

ADVANCING CIRCULAR GASTRONOMY IN INDONESIAN TOURISM

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Article Info	Abstract
<p>Keywords: Circular gastronomy, culinary heritage, Sustainable tourism, Food waste, Policy framework.</p> <p>Received: July 29, 2025</p> <p>Accepted: November 24, 2025</p> <p>Published: December 05, 2025</p>	<p>This study addresses a critical research gap in the contextual implementation of circular gastronomy within Indonesia's tourism sector, where the integration of sustainability, culinary heritage, and circular economy principles remains fragmented. Current practices and regulations predominantly focus on technical solutions or isolated waste-reduction efforts, often overlooking the rich cultural context and multi-stakeholder collaboration required for systemic change. Using a qualitative literature review and thematic analysis of global best practices, policy documents, and Indonesian case studies, the research reveals significant barriers—including limited regulatory support, low stakeholder awareness, and fragmented cross-sector engagement—while also identifying opportunities in leveraging local food traditions, empowering communities, and targeting eco-conscious travelers. The findings highlight the urgent need for multidimensional, culturally adaptive frameworks and comprehensive policies that bridge technical solutions and Indonesia's unique gastronomic identity. In the context-specific circular gastronomy framework that highlights Indonesia's rich cultural heritage, community engagement, and local ecosystems, Indonesia is positioned as an innovator in sustainable gastronomy. To advance holistic implementation, future efforts should integrate these sociocultural elements into research and practice, in parallel with the development of tailored policies, incentives, and multi-sector collaboration.</p>

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INTRODUCTION

The concept of circular gastronomy, as articulated by Nyberg et al. in the *Journal of Gastronomy and Food Science*, signifies a comprehensive and integrated framework in which food, meals, and sustainability are interwoven according to the principles of the circular economy. It encompasses the collective knowledge and skills required to design and reimagine food and meals, with a strong emphasis on re-creation and redesign, thereby advancing gastronomy towards a sustainable future (Nyberg et al., 2022). This framework highlights a commitment to embedding sustainability across all aspects of food and dining through innovative strategies that promote closed-loop systems and minimize waste.

In essence, circular gastronomy applies the tenets of the circular economy specifically to the gastronomic sector, foregrounding sustainable food production, waste reduction, and the cultivation of regenerative food systems aimed at reducing environmental impact while advancing social and economic sustainability (Moura et al., 2024). Beyond addressing critical environmental challenges, this concept enriches the dining experience by fostering consumer awareness of and engagement with sustainable practices. Practical applications frequently cited in the literature include reducing food waste, utilizing locally sourced and seasonal ingredients, and converting organic waste into compost—each a vital strategy aligned with broader sustainability objectives (Ruiz-Real et al., 2020). Within the Indonesian context, the realization of circular gastronomy can be achieved by synthesizing the nation's rich traditional culinary heritage with tourism-based dining experiences, underpinned by sustainability and circular economy frameworks (de Pablo Valenciano et al., 2019). This synthesis can be conceptualized along three foundational pillars—food, dining experience, and sustainability—which together form an ecosystem that both protects and celebrates Indonesia's culinary identity while advancing low-waste, regenerative food systems in the tourism industry.

Several practical applications of circular gastronomy can be observed globally, including the pioneering example of Restaurant Nolla in Helsinki, Finland, recognized as the first zero-waste restaurant in the Nordic region. The restaurant operates without a trash bin in its kitchen, reflecting its strong commitment to utilizing every ingredient. It sources local and seasonal produce, avoids plastic packaging, and composts all organic waste. This initiative exemplifies circular gastronomy in practice. This concept is further explored through the Ellen MacArthur Foundation's platform (www.ellenmacarthurfoundation.org), particularly in its prominent initiative *The Big Food Redesign* (2021). This framework advocates for a transformation of the food system from production to distribution, by embedding sustainability principles throughout. It promotes the reduction of dependency on global resources while simultaneously strengthening resilient local food systems. Such an approach is highly relevant for implementation within the hospitality and restaurant sectors in tourist destinations. In Indonesia, a local example can be found in Sari Bodag Meliah, a community-based restaurant in Ubud, Bali, which designs its menu based on the availability of organic produce harvested from its own garden. The restaurant also recycles livestock waste into compost, involving local farmers and reinforcing circular practices at the community level. Bali's farm-to-table cooking class—such as Pemulan Organic Farm and Paon Bali—integrate organic farming, waste composting, and traditional cooking techniques, thereby demonstrating holistic circular practices within culinary tourism. Other notable examples include zero-waste initiatives in Borobudur and Yogyakarta homestays



where banana stems, cassava leaves and rice husks are utilized in local cooking and handcrafts; as well as community-led seafood-waste valorization projects in Lombok, where fish bones and other by-products are transformed into broths and seasoning powders.

Food waste, however, remains a pressing global issue with far-reaching social, economic, and environmental implications, undermining food system resilience and contributing substantially to greenhouse gas emissions. Globally, UNEP 2024 report, estimates that 1.05 billion tonnes of food were wasted in 2022 (132 kg per person). In the Indonesian context, food waste is estimated at 23-44 million tonnes per year (115-184kg per person) (Rasyaad, et al 2023). Ranked among the world's largest producers of food waste, Indonesia faces particularly acute challenges, as mounting waste exacerbates pressures on natural resources, societal welfare, and economic development. The tourism sector—an essential contributor to Indonesia's GDP and employment—further magnifies these issues, as tourism-related gastronomy and food services frequently generate high levels of food and energy consumption, directly intensifying carbon emissions and environmental degradation (Waluyo & Kharisma, 2023). While international tourism supports economic growth and job creation, it simultaneously increases the national carbon footprint, making it increasingly difficult to achieve a sustainable equilibrium between economic advancement and environmental stewardship increasingly (Adhariani, 2024).

Conventional food service models within the tourism industry typically operate on a linear “produce-consume-dispose” paradigm, which thereby accelerates resource depletion and increases waste generation. In response, the emerging paradigm of circular gastronomy seeks to operationalize closed-loop resource cycles, design menus and production processes that minimize waste, foster co-creation in food systems, and transform by-products into secondary resources. Despite its potential, the systematic integration of circular gastronomy into the Indonesian tourism sector remains underexplored, particularly with respect to stakeholder education and regulatory infrastructure (Akomea-Frimpong et al., 2024).

Current research on sustainable gastronomy in Indonesia typically centres on isolated practices such as organic sourcing or waste minimization, often overlooking the development of integrative, cross-sectoral models suited to Indonesia's unique culinary and tourism contexts. The absence of contextually relevant frameworks, coupled with insufficient policy emphasis on gastronomic circularity has resulted in a disconnect between high-level sustainability objectives and actionable measures at the destination level (Yubianto & Putra, 2024; Pramezwarya & Ayuningsih, 2019; Mudana et al., 2024).

Consequently, this research critically examines circular gastronomy within Indonesia's tourism sector, aiming to map the associated policy and practice challenges and to advance a robust, context-sensitive theoretical framework for implementation. The study is grounded in circular economy theory (Stahel, 2019), which advocates decoupling economic growth from resource extraction by maximizing value retention, reuse, and regeneration. Within the field of gastronomy, scholars such as Sanchez & Schlegelmilch and Nyberg et al. extend these ideas by promoting a holistic approach that emphasizes closed-loop systems, ecological integrity, community participation, and cultural preservation (Saracevic & Schlegelmilch, 2024; Nyberg et al., 2022). Further informed by the work of UNESCO, UNWTO, and the Sustainable Development Goals (SDGs) (Hák et al., 2016), the study draws on principles of sustainable and regenerative gastronomy



designed not only to maintain but also to restore food systems through innovation, education, and stakeholder engagement (Lehtokunnas, 2023; Lehtokunnas et al., 2022).

Addressing these research gaps, the present study seeks to develop a multidimensional, context-adaptive model that strategically links circularity, gastronomy, and hospitality within Indonesian tourism. By leveraging the country's traditional culinary heritage and fostering community-driven innovation (Dias et al., 2023; Everitt et al., 2018; Hjalager & Richards, 2002), this approach is intended to guide the systemic transformation required in policy and destination management to achieve genuinely sustainable and regenerative food tourism.

