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Operationalising sustainability in professional kitchens: The interplay of chef competencies, environmental values and human resource management strategies

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ABSTRACT

Food waste reduction and lowering greenhouse gas emissions (GHGE) of diets are key focus areas of the food systems transition. Inspired by the ecological systems theory, this exploratory study assesses how chefs' competencies, environmental values, human resource management (HRM) practices interact in a microsystem to reduce food waste and GHGE of food offers. A participant selection framework was developed to explore four perspectives: kitchen, sustainability, industry support and catering education. Twenty-three stakeholders, 9 (39 %) chefs, 6 (26 %) industry stakeholders, 5 (22 %) chef educators and 3 (13 %) sustainability professionals in the sector were interviewed. While the study set out to examine the role of HRM in shaping environmental kitchen practices, the findings suggest that HRM does not directly influence behaviours related to food waste and GHGE reduction. Instead, kitchen leadership, as part of the microsystem, where daily interactions and operational decisions occur, emerges as a potentially more influential factor. Within this immediate environment, daily interactions and skill application, such as culinary techniques, product knowledge, logistics, creativity, and innovation, play a central role in shaping sustainable practices. These competencies not only support operational efficiency but also foster entrepreneurial thinking. While broader societal discourse reflects a macrosystem shift in environmental attitudes, the study stresses the need to translate this awareness into applied skills within the microsystem, where behaviour change is most effectively enacted.

1. Introduction

There are emerging sustainable practices, such as food waste, energy, and water management, in the Hospitality and Food Service (HaFS) sector due to increased environmental awareness (Robinson et al., 2024). Academics and activists are calling for food systems transformation to reduce environmental impacts (Filimonau et al., 2023; Seo et al., 2023). This is because how food is produced, transported, processed, consumed, and disposed of has the potential to increase or decrease greenhouse gas emissions (GHGE) in the food system (Willett et al., 2019). Two significant components of possible HaFS GHGE reductions are decreasing and preventing food waste, as well as ingredient selection and food offer change. A 29–70 % GHGE reduction potential for a global dietary shift in line with current healthy eating guidelines was found by Springmann et al. (2016). Speck et al. (2022) estimated recipe reformulation and food offer change could reduce GHGE by 44 %

in the German catering sector.

Food waste has been associated with 4.9 MtCO₂e. emissions in the German catering industry (Meier et al., 2021). Total global food waste in the HaFS Industry is estimated to be 244 Mt (United Nations Environment Programme, 2021) per year, with 19 % of this avoidable (FAO, 2019). Data for HaFS food waste has been described as difficult to model because current data sources are limited due to a lack of consistent and reliable data sources (WRAP, 2023a). However, total food waste in the UK was estimated to be 10.7 Mt in 2021, of which 10 % is estimated to be associated with HaFS (Malik et al., 2024). Total UK food waste accounts for around 36 MtCO₂e. (WRAP, 2021). Thus, research into food waste reduction in HaFS (Filimonau et al., 2017, 2023; Filimonau et al., 2024; Ko and Lu, 2021) and on reducing GHGE in food businesses through food offer change (Guimarães et al., 2024) is an increasing area of research.

Nevertheless, limited research has investigated their intersection:

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how chefs can jointly change the food offers to prevent food waste and reduce GHGE in HaFS. This is surprising considering their synergetic impact on the environment and potential coherence of their solutions are connected. This research project explores food waste and GHGE of food as interconnected environmental entities in a broader food system. Both can be influenced by food offers and menu design (Filimonau et al., 2017).

The largest contributor of GHGE and tonnage of food waste in the UK is households; still, reducing food waste in the hospitality sector is seen as essential in reducing the overall GHGE associated with the sector (Jeswani et al., 2021; WRAP, 2023b). A recent UK food waste update states HaFS lags progress in other sectors (WRAP, 2023a). HaFS needs to reduce food waste by 58 % by 2030, equating to 8.7kg/person reductions to achieve the Courtauld targets (WRAP, 2023a).

In HaFS businesses such as institutional catering, private catering, restaurants or hotels, chefs contribute to the food offer and menu design (Coskun et al., 2023). In recent years, sustainable menu design and recipe reformulation have become increasingly of interest to academics (Benvenuti et al., 2016; Edalati et al., 2021; Filimonau et al., 2017; Filimonau and Krivcova, 2017; Oruçoğlu et al., 2024; Speck et al., 2022). Filimonau et al. (2017) argue that menu reformulation towards greater sustainability requires managers and consumers to understand the impact of GHGE; accordingly, chefs are not the only stakeholders responsible for shifting menus and food offers. Pollicino et al. (2024) reviewed 90 behavioural change techniques for the food service industry, which could help to transform menus towards healthy and sustainable food choices. Their findings are structured under six themes: product, presentation, people, promotion, price, and placement. Three of the recommended product techniques and the only recommended technique in the people themes are directly linked to menu curation and the role of chefs (4 out of 15 recommended techniques).

One of the four behavioural techniques linked to chefs recommended by Pollicino et al. (2024) suggests that chefs' training is a relevant strategy to drive forward other methods, such as those in the product change strategy's theme. Others have researched how kitchen brigades and chefs can support food waste reductions in HaFS, and there is evidence for multiple access points for practice change (Chawla et al., 2022; Chawla and Lugosi, 2025; Filimonau et al., 2024). Some anchor the opportunity in innovation and creativity (Sezerel et al., 2025) others in 'green' transformational leadership (Filimonau et al., 2024) as well as the environmental habitus of chefs (Bhaskara et al., 2024). This suggests that exploring the specific context in which chefs make sense of food waste and GHGE reduction could help uncover opportunities for transformational change.

Zick et al. (2024) used Bronfenbrenner's ecological systems theory in a review of other research linked to GHGE and chefs to map systems' dimensions. In this conceptual exploration of previous studies, the chef's workplace was situated within the microsystems dimension. Filimonau et al. (Filimonau et al., 2024a) previously employed Bronfenbrenner's work to assess how chefs develop practices to manage food waste. However, their study framed the microsystem around personal relationships with friends, family members, and schooling. This explorative study challenges their boundary and argues that the microsystem should encompass workplace relationships, as other academic evidence suggests that HaFS, particularly kitchen brigades, could be understood as communities of practice (de Oliveira et al., 2024). The findings of Filimonau et al. (2024a,b) enrich the understanding of habit formation, but the boundary setting does not consider the impact of shifts in personal relationships when individuals enter permanent workplaces and other meaningful communities away from work and family life (Pocock et al., 2012), nor the effect of key life events in adulthood, such as parenthood (Ashton et al., 2024). Work habits may be underpinned by patterns formed in early development through family members, carers or schooling. Once individuals step into the workplace, the formation of habits may not only be reinforced, but new habits can also be established; these practice formations are contextual and gendered (Ashton

et al., 2024). Filimonau et al. (2024a,b), however, highlight the importance of competencies and skills development of chefs. Thus, exploring chefs' skills and competency linked to food waste and GHGE reduction within the extended microsystem described by Zick et al. (2024) may further the understanding of actionable pathways for food systems transformation.

2. Methods

The following section outlines the theoretical development of the research question and previous research that links to it. This is followed by a description of the participant selection framework, the participant recruitment, and the analysis of the stakeholder interviews.

