmental well-being [4]. Locally sourced ingredients are a cornerstone of safe and healthy food systems. By prioritising regional suppliers, restaurants reduce the carbon footprint associated with long-distance transportation, ensure fresher ingredients, and support local economies. Local sourcing also enhances food safety by shortening supply chains, making it easier to monitor and control food quality. Restaurants like Blue Hill at Stone Barns [43] exemplify the benefits of local sourcing, designing menus around seasonal ingredients grown on nearby farms. This approach not only supports sustainable agricultural practices but also promotes nutrient-dense, flavourful dishes that resonate with health-conscious consumers. Nutrient-dense foods such as whole grains, legumes, nuts, and fresh produce are not only beneficial for human health but also align with sustainable agricultural practices. For example, legumes enrich the soil with nitrogen, reducing the need for synthetic fertilisers, while also providing an affordable source of protein.

Ethical considerations also play a role in promoting safe and healthy food systems. By sourcing ingredients from fair-trade and certified organic producers, gastronomy businesses ensure that their offerings meet rigorous health and sustainability standards. This commitment builds consumer trust while supporting responsible farming practices. Gastronomy establishments are uniquely positioned to influence public health by shaping dietary behaviours. By offering balanced, nutrient-dense meals that prioritise fresh, minimally processed ingredients, restaurants can promote healthier eating habits. Educational initiatives, such as providing information about the nutritional benefits of menu items, further empower consumers to make informed choices. Indirect incentives ("nudges") for making food decisions, such as the presence of only healthy products available to consumers in self-service machines, should be considered public health measures.

Collaboration with health professionals and dietitians can also enhance the impact of feeding on public health. For instance, partnerships with local hospitals or wellness programmes can create tailored menus that cater to specific dietary needs, such as low-sodium or high-fibre diets. Innovation plays a pivotal role in advancing safe and healthy food systems. Techniques like sous-vide cooking

not only enhance flavour but also ensure food safety by cooking ingredients at precise temperatures [121]. Similarly, fermentation, an ancient preservation method, is gaining renewed attention for its health benefits and sustainability. Fermented foods like kimchi and kombucha are rich in probiotics, which support gut health, while also extending the shelf life of ingredients [122]. Chefs who creatively incorporate these techniques into their menus demonstrate how tradition and innovation can converge to promote health and sustainability. For example, restaurants that experiment with fermented vegetable dishes not only reduce food waste but also introduce consumers to unique flavours and health benefits.

Food waste is a major challenge for safe and healthy food systems. Restaurants can address this issue by adopting circular economy principles, such as repurposing food scraps into new dishes or donating surplus food to local charities [123]. These practices not only minimise waste but also enhance food security by ensuring that nutritious food reaches those in need. Programmes like Too Good To Go, which connects consumers with surplus food from restaurants, exemplify how technology can facilitate waste reduction while promoting access to healthy meals. Such initiatives align with broader sustainability goals and demonstrate the potential to address systemic challenges in food systems.

3.9. Incorporate Inclusive and Transparent Governance Structures, Processes, and Grievance Mechanisms

Inclusive and transparent governance forms the backbone of ethical and sustainable feeding practices. It ensures accountability, equity, and resilience within food systems by fostering trust among stakeholders, including employees, consumers, suppliers, and the wider community. Transparent governance not only supports sustainable business operations but also strengthens organisational reputation and contributes to long-term success. Transparency is essential for building trust and accountability in food systems. By openly sharing information about sourcing, production practices, and sustainability efforts, feeding establishments can demonstrate their commitment to ethical operations. Blockchain technology also enhances transparency by providing an immutable record of food supply chains. This technology ensures that stakeholders can verify the origins and handling of ingredients, from farm to fork. Inclusive governance goes beyond transparency to ensure that all stakeholders have a voice in decision-making processes. This includes employees, producers, and community members whose livelihoods and well-being are directly impacted by food operations. By integrating inclusive practices into governance structures, businesses can foster equity, innovation, and resilience. One practical approach is the establishment of worker councils or committees that allow employees to contribute to organisational policies and decisions. Such mechanisms ensure that the voices of those on the frontlines of gastronomy are heard, particularly in areas related to labour conditions, workplace safety, and sustainability initiatives. Establishments like Grillaera in Málaga (Spain), which openly publishes its employees' working conditions, demonstrate how inclusive governance can foster trust and accountability. Collaborative governance models, such as producer cooperatives, also exemplify inclusivity in food systems. For instance, the Basque cooperative model supports small-scale farmers by pooling resources and distributing profits equitably. These models align with the principles of inclusive governance by empowering producers and ensuring fair value distribution across the supply chain.

Grievance mechanisms are essential for upholding the principles of equity and dignity in food system. These mechanisms provide a formal channel for workers and other stakeholders to voice concerns, report unethical practices, and seek resolution. For example, restaurants can establish anonymous reporting systems that allow employees to raise issues such as harassment, wage discrepancies, or unsafe working conditions without fear of retaliation. These systems should be supported by clear policies, training programmes, and leadership commitment to ensure their effectiveness.