METHODOLOGY

This research employs a qualitative literature review as its primary methodology, (Snyder, 2019; Seaman, 2008). The literature analysed encompasses peer-reviewed works published from 2010 to 2024 in total of 54 journal articles, 12 key international policy documents (e.g., UNWTO, 2019, 2021, 2022; UNEP, 2021; FAO, 2019; EU Circular Action Plan, 2020; Ellen MacArthur Foundation, 2021; ASEAN Gastronomy White Paper, 2019; OECD, 2020; and World Bank, 2020), and five Indonesian regulations such as RPJN 2025-2045, Perpres 83/2018, Permenparekraf 14/2021, and the Ministry of Tourism Document (2024)

Data were collected through a structured manual search process. Relevant documents were identified by scanning titles, abstracts, and keywords from academic journals, policy reports, and national regulations, using predefined inclusion criteria and direct relevance to circular economy, gastronomy, food waste, or tourism. In addition to peer reviewed journal articles, this study also examined non-commercial publications, such as official reports, policy documents, and national regulations obtained from sources including UNWTO, the European Commission, and the Indonesian Ministry of Tourism and Creative Economy.

The literature analysis was conducted in several steps: (1) identifying and collecting relevant materials using specific keywords; (2) removing duplicates and irrelevant items; (3) screening titles and abstracts to ensure suitability; (4) reading full texts for detailed evaluation; (5) coding content based on main themes; and (6) synthesising the results into key thematic insights connecting global perspectives with the Indonesian context.

A thematic analysis framework was adopted, systematically coding documents along major themes: conceptual development of circular gastronomy, policy frameworks, stakeholder engagement, and implementation case studies in both global and Indonesian contexts (Braun & Clarke, 2006; Nowell et al., 2017). The coding process followed two main steps: (1) screening of full texts to ensure relevance to the research questions, and (2) inductive and deductive coding of the content to extract recurring concepts and patterns, which were then grouped into thematic categories. Coding was conducted manually to maintain close engagement with the data. The alignment between these procedures and the study's results is evident in the thematic structure of the findings, which present a synthesis of global trends, Indonesian policy and practice, as well as opportunities and barriers for advancing circular gastronomy in tourism.

FINDINGS AND DISCUSSION

The Journey toward Circular Gastronomy Development

Despite the rapid evolution of the tourism industry, gastronomy tourism has undergone significant transformation, moving beyond more food tasting to immersive, sustainability-oriented experiences. Globally, the trajectory of culinary tourism has mirrored a paradigm shift: between 2010 and 2015, initial efforts centered on industry awareness through pioneering zero-waste initiatives and “farm-to-table” models, as exemplified by Restaurant Nolla in Finland (Nguyen, 2019). The subsequent period (2015–2020) witnessed growing implementation, with the emergence of circular restaurants, greater consumer participation, and nascent policy attention to sustainable practices. Since 2020, circular gastronomy principles have been progressively institutionalized, incorporated into tourism policy frameworks, education, and industry guidelines in alignment with the Sustainable Development Goals (SDGs). In the European context, this progression can be mapped into three distinct phases: exploration, early implementation, and institutionalization which together illustrate how circular gastronomy has evolved from conceptual ideas into structured practices and formal recognition within industry and policy.

The growing concern over environmental issues —particularly food waste generated by the tourism sector —has led to the emergence of the concept of *circular gastronomy*. This concept applies the principles of the circular economy to food systems by aiming to reduce food waste, maximize resource efficiency, and integrate regenerative cycles, such as composting and the reuse of food materials (e.g., nose-to-tail cooking, upcycling food scraps). Renfors et al. (2024) demonstrate that circular restaurants implement circular menu design, close loop cooking, and waste reprocessing to minimise resource inefficiencies. This approach also emphasizes environmentally friendly and efficient operations, including the use of sustainable ingredients, packaging reduction, and technological innovations that optimize food cycles to minimize waste. Circular gastronomy represents a holistic model that integrates dining experiences, health benefits, and environmental impact, positioning itself as a forward-looking, responsible, and innovative future for the gastronomy sector. In essence, circular gastronomy is not merely about reducing waste; it is about creating a regenerative food system that nourishes both people and the planet. (Farrell et al., 2024; Jamaludin et al., 2022)

Since 2020, circular gastronomy principles have become progressively institutionalized at the global level, integrated into policy frameworks, culinary education, and industry guidelines in alignment with SDGs. Despite this mainstreaming, significant research gaps persist, particularly in Indonesia, where existing studies rarely explore the nuanced integration of cultural narratives, local ingredient sourcing protocols, and sustainability education within circular gastronomy (Nyberg et al., 2022). Most academic work continues to focus narrowly on food waste reduction or supply chain efficiency, often overlooking the broader systemic transformation required to shift toward regenerative gastronomic tourism. Furthermore, while the UNWTO (2022) identifies food waste—estimated at up to 32 kg per tourists annually in hotels and restaurants—as a critical challenge for global tourism, there remains a lack of contextualized, destination-specific models for Indonesia (Teigeiro & Dia, 2014). A closer look at earlier global trends underscored the depth of this research gap. From 2015 to 2020, the practical adoption of



circular gastronomy gained momentum, marked by the emergence of purpose-driven circular restaurants, increased consumer participation, and growing policy attention to sustainable culinary practices. These developments followed an exploratory phase between 2010 and 2015, during which pioneering restaurants and grassroots initiatives experimented with zero-waste approaches and farm-to-table system. Together, these global milestones demonstrate a gradual but structured evolution toward circular food systems — an evolution that Indonesia has yet to fully capture or adapt within its own tourism and gastronomy landscape.

Gastronomy tourism, initially adopting a more holistic and sustainability-oriented approach, has progressed into sustainable gastronomy, which emphasizes environmental and social sustainability and has ultimately transformed into this circular model. It seeks to redesign food system using systemic, zero-waste and regenerative practices, particularly within hospitality and food service sectors (Shanchez and Schlegekmikch, 2020). It represents the application of circular economy principles in the food and culinary sector, combining expertise in food preparation, food systems, and the management of kitchen and food waste. Nyberg et al. (2022), Nguyen (2019), UNWTO (2023), and Ellen MacArthur Foundation (2021) identify three phases in the development of circular gastronomy in Europe: the exploration phase, the early implementation phase, and the institutionalization phase. These phases reflect a gradual transition from conceptual adoption to practical integration and formal recognition within policy and industry standards.

Table 1. Stages of Circular Gastronomy Development in Europe

No	Phase	Description
1	Exploration (2010–2015)	Restaurants began experimenting with zero-waste practices and farm-to-table concepts, initiating early awareness of circular food systems.
2	Early Implementation (2015–2020)	The emergence of circular restaurants (e.g., Nolla in Finland) and increased efforts in consumer education marked a shift toward practical adoption.
3	Institutionalization (2020–present)	Supported by green policies and the Sustainable Development Goals (SDGs), circular gastronomy has expanded to industrial scales and culinary education.

Source: Nyberg et al. (2022), Nguyen (2019), UNWTO (2023), and Ellen MacArthur Foundation (2021).

Table 1 systematically chronicles the evolution of circular gastronomy in Europe through three distinct phases, as identified by Nguyen (2019), UNWTO Report Global Roadmap for Food Waste Reduction in Tourism (2023), and Ellen MacArthur Foundation (2021).

Exploration (2010–2015): During this initial phase, restaurants began experimenting with sustainability-oriented practices, such as zero-waste initiatives and farm-to-table sourcing. The emphasis was on increasing awareness of the possibilities and importance of circular food systems within the food service sector. These early efforts were primarily experimental and grassroots in nature, laying the groundwork for broader transformations by raising both industry and public consciousness about food system circularity (Wendler, 2016).

Early Implementation (2015–2020): In the second phase, the movement evolved from isolated experimentation to more structured adoption. Notably, the emergence of



purpose-driven circular restaurants, such as Nolla in Finland demonstrated the practical feasibility of integrating circular principles into regular operations. Concurrently, there was a marked increase in consumer education efforts, indicating a transition from awareness to actionable behaviour changes and a more systematic application of circular strategies in the gastronomic sector (Alhola et al., 2019).

Institutionalization (2020–present): The third and current phase is characterized by significant systemic integration. Circular gastronomy has become aligned with broader policy frameworks, including green policy initiatives and the United Nations Sustainable Development Goals (SDGs). This phase marks the scaling up of circular practices to the industrial level and their formal incorporation into culinary education systems, reflecting the transition from niche innovation to mainstream, policy-driven adoption across the industry (Prokic et al., 2022).