2.1. Theoretical development

This research is part of a broader project that explores chefs' experiences transitioning to food offers with reduced food waste and GHGE. In this study, the chefs' microsystems interactions were explicitly explored. Human Resource management (HRM) strategies are understood as curators of social norms in businesses (Tuan, 2022; Umrani et al., 2022). Chefs' competencies and skills are their capacity to have the agency to act on the desired behaviours (reducing food waste and GHGE) (Filimonau et al., 2023) and environmental values as the precursor for the beliefs about these behaviours (Haldorai et al., 2024). Thus, the interactions between HRM, chefs' competencies, skills and environmental values are framed by Ajzen's Theory of Planned Behaviour (TPB) (Yuriev et al., 2020).

Suhairom et al. (2019) outline six chef capacity dimensions: Technical, Non-Technical, Personal Quality, Self-Concept, Physical State, and Motives, highlighting the broad skillset required. These dimensions reflect a holistic view of competency, defined as a constellation of knowledge, skills, abilities, and personal attributes that enable superior performance. Skills are framed as both technical (e.g., culinary techniques, costing, hygiene) and non-technical (e.g., communication, leadership), while knowledge encompasses culinary science, nutrition, and cultural understanding (Suhairom et al., 2019). Competencies are further distinguished as either threshold (basic job requirements) or differentiating (attributes of high performers), suggesting that both visible (skills and knowledge) and hidden (motives, self-concept) elements interact to shape professional effectiveness (Suhairom et al., 2019). However, which of these support food waste and GHGE reduction remains unclear. Franchini et al. (2024) found culinary students had good nutrition knowledge but limited sustainability knowledge, which improved with training but remained lower than nutrition knowledge. Ko and Lu (2021) developed a competence scale to assess how training improves hospitality students' food waste reduction skills. In this study, skills are seen as applied knowledge developed through iterative learning, aligning with Fischer's dynamic skills theory (Fischer, 2009), which describes a reciprocal relationship where knowledge and skills reinforce each other.

Chefs are one part of the wider staff within HaFS. Previous literature has focused on broader HRM practices and their link to the environmental management of service organisations (Tanova and Bayighomog, 2022), suggesting that modern HRM goes beyond traditional personal management and considers organisations' broader strategic goals, including ecological sustainability; this can be achieved through corporate social responsibility (CSR) roles and practices.

Stahl et al. (2020) highlight tensions between HRM and CSR, rooted in their differing stakeholder focuses; HRM prioritizes internal needs, while CSR targets external ones. (Ma et al., 2024) found CSR practices positively impacted food waste reduction in Chinese hotels. Zientara and Zamojska (2018) argue that strong environmental performance requires employee engagement fostered through a shared green organisational climate. However, there is limited research on how CSR and HRM practices in the HaFS sector influence chefs' pro-environmental

behaviours and adoption of food waste and GHGE reduction practices.

Some studies suggest that green HRM (Suleman et al., 2025) and green transformational leadership, specifically supervisor support, can increase pro-environmental behaviours such as better food waste management (Filimonau et al., 2024). Green organisational climate augments green transformational leadership (Filimonau et al., 2024). Thus, organisational culture and values play a role in reducing food waste and potentially GHGE reduction efforts. Strategic HRM could, therefore, help curate a green organisational climate. A systematic review also found limited published evidence linked to green human resource practices for restaurants and small and medium enterprises in Europe, and a potential gap in theoretical frames related to the TPB (Suleman et al., 2025).

HRM can be framed as a set of organisational practices and managerial strategies that influence employee behaviour, particularly in relation to environmental sustainability, which may impact the chefs' ability to engage with food waste and GHGE reduction practices (Zientara and Zamojska, 2018). For this study, these could include recruitment criteria, environmental training, internal communication focusing on food waste and GHGE, creating environmental policies, strategic CSR, such as setting environmental performance targets and incentivising practices, amongst others. This study is explorative therefore, the choice of HRM as a broad category was intentional to allow participants to share any such practices and strategies.

The exploration of environmental values in this study builds on the value theory of Bouman et al. (2018), who associate a specific set of human values to climate action and Bergman (1998), who links human values to beliefs, behaviours and attitudes and argues beliefs, behaviours and attitudes are modulated by the context and social group of people. A systematic review of green HRM practices (Suleman et al., 2025) suggests that personality traits and values have been implicated in environmental behaviours, linking HMR practices with environmental values.

Environmental values, chefs' competencies, skills, and HRM practices can be the focus of individual research assessments. Here, they are seen as interconnected by curating the microsystem in which food waste and GHGE reduction practices are carried out. Participants were required to help illuminate perspectives linked to sustainability, education in HaFS, kitchen, and industry perspectives.

This study is exploring the microsystem in which chefs are reducing food waste and GHGE alongside wider industry stakeholders. Despite being a key actor in HaFS, chefs' voices are rarely considered in academic research. Previous studies have ascribed this to limited access to chefs due to a lack of time and resources (Fooladi et al., 2019). This project engaged with sector actors through 23 semi-structured interviews to scope UK HaFS views on 1) culinary skills, 2) environmental values of chefs and 3) HRM practices and strategies which are believed to shape the microsystem in which chefs operate.

The research questions of this study were:

RQ1: If and which competencies and skills of chefs are linked to the reduction of food waste and GHGE of food offers in catering, and if stakeholders observed those?

RQ2: To understand if and how HaFS stakeholders have observed the environmental values of chefs.

RQ3: Do HaFS stakeholders perceive HRM strategies as enabling environmental behaviours? How are HRM strategies influencing businesses' sustainability ambitions?

RQ4: Do HRM strategies, environmental values, and chef competencies and skills play a role in a microsystem involved in the creation of food offers with reduced food waste and GHGE?

Fig. 1 visualises a proposed microsystems pathway, which will be explored with this study, linked to RQ4.

The literature indicates that chef competencies, skills, environmental values and HRM strategies and practices could influence chefs' food

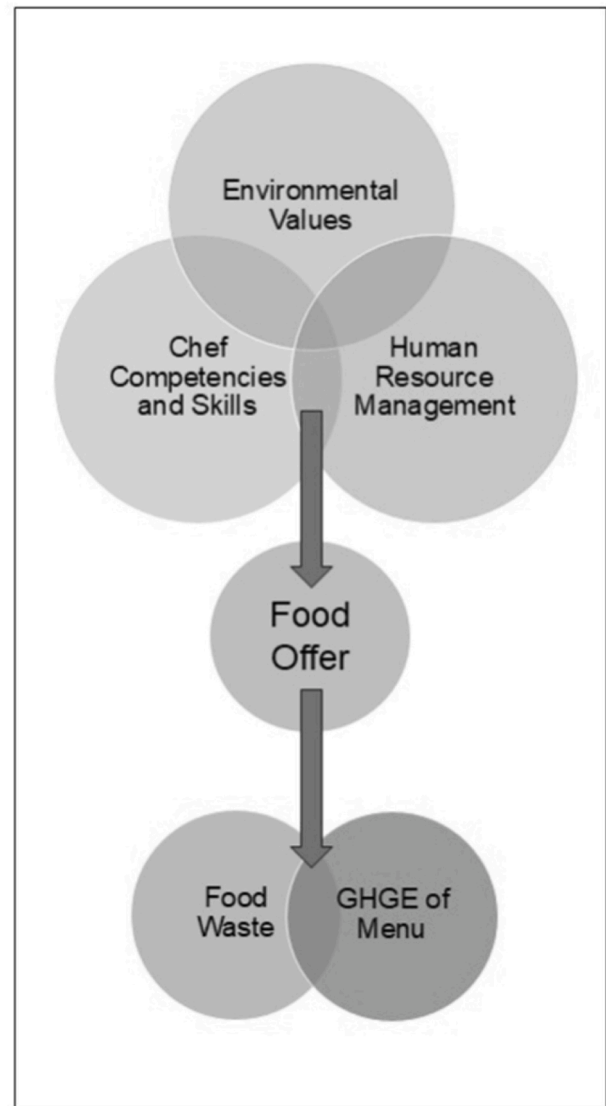


Fig. 1. Simplified proposed microsystem interaction.