Governance structures that prioritise accountability are crucial for continuous improvement in food system. Tools like environmental audits, supply chain assessments, and impact reporting frameworks allow businesses to evaluate their performance against sustainability and ethical

benchmarks. Certifications and standards, such as Fair Trade and Rainforest Alliance [110], also play a role in governance by ensuring compliance with ethical and sustainability criteria. Gastronomy establishments that adhere to these standards demonstrate their commitment to responsible practices, building trust with consumers and stakeholders. Transparent governance extends beyond operational accountability to include the social impact of feeding practices. Restaurants that engage with local communities, producers, and consumers in meaningful ways create a culture of trust and collaboration. For example, initiatives like community-supported agriculture (CSA) programmes allow consumers to invest directly in local farms, fostering transparency and strengthening the relationship between producers and diners. Educational programmes also contribute to transparent governance by raising awareness about sustainable and ethical practices. Workshops, public reporting, and consumer engagement campaigns enable businesses to communicate their governance efforts effectively, fostering a sense of shared responsibility among stakeholders.

Examples of transparent governance highlight its potential to drive sustainability and equity. Blue Hill at Stone Barns [43], for instance, integrates transparent sourcing practices with community engagement, creating a governance model that benefits both the business and its stakeholders. Similarly, organisations like Fair Kitchens advocate for inclusive governance by promoting ethical workplace practices and providing resources for employee well-being. Another notable example is the Nordic Food Policy Lab, which facilitates cross-border collaboration to develop sustainable food policies. By engaging governments, businesses, and civil society, the lab demonstrates how inclusive governance can address systemic challenges in food systems, from waste reduction to climate resilience. While the benefits of inclusive and transparent governance are clear, challenges remain in implementing these practices effectively. Resistance to change, lack of resources, and inadequate training can hinder the adoption of robust governance frameworks. However, these challenges present opportunities for innovation and collaboration. Partnerships with NGOs, government agencies, and technology providers can provide the expertise and resources needed to overcome barriers and strengthen governance structures.

3.10. Assess and Address Impacts While Promoting Accountability

Assessing and addressing environmental, social, and economic impacts is a cornerstone of sustainable food systems. By adopting tools and frameworks that measure these impacts, feeding establishments can identify inefficiencies, implement targeted improvements, and align with global sustainability goals. Promoting accountability through transparency and stakeholder engagement ensures that these efforts foster trust and drive industry-wide change. The dynamic nature of food systems requires ongoing evaluation to ensure that sustainability goals are met effectively. Tools like Life Cycle Assessment (LCA) provide a comprehensive approach to analysing the environmental footprint of food production, processing, and consumption [124]. LCA enables restaurants to evaluate factors such as energy use, water consumption, greenhouse gas emissions, and waste generation, identifying opportunities to reduce their ecological impact. For instance, restaurants implementing LCA can pinpoint inefficiencies in their supply chains, such as excessive packaging or reliance on resource-intensive ingredients. These insights allow businesses to make informed decisions that enhance sustainability while reducing costs. The adoption of LCA by industry leaders like Noma Projects demonstrates its potential to guide impactful changes in feeding practices.

Beyond environmental considerations, assessing social and economic impacts is critical for ensuring that gastronomy contributes positively to communities and stakeholders. Metrics such as fair wages, worker well-being, and contributions to local economies provide valuable insights into the social equity of food operations. Social impact assessments also help identify gaps in inclusivity and worker rights, enabling businesses to align with principles of fairness and dignity. Economic assessments focus on evaluating contributions to local economies, such as sourcing from regional suppliers and supporting small-scale producers. By measuring these impacts, feeding establishments can highlight their role in fostering economic resilience and empowering marginalised communities.

For example, initiatives like the Basque cooperative model demonstrate how equitable business practices can strengthen both local economies and the food sector.

Transparency is key to building trust and promoting accountability in food systems. By publishing detailed sustainability reports, restaurants and food businesses can communicate their progress toward environmental, social, and economic goals. These reports not only enhance consumer confidence but also encourage peer organisations to adopt similar practices, driving collective progress in the industry. Sustainability reports typically include data on energy use, waste reduction, water conservation, and social equity efforts. For instance, Blue Hill [43] at Stone Barns regularly shares updates on its sustainable sourcing and community engagement initiatives, showcasing its commitment to accountability. Similarly, restaurants adopting certifications such as Fair Trade, Rainforest Alliance [110], or LEED demonstrate their adherence to rigorous sustainability standards, further reinforcing their credibility. Technology plays a transformative role in assessing and addressing impacts. Tools such as blockchain enable real-time monitoring and verification of supply chain practices, ensuring that ingredients meet sustainability and ethical standards. Artificial intelligence (AI) also enhances impact assessment by analysing large datasets to identify patterns and predict future outcomes. For example, AI can evaluate the long-term benefits of switching to renewable energy sources or implementing circular economy practices in feeding. These insights enable businesses to adopt proactive strategies that align with sustainability goals.

Engaging with stakeholders is essential for promoting accountability and driving systemic change. Collaboration with suppliers, employees, consumers, and community members ensures that food management practices reflect shared values and priorities. Stakeholder engagement also fosters innovation by incorporating diverse perspectives and expertise into sustainability initiatives. Collaborative platforms, such as food policy labs and community-supported agriculture (CSA) programmes, provide opportunities for dialogue and knowledge exchange. These initiatives not only enhance accountability but also create shared ownership of sustainability goals. For instance, the Nordic Food Policy Lab engages governments, businesses, and civil society to co-develop policies that address food system challenges, demonstrating the power of collaborative accountability.