The development of circular gastronomy in Europe, as mapped Nyberg et al (2022), Nguyen (2019), UNWTO (2023), and Ellen MacArthur Foundation (2021) demonstrates an incremental progression through three key phases: Exploration (2010–2015), Early Implementation (2015–2020), and Institutionalization (2020–present). The initial phase was characterized by experimental adoption of zero-waste practices and a growing awareness surrounding circular food systems, largely driven by pioneering restaurants and grassroots initiatives (Pantaleón et al., 2023). The subsequent phase was featured the emergence of dedicated circular restaurants and more systematic consumer education, marking a transition from conceptual adaptation to practical application. In its current manifestation, European circular gastronomy benefits from alignment with supportive policies and the Sustainable Development Goals (SDGs), facilitating large-scale industrial integration and incorporation into formal culinary education (Prakoso & Anwar, 2024).

The development of circular gastronomy is closely linked to the broader concept of the Circular Food Economy (CFE). As defined by Dayana et al. (2023), “*CFE is a co-creative food ecosystem that enhances food safety, food security, and biodiversity conservation, prevents food losses and waste, manages perishability, and utilizes regenerative agriculture.*” It represents a regenerative, inclusive, and collaborative food ecosystem approach, primarily aimed at reducing food loss and waste (FLW), conserving biodiversity, and improving food security. However, the implementation of this concept faces several challenges, including consumer behaviour patterns, limited economic incentives, technological barriers, and regulatory constraints. The principles of CFE are directly reflected in circular gastronomy, which serves as a specific application of CFE in the context of culture, tourism, and dining experiences, integrating economic, environmental, and social values within local food systems. Key elements of circular gastronomy —such as food waste reduction, the use of regenerative and locally sourced ingredients, and consumer participation in co-creative food cultures —are derived from the CFE framework. In the tourism context, circular gastronomy extends the scope of CFE by incorporating educational components, culinary heritage preservation, and storytelling as added experiential values. Each principle of the circular economy and CFE can be adapted and operationalized within circular gastronomy. This alignment reflects a more holistic and place-based approach that addresses not only sustainability but also the authenticity and experiential quality of gastronomic offerings. In line with Hendriyani et al. (2020), six key



dimensions shape the gastronomic experience: food quality, service quality, atmosphere, cleanliness, price, and storytelling. Their findings indicate that the overall dining experience significantly influences tourist satisfaction and loyalty, with satisfaction having a direct positive impact on loyalty. Thus, integrating CFE principles into gastronomic practices not only supports sustainable development but also enhances tourist satisfaction and destination competitiveness.

Table 2. The Transition from Circular Economy to Circular Gastronomy

Circular Economy	Circular Food Economy (CFE)	Circular Gastronomy
Redesign of products and processes	Co-creation in food systems	Redesign of menus and zero-waste kitchen operations
Reduction of waste and pollution	Prevention of food waste	Minimization of food waste
Circulation of energy and materials	Prevention of food loss	Utilization of food scraps and local ingredients
Regenerative systems	Transformation from linear to circular food systems	Support for regenerative and inclusive food systems

Source: Ellen MacArthur Foundation (2021), Schlegelmilch. (2020), Iqbal & Kang (2024), Dayana et al., 2023)

The predominant European framework is anchored in high-resource, highly institutionalized contexts, often overlooking the nuanced roles of cultural heritage, community-scale enterprises, and the specificities of agricultural systems found in the Global South. Furthermore, while European models foreground economic and environmental dimensions, they tend to marginalize the significance of culinary narratives, rituals, and broader cultural identity in shaping circular gastronomy practices (Keys & McConnell, 2005). To illustrate the transition from the circular economy to circular gastronomy, the Ellen MacArthur Foundation (2021), in its report “*The Big Food Redesign: Regenerating Nature with the Circular Economy*,” explores how the food and restaurant industries can transform by adopting circular economy principles. This report is highly relevant to the gastronomic context, as it outlines regenerative strategies across the entire food system, from production to consumption. Iqbal and Kang (2024) contribute to this discourse by introducing a secondary supply chain model for food waste management within the culinary industry. Their work emphasizes the importance of integrating circular economy principles into food systems to manage surplus and waste more efficiently. Schlegelmilch (2020) provides a foundational theoretical and practical framework for circular gastronomy in Europe. Their research details the evolution of sustainable culinary value chains and presents circular gastronomy as a comprehensive model that links resource efficiency, waste minimization, and value creation in the food sector. From a tourism-specific perspective, the UNWTO (2022) report “Global Roadmap for Food Waste Reduction in Tourism” highlights the critical role of circular approaches in food management across the tourism sector including restaurants, hotels, and cruise ships. The report identifies tourists not only as consumers but also as significant contributors to food waste. It estimates that tourism-related food services generate approximately 32 kg of food waste per tourist annually. To monitor and reduce waste, the report introduces key performance indicators such as “food waste per guest night” (for hotels) and “per guest day” (for cruises). These metrics position tourists as central actors in the success of food waste reduction initiatives. Furthermore, the report advocates enhanced tourist education



and engagement in sustainable practices, including modifications to food service systems—such as reducing oversized buffets that encourage overconsumption— and guest involvement in sustainability programs, such as composting and food donation initiatives. The active involvement of tourists is deemed essential for achieving the global target of a 50% reduction in food waste by 2030. This goal underscores the necessity of transforming food systems within tourism through circular principles and shared responsibility among stakeholders, particularly consumers.

In Indonesia, the “Gastronomy Triangle” (AGI, 2016) offers an alternative perspective that emphasizes the integration of local ingredients, traditional and innovative cooking techniques, and culturally aware consumption behaviours. Indonesian circular gastronomy leverages food authenticity, local ingredient optimization, and waste valorisation, while also prioritizing the experiential and ritualistic elements of meals and embedding sustainability across ecological, economic, and sociocultural domains (Polat & Aktaş-Polat, 2020). This approach underscores that preserving culinary heritage can go hand in hand with sustainability goals. Adopting circular gastronomy in Indonesia is therefore essential strengthen the tourism sector’s contribution to sustainability. Circular gastronomy can be understood as the application of circular economy principles within gastronomy, focusing on sustainable food production, waste minimization, and the development of regenerative food systems. It aims to reduce environmental impact while simultaneously promoting social and economic sustainability (Nyberg et al., 2022). Beyond addressing environmental challenges, this concept enhances the overall dining experience by fostering consumer awareness and engagement with sustainable practices. Examples of such practices, identified in various studies, include food waste reduction, the use of locally sourced and seasonal ingredients, and the transformation of organic waste into compost (Ruiz-Real et al., 2019). These practices constitute essential strategies within circular gastronomy that align with broader sustainability goals. In the Indonesian context, the circular gastronomy can be holistically envisioned by integrating traditional culinary heritage with tourist dining experiences, guided by sustainability and circular economy principles. This integration can be conceptualized through three fundamental pillars: food, dining experience, and sustainability. Collectively, these pillars shape an ecosystem that not only preserves local culinary identity but also promotes the creation of low-waste, regenerative food systems embedded within the tourism sector.



Figure 1: Indonesian Circular Gastronomy Concept
Source: Nyberg, M., et.al: 2022, AGI:2016, Hendriyani, D., et.al: 2020



The first pillar is food, which emphasizes the use of diverse and locally sourced Indonesian ingredients derived from the nation's rich natural resources and biodiversity. This pillar focuses is on maximizing ingredient utilization while highlighting quality, authenticity, and the unique spices inherent in traditional Indonesian cuisine. According to the Indonesian Gastronomy Academy (AGI, 2016) and its Triangle Concept of Indonesian Gastronomy, authentic local food is deeply influenced by both culture and history. Food connected to culture is expressed through traditional rituals and local customs, while its historical dimension is reflected in the use of spices. The cultural-historical linkage is further reinforced through the stories embedded in each dish. In the context of the Indonesian Circular Gastronomy Concept, food also involves minimizing raw material waste by transforming food scraps into new products or using entire ingredients efficiently from root to stem and nose to tail. This approach aligns with the principles of circularity and promotes sustainable resource use.