waste and GHGE reduction behaviours and work synergistically. The paper develops a theoretical, conceptual framework of the microsystem to explore the potential for these three factors to shape the creation of food offers and menu engineering, which could have implications for food waste and food-associated GHGE. It further describes a participant selection framework for interviewing stakeholders to explore the competencies and skills of chefs, environmental values, and HRM management strategies. The findings were reviewed against the recommendations of Yuriev et al. (2020) to understand whether the proposed model could be studied further with the TPB.

2.2. Participant selection framework

A framework for stakeholder selection was developed to gain insights into these four perspectives: kitchen, sustainability, HaFS education, and industry support. This approach was taken to reduce the potential of selection bias among non-respondents and respondents unaware of the themes relevant to this research (Karatsareas, 2022). Bronfenbrenner's ecological systems theory inspires the framework (Bronfenbrenner, 1995) and acknowledges that the positionality of each stakeholder leads to blind spots in their awareness of the microsystem's interactions. By consciously selecting stakeholders who are working with chefs from

different angles, it is hoped these blind spots can be minimised beyond the underlying purposive sampling method.

To ensure rich, relevant and diverse insights (Moser and Korstjens, 2018) participants were selected based on the following criteria:

- A. Professionals working in organisations (e.g. trade bodies, NGOs, consultancies) that engage with HaFS and chefs, established for at least two years.
- B. Sustainability professionals supporting chefs in reducing environmental impacts, with a minimum of two years experience.
- C. Practising chefs with at least two years of professional experience.
- D. Chef educators or trainers with a minimum of two years in the role.
- E. All participants had to be over the age of 18.

A diverse representation of the industry was sought, with participants of varying gender expressions and cultural identities invited, because intersectionality may shape lived experiences and influence thematic framing (Netto et al., 2020; Rodriguez et al., 2024). To mitigate sampling bias, efforts were made to recruit participants of different gender identities, ethnic backgrounds, and sector tenure. Given persistent gender disparities in professional kitchens (Ashton et al., 2024; Temizkan and Uslu, 2023), a target of 40–45 % female representation was set.

Detailed participant selection criteria can be found in the Supplementary Information (SI), Appendix A.

Fig. 2 is a simplified visualisation of the selection criteria. Additionally, age, gender, cultural identity, sector perspective and length in the industry were taken into consideration.

2.3. Interview development and implementation

Semi-structured interviews were chosen to explore the participants' ideas of culinary skills linked to a reduction of food waste and GHGE, environmental values and HMR. To the authors' knowledge, these three concepts have not previously been linked jointly with food waste and GHGE reduction in catering. Semi-structured interviews are a frequent method at early research stages to test assumptions and concepts (Kallio et al., 2016). Research on semi-structured interview methods suggests

that most stakeholder interview processes reach saturation regarding key themes between 9 and 17 (Wutich et al., 2024). For this research, the higher end of the range, ~20 interviews, was chosen as a minimum.

A semi-structured interview guide draft was created by the lead researcher, inspired by the five steps by Kallio et al. (2016) and considers the thought journey of the participants by building on each theme. This guide was critiqued by the research team, resulting in the guide in the SI, Appendix B. The opening set of questions allowed participants to describe their cultural identity, role, length of work experience and how they work in the sector with chefs. The questions were open-ended to allow for some ambiguity in responses and encourage sharing of broader narratives. The 23 semi-structured interviews were conducted in May and July 2023 the principal researcher, with ethical approval from Brunel University (41620-LR-Apr/2023- 44713-3).

2.4. Participant recruitment

Participants were recruited purposively through personal and wider industry networks in the UK. A detailed description of the recruitment process and distribution of participants can be found in SI.

2.5. Data analysis

Interviews were recorded, transcribed with Microsoft Teams, and stored on the university cloud drive for data security. The transcripts were reviewed and anonymised. Unique participant codes were given to each contributor. The names of businesses or people mentioned in the interview were anonymised. (If a named restaurant was mentioned, it would become a descriptive reference such as 'an Italian fine dining restaurant in London'. If a particular industry stakeholder was mentioned, it would become, for example, a male chef advocating for zero-waste restaurants, etc.). Transcripts were corrected, and duplicate words in a sentence were removed for clarity.

Descriptive data of the participant identifiers, such as length in industry, role, and gender identity, were taken from the conversation and recorded in an interview tracker. Transcripts were thematically analysed using NVivo 12.6.1.970.

Three rounds of coding were carried out, participant group by

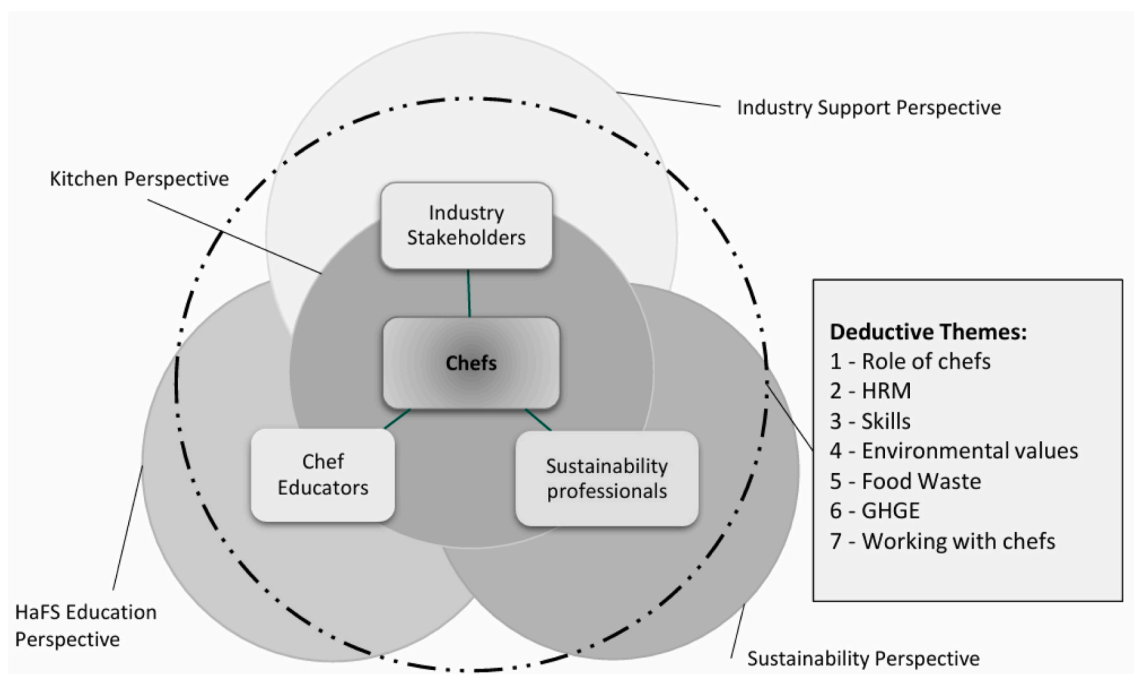


Fig. 2. Visual representation of participant selection framework.

participant group, in chronological order. Categories for themes were created to analyse deductive and inductive themes (IT). Seven deductive themes (DT) or interview dimensions were defined in the interview guide (Appendix B): the role of chefs, environmental values, chefs' competencies, skills, HRM, food waste, GHGE, and working with chefs' best practices (see Table 1). IT were captured whilst reviewing the interviews. If participants spoke about competencies and skills in other interview segments, this was noted and added under DT skills. Thirty-one IT were created based on recurring topics from participants.