Promoting accountability is not only a moral imperative but also a strategic advantage for feeding businesses. Transparent operations build consumer trust and loyalty, enhancing brand reputation and market competitiveness. Studies indicate that consumers are more likely to support businesses that demonstrate a commitment to sustainability and ethical practices. Accountability also mitigates risks associated with non-compliance, reputational damage, and resource inefficiencies. By adhering to sustainability frameworks and publishing regular assessments, gastronomy establishments can anticipate regulatory changes and adapt proactively, ensuring long-term viability. Leading gastronomy businesses provide compelling examples of how impact assessment and accountability drive positive change. El Celler de Can Roca, for instance, conducts comprehensive environmental audits to evaluate its waste management, energy use, and water consumption. These audits inform the restaurant's strategies for minimising its ecological footprint while maintaining high standards of culinary excellence. Similarly, the EAT-Lancet Commission highlights the potential of science-based targets for aligning gastronomy with planetary health goals. By adopting frameworks that balance nutritional needs with environmental limits, businesses can contribute to global efforts to achieve sustainable food systems [4]. Implementing robust impact assessment and accountability practices poses challenges, including resource constraints, data collection complexities, and resistance to change. However, these challenges present opportunities for innovation and collaboration. Additionally, the growing consumer demand for transparency and sustainability creates a favourable environment for feeding businesses to adopt and showcase their accountability efforts. By responding to these demands, businesses can strengthen their market position while contributing to systemic improvements in food systems.

4. Conclusions and Future Directions

Sustainable and food safety is a complex issue that requires the collaboration of multiple stakeholders, including consumers, producers, regulators and educators, to ensure that food is safe and healthy for everyone.

Sustainable feeding implies that actors who use or generate renewable resources, preserve ecosystems, reduce pollution and increase resilience to climate change will receive incentives, while others must reduce their environmental footprint. Sustainable feeding represents a critical opportunity to address global challenges such as food security, environmental degradation, and social inequities. This study underscores the importance of integrating CSR, CE, and CFS-RAI frameworks to create food systems that are resilient, equitable, and aligned with sustainability goals. These systems must also improve the nutritional health of consumers, and the economic survival of producers, especially the most vulnerable in the value chain.

By combining CSR initiatives with circular economy models, the food sector can foster practices that are environmentally sustainable, economically viable, and socially inclusive. Applying CFS-RAI principles further enhances the sector's capacity to contribute to food security, promote resource efficiency, and increase resilience to climate change. A balance between preserving cultural heritage and embracing innovation is essential for maintaining biodiversity and supporting culinary creativity. Additionally, transparent governance and collaborative stakeholder engagement emerge as vital strategies for driving systemic change and ensuring accountability.

Overcoming barriers such as resource constraints, shifting consumer behaviours, and regulatory misalignment requires targeted investments in education, infrastructure, and technology.

It is necessary to align sustainable and responsible practices such as ethical sourcing, individual responsibility for consumption, fair labor standards of food producers and processors, attention to the legitimate needs of stakeholders, and environmental management with circular economy strategies that take advantage of waste and regenerate natural systems.

This study is not without limitations. The introductory and theoretical nature of the study, its interdisciplinary nature (sociological, psychological, political and cultural) can be considered as a handicap or as a framework to develop empirical research on the proposed topics.

Future advances in blockchain, artificial intelligence, and renewable energy systems will play a significant role in scaling sustainable practices within food system. We can use artificial intelligence systems to preserve and promote culinary traditions - especially those of groups and peoples in danger of extinction - as well as to explore new ways of taking advantage of available food resources, combining culinary tradition with dietary modernity. Blockchain technology is proposed as a solution to track the food supply chain, ensuring transparency and security from production to consumption. Restaurant food safety inspections are crucial to maintaining safety standards, and certified food safety management systems do not always guarantee compliance. The combined use of information technologies, culinary education and knowledge of food safety practices among food producers and handlers will allow new levels of responsible and sustainable innovation in feeding practices.

The change in consumer behaviors should not be considered as an imposition, but as a participatory decision-making process in which the consumers freely decide to improve their eating habits. Public administrations can help overcome the biases that prevent making good decisions regarding food, using the techniques of Behavioral Economics and Economic Psychology. Ultimately, the sector has the potential to lead transformative shifts toward more equitable and resilient food systems. Further interdisciplinary research is necessary to deepen understanding and facilitate the practical application of sustainable food principles on a global scale with multisectoral and international cooperation that ensures a healthier and fairer system of food management, distribution, and consumption.

Research on sustainable food system must be carried out from an interdisciplinary approach (social, cultural, economic and psychological) that allows us to understand all the interactions between the preservation of gastronomic tradition, food innovation and the responsibility and

sustainability of management decision-making processes in food systems, so that Sustainable Feeding can be a driving force for the sustainable development of communities.