The second pillar is the meals experience which extends beyond food as a product and frames it as a comprehensive experience involving consumption, service, and sociocultural interaction. In Indonesia, meals are often imbued with ritualistic, traditional, and communal values that shape the core of the local food culture. Research conducted by Hendriyani et al. (2020) demonstrates that tourists' traditional dining experiences in Bali are influenced by several factors: food quality, service quality, ambiance, price, cleanliness and health aspects, as well as storytelling behind the dishes. These elements significantly enhance tourist satisfaction and loyalty. Within the Indonesian Circular Gastronomy framework, the meals experience also encompasses responsible consumption practices such as portion control to avoid food waste and encouraging healthy and sustainable eating patterns. Educating tourists is essential and can be effectively facilitated through food storytelling, especially during interactive moments throughout the dining experience.

The third pillar is sustainability, which lies at the core of the Indonesian Circular Gastronomy Concept. This pillar promotes sustainable resource management, including food waste reduction, recycling, and the reuse of food ingredients as well as eco-friendly packaging. It also involves the preservation of ecosystems and local culture to ensure that Indonesian gastronomy continues to thrive without compromising environmental and sociocultural integrity. Sustainability in this context require balancing ecological, social, and economic dimensions. Accordingly, the Indonesian Circular Gastronomy Concept integrates the optimal use of authentic local ingredients with cultural dining experiences that foster responsible and sustainable consumption. It reflects circular economy principles by maintaining the equilibrium among nature, society, and economy through efficient, regenerative food system practices.

This concept not only aims to preserve Indonesia's culinary and cultural heritage but also ensures that food production and consumption are carried out in an environmentally responsible and future-oriented manner. Economically, the development of circular gastronomy enhances resource efficiency and reduces operational waste, resulting in cost savings, as demonstrated by initiatives from IHG and Accor (Bux & Amicarelli, 2022). Socially, the adoption of circular gastronomy practices strengthens brand reputation, attracting environmentally conscious tourists—an expanding market segment (Booking.com, 2021). Moreover, such practices foster local economic development by promoting the use of local ingredients and supporting small-scale farmers, as exemplified by sustainable restaurants in Bali (Trip Canvas, 2019).



International and National Regulations Advancing Circular Gastronomy in Indonesia

In the pursuit of an inclusive and sustainable economic transformation aligned with the Vision of Golden Indonesia 2045, the Indonesian government has articulated strategic policies for the development of the tourism sector. These include strengthening the culinary tourism sector as part of the creative economy, which holds significant potential to improve community welfare. The Ministry of Tourism of the Republic of Indonesia has explicitly identified gastronomy as one of the nation's "hidden gems" of tourism. Through its strategic document *Gastronomy Towards World-Class Destinations*, gastronomy is conceptualized not merely as a food offering but as a multisensory cultural experience, with emphasis on four pillars: culinary innovation, sustainable ecosystems, global marketing, and multi-stakeholder collaboration (Ministry of Tourism, 2024a).

The sustainability aspect of gastronomy is a key priority in the national initiative *Indonesia Spice Up the World (ISUTW)*. This initiative aims to enhance Indonesia's global competitiveness as a gastronomic tourism destination by promoting spices and seasonings, developing Indonesian restaurants abroad, and strengthening domestic gastronomic destinations. This approach is closely aligned with circular gastronomy principles, including the sustainable use of local ingredients, food waste minimization, and the promotion of environmentally friendly supply chains (Purwasito, 2016).

At the national level, long-term development policy is also supported by Law No. 59 of 2024 on the National Long-Term Development Plan (RPJPN) 2025–2045, which outlines a development trajectory reducing greenhouse gas emission intensity toward net-zero and enhancing responsible consumption and production (SDG 12). This legal framework provides both a normative and operational basis for developing gastronomy tourism grounded in circularity and sustainability principles. Indonesia also plays an active role in regional cooperation, as reflected in the ASEAN Gastronomy White Paper, which supports the development of the ASEAN Region of Gastronomy. This regional initiative aims to strengthen sustainable food systems through tourism by integrating the agriculture, culture, and education sectors (ASEAN Tourism Ministerial Meeting, 2019). Collectively, these national and regional policy instruments demonstrate that the development of Indonesia's gastronomy tourism is being directed toward:

- elevating the value of local ingredients and culinary uniqueness;
- promoting environmentally sustainable culinary practices;
- enhancing global competitiveness through culinary diplomacy and national branding;
- ensuring inclusive stakeholder engagement through cross-sector collaboration (Pentahelix model).

As such, gastronomy tourism is positioned not merely as a complementary strategy within national tourism, but as a transformative instrument of the creative economy that supports sustainable food systems, cultural diplomacy, and tourism development aligned with the Sustainable Development Goals (SDGs).

To support the development of circular gastronomy in Indonesia, alignment with global policy directions that emphasize sustainability in food systems and tourism is essential. Three major international frameworks serve as critical foundations for this agenda:

1. SDG 12.3 on reducing food waste in the retail and consumption sectors;
2. UNWTO Guidelines for the Development of Gastronomy Tourism; and



3. The European Union Circular Economy Action Plan (2020).

Table 3. Major International Policy Frameworks Supporting Circular Gastronomy Development

No	International Framework	Key Policies Focus
1	SDG 12.3 on reducing food waste in the retail and consumption sectors	Aims to reduce global food waste by 50% at the retail and consumer levels, while minimizing food losses along production and supply chains.
2	UNWTO Guidelines for the Development of Gastronomy Tourism	Promotes a holistic approach to gastronomy development that emphasis sustainability, cultural identity and active community participation.
3	The European Union Circular Economy Action Plan (2020)	Advocates a systemic transition toward a circular economy based on redesign, reuse, recycling and waste reduction across all industrial sectors, including food and beverage.

Source: Document analysis conducted by authors' team

First, SDG Target 12.3 aims to halve global food waste by 2030. In the context of gastronomy tourism, this target can be pursued through initiatives such as educating tourists on responsible portion sizes, encouraging the use of local ingredients, and innovating in food waste processing to create value-added products. Circular gastronomy serves as a core strategy for achieving this target by fostering more efficient food systems, minimizing waste, and shifting the consumption paradigm from excess to responsibility.

Secondly, the UNWTO Gastronomy Tourism Guidelines issued by the United Nations World Tourism Organization recommend a holistic approach to gastronomy development, emphasizing sustainability, cultural identity, and the active engagement of local communities. Circular gastronomy reinforces these guidelines by promoting zero-waste kitchen practices, the reuse of food materials, and cross-sector collaboration among restaurants, local farmers, and tourism stakeholders. The UNWTO report also outlines two models for measuring the impacts of food consumption, including those developed by the World-Wide Fund for Nature (WWF), which provide frameworks for assessing consumer-driven environmental footprints. These approaches not only enhance the tourist experience but also foster greater awareness of the environmental impacts associated with excessive food consumption.

Thirdly, the European Union's Circular Economy Action Plan (2020) strongly advocates a transition toward a circular economy by prioritizing redesign, reuse, recycling, and waste reduction across all industrial sectors, including food and beverage. When adapted into circular gastronomy, the circular economy framework can be operationalized through practices such as the use of low-carbon, locally sourced ingredients, sustainable logistics systems, the reduction of plastic packaging in restaurants and hotels, and the integration of technology in food waste management. This action plan establishes a comprehensive operational framework that can be adopted transnationally to support the advancement of circular economy principles within the gastronomic tourism sector.

Together, these international references—SDG 12.3, the UNWTO Gastronomy Tourism Guidelines, and the EU Circular Economy Action Plan—provide essential policy foundations that align with and reinforce the implementation of circular gastronomy. By incorporating sustainability, cultural richness, and system-wide collaboration, circular gastronomy emerges as a transformative pathway for developing responsible and resilient food systems within the global tourism industry.



At the national level, several regulations address sustainability and waste management in tourism; however, there is currently no specific regulation that explicitly governs the implementation of circular gastronomy in Indonesia as shown in Table 4.

Table 4. Key National Policy Frameworks Related to Sustainability and Circular Gastronomy in Indonesian Tourism

No	National Policy	Main Focus
1	Presidential Regulation No. 83 of 2018 on Marine Debris Management	Establishes the National Action Plan for Marine Debris 2018-2025 with the goal of reducing marine plastic waste by 70% by 2025
2	Ministerial Regulation of Tourism and Creative Economy No 14 of 2021 on sustainable Tourism Destinations	Outlines a comprehensive sustainability framework structured around four pillars: (1) sustainable management, (2) socio-economic sustainability, (3) cultural sustainability and (4) environmental sustainability.
3	National Long-term Development Plan (RPJPN) 2025-2045	Defines Indonesia's long term vision for a green, inclusive, and sustainable economy emphasizing resource efficiency, decarbonization and the circular economy as pillars of national transformation.