The culinary workforce competencies framework developed by Suhairom et al. (2019) was used to code skills and competencies mentioned by the participants thematically.

A full criteria list for reporting qualitative research (Tong et al., 2007) can be found in the SI, Appendix E.

3. Results

This section presents the descriptive results followed by the qualitative results. The latter are presented in reference to the research questions.

3.1. Descriptive results

The researcher contacted 49 stakeholders. 23 (47 %) interviews took place. The highest proportion of interview contributors were chefs, 9 (39 %), followed by industry stakeholders, 6 (26 %), educators, 5 (22 %) and sustainability professionals, 3 (13 %). A detailed breakdown of the

descriptive results of this study can be found in the SI, Appendix C.

3.2. Qualitative results

Table 1 lists seven DTs. For each DT, IT extracted from the records of the interviews are recorded below. A total of 38 IT were extracted after two rounds of coding. Quotes from participants as examples for each of these 38 themes are presented in the SI, Appendix D. After quantitatively reviewing the 38 IT, seven were removed because they had received less than 20 % of the responses for the respective DT. Thus, 31 IT are presented here from seven different interview dimensions. The following section summarises the key findings for each DT.

The thematic analysis of the culinary skills and competencies used the framework developed by Suhairom et al. (2019) to guide the core categories. Five competency categories from Suhairom et al. (2019) were found to be linked to food waste and GHGE reduction, four technical and one non-technical category. Thirteen inductive subthemes for those five culinary competencies emerged in the thematic coding. These are displayed in Table 2.

3.3. RQ1 - *If and which competencies and skills of chefs are linked to the reduction of food waste and GHGE of food offers in catering, and if stakeholders have observed those?*

Education and training were seen as vital for successful chef careers, especially in commercial kitchens. Participants highlighted varied learning paths such as formal education, self-training, and international

Table 1

Inductive themes (IT) extracted from each interview dimension. Specific quotes related to these themes can be found in the SI, Appendix D. N of participants using IT as framing.

Chefs' skills	Food waste	Greenhouse gas emissions (GHGE)	Environmental values	Human resource management (HRM)	Role of chefs	Working with chefs - best practice
Advanced skills: Analytical, communication, people management, and menu engineering are essential in later careers linked to food waste and GHGE. (N8 = 35 %)	Increase of food prices - Drive action, not always understood as GHGE impact. (N9 = 39 %)	Linked to food offer planning - Management, procurement, menus, senior chefs responsible. (N11 = 48 %)	Increased environmental knowledge and awareness in society and sector. (N13 = 57 %)	Participants linked HRM with CSR as a strategic aim, predominantly through social responsibility for staff. (N12 = 52 %)	Cook tasty food and transform ingredients. (N18 = 78 %)	In-person - Technology is more common in senior roles, and in-person interaction is most effective. (N15 = 65 %)
Skills and knowledge foundations vary - UK and international colleges, self-trained, no standard CPD for chefs, grew up with a link to farming or in cities. (N8 = 35 %)	Responsibility business dependent - Sustainability manager, restaurant management, head chef. (N7 = 30 %)	Impact of livestock production - Plant-based is referred to as lower GHGE, but livestock is essential to fertilise the soil. (N10 = 43 %)	Drivers are linked to traditional chef values - seasonality and quest for the best produce. (N13 = 57 %)	HRM reach and scope are business-dependent and can be non-existent. (N10 = 43 %)	Different chef identities: chef manager, chef-owner, media chef, freelance chef, entrepreneur chef, line chef, development chef, identities vary in subsectors. (N12 = 52 %)	Competitive and collaborative - engage in friendly competition and enjoy collaborative working. (N12 = 52 %)
Basic, fundamental skills - Cooking methods, knife and ingredient skills, necessary at the start, linked to food waste, possibly to GHGE. (N7 = 30 %)	Opportunity to innovate and USP - Allows creative thinking, tangible and marketable. (N6 = 26 %)	Energy consumption - Use of equipment, transport efficiency and green energy - driven by cost. (N9 = 39 %)	Enablers vary depending on business, catering vs hotel vs restaurant. (N13 = 57 %)	Catering struggle and recruitment crisis - Learning and development, wage increases and benefits used to counter the lack of chefs. (N6 = 26 %)	Develop menus - creators and inventors of food offers. (N8 + 35 %)	Shared decision making - Involvement in change is expected and needed. (N11 = 48 %)
Participants grapple with whether skills are applied knowledge. (N6 = 26 %)		Local vs. global - Local and seasonal are seen as key variables; grow your own. (N9 = 39 %)	External influence - Management, customers, accreditations. (N13 = 57 %)		The role changed from invisible to visible and from authoritative to empathetic leader. (N7 = 30 %)	Attention span - Limited head space in business; ADHD is common in kitchen teams. (N10 = 43 %)
Skills decline - Ingredient knowledge, fundamental skills, linked to the recruitment crisis, possibly to the standardisation and specialisation of businesses. (N6 = 26 %)		Recycling and packaging - Reduced packaging, circular thinking. (N5 = 22 %)	Reference to pro-environmental behaviours and attitudes, but not values. (N6 = 26 %)		Manage logistics of food preparation - food safety, procurement, stock keeping. (N6 = 26 %)	Time famine of chefs - Busy, but also attached to an image of being busy. (N9 = 39 %)

Table 2
Summary of thematic analysis of culinary competencies for food waste and GHGE reduction.