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References

1. Boon, B., & Schifferstein, H. N. Seasonality as a consideration, inspiration and aspiration in food design. *International Journal of Food Design* **2022**, *7*(1), 79-100.
2. Tilman, D., Cassman, K. G., Matson, P. A., Naylor, R., & Polasky, S. Agricultural sustainability and intensive production practices. *Nature* **2002**, *418*(6898), 671-677.
3. Tukker, A., & Jansen, B. Environmental impacts of products: A detailed review of studies. *Journal of Industrial Ecology*, **2006** *10*(3), 159-182.
4. Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S., ... & Jonell, M. Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. *The Lancet* **2019**, *393*(10170), 447-492.
5. Chaudhary, A., & Kastner, T. Land use biodiversity impacts embodied in international food trade. *Global Environmental Change* **2016**, *38*, 195-204.
6. Barnosky, A. D., Matzke, N., Tomiya, S., Wogan, G. O., Swartz, B., Quental, T. B., ... & Ferrer, E. A. Has the Earth's sixth mass extinction already arrived? *Nature*, **2011**, *471*(7336), 51-57.
7. Scherer, L., & Pfister, S. Global biodiversity loss by freshwater consumption and eutrophication from Swiss food consumption. *Environmental Science & Technology* **2016**, *50*(13), 7019-7028.
8. Fuster, M. The duality of food: Reflections on power, inequity, and liberation. *Gastronomica: The Journal of Food and Culture* **2024**, *24*(2), IV-VIII.
9. Türkmenadağ, T., & Karaman, N. Gender inequality in the culinary profession in tourism from the perspective of university students with working experiences in culinary. *Frontiers in Sociology* **2024**, *9*, 1323096.
10. Zielińska, A., Dąbrowska, M., Vovk, I., & Drozda, M. Addressing food waste: An analysis of causes, impacts, and solutions in modern societies. *Journal of Sustainable Development of Transport and Logistics* **2023**, *8*(2), 284-297.
11. Vittuari, M., De Menna, F., García-Herrero, L., Pagani, M., Brenes-Peralta, L., & Segrè, A. Food systems sustainability: The complex challenge of food loss and waste. *Sustainable Food Supply Chains* **2019**, 249-260.
12. Alexander, C., Gregson, N., & Gille, Z. Food waste. *The Handbook of Food Research* **2013**, 471-483.
13. Piras, S., Pancotto, F., Righi, S., Vittuari, M., & Setti, M. Community social capital and status: The social dilemma of food waste. *Ecological Economics* **2021**, *183*, 106954.
14. FAO. The State of Food and Agriculture 2023: Revealing the true cost of food to transform agrifood systems. FAO Rome, **2023**.
15. Opio, C., Gerber, P., Mottet, A., Falcucci, A., Tempio, G., MacLeod, M., ... & Steinfeld, H. *Greenhouse gas emissions from ruminant supply chains: A global life cycle assessment*. FAO Rome, **2013**
16. Glenn, E. N. From servitude to service work: Historical continuities in the racial division of paid reproductive labor. *Signs* **1992**, *18*(1), 1-43. <https://doi.org/10.1086/494777>

17. May, J. D., Bellwood-Howard, I., Cabral, L., Glover, D., Job Schmitt, C., Mendonça, M. M. D., & Sauer, S. Connecting food inequities through relational territories. *The Institute of Development Studies and Partner Organisations* **2022**.
18. Kandpal, V., Jaswal, A., Santibanez Gonzalez, E. D., & Agarwal, N. (2024). Corporate social responsibility (CSR) and ESG reporting: redefining business in the twenty-first century. *Sustainable Energy Transition: Circular Economy and Sustainable Financing for Environmental, Social and Governance (ESG) Practices* **2024**, 239-272, Cham: Springer Nature Switzerland.
19. Bano, M., Zowghi, D., & Gervasi, V. A vision for operationalising diversity and inclusion in AI. *Proceedings of the 2nd International Workshop on Responsible AI Engineering* **2024**, 36-45.
20. European Commission. *The European Green Deal: Transformation towards sustainability*. **2019**. https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en
21. Shim, J., Moon, J., Lee, W. S., & Chung, N. The impact of CSR on corporate value of restaurant businesses using triple bottom line theory. *Sustainability* **2021**, 13(4), 2131.
22. Jindřichovská, I., Kubíčková, D., & Mocanu, M. Case study analysis of sustainability reporting of an agri-food giant. *Sustainability* **2020**, 12(11), 4491.
23. Martos-Pedrero, A., Jiménez-Castillo, D., & Cortés-García, F. J. Examining drivers and outcomes of corporate social responsibility in agri-food firms. *Agricultural Economics/Zemědělská Ekonomika* **2022**, 68(3).
24. Garcia-Torres, S., Rey-Garcia, M., & Sáenz, J. Enhancing sustainable supply chains through traceability, transparency and stakeholder collaboration: A quantitative analysis. *Business Strategy and the Environment* **2024**.
25. Hiem, A., Sampson, G., Pampin, M. P., Treweek, J., McCord, M., Newsom, M. D., ... & Clapham, L. (2024). Improving standards and certification in agri-food supply chains: Ensuring safety, sustainability and social responsibility. *Burleigh Dodds Science Publishing* **2024**, vol 148.
26. Martin, S. J. The third plate: Field notes on the future of food. *Canadian Food Studies La Revue Canadienne Des études Sur l'alimentation* **2014**, 1(2), 4–6. <https://doi.org/10.15353/cfs-rcea.v1i2.47>
27. Stahel, W. R. (1982). The product-life factor. *Mitchell Prize Winning Paper*. The Woodlands, TX: Houston Area Research Center (HARC) **1982**. Retrieved from <http://product-life.org/en/major-publications/the-product-life-factor>
28. MacArthur, E. Towards the circular economy. *Journal of Industrial Ecology* **2013**, 2(1), 23-44.
29. Hannon, J., & Zaman, A. U. Exploring the phenomenon of zero waste and future cities. *Urban Science* **2018**, 2(3), 90.
30. Kandpal, V., Jaswal, A., Santibanez Gonzalez, E. D., & Agarwal, N. Circular economy principles: shifting towards sustainable prosperity. *Sustainable Energy Transition: Circular Economy and Sustainable Financing for Environmental, Social and Governance (ESG) Practices*, **2024**, 125-165.
31. MacArthur, E., & Heading, H.. How the circular economy tackles climate change. *Ellen MacArthur Foundation* **2019**, 1, 1-71.
32. Vermunt, D. A., Negro, S. O., Verweij, P. A., Kuppens, D. V., & Hekkert, M. P. Exploring barriers to implementing different circular business models. *Journal of Cleaner Production* **2019**, 222, 891-902.
33. Kazancoglu, I., Sagnak, M., Kumar Mangla, S., & Kazancoglu, Y. Circular economy and policy: A framework for improving the corporate environmental management in supply chains. *Business Strategy and the Environment*, **2021**, 30(1), 590-608.
34. Sunstein, C.R. & Thaler, R.H. *Nudge. Improving Decisions about Health, Wealth and Happiness*. Yale University Press, **2008**.
35. Wansink, B. *Mindless Eating: Why we eat more than we think*. Bantam, **2006**.
36. Weber, R. H. Public-private partnerships as incentive to foster sustainable technologies. *Green Taxation and Environmental Sustainability* **2012**, 177-193.
37. Jiménez Aliaga, R., De los Ríos-Carmenado, I., San Martín Howard, F., Calle Espinoza, S., & Huamán Cristóbal, A. Integration of the Principles of Responsible Investment in Agriculture and Food Systems CFS-RAI from the Local Action Groups: Towards a Model of Sustainable Rural Development in Jauja, Peru. *Sustainability* **2022**, 14(15), 9663.