Source: Document analysis conducted by authors' team

Key national policies include Presidential Regulation No. 83 of 2018 on Marine Debris Management, Ministerial Regulation of Tourism and Creative Economy No. 14 of 2021 on Sustainable Tourism Destinations, and the National Long-Term Development Plan (RPJPN) 2025–2045, which outlines a vision for green economic transformation and high-quality tourism. Presidential Regulation No. 83/2018 establishes a national framework for reducing marine plastic waste, with a target of cutting such waste by 70% by 2025. This policy is operationalized through the National Action Plan for Marine Debris (RAN PSL) 2018–2025, which encompasses five strategic pillars: (1) public awareness campaigns, (2) land-based waste control (both upstream and downstream), (3) coastal and marine waste management, (4) financing, institutional strengthening, and law enforcement, and (5) research and technology development. Programmatic efforts include public education, the development of biodegradable plastics, waste-to-energy initiatives, the application of standard operating procedures (SOPs) for marine vessels and tourism operators, waste management facilities for small islands, and cross-sector collaboration. As of 2022, approximately 35% of the plastic leakage reduction target had been achieved, resulting in on-the-ground impacts such as the establishment of “Coastal Schools,” plastic bag bans, and institutional strengthening in waste governance (Riksfardini & Asmara, 2023).

In parallel, Ministerial Regulation No. 14/2021 on Sustainable Tourism Destinations provides a structured sustainability framework grounded in four pillars: sustainable management, socio-economic sustainability, cultural sustainability, and environmental sustainability. Under the pillars of cultural and economic sustainability, the policy encourages the development of culturally rooted local tourism products, including gastronomy. Meanwhile, the RPJPN 2025–2045 emphasizes Indonesia's transition toward a green, inclusive, and sustainable economy, prioritizing resource efficiency, decarbonization, and the strengthening of the circular economy. In the tourism sector, the RPJPN supports the development of environmentally responsible, community-based, and carrying-capacity-conscious tourism. This direction aligns closely with efforts to reduce



food waste as part of green economy strategies that promote sustainable consumption and production, particularly within the tourism and culinary sectors. Systematic food waste management—through education, technology, and multi-stakeholder collaboration—can significantly support the RPJPN's goals of developing ethical, resource-efficient tourism that contributes to the achievement of SDG targets, particularly SDG 12.3 on halving food waste by 2030. Despite these supportive frameworks, it is important to note that neither international nor national policy frameworks have yet established explicit regulatory guidelines for the implementation of circular gastronomy. This regulatory gap highlights the need to integrate circular gastronomy principles into future tourism, food, and environmental policy instruments. Together, these policies and strategies underscore the importance of regulations not only as compliance mechanisms but as catalysts for systemic change, promoting sustainability and resilience in gastronomy (Matthews et al., 2021).

Opportunities and Challenges in Implementing Circular Gastronomy within Indonesia's Tourism Sector.

Despite its clear benefits, the implementation of circular gastronomy in tourism destinations—particularly in Indonesia—faces several notable challenges. Nyberg et al. (2022) highlight the lack of comprehensive understanding of circularity and gastronomy as an integrated concept, which complicates practical adoption. Furthermore, studies have indicated a pressing need for deeper investigation into the drivers and barriers of consumer engagement in circular practices, specifically in the context of food waste management (Wu et al., 2021). One of the major barriers to reducing food waste in the tourism sector is the low level of awareness among culinary tourism stakeholders regarding the concepts of circular gastronomy and food system sustainability. Many food service operators, including restaurants, hotels, and local food vendors, lack an understanding of the economic, social and environmental impacts of food waste. This limited literacy results in food waste management being sidelined in tourism operations.

Additionally, the absence of specific regulations and technical guidelines further hinders the adoption of sustainable practices such as organic waste segregation, redistribution of surplus edible food, and the conversion of food waste into compost or energy (UNEP, 2021; FAO, 2019). Without accessible and practical regulatory frameworks, food service businesses remain limited in their capacity to integrate circular principles into day-to-day operations. Another significant challenge lies in the fragmented coordination among the tourism, food and environmental sector. Cross-sectoral collaboration remains limited, as tourism, agriculture and environmental often work uncoordinated. This is compounded by lack of data and in-depth research on the scale, sources, and impacts of food waste at tourism destinations, especially in developing countries such as Indonesia. Without accurate and integrated data, policy formulation and program planning for food waste reduction cannot be effectively targeted or implemented. To address these challenges, stronger synergies among stakeholders including academia, industry, and government are urgently needed. Collaborative efforts should focus on enhancing data-driven research, improving stakeholder capacity, and formulating context-specific, actionable policies at the destination level (Papargyropoulou et al., 2014; WRAP, 2020).

Another key challenge is the fragmented coordination among sectors, particularly between tourism, food, and environmental governance. Cross-sectoral collaboration

remains limited, hindering the development of an integrated ecosystem capable of addressing food waste in a comprehensive and holistic manner. This issue is further exacerbated by the scarcity of robust data and in-depth research regarding the scale, sources, and impacts of food waste in tourism destinations, especially in developing countries such as Indonesia. Without accurate and integrated data, policymaking and the design of effective food waste reduction programs remain suboptimal. To overcome these challenges, multi-stakeholder synergies are essential. This includes cooperation among academics, industry practitioners, and government actors to strengthen data-driven research and to promote practical and context-specific policy development at the destination level (Papargyropoulou et al., 2014; WRAP, 2020).

Many tourism and hospitality stakeholders exhibit limited literacy regarding circularity which often relegates food waste management to a secondary concern. A major contributing factor is the absence of robust, sector-specific regulations: without clear guidance on food waste segregation, redistribution, or composting, implementation across tourism business becomes inconsistent and largely suboptimal (De Jong et al., 2018). Further complicating matters is the cross-sectoral fragmentation among tourism, food, and environmental authorities, which results in siloed interventions rather than coordinated, ecosystem-level strategies. Insufficient and unreliable data on the extent and types of food waste further compound the difficulty of designing targeted, evidence-based interventions. Economic barriers—such as constrained resources and the lack of accessible green financing—impede investment in eco-innovative solutions. Finally, both tourists and industry actors demonstrate gaps in awareness and engagement with the core tenets of circular gastronomy, indicating a critical area for further research and practical outreach (Kivela & Crotts, 2005). These intertwined challenges highlight an urgent research and policy gap: the need for comprehensive regulatory support and multi-stakeholder collaboration to systematically embed circular gastronomy within Indonesia's tourism sector.

Culinary tourism destinations such as Bali, Yogyakarta, Minangkabau, and Lombok hold significant potential to be developed as models of circular gastronomy in Indonesia. These regions are not only rich in local culinary heritage but also possess strong community structures, traditional food processing expertise, and well-established tourism appeal. This potential aligns with the principles of place-based development, wherein local strengths and resources are leveraged to drive sustainable tourism transformation (Richards, 2018; UNWTO, 2019). Circular gastronomy in these destinations could therefore serve as a replicable model that integrates environmental sustainability, cultural preservation, and economic empowerment within the broader framework of sustainable tourism development.

The hospitality and restaurant industries also play a strategic role in food waste reduction. Hotels and restaurants can adopt integrated waste management systems, such as food composting and adaptive portioning mechanisms, to prevent overproduction and minimize leftovers. Moreover, partnerships with local farmers not only shorten the supply chain but also enhance food security and support local economies. These practices have been shown to improve operational efficiency and shape tourist perceptions, especially among travellers who are increasingly concerned with environmental issues (Gössling & Hall, 2019; WRAP, 2020). Furthermore, eco-certifications such as Green Key or



EarthCheck can serve as incentives for industry stakeholders to adopt circular economy principles.