Competency Category ^a	Technical ^a	Technical ^a	Technical ^a	Technical ^a	Non-technical ^a
	Threshold Competencies		Differentiating competencies		
Culinary competency ^a	'Mastery of culinary techniques' ^a & 'culinary products knowledge-wise' ^a (36 quotes)	Catering services and operations ^a (Logistics) (8 quotes)	Creativity ^a (8 quotes)	Innovation ^a (14 quotes)	Entrepreneurship ^a (3 or 18 % quotes)
Inductive sub-theme for competency	Food knowledge and menu engineering (15 = 42 % quotes)	Application of logistical/operational skills lowers resource use. (7 = 88 % quotes)	Re-use and re-purpose of ingredients (2 = 22 % quotes)	Production methods and storytelling (6 = 43 % quotes)	N/A
Inductive sub-theme for competency	System's thinking (11 = 31 % quotes)	Lack of logistical/operational skills leads to food waste. (1 = 13 % quotes)	Marketing (2 = 22 % quotes)	Traditional skills reimagined and storytelling. (6 = 43 % quotes)	N/A
Inductive sub-theme for competency	Lack of knowledge of GHGE (6 = 17 % quotes)	N/A	Recipe development and learning (2 = 22 % quotes)	Use of new technology (2 = 14 % quotes)	N/A
Inductive sub-theme for competency	Cooking technique (4 = 11 % quotes)	N/A	Research and curiosity (2 = 22 % quotes)	N/A	

^a Culinary competency category and subthemes adapted from [Suhairom et al. \(2019\)](#). The classification into threshold and differentiating competencies highlights how foundational skills support daily operations, while advanced competencies enable strategic innovation. These categories and subthemes collectively illustrate the multifaceted role of chefs in sustainability transitions.

standards, emphasising the need for continuous skill development. Key competencies linked to fundamental skills included cooking techniques and ingredient handling, whereas menu planning and broader skills such as communication and management were framed as advanced skills. Concerns were raised about declining fundamental skills and ingredient knowledge, partly due to recruitment issues and industry changes. Challenges included the lack of standardised professional development, integrating sustainability into training, and adapting to evolving technologies and business models.

Unexpectedly, participants appeared to grapple with the difference between skills and knowledge.

IS-001-F - *Somebody needs to take that theory and say, OK, I can see today or yesterday you did your e-learning module on knife skills. Let's go through it and do it practically. And you do that once with someone and they'll remember it.*

When discussing food waste reduction, participants highlighted innovation, role-specific responsibilities, and the importance of food offer planning. Rising food prices, driven by inflation and energy costs, were linked to menu adjustments and a stronger focus on waste reduction. Chefs often used creative strategies to repurpose surplus ingredients, driven by the need for innovation and market differentiation. Practices like accurate ordering and repurposing helped reduce both visible and invisible waste, with responsibility shared among chefs, managers, and sustainability leads.

Efficient menu design, use of offcuts, and balancing waste reduction with other priorities, such as food safety, productivity, and procurement, were recurring themes. Broader sustainability concerns included energy use, sourcing, livestock impacts, packaging, and transport.

ED-004-M - *However, fresh stuff, you 86ing (removing an item from the menu), if you have 20 portions, ideally you sell all 20 portions, you've got no wastage when you're preparing something. What can you do with the offcuts and how smartly and how efficiently can you use those because they're paid for when you cost out your prime cuts for what you're doing, what do you do with the offcuts that are now paid for ...*

Some participants spoke about GHGE whilst referring to food waste, but there was uncertainty about that link.

CH-004-M - (What do you know about GHGE reductions or reduction efforts associated with menus?) *but you know to be honest I don't really know the question to answer it but I believe you know if we separate the food already in bins and the oil and all this I'm sure this might reduce already the percentage of it.*

Cost-saving measures like green energy and local sourcing were common, with examples such as carbon-neutral operations and rooftop gardens. While plant-based diets were linked to lower emissions, some acknowledged the environmental role of livestock.

IS-004-M - *in terms of greenhouse gas emission reductions, I mean a huge impact of that is of course the meat that people are serving.*

The inductive analysis of skills linked to food waste and GHGE reduction supports that the transformation of menus toward sustainability requires a combination of both technical and non-technical competencies. Key technical skills include in-depth food knowledge, menu engineering, systems thinking, and logistical and operational expertise. Complementing these are essential non-technical attributes such as creativity, curiosity, and a strong drive for innovation. These capabilities collectively enable practices like ingredient repurposing and the design of low-waste menus. Together, they support more sustainable food planning and informed operational decision-making across the culinary sector.

Overall, there is a growing awareness among chefs and procurement teams of the need to integrate sustainability into menu planning. However, there are also misconceptions about the impact of different actions, with many focusing on the distance of transport, reducing packaging or the energy used in cooking.

3.4. RQ2 - To understand if and how HaFS stakeholders have observed the environmental values of chefs

Participants found it challenging to articulate environmental values, as these are deeply personal, but they did report a noticeable rise in environmental attitudes and behaviours within the culinary sector. This shift is reflected in practices like zero-waste initiatives, local sourcing, and seasonal menus. Influences such as education, media, customer expectations, and cost pressures were seen as key drivers. Traditional chef values, such as 'chefsmanship', like seasonality and pursuit of quality, were often aligned with sustainability. Sustainability was seen as a space for innovation. Environmental practices varied across catering sectors, shaped by business models, customer demands, and external pressures like net-zero goals and industry standards.

SM-001-F - *So, I think if we separate like behaviour and actions that chefs can do, you've got kind of in-kitchen practices. So, you've got like energy awareness or water awareness, but also like food waste awareness. So not just measuring and monitoring food waste, but that kind of careful*

stock management. You know, some chefs are much better than others at that stuff.

3.5. RQ3 - Do HaFS stakeholders perceive HRM strategies as enabling environmental behaviours? How are HRM strategies influencing businesses' sustainability ambitions?

While participants acknowledged HRM's role in employee well-being, recruitment, and improving working conditions, especially post-COVID, there was little direct connection made between HRM and food waste or GHGE reduction. Challenges such as limited HR support, resource constraints, and staff retention were common, particularly in smaller establishments. Although some saw the potential for HRM to support sustainability only a few explicitly linked HRM practices to environmental outcomes, suggesting this remains an untapped area for environmental sustainability.

CH-006-M - *They could work together with, H.R. too, because (...) you can't depend on one person being the head chef to implement that. There's no way the head chef got way too much to be doing, and so it has to be (...) formally put together between (...) the owners, the head chef, if whoever is in (...) charge of H.R., I mean, it has to be a team effort and everyone needs to agree and buy into what people are doing and (...) understand why it's a problem. Because again, like if you don't understand why it's a problem, then why would you care about doing anything about it?*

3.6. RQ4 - Do HRM strategies, environmental values, and chef competencies and skills play a role in a microsystem involved in the creation of food offers with reduced food waste and GHGE?

The thematic analysis suggests that while HRM strategies operate at the exosystem level, shaping policies and structures, they do not directly influence the microsystem interactions within kitchens that drive food waste and GHGE reduction. Instead, chef competencies and skills, embedded in daily kitchen routines and interpersonal dynamics, appear more influential in shaping sustainable menu practices.

Although environmental values could not be assessed through semi-structured interviews, increased environmental attitudes and behaviours were reported, likely reflecting a macrosystem-level shift in societal discourse. Chefs today balance culinary creativity with administrative, leadership, and even marketing responsibilities, reflecting a shift toward more visible and multifaceted professional identities. This evolving role of chefs, balancing creativity, leadership, and administrative tasks, illustrates the complexity of the microsystem, where professional identity and practical constraints intersect. The emergence of empathetic leadership and the challenge of "time famine" highlight the need for interventions that are practical, time-efficient, and visually engaging, tailored to the realities of kitchen environments and the multifaceted roles chefs now occupy.

4. Discussion

The discussion will review the results of this study in the order of the research questions and link those back to the proposed microsystems model. First, the role of chefs' competencies and skills in food waste and GHGE reduction will be discussed, followed by environmental values, HRM strategies and their impact on food waste and GHGE. In the final section, the proposed theoretical microsystems model will be revised based on the insights from this research.