38. Alongi, M., & Anese, M. Re-thinking functional food development through a holistic approach. *Journal of Functional Foods* **2021**, *81*, 104466.
39. FAO. State of Food Security and Nutrition in the World. Rome: FAO Rome, **2020**.
40. Serradilla Rufino, A. FAO's CFS-RAI Principles as an Instrument to Revitalise Rural Areas. *25th International Congress on Project Management and Engineering*, **2021**.
41. Pirani, S. I., & Arafat, H. A. Reduction of food waste generation in the hospitality industry. *Journal of Cleaner Production* **2016**, *132*, 129-145.
42. Coelho, P., Prista, C., & Sousa, I. Brewing mainly from stale bread: A pale ale case study. *Beverages* **2024**, *10*(2), 23.
43. Rao, T. Restaurants hail composting, and fret over adapting. *The New York Times* **2013**, A20-L.
44. Lambek, N. The UN Committee on World Food Security's break from the agricultural productivity trap. *Transnational Legal Theory* **2019**. <https://doi.org/10.1080/20414005.2018.1573406>
45. Tesfai, M., Nagothu, U. S., & Adugna, A. Pulses–millets crop diversification by smallholders and their potential for sustainable food and nutrition security. *Agricultural Development and Sustainable Intensification* **2018**, 136-161.
46. McLaren, S., Berardy, A., Henderson, A., Holden, N., Huppertz, T., Joliet, O., ... & Rugani, B. Integration of environment and nutrition in life cycle assessment of food items: Opportunities and challenges. FAO Rome **2021**
47. Garcia-Hernandez, F.R., & Quevedo-Aguado, M.P. El factor Responsabilidad de los Cinco Grandes: revisión sistemática de investigaciones (2010-2022). The Big Five's Responsibility Factor: A Systematic Research Review (2010-2022) *Cuadernos Hispanoamericanos de Psicología* **2023**, *22* (2). <https://doi.org/10.18270/chps.v22i2.4209>
48. DeYoung, C. G. Cybernetic big five theory. *Journal of Research in Personality* **2015**, *56*, 33-58. <http://dx.doi.org/10.1016/j.jrp.2014.07.004>
49. Strickhouser, J., Zell, E., & Krizan, Z. Does Personality Predict Health and Well-Being? A Meta synthesis. *Health Psychology* **2017**, *36*, 797-810. <http://dx.doi.org/10.1037/hea0000475>
50. Sutin, A. R., Stephan, Y., & Terracciano, A. Facets of conscientiousness and risk of dementia. *Psychological Medicine*, **2018**, *48*, 974 –982.
51. Sutin, A. R., & Terracciano, A. Personality and body weight: Mechanisms, longitudinal associations, and context. *Pasonariti Kenkyu* **2017**, *26*, 1–11. <http://dx.doi.org/10.2132/personality.26>
52. Lahti, M., Rääkkönen, K., Lemola, S., Lahti, J., Heinonen, K., Kajantie, E., Pesonen, ... & Eriksson, J. Trajectories of Physical Growth and Personality Dimensions of the Five-Factor Model. *Journal of Personality and Social Psychology* **2013**, *105*(1), 154–169. <http://dx.doi.org/10.1037/a0032300>
53. Jokela, M., Pulkki-Råback, L., Elovainio, M., & Kivimäki, M. Personality traits as risk factors for stroke and coronary heart disease mortality: Pooled analysis of three cohort studies. *Journal of Behavioral Medicine* **2014**, *37*, 881– 889. <http://dx.doi.org/10.1007/s10865-013-9548-z>
54. Nystrand B.T., Olsen S.O., & Tudoran A.A. Individual differences in functional food consumption: The role of time perspective and the Big Five personality traits. *Appetite* **2021**, *156*, art. no. 104979. <http://dx.doi.org/10.1016/j.appet.2020.104979>
55. Lin, X., Wang, S., & Gao, Y. (2024). Global trends and research hotspots of EAT-Lancet diet: A bibliometric analysis. *Frontiers in Nutrition* **2024**, *10*, 1328351.
56. Milster, M. C. A curriculum for culinary professionals. Doctoral dissertation, Saint Louis University **2019**.
57. Cabral, L., Devereux, S., Nisbett, N., Metcalfe, S., & Robinson, S. *Pathways to equitable food systems*. Institute of Development Studies, Australia **2023**
58. Karlsson, J. Challenges and opportunities of foreign investment in developing country agriculture for sustainable development. FAO Rome **2014**.
59. Luttrell, C., Larson, A. M., Schoneveld, G., Kalman, R., & Gallagher, E. (2024). *Transformative land investment: Standards and guidelines for inclusive development*. CIFOR-ICRAF **2024**. 10.17528/cifor-icraf/009112
60. Roy, S., Bose, A., Basak, D., & Chowdhury, I. R. Towards sustainable society: The sustainable livelihood security (SLS) approach for prioritizing development and understanding sustainability: An insight from West Bengal, India. *Environment, Development and Sustainability* **2024**, *26*(8), 20095-20126.