Educational tourism also offers significant opportunities to internalize sustainability values within the tourist experience. Programs such as visits to organic farms, zero-waste cooking classes, and community-based culinary tours can function as both educational and recreational platforms. Through these experiences, tourists move beyond passive consumption and become agents of change who are aware of the environmental impacts of their food choices. Additionally, the advancement of digital technologies can support food waste reduction through innovations such as stock-monitoring applications, food redistribution platforms, and circular logistics systems. These digital solutions have proven effective in urban and global tourism contexts and are increasingly integral to the digital transformation agenda in tourism, as emphasized in Indonesia's National Long-Term Development Plan (RPJPN) 2025–2045 (UNEP, 2021; World Bank, 2020).

Based on the identified opportunities and challenges in implementing circular gastronomy in the tourism sector, this study proposes four policy recommendations relevant to the Indonesian context and valuable for consideration by tourism stakeholders. First, the integration of circular gastronomy concepts into the sustainable tourism destination standards is a strategic measure to reinforce Indonesia's commitment to achieving the Sustainable Development Goals (SDGs), particularly SDG 12 on responsible consumption and production. Circular gastronomy should be embedded within destination assessment indicators, including Indonesia's existing CHSE framework (Cleanliness, Health, Safety, and Environment), developed by the Ministry of Tourism and Creative Economy. By incorporating circularity principles into destination quality standards, tourism managers receive structural incentives to adopt practices such as food waste reduction, organic waste processing, and the efficient use of local ingredients (UNEP, 2021; UNWTO, 2021).

Second, the development of a National Circular Gastronomy Guideline is essential to provide clear and applicable technical references for industry practitioners and relevant stakeholders. Such a guideline should be grounded in both international best practices and local wisdom, reflecting the culinary heritage and cultural diversity across Indonesian regions. This approach would strengthen the dimension of glocalization in culinary tourism development by merging global standards with local contexts. The guideline could include strategies for inventory management, the reuse of surplus edible food, and community-based food ethics practices (FAO, 2019; Papargyropoulou et al., 2014). Third, offering economic incentives—such as green certifications, tax reductions, or access to green financing for hotels and restaurants adopting circular gastronomy—represents a market-based approach to fostering behavioural change in the industry. Certifications such as EarthCheck, Green Key, or those endorsed by the Global Sustainable Tourism Council (GSTC) can be used to assess the extent to which hospitality businesses manage food waste and organic waste sustainably. Moreover, green financing schemes are essential to support investment in eco-innovations and environmentally friendly infrastructure in the hospitality and culinary sectors (OECD, 2020; World Bank, 2020).

Fourth, multi-stakeholder collaboration and curriculum innovation in vocational education are critical long-term pillars. Circular gastronomy requires not only regulatory frameworks but also a broader social and cultural transformation involving chefs, academics, tourism associations, indigenous communities, and younger generations.



Therefore, tourism vocational education should begin integrating specialized modules on food circularity, food waste management, and food ethics into its curricula. This ensures that future tourism professionals are equipped with the awareness and competencies needed to implement sustainability principles from an early stage (Richards & Hjalager, 2018; BCFN, 2021). These recommendations are closely aligned with the City of Gastronomy Implementation Framework and Action Plan 2020–2024, which outlines key indicators for achieving the City of Gastronomy vision. These indicators span cultural, health, economic, environmental, and educational dimensions, positioning the city not only as a hub of food and beverage but as a collaborative platform for building inclusive, sustainable, and creative urban development.

Key indicators include: (1) festivals and the preservation of local cultural and culinary knowledge; (2) access to healthy and locally sourced food; (3) environmental sustainability through regenerative agriculture and circular food economy practices; (4) support for local economies through the growth of small-scale and artisanal agribusinesses and culinary enterprises; and (5) education and training in gastronomy and tourism to foster sustainable career pathways. The framework also emphasizes the importance of multi-stakeholder collaboration involving governments, indigenous communities, the food and beverage industries, the education sector, and international organizations to ensure impactful and inclusive implementation. Within this context, gastronomy becomes a medium for social transformation, public health promotion, creative innovation, and the strengthening of local identities in the global arena, particularly through the UNESCO Creative Cities of Gastronomy network.

Advancing the Circular Gastronomy Framework in Indonesian Tourism

The “Advancing the Circular Gastronomy Framework in Indonesian Tourism” model as illustrated as Figure 1, encapsulates a comprehensive and culturally grounded approach to developing a sustainable gastronomy sector. It systemically outlines the challenges and opportunities in the field, progressing toward research-based insights, urgent needs and context-specific recommendations. At its core, the model bridges technical innovation with cultural heritage, distinguishing it from policy-centric approaches commonly found in European contexts. By foregrounding Indonesia’s Gastronomy Triangle—highlighting the synergy of local ingredients sourcing, diverse culinary practices, and culturally sensitive consumption patterns—the framework emphasizes sociocultural transformation, community participation, and the integration of tropical ecosystems. Ultimately, it positions Indonesia as a global innovator in circular gastronomy, advancing both academic perspectives and pragmatics pathways for implementation.



Figure 1. Advancing the Circular Gastronomy Framework in Indonesian Tourism

Figure 1 illustrates the structured framework for advancing circular gastronomy within Indonesian tourism, mapping the progression from the current state and key challenges to targeted research, urgent needs, strategic recommendations, and the overall vision. The chart visually organizes each component, highlighting how existing issues, barriers, opportunities, and foundational research collectively inform actionable steps and position Indonesia as an innovative leader in sustainable, culturally grounded gastronomy. The following outlines the structural components of *the Advancing the Circular Gastronomy Framework in Indonesian Tourism*:

- 1) **Current State:** Identifies existing issues in Indonesia’s tourism gastronomy sector.
- 2) **Barriers & Opportunities:** Depicts the factors that shape and influence the key area requiring critical attention.
- 3) **Research & Analysis:** Represents the foundational work that integrates both local and global insights.
- 4) **Urgent Needs:** Functions as the bridge, synthesizing challenges and opportunities into actionable directions.
- 5) **Key Recommendations:** Provides context-appropriate, holistic steps for effective implementation.
- 6) **Vision:** Articulates the long-term aspiration of positioning Indonesia as a leader in sustainable gastronomy.

These six steps must be carried out in a chronological and comprehensive manner to effectively advance circular gastronomy within Indonesian tourism. Beginning with the identification of the current state, the process first highlights pressing issues faced by the sector. Subsequently, analyzing barriers and opportunities becomes crucial for understanding the factors require immediate attention. Building on this, the research and analysis stage draws upon both global trends and local realities, providing the foundational insights needed for strategic planning. Addressing urgent needs then functions as a connecting bridge, translating challenges and opportunities into targeted actions. The formulation of key recommendations ensures the implementation of integrative, context-specific strategies. Ultimately, this structured progression culminates in a clear vision: positioning Indonesia as a leader in sustainable gastronomy through holistic, culturally grounded transformation. Although the proposed model is primarily conceptual, it is derived from a thematic analysis of peer-reviewed studies, international policy documents,

and Indonesian case studies. Future research will strengthen this model through empirical validation, including stakeholder interviews, food waste data analysis, and prototyping in selected destinations.

CONCLUSION

This article makes a significant conceptual framework contribution by addressing research gaps in sustainable gastronomy and introducing a context-specific circular gastronomy framework for Indonesia. By centering Indonesia's "Gastronomy Triangle"—the synergy of local ingredient sourcing, both traditional and innovative culinary practices, and culturally sensitive sustainable consumption—the study highlights the importance of cultural dynamics, community participation, and the richness of tropical ecosystems. This approach shifts academic discussions from a narrow focus on supply-chain efficiency and waste reduction toward a holistic integration of sustainability, heritage preservation, community empowerment, and consumer education. By contrasting the more policy-driven and institutionalized European models with Indonesia's culturally grounded gastronomy approach, the article demonstrates that local wisdom and tradition-based solutions can be highly adaptive and relevant for developing and tropical countries.

The novelty of this research lies in the development of a contextually relevant circular gastronomy framework that foregrounds Indonesia's unique cultural heritage, community engagement, and diverse local ecosystems—elements often neglected in previous studies that are predominantly European-focused. By introducing the "Gastronomy Triangle" concept, this article expands the scope of circular gastronomy to include sociocultural transformation alongside environmental and economic considerations. Consequently, Indonesia is positioned not merely as a follower, but as a leading innovator in the global discourse on sustainable gastronomy.