Overall, the interviews confirmed that there are competencies and skills that enhance chefs' capacity to shift food offers and reduce food waste and GHGE in catering. However, this was challenged by some participants who perceived that the lack of environmental behaviours is rooted in missing knowledge rather than skills. The interviews

confirmed competencies and skills as a relevant contributor to reduction efforts in food waste and GHGE. However, the competencies, including skills and knowledge levels of chefs linked to food waste and GHGE, differ.

The unexpected emphasis on knowledge over skills may reflect a shift toward broader capacity frameworks that encompass the qualities needed for a role. This aligns with [Wheelahan et al. \(2022\)](#), who argue that skills policy is shaped by human capital theory, which commodifies worker capabilities. As a result, skills and knowledge perceived to add business value are prioritized in training and awareness. Since environmental behaviours may not always yield immediate business benefits and can even incur costs ([Jacobs and Klose, 2016](#); [Zanella, 2020](#)), they may not be recognised or developed as 'skills and competencies' contributing to this disconnect.

We will briefly summarise how academia conceptualises the difference between skills and knowledge and how they are connected. Fischer's skill theory describes how cognition and environmental experiences interact to develop skills ([Fischer, 2009](#)). As cognition develops with age, skills are dynamic and evolve throughout life. This suggests there is an interaction between knowledge and skill; this interaction is dynamic, and with new knowledge, new skills can be developed, but equally, these skills can contribute to new knowledge. This is further supported by the experiential learning theory first proposed by Kolb ([Azar et al., 2020](#); [Ochago et al., 2024](#)).

[Fischer \(2009\)](#) argues that research questions often develop dynamically between research and practice, and this could explain why the research question was reinterpreted by the participants and actively challenged. As GHGE knowledge in food production is still emerging, it is unsurprising that catering practices and related skills are underdeveloped. [Franchini et al. \(2024\)](#) delivered an educational intervention at a catering college in Italy. Participants referenced more skills linked to food waste reduction than GHGE reduction. Food waste reduction is a concept most participants would be more familiar with, given that food waste reduction helps to ensure profit margins. It is a concept that has been included in training for many decades. Some educators' feedback supported the idea that the teaching of environmental impacts of food, linked explicitly to GHGE, is only now being implemented and that the educational frameworks and standards required for chef NVQ levels have not been updated in the past decade. [Filimonau et al. \(2023\)](#) similarly observed that although awareness of food waste is growing, chefs lack the skills to address it. Recent ESG legislation may shift GHGE reduction into a value-adding skill, creating opportunities for research into how chefs interpret and apply this new knowledge. [Stam et al. \(2023\)](#) emphasise that learning is shaped by social context, reinforcing the need to understand how chefs develop skills and competencies within their working environments.

[Suhairom et al. \(2019\)](#) identified a set of competencies deemed essential for superior culinary performance, and while the UK City & Guilds skills standards in their data analysis were considered, the primary data collection (semi-structured interviews) was collected from Malaysian chefs. It was also not explicitly designed to explore the skills and competencies linked to food waste and GHGE reduction. Thus, it is unsurprising that not all six competency constructs: Technical, Non-Technical, Personal Quality, Self-Concept, Physical State, and Motives were mentioned in the context of food waste and GHGE reduction. However, the findings here fit into four of the subthemes under technical and into one of the subthemes for non-technical capacities. Five competency categories from [Suhairom et al. \(2019\)](#) were found to be linked to food waste and GHGE reduction, four technical and one non-technical. These categories reflect both foundational and advanced capacities, with threshold competencies supporting operational efficiency and differentiating competencies enabling strategic innovation. The emergence of thirteen inductive subthemes, such as systems thinking, menu engineering, and ingredient repurposing, demonstrates how these competencies interact to shape sustainable culinary practices. These subthemes also reveal how chefs navigate constraints and

opportunities within their microsystem, directly addressing RQ1 by illustrating the observed competencies that support environmental outcomes.

Suhairom et al.'s (2019) framework summarises competencies, not skills, and it supports the breadth of capacity requirements for chefs. They emphasise that a chef is an all-rounder in the hospitality industry who needs advanced culinary experience and food knowledge, which the participants of this study confirmed. Notably, the emergence of creativity and innovation as key themes aligns with Tang's (2017) distinction: creativity is associated with the generation of novel ideas, while innovation involves the application and implementation of those ideas in practice. This distinction is particularly relevant in sustainability contexts, where chefs must not only conceive new approaches to reduce waste but also operationalise them effectively. The subthemes identified here reinforce the need for diverse and synergistic competencies that enable chefs to transform food offers in ways that are both imaginative and impactful. Importantly, the classification into threshold and differentiating competencies provides a framework to understand how basic operational skills (e.g., logistics, culinary techniques) interact with higher-order capacities (e.g., creativity, innovation) to drive sustainability. This layered competency structure helps explain the mechanisms through which chefs enact change, linking directly to RQ1 and RQ4 by showing how these competencies operate within the microsystem and contribute to food waste and GHGE reduction.

Chefs are often time-scarce (Cerasa et al., 2020; Murray-Gibbons and Gibbons, 2007), as confirmed by this study's findings. Thus, space and opportunity for sense-making might be needed. Participatory research and systems change facilitation (Scharmer, 2016) could help chefs navigate the complex, sometimes conflicting goals of reducing food waste and GHGE, enabling them to adopt new narratives and apply this knowledge in practice.

Several researchers, including Liu-Lastres et al. (2023), Pratten (2003), Pratten and O'Leary, 2007 and Rydzik and Kissoon (2022), have examined the decline in culinary skills. Pratten and O'Leary, 2007 noted that the NVQ-level training content was already seen as inadequate at the time. Participants echo this, highlighting that many of the catering school courses remain outdated, with nutrition training, for example, offered only as optional enrichment rather than core curriculum.

The study identified five themes related to environmental beliefs, attitudes, and behaviours, but not value, with each theme mentioned by over 20 % of participants, except 'Opportunity to innovate and a USP', noted by only three. Unsurprisingly, pro-environmental behaviours, beliefs and attitudes were reported rather than 'values'. Pro-environmental beliefs and behaviours are thought to be underpinned by a set of intrinsic personal values (Bouman et al., 2018), which are consistent throughout a person's life. Biospheric (i.e., valuing the environment), altruistic (i.e., caring about the welfare of other people), egoistic (i.e., prioritising personal opportunities) and hedonic values (i.e., the desire to be comfortable) are most predictive of environmental beliefs and behaviours (Bouman et al., 2018). Thus, these dimensions of personal values could be understood as the core construct of one's environmental values. While prior studies have used validated tools like the European Values Study (2020) to assess such values, this study relied on semi-structured interviews focused on observed or recalled behaviours. To accurately assess environmental values, future research should use validated questionnaires rather than anecdotal accounts.

Bergman (1998) examined how attitudes, beliefs and values are defined and used across disciplines, noting that overlapping definitions can cause confusion. He argues that cognitive constructs and their evaluations shape attitudes, while values are stable and inert. The strength of an attitude, shaped by knowledge, curiosity and social relevance, affects behaviour and interacts with personal values. Beliefs and behaviours are co-constructed by individuals and their social groups. This suggests that examining chefs' beliefs, attitudes, and behaviours can help map the meanings and structures behind environmental actions in HaFS and highlight the role of external influences on

behavioural and attitudinal change.