61. Gneiting, U., & Sonenshine, J. (2018). A living income for small-scale farmers: Tackling unequal risks and market power. *Oxfam* **2018**. 10.21201/2018.3606
62. Richardson, L., & Fernqvist, F. Transforming the food system through sustainable gastronomy: How chefs engage with food democracy. *Journal of Hunger & Environmental Nutrition* **2024**, 19(2), 260-276.
63. Rainero, C., & Modarelli, G. Food tracking and blockchain-induced knowledge: A corporate social responsibility tool for sustainable decision-making. *British Food Journal* **2021**, 123(12), 4284-4308.
64. Yarime, M., Carliell-Marquet, C., Hellums, D. T., Kalmykova, Y., Lang, D. J., Le, Q. B., ... & Watts, P. Dissipation and recycling: What losses, what dissipation impacts, and what recycling options?. *Sustainable Phosphorus Management: A Global Transdisciplinary Roadmap* **2014**, 247-274.
65. Galarraga, A., & Martinez de Albeniz, I. Innovation and creativity in gastronomy beyond haute cuisine restaurants: Towards an innovation ecosystem in Gastronomytech in the Basque Country. *Creativity and Innovation Management* **2024**.
66. Nelli, L. C. Rooftop greenhouses: Smart and inclusive design. *The Importance of Greenery in Sustainable Buildings* **2022**, 125-154.
67. Diding, R., & Thompson, B. Motivating Pulse-Centric Eating Patterns to Benefit Human and Environmental Well-Being. *Nutrients* **2020** Nov 14;12(11):3500. 10.3390/nu12113500.
68. Mujeres en Gastronomía (MEG). Available online: <https://asociacionmeg.com/en> (accessed on 03 October 2025).
69. Albors Garrigós, J., Haddaji, M., & García-Segovia, P. Gender discrimination in haute cuisine: A systematic literature and media analysis. *International Journal of Hospitality Management* **2020**, 89. <https://doi.org/10.1016/j.ijhm.2020.102569>
70. Türkmenbaş, T., & Karaman, N. Gender inequality in the culinary profession in tourism from the perspective of university students with working experiences in culinary. *Frontiers in Sociology* **2024**, 9. <https://doi.org/10.3389/fsoc.2024.1323096>
71. Hall, R., & Osorio, M. Agricultural investment, gender, and land in Africa: Towards inclusive, equitable, and socially responsible investment. *PLAAS Conference Report* **2014**.
72. Jeevanandam, S., & Chidambaram Praveena, S. Addressing gender bias in the study of anonymous job matching platform in Germany. Master's Thesis, Uppsala University, Uppsala, Sweden. **2023**
73. MEG (Mujeres en Gastronomía). Website. Available online: <https://asociacionmeg.com/en/meg-in-spain-joins-against-invisibility/> (accessed on 23 July 2025).
74. Stella Pure Gold and Gastromotiva. *Juntas na Mesa e na Liderança*. Available online: <https://gastromotiva.org/en/2024/04/18/stella-pure-gold-and-gastromotiva-launch-free-course-for-women/> (accessed on 12 August 2025).
75. The LEE Initiative. Women Culinary and Spirits Program. Available online: <https://www.leeinitiative.org/women-culinary-spirits> (accessed on 12 August 2025).
76. ICEX. Spanish Gastronomy Training Program. Available online: <https://www.foodswinesfromspain.com/en/fws-academy/spains-pantry-certificate/hospitality-training-certificate-info> (accessed on 12 August 2025).
77. Maxwell Leadership. Training for Women. Available online: <https://www.maxwellleadership.com/transform-your-organization/organizational-solutions/on-site-workshop/for-women/> (accessed on 13 August 2025).
78. Center for Creative Leadership (CCL). Women's Leadership Development. Available online: <https://www.ccl.org/leadership-challenges/womens-leadership-development/> (accessed on 13 August 2025).
79. García-Henche, B., & Cuesta-Valiño, P. The increasing visibility of women in gastronomy. *International Journal of Gastronomy and Food Science* **2022**, 30. <https://doi.org/10.1016/j.ijgfs.2022.100589>
80. Singh, P. (2024). Innovations in sustainable food systems: The role of youth. *Food and Sustainability Journal* **2024**.
81. Glover, D., & Sumberg, J. Youth and food systems transformation. *Frontiers in Sustainable Food Systems* **2020**, 4, 101.