Theoretically, future research and the development of circular gastronomy frameworks should integrate cultural heritage and community engagement. Practically, it is essential to develop sector-specific policy guidelines, provide incentives, foster cross-sectoral collaboration, and enhance stakeholder literacy. Clearer regulations, integrated data systems, and community empowerment are recommended to support Indonesia's efforts to become a global reference for holistic and contextually grounded circular gastronomy implementation. In alignment with Indonesia's national policy frameworks—which prioritizes quality and sustainable tourism through designated priority destinations and tourism areas—the proposed circular gastronomy framework can be strategically adopted by local governments as a policy innovation. Its practical application lies in strengthening destination competitiveness from a gastronomic perspective. Therefore, the integration of circular gastronomy principles into regional tourism development plans is strongly recommended as a strategic direction for local governments.

This article is subject to several limitations. As a qualitative, literature-based study, the analysis relies on secondary data, which may not fully capture the actual practices of circular gastronomy. The absence of empirical fieldwork limits the ability to validate how circular gastronomy is being operationalized in the destination level. Therefore, future research should prioritize empirical data collection, explore policy experimentation, and cross-sector governance to accelerate systemic transitions toward regenerative food tourism.



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REFERENCES

- Adhariani, D. (2024). Surplus Indonesia: Tackling food waste through app. *Emerald Emerging Markets Case Studies*, 14(4), 1–25.
- Akomea-Frimpong, I., Tetteh, P. A., Ofori, J. N. A., Tumpa, R. J., Pariafsai, F., Tenakwah, E. S., Asogwa, I. E., Vanapalli, K. R., Adu-Gyamfi, G., & Kukah, A. S. (2024). A bibliometric review of barriers to circular economy implementation in solid waste management. *Discover Environment*, 2(1), 20.
- Alhola, K., Ryding, S., Salmenperä, H., & Busch, N. J. (2019). Exploiting the potential of public procurement: Opportunities for circular economy. *Journal of Industrial Ecology*, 23(1), 96–109.
- ASEAN Tourism Ministerial Meeting. (2019). ASEAN Gastronomy White Paper.
- ASEAN Tourism Ministerial Meeting. (2019). The development of ASEAN gastronomy network and region of gastronomy: White paper. Ministry of Tourism and Sports, Thailand.
- Barilla Center for Food & Nutrition (BCFN). (2021). Food and Education: Integrating Sustainability into Curricula. Barilla Center for Food & Nutrition.
- Boiko, V., Liubynskiy, O., Strikha, L., Zarakhovskiy, O., & Neilenko, S. (2021). Development of Culinary Tourism in European Countries.
- Booking.com. (2021). Sustainable Travel Report.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101.
- Bux, C., & Amicarelli, V. (2022). Circular economy in the hospitality industry: An overview and implications. *Journal of Cleaner Production*.
- Cheshire, M. (2019). Food waste and the circular economy. *Food Ethics*, 4(1), 1-12
- Coordinating Ministry for Maritime Affairs and Investment of the Republic of Indonesia. (2021). *Indonesia Spice Up the World: Action Plan 2022-2024*. Jakarta: Coordinating Ministry for Maritime Affairs and Investment.
- Dayana, I., Rahman, M. A., & Setiawan, B. (2023). Circular food economy: A co-creative ecosystem to reduce food loss and waste. *Journal of Sustainable Food Systems*.
- De Jong, A., Palladino, M., Puig, R. G., Romeo, G., Fava, N., Cafiero, C., Skoglund, W., Varley, P., Marcianò, C., & Laven, D. (2018). Gastronomy tourism: An interdisciplinary literature review of research areas, disciplines, and dynamics. *Gastronomy and Tourism*, 3(2), 131–146.
- de Pablo Valenciano, J., Uribe-Toril, J., & Ruiz-Real, J. L. (2019). Entrepreneurship and education in the 21st century: Analysis and trends in research. *Journal of Entrepreneurship Education*, 22(4), 1–20.
- Dias, Á., Silva, G. M., Patuleia, M., & González-Rodríguez, M. R. (2023). Developing sustainable business models: Local knowledge acquisition and tourism lifestyle entrepreneurship. In *Knowledge management, organisational learning and sustainability in tourism* (pp. 37–56). Routledge.
- Donati, M., Zocca, M., & Galli, F. (2019). Circular economy in the food sector: Perspectives and policy implications. *Sustainability*, 11(16), 4434.

- Ellen MacArthur Foundation. (2021). *The Big Food Redesign: Regenerating Nature with the Circular Economy*.
- Everitt, T., Lea, G., & Hutter, M. (2018). AGI safety literature review. ArXiv preprint ArXiv:1805.01109.
- Food and Agriculture Organization of the United Nations (FAO). (2019). *The State of Food and Agriculture 2019. Moving Forward on Food Loss and Waste Reduction*. Food and Agriculture Organization of the United Nations.
- Gossling, S., & Hall, C. M. (2019). *Sustainable Culinary Systems: Local Foods, Innovation, and Tourism & Hospitality*. Routledge.
- Hák, T., Janoušková, S., & Moldan, B. (2016). Sustainable Development Goals: A need for relevant indicators. *Ecological Indicators*, 60, 565–573.
- Hendriyani, I. G. A. D., Budiarsa, M., Antara, M., & Sudiarta, N. (2020). The Loyalty Model of Foreign Tourists Consuming Traditional Balinese Food. *Global Business & Finance Review*, 25(3), 34–48.
- Hjalager, A.-M., & Richards, G. (2002). *Tourism and gastronomy* (Vol. 11). Routledge London.
- Indonesian Gastronomy Academy (AGI). (2016). *Triangle Concept of Indonesian Gastronomy*. Indonesian Gastronomy Academy.
- Iqbal, M., & Kang, M. (2024). Circular economy of food: A secondary supply chain model on food waste management. *Journal of Cleaner Production*.
- Jamalludin, M., Ibrahim, N., & Latif, A. (2022). Sustainable gastronomy and regenerative food systems. *Sustainability*, 14(12), 7654.
- Kementerian Pariwisata. (2024a). *Gastronomi Menuju Destinasi Kelas Dunia*. Kementerian Pariwisata dan Ekonomi Kreatif Republik Indonesia.
- Keys, E., & McConnell, W. J. (2005). Global change and the intensification of agriculture in the tropics. *Global Environmental Change*, 15(4), 320–337.
- Kivela, J., & Crotts, J. C. (2005). Gastronomy tourism: A meaningful travel market segment. *Journal of Culinary Science & Technology*, 4(2–3), 39–55.
- Lehtokunnas, T. (2023). Regenerative food systems and tourism. *Journal of Ecotourism*, 22(1), 45–60.
- Lehtokunnas, T. (2023). The circular economy futures in the making: transformativity and object ontologies in food waste practices in Finnish households, supermarkets and biogas plants. *Futures*, 153, 103241.
- Lehtokunnas, T., Mattila, M., Närvänen, E., & Mesiranta, N. (2022). Towards a circular economy in food consumption: Food waste reduction practices as ethical work. *Journal of Consumer Culture*, 22(1), 227–245.
- Matthews, C., Moran, F., & Jaiswal, A. K. (2021). A review on European Union’s strategy for plastics in a circular economy and its impact on food safety. *Journal of Cleaner Production*, 283, 125263.
- Ministerial Regulation of Tourism and Creative Economy No. 14 of 2021 on Sustainable Tourism Ministry of Tourism and Creative Economy. (2024a). Presentation on gastronomy destinations. Deputy for tourism products and event management.
- Ministry of Tourism and Creative Economy. (2024b). *Upgrading Tourism: Gastronomy as a Strategy Toward Class Destinations*. Jakarta: Ministry of Tourism and Creative Economy
- Ministry of Tourism and Creative Economy. (2025c, February 28). *Gastronomy Materials: Marine Tourism, Wellness Tourism, Gastronomy and MICE*. Presented by Dr. (Cand.) Ayu Nurwitasari
- Moura, A., Costa, V., Devile, E., Camões, H., Maia, B., & Melo, C. (2024). Exploring the Intersection between Circular Economy, Gastronomy, and Sustainability: A Review of Current Discourse. *Revista Turismo & Desenvolvimento (RT&D)/Journal of Tourism & Development*, 46.
- Mudana, I. G., Wijaya, I. N. C., Ginaya, I. G., Gusman, D., & Ardini, N. W. (2024). Application of Soft Systems Methodology Approach to Find Sustainable Gastronomic Solutions in Bali, Indonesia. *Academica Turistica-Tourism and Innovation Journal*, 17(2).
- National Long-Term Development Plan (RPJPN) 2025–2045
- Nguyen, V. M. (2019). Sustainability of a zero-waste restaurant: Case study: Nolla Restaurant, Helsinki.



- Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, 16(1), 1609406917733847.
- Nyberg, M., Andersson, T., & Gustafsson, I.-B. (2022). Circular gastronomy: Integrating sustainability into food and meal design. *Journal of Gastronomy and Food Science*, 28, 100462.
- Nyberg, M., Börjesson, S.-M. E., Höijer, K., Olsson, V., Rothenberg, E., & Wendin, K. (2022). Circular gastronomy—Exploring a new compound concept at the interface between food, meals and sustainability. *International Journal of Gastronomy and Food Science*, 30, 100610.
- Organisation for Economic Co-operation and Development (OECD). (2020). *Developing Sustainable Tourism Strategies*. OECD Publishing.
- Paparella, A., Rossi, R., & Zanasi, C. (2023). Circular food economy and gastronomy in practice. *International Journal of Gastronomy and Food Science*.
- Papargyropoulou, E., Lozano, R., Steinberger, J. K., Wright, N., & Ujang, Z. B. (2014). The food waste hierarchy as a framework for the management of food surplus and food waste. *Journal of Cleaner Production*, 76, 106-115.
- Pemerintah Republik Indonesia. (2024). *Undang-Undang Republik Indonesia Nomor 59 Tahun 2024 tentang Rencana Pembangunan Jangka Panjang Nasional Tahun 2025–2045*. Jakarta: Sekretariat Negara Republik Indonesia.
- Prakoso, H. A., & Anwar, V. A. (2024). Relevansi Ide Poin SDG's dan GNH Dalam Implementasi Pembangunan Sosial-Ekonomi yang Adil Melalui Sektor Pariwisata di Bhutan. *Jurnal Partisipatoris*, 6(1), 73–92.
- Pramezwarya, A., & Ayuningsih, S. F. (2019). Sustainable Gastronomy & Shopping Destination Development in Bandung City—West Java Indonesia. *International Journal of Innovation, Creativity and Change*, 5(6), 1153–1163.
- Presidential Regulation No. 83 of 2018 on Marine Debris Management.
- Prokic, D., Stepanov, J., Curcic, L., Stojic, N., & Pucarevic, M. (2022). The role of circular economy in food waste management in fulfilling the United Nations' sustainable development goals. *Acta Univ. Sapientiae Aliment*, 15(1), 51–66.
- Purnomo, H., AP, R. A. A., Sari, A. D., & Firdaus, F. (2024). Global Circular Economy Practice: Drivers, Barriers and Strategies for Food System in Indonesia. *International Journal of Sustainable Development & Planning*, 19(9).
- Purwasito, A. (2016). Indonesia Spice Up the World: Gastronomy as cultural diplomacy. *Cultural Studies Review*, 22(1), 89-101.
- Rahardjo, T. (2020). Local food and culinary heritage in Indonesia. *Culinary Heritage Journal*, 5(2), 12â€“24.
- Richards, G. (2018). Cultural tourism: A review of recent research and trends. *Journal of Hospitality and Tourism Management*, 36, 12-21.
- Richards, G., & Hjalager, A. M. (2018). Tourism and gastronomy education: An international perspective. *Journal of Gastronomy and Tourism*, 3(3), 14-158.
- Riksfardini, D., & Asmara, A. (2023). Evaluation of marine plastic waste management policy in Indonesia. *Environmental Policy and Governance*, 33(2), 99-111.
- Rotondo, F., Corsi, S., & Ghezzi, A. (2025). Circular economy and gastronomy: Innovations for sustainability. *International Journal of Hospitality Management*, 105, 103278.
- Ruiz-Real, J. L., Uribe-Toril, J., & Gázquez-Abad, J. C. (2020). Destination branding: Opportunities and new challenges. *Journal of Destination Marketing & Management*, 17, 100453.
- Ruiz-Real, J. L., Uribe-Toril, J., De Pablo Valenciano, J., & Gázquez-Abad, J. C. (2019). Worldwide research on circular economy and environment: A bibliometric analysis. *International Journal of Environmental Research and Public Health*, 16(14), 2699.
- Sanchez, J., & Schlegelmilch, B. B. (2020). Circular gastronomy: Creating sustainable culinary value chains. *Journal of Business Research*, 120, 313-323.
- Saracevic, S., & Schlegelmilch, B. B. (2024). Activist brand perception: Conceptualization, scale development and validation. *Journal of Business Research*, 180, 114732.
- Seaman, C. B. (2008). Qualitative methods. In *Guide to advanced empirical software engineering* (pp. 35–62). Springer.
- Septyana, V., & Saragih, R. P. (2024). The branding narrative of "Indonesia Spice Up The World" through the participation of the Indonesian diaspora in South Korea as brand ambassadors. *Bricolage: Jurnal Magister Ilmu Komunikasi*, 10(1), 119–130.

- Silander, D. (2019). The European Commission and Europe 2020: Smart, sustainable and inclusive growth. *Smart, sustainable and inclusive growth* (pp. 2–35). Edward Elgar Publishing.
- Skaf, L., Franzese, P. P., Capone, R., & Buonocore, E. (2021). Food waste and environmental impact: A global review. *Ecological Indicators*, 125, 107879.
- Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*, 104, 333–339.
- Spenceley, A., & Rylance, A. (2019). The contribution of tourism to achieving the United Nations Sustainable Development Goals. *A Research Agenda for Sustainable Tourism*, 107–125.
- Stahel, W. R. (2016). The circular economy. *Nature*, 531(7595), 435.
- Stahel, W. R. (2019). *The circular economy: A user's guide*. Routledge.
- Sukarno, M., & Mutiarin, D. (2023). Branding tourism and collaborative governance: A case study from Nglanggeran village. *Jurnal Studi Komunikasi*, 7(3), 797–812.
- Teigeiro, L. R., & Díaz, B. (2014). Estimation of multipliers for the activity of hotels and restaurants. *Tourism Management*, 40, 27–34.
- Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Medical Research Methodology*, 8(1), 45.
- Thomas, J., Harden, A., & Newman, M. (2012). Synthesis: combining results systematically and appropriately. *An Introduction to Systematic Reviews*, 1, 191–193.
- Tourism and Gastronomy*. (2003). Routledge.
- Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management*, 14(3), 207–222.
- TripCanvas. (2019). 12 Restaurants in Bali That Support Local Farmers and Serve Organic Food.
- United Nations Environment Programme (UNEP). (2021). *Food Waste Index Report 2021*. United Nations Environment Programme.
- United Nations World Tourism Organization (UNWTO). (2019). *Tourism and the Sustainable Development Goals Journey to 2030*.
- United Nations World Tourism Organization (UNWTO). (2021). *Guidelines for the Development of Gastronomy Tourism*.
- United Nations World Tourism Organization (UNWTO). (2022). *Global Roadmap for Food Waste Reduction in Tourism*.
- Waluyo, & Kharisma, D. B. (2023). Circular economy and food waste problems in Indonesia: Lessons from the policies of leading countries. *Cogent Social Sciences*, 9(1), 2202938.
- Waste and Resources Action Programme (WRAP). (2020). *Food Waste Reduction Roadmap Progress Report 2020*.
- Wendler, J. (2016). Grassroots experimentation: Alternative learning and innovation in the Prinzessinnengarten, Berlin. In *The experimental city* (pp. 150–162). Routledge.
- Winarno, F. G. (2017). Indonesian cuisine: A cultural and historical perspective. *Culinary Journal of Indonesia*, 1(1), 1-10.
- World Bank. (2020). *Transforming Tourism Through Digital Innovations*.
- Wu, L., Chen, J., & Zheng, Y. (2021). Consumer engagement in sustainable food practices. *Journal of Consumer Behaviour*, 20(5), 1172-1185.
- Yubianto, S. D., & Putra, A. N. (2024). Sustainable gastronomy practices in Indonesia's island tourism: A focus on Bali and Labuan Bajo. *Journey: Journal of Tourismpreneurship, Culinary, Hospitality, Convention and Event Management*, 7(2), 143–158.



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