Participants noted a rise in public environmental awareness, which may have strengthened chefs' pro-environmental attitudes, such as reducing food waste or GHGE. They observed that environmental issues are now more commonly discussed, suggesting growing attention to sustainability in the HaFS sector. Filimonau et al. (2023) support this, highlighting increased awareness and the role of corporate influence, arguing that action often depends on alignment with company policies. Given the slight gender imbalance in our sample (more male participants), it is worth noting that food waste behaviours can vary by gender (Ashton et al., 2024), possibly tempering the evidence of environmental attitudes and behaviours here.

Our results indicate that if environmental behaviours such as food waste and GHGE reduction can support taste and food quality, there is a greater likelihood for chefs to endorse such behaviours. These findings echo Pereira et al. (2019), who argue that by incorporating Indigenous knowledge and traditional foods into the food system, chefs can build more sustainable, equitable, and just food systems. The direct work of chefs and their social groups appears currently not to be curated towards environmental behaviours by HRM strategies, and the apparent gap in the understanding of embedded GHGE in foods is a further barrier to change.

Interviews revealed that management, customers, media, and industry accreditations strongly influence environmental behaviours. Yaris and Yazıcioglu (2022) found that adopting eco-friendly practices in restaurants depends on the interplay between attitudes and subjective norms. They argue that such practices thrive in supportive contexts; managers are more likely to adopt them when they are seen as financially beneficial or socially expected. This reinforces the idea that the context in which chefs operate is crucial for driving changes to reduce food waste and GHGE.

Nevertheless, the analysis does not support the proposed idea that HRM practices consistently support pro-environmental behaviours such as GHGE and food waste reduction in the sector. However, the 'social' dimension of CSR was seen as being promoted and supported by HRM. Ensuring compliance with legal requirements such as how to treat people, what minimum requirements are needed to work in kitchens, diverse and equitable recruitment, and staff welfare considerations were most participants' key reference points to HRM.

Ma et al. (2024) found that CSR in Chinese hotels directly influenced food waste reduction, driven by moral attitudes, employee admiration, and climate change awareness. However, participants in this study reported that HRM practices focused mainly on the social side of CSR, with little support for environmental goals. This aligns with Stahl et al. (2020), who highlight tensions between HRM and CSR due to differing stakeholder priorities, HRM focuses internally, while CSR looks outward. The staffing shortages and economic pressures noted by participants suggest HRM teams prioritized recruitment and employee well-being over environmental initiatives. Stahl et al. (2020) also observed that few HRM functions actively shape CSR practices, which reflects our findings.

Zientara and Zamojska (2018) propose organisations' environmental performance needs employee engagement. Most organisations improve their environmental performance through CSR strategies, which aim to increase staff's pro-environmental behaviours. Direct peers (i.e. the kitchen brigade) are the initial context of sense-making of environmental actions, but an organisation's policy and strategy can modulate this process. This is true for green organisational climate, i.e., the shared understanding of a business's commitment to environmental sustainability. This reflects the concept of this research, which is that the environmental values of chefs, HRM strategies, and chefs' competencies and skills are interlinked.

Participants revealed that HRM's role varies greatly among different business types in the HaFS sector. Kusluvan et al. (2010) cite the business model as the underlying reason for differences in HRM strategies in contract catering, hotels, independent restaurants, and businesses of

varying sizes. Sarwar et al. (2024) evidenced the divergence of HRM linked to CSR on environmental performance in hotels in the UK, Italy, and Pakistan. Sustainable performance was relatively stronger in 5-star hotels. However, three-star hotels performed better than 4-star hotels. Thus, comparing different types of HaFS businesses could help to understand and map where HRM currently support the environmental dimensions of CSR.

This study identified key chef competencies and skills that support food waste and GHGE reduction but found no consistent evidence that HRM strategies directly influence these behaviours. Due to methodological limitations, underlying environmental values were not captured, though an increase in pro-environmental attitudes and behaviours was reported.

Yuriev et al. (2020) propose a roadmap for applying the TPB, which raises questions about its suitability for exploring broad outcomes like food waste and GHGE reduction. More targeted behavioural variables, such as the 'intention to reuse by-products' or 'increase plant-based dishes', may be more appropriate to test TPB. Thus, the model (Fig. 3) has been adapted to behaviours and attitudes rather than environmental values. Given that some participants questioned whether skills or knowledge gaps hinder pro-environmental action, integrating dynamic skills or experiential learning theory could help explain context-specific behaviours and how abstract concepts like embedded GHGE translate into menu design. We found that there was no consistent understanding of embedded GHGE; thus, Chawla and Lugosi's (2025) insights might help explain why there were fewer GHGE reduction behaviours observed. The lack of shared understanding around GHGE may also limit the shared value and purpose of menu reformulations. Without that,

chefs may not be in a position to develop this practice. Finally, the perceived disconnect between HRM strategies and kitchen-level behaviours suggests that while HRM operates at the mesosystem level, kitchen team dynamics and leadership (Filimonau et al., 2024) are more likely to shape the microsystem where social norms are formed thus, the work of Ashton et al. (2024) on interactions of different systems boundaries could be helpful to develop the revised model Fig. 3 further.

5. Study limitations

This is a cross-sectional study carried out in the UK, which relied on professional and personal networks, and thus, the findings might contain selection bias, are not globally representative and temporal. While these reflect the views of people in the UK sector at the time of the study, new themes and priorities are emerging. Recruitment was time-intensive, with 9 stakeholders declining, 9 not responding, and 8 recommending others. Time constraints, and lack of interest were barriers. Scheduling interviews with chefs was particularly difficult due to their demanding work schedules and limited availability. Although most interviews were conducted online via Microsoft Teams, some were interrupted by colleagues, which may have affected the depth of responses. These interruptions, along with the variability in interview settings (e.g., kitchens, offices, homes), introduced inconsistencies in data collection. It was also difficult accessing sustainability professionals, whose roles are relatively new and less prevalent in the sector. These factors may have shaped the scope and depth of the data collected. Thus, future studies may wish to review how these insights stack up over time and potentially create more longitudinal insights to understand changes over