82. Requelme, N., & Afonso, A. The Principles for Responsible Investment in Agriculture (CFS-RAI) and SDG 2 and SDG 12 in agricultural policies: Case study of Ecuador. *Sustainability* **2023**, *15*, 15985. <https://doi.org/10.3390/su152215985>
83. Walpole, G., Dewale, B., Evans, S., Fuller-Love, N., Hopkins, S., Liu, Z., ... & Kyaw, S. *Circular economy implementation: Case studies in Wales*. Cardiff Metropolitan University, Gales **2023**
84. Woodhouse, A., & Rodgers, L. Culinary arts education: Unpacking and disrupting its master-apprentice pedagogy. *International Journal of Gastronomy and Food Science* **2024**, *35*, 100898.
85. Cinel, A. The role of the entrepreneur's social ties in the different stages of growth of an innovative start-up: Eight case studies in the food industry. Master's Thesis, Universita Ca Foscan Venezia, Italia, **2020**.
86. Martusewicz, R. A., Edmundson, J., & Lupinacci, J. Teaching for the commons: Educating for diverse, democratic, and sustainable communities. *EcoJustice Education* **2020**, 247-275.
87. Shawki, N., & Schnyder, M. Slow Food: Situating local chapters in a broader social movement community. *Security and Intelligence*, **2024**, 9(2).
88. Sampson, D., Cely-Santos, M., Gemmill-Herren, B., Babin, N., Bernhart, A., Bezner Kerr, R., ... & Wittman, H. Food sovereignty and rights-based approaches strengthen food security and nutrition across the globe: A systematic review. *Frontiers in Sustainable Food Systems* **2021**, *5*, 686492.
89. Varzakas, T., & Antoniadou, M. A holistic approach for ethics and sustainability in the food chain: The gateway to oral and systemic health. *Foods* **2024**, *13*(8), 1224.
90. Vamshi, M., Jagadeesan, R., Lamani, H. D., Rout, S., VijayKumar, R., Jagadesh, M., & Sachan, K. The revolutionary impact of regenerative agriculture on ecosystem restoration and land vitality: A review. *Journal of Geography, Environment and Earth Science International* **2024**, *28*(4), 1-14.
91. Larmer, M. Hope against hope: Future-making praxes in the Hudson Valley alternative food movement. Master's Thesis, University of Exeter, England, **2024**.
92. Mann, A. The protection of small-scale fisheries in global policymaking through food sovereignty. *Sustaining Seas: Oceanic Space and the Politics of Care* **2020**, 185.
93. Barnes, R. Stewardship beyond the state: Implications for the regulation of marine genetic resources in areas beyond national jurisdiction. *Marine Bioprospecting, Biodiversity and Novel Uses of Ocean Resources New Approaches in International Law* **2024**
94. Foscaro, A. Growing cities: Agritecture as a possible solution. A proposal for C40 Reinventing Cities-Milan. Master's Thesis, Politecnico Milano, Italia **2021**
95. Ibrahim, L. A., Shaghaleh, H., El-Kassar, G. M., Abu-Hashim, M., Elsadek, E. A., & Alhaj Hamoud, Y. Aquaponics: A sustainable path to food sovereignty and enhanced water use efficiency. *Water* **2023**, *15*(24), 4310.
96. Rana, J. C., Bisht, I. S., Mathur, P., Fadda, C., Mitra, S., Ahlawat, S. P., ... & Yadav, R. Involving rural youth in agroecological nature-positive farming and culinary agri-ecotourism for sustainable development: The Indian scenario. *Sustainability* **2024**, *16*(21), 9417.
97. Zhang, D., Sial, M. S., Ahmad, N., Filipe, A. J., Thu, P. A., Zia-Ud-Din, M., & Caleiro, A. B. Water scarcity and sustainability in an emerging economy: A management perspective for future. *Sustainability* **2020**, *13*(1), 144.
98. Graber, A., & Junge, R. Aquaponic systems: Nutrient recycling from fish wastewater by vegetable production. *Desalination* **2009**, *246*(1-3), 147-156.
99. Carolan, M. Ethical eating as experienced by consumers and producers: When good food meets good farmers. *Journal of Consumer Culture* **2022**, *22*(1), 103-123.
100. Damasceno, R. R., Bonvini, O., de Sousa Martins, N., Bastos, R. M. S., Garcez, T. C. D. N. A., de Goes Carneiro, A. P., & de Alencar Costa, E. How can gastronomy impact the social change of a vulnerable population assisted by social programs? The case of Brazilian social gastronomy. *International Journal of Gastronomy and Food Science* **2023**, *32*, 100728.
101. Sarkar, M., & Modak, B. K. Towards a sustainable future: Integrating indigenous knowledge to address the challenges of climate change in West Bengal, India. In *Climate Crisis, Social Responses and Sustainability: Socio-ecological Study on Global Perspectives*. Cham: Springer Nature Switzerland, **2024**; pp-457-485

102. Granzotto, F., Aita, C., Silveira, D. D., Mayer, F. D., Pujol, S. B., Pinas, J. A. V., & Hoffmann, R. Use of anaerobic biodigester in the treatment of organic waste from a university restaurant. *Journal of Environmental Chemical Engineering*, **2021**, 9(5), 105795.
103. Feodorov, C., Velcea, A. M., Ungureanu, F., Apostol, T., Robescu, L. D., & Cocarta, D. M. Toward a circular bioeconomy within food waste valorization: A case study of an on-site composting system of restaurant organic waste. *Sustainability* **2022**, 14(14), 8232.
104. Mandić, I. T., Tišma, S., & Biondić, I. Gastronomy at the crossroads towards climate neutrality: From counting calories to monitoring CO₂ emissions. *Ninth International Scientific-Business Conference LIMEN Leadership, Innovation, Management and Economics: Integrated Politics of Research* **2023**. 10.31410/LIMEN.2023.349
105. Kühne, S. J., Reijnen, E., Laasner Vogt, L., & Baumgartner, M. Can carbon labels encourage green food choices?. *Frontiers in Psychology* **2023**, 13, 902869.
106. Hertel, T., Elouafi, I., Tanticharoen, M., & Ewert, F. Diversification for enhanced food systems resilience. *Science and Innovations for Food Systems Transformation* **2023**, 207-215. Cham: Springer International Publishing.
107. Sacchi, G., Belletti, G., Biancalani, M., Lombardi, G., & Stefani, G. The valorization of wheat production through locally-based bread chains: Experiences from Tuscany. *Journal of Rural Studies* **2019**, 71, 23-35.
108. Nuwarapaksha, T. D., Udumann, S. S., & Atapattu, A. J. Fostering food and nutritional security through agroforestry practices. *Agroforestry* **2024**, 285-318.
109. Tulaeva, S., Tysiachniouk, M., Pappila, M., & Tynkkynen, M. Marine Stewardship Council Certification in Finland and Russia: Global standards and local practices. *Sustainability* **2023**, 15(5), 4063.
110. Zu Lynar, S. Agroforestry certification and tree cover protection in cocoa and coffee production systems. Master's Thesis, Uppsala University, Sweden, **2021**
111. Gazzola, P., Pavione, E., Barge, A., & Fassio, F. Using the transparency of supply chain powered by blockchain to improve sustainability relationships with stakeholders in the food sector: The case study of Lavazza. *Sustainability* **2023**, 15(10), 7884.
112. De Miguel Molina, M., De Miguel Molina, B., Santamarina Campos, V., & Del Val Segarra Oña, M. Intangible heritage and gastronomy: The impact of UNESCO gastronomy elements. *Journal of Culinary Science & Technology* **2016**, 14(4), 293-310.
113. Fontefrancesco, M. F., Zocchi, D. M., & Pieroni, A. Scouting for food heritage for achieving sustainable development: The methodological approach of the atlas of the Ark of Taste. *Heritage* **2022**, 5(1), 526-544.
114. Knorr, D., & Augustin, M. A. Preserving the food preservation legacy. *Critical Reviews in Food Science and Nutrition* **2023**, 63(28), 9519-9538.
115. Garcia, M., Condori, B., & Castillo, C. D. Agroecological and agronomic cultural practices of quinoa in South America. *Quinoa: Improvement and Sustainable Production* **2015**, 25-46.
116. Belderok, B., Mesdag, J., & Donner, D. A. Bread-making quality of wheat: A century of breeding in Europe. *Springer Science & Business Media* **2020**.
117. Bottinelli, S., & Valva, M. D. A. (Eds.). *The taste of art: Cooking, food, and counterculture in contemporary practices*. University of Arkansas Press, USA **2017**.
118. Neamah, H. A., & Tandio, J. Towards the development of foods 3D printer: Trends and technologies for foods printing. *Heliyon* **2024**. 10(13):e33882. [10.1016/j.heliyon.2024.e33882](https://doi.org/10.1016/j.heliyon.2024.e33882)
119. Bandi, P. R. Enhancing personal sustainability by redefining preferences regarding the appearance of fresh foods. *Frontiers in Sustainability* **2023**, 4, 1284110.
120. Hao, F., Guo, Y., Zhang, C., & Chon, K. Revolutionizing the restaurant industry: Exploring the implementation and impact of blockchain technology on the dining experience. *Asia Pacific Journal of Tourism Research* **2024**, 1-14.
121. Misu, G. A., Canja, C. M., Lupu, M., & Matei, F. Advances and drawbacks of sous-vide technique—A critical review. *Foods* **2024**, 13(14), 2217.
122. Choi, S. Kombucha and kimchi: How probiotics and prebiotics can improve brain function. Simon and Schuster, New York, USA **2019**.

123. Sundin, N., Bartek, L., Osowski, C. P., Strid, I., & Eriksson, M. Sustainability assessment of surplus food donation: A transfer system generating environmental, economic, and social values. *Sustainable Production and Consumption* **2023**, *38*, 41-54.
124. Chung, M. M. S., Bao, Y., Zhang, B. Y., Le, T. M., & Huang, J. Y. Life cycle assessment on environmental sustainability of food processing. *Annual Review of Food Science and Technology* **2022**, *13*(1), 217-237.

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