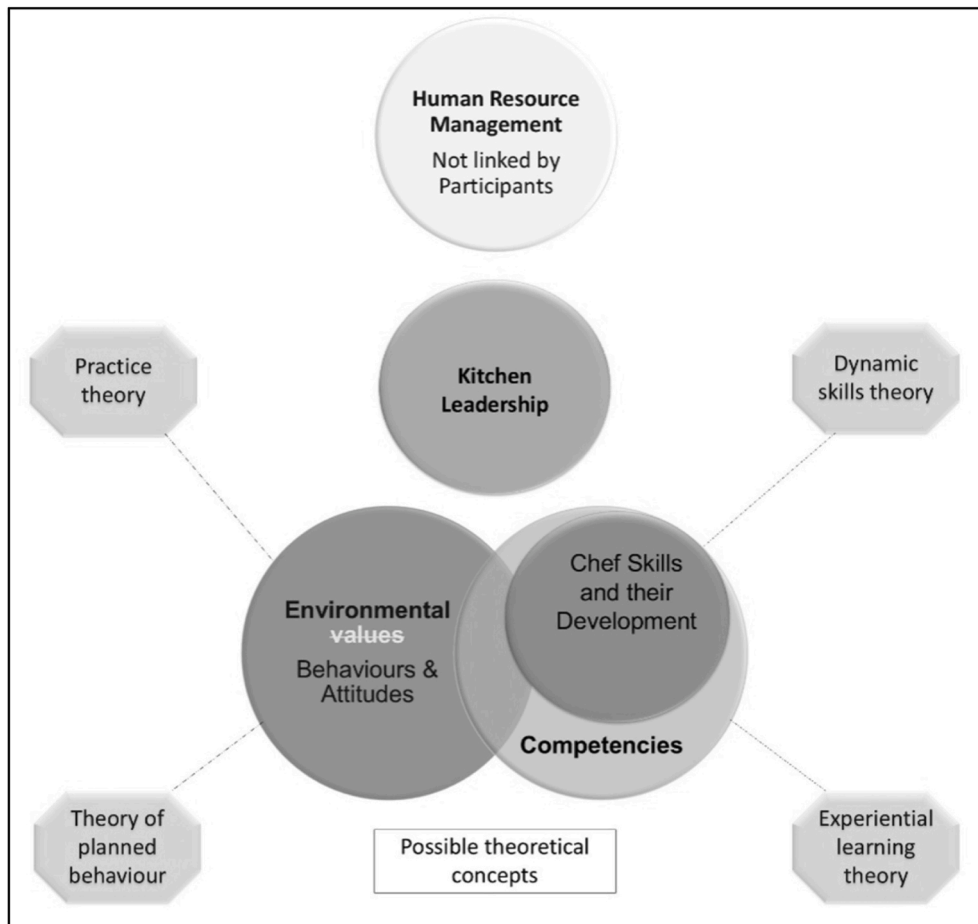


Fig. 3. Revised microsystems model – 1) the disconnect between HRM strategies (at the meso-system level) and kitchen-level behaviours (at the microsystem).2 The replacement of environmental values with environmental behaviours and attitudes.

time.

Others have reported that gender influences sustainable practices (Ashton et al., 2024). This study had a higher proportion of people identifying as male (57 %), which may have influenced the types of practices and attitudes reported. Given persistent gender disparities in professional kitchens and evidence that women may approach sustainability differently, gender should be considered a relevant factor in future research. A more balanced sample could help uncover gendered dimensions of environmental behaviours and competencies.

While the study reached thematic saturation across most interview dimensions, saturation was less evident in discussions specifically related to GHGE. Several participants struggled to articulate the connection between food procurement, menu design, and GHGE, often conflating it with general energy used, type of transport of products or food waste. This suggests that GHGE remains an abstract or unfamiliar concept for many chefs and stakeholders in the HaFS sector. As a result, the depth and consistency of data related to GHGE were limited, and some inductive themes, such as systems thinking or embedded carbon, were underrepresented. This limitation highlights the need for future studies to incorporate targeted prompts, visual tools, or training materials to support participants in engaging with complex environmental concepts like GHGE.

Our analysis suggests that distinct drivers and enablers may influence different subsectors within HaFS businesses. Businesses that have made either mandatory or voluntary commitments to report specific environmental impacts, such as food waste, tend to engage more actively in internal communication and collaborate with campaigns and organisations to raise awareness and drive change both internally and externally. This presents an opportunity to explore more specific aspects of HRM within these subsectors, including internal policies, communication strategies, training, and recruitment practices, which this study did not aim to do. Additionally, support mechanisms vary across the sector, as highlighted in the [Transition Plan Taskforce's 2024](#) (2024) for Food and Beverage.

Bergman (1998) argued that social groups influence the construct and strength of attitudes. Thus, if there are different reporting priorities, information sources and support for various parts of the sector, the way pro-environmental attitudes are shaped may differ. This would suggest there should be observable differences in the practices linked to food waste and GHGE of food offers, as well as the co-created meaning, which could be explored by further research.

6. Conclusion

This exploratory study offers initial insights into the competencies and skills that may enhance chefs' capacity to shift food offers and reduce food waste and GHGE. However, these findings are based on a relatively small and context-specific qualitative dataset. As such, they should be interpreted as indicative rather than definitive. The study highlights potential pathways for sustainability in professional kitchens, but further research is needed to validate and generalize these findings across different HaFS settings and chef demographics.

This study resulted in the following key learnings:

- A. There is some evidence that specific competencies and skills could enhance the chefs' capacity to shift food offers and reduce food waste and GHGE. Some participants challenged the researcher's proposal that skills are the precursor of pro-environmental behaviours: for them, the lack of engagement with food waste and GHGE reduction was rooted in a lack of knowledge. This opened an exploration of skills theories to explain abilities to act differently based on emerging knowledge. Given that chefs have been framed in this study and elsewhere as time-scarce, there would need to be a space created for collective sense-making to support practice formation.
- B. Exploring chefs' environmental values would require using a validated tool, whereas pro-environmental attitudes and behaviours are

more likely to be markers of action and transition in kitchens. Participants reported increased pro-environmental beliefs, behaviours and attitudes driven by increased public awareness and cost pressures.

- C. HRM strategies were not consistently linked to pro-environmental behaviours and attitudes by the participants. The 'social' dimension of CSR was linked to HRM. In contrast, the 'environmental dimension' of CSR was mentioned very rarely, and when it was, it was an opportunity for HRM but not experienced by participants in reality. HRM was seen as being focused on recruitment and ensuring people in the business have the legally required training.
- D. Participatory research methods could support chefs in exploring the potentially paradoxical decisions to reduce food waste, GHGE of food offers, and associated complexities. These Participatory methods may allow chefs to integrate new knowledge of GHGEs and develop the ability to apply this 'new' knowledge in their contexts, such as menu engineering.

While HRM may not directly drive environmental outcomes, it influences workplace culture, training, and staff retention, indirectly supporting sustainability. Chefs' growing environmental awareness must be matched with both technical and non-technical skills, such as food knowledge, menu engineering, systems thinking, logistics, creativity, and innovation, to enable practices like ingredient repurposing and low-waste menu design. These capabilities are essential for sustainable food planning and operations.

However, parts of the proposed model were not confirmed. Specifically, the assumed link between HRM strategies and pro-environmental behaviours, while the concept of skills linked to reducing food waste and GHGE, was challenged, indicating that it requires greater competency sets than the focus on technical and non-technical skills; these areas need refinement in future research.

Given the exploratory nature of this research, its conclusions are best understood as a foundation for future inquiry rather than a comprehensive account of sector-wide practices. Larger, more diverse samples and mixed-method approaches could help substantiate and expand upon the themes identified here.

CRediT authorship contribution statement

Andrea Zick: Writing – original draft, Visualization, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Ximena Schmidt R.:** Writing – review & editing, Supervision. **Christian Reynolds:** Writing – review & editing, Supervision.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the author(s) used Grammarly Pro in order to improve the grammar and spelling of this paper. After using this tool/service, the author(s) reviewed and edited the content as needed and took full responsibility for the content of the published article.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijgfs.2025.101330>.

Data availability

Data will be made available on request.

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Glossary

- IT*: Inductive themes
DT: Deductive themes
GHGE: Greenhouse gas emissions
CSR: Corporate social responsibility
HRM: Human resource management
TPB: Theory of planned behaviour
HaFS: Hospitality and food service