

**Today's Wastage is Tomorrow's Shortage: A Systematic Literature Review on Food Waste from Social Responsibility Perspective**

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**Yee-Shan Chang**

School of Hospitality, Tourism & Events, Taylor's University, Malaysia,  
ccyshan1018@gmail.com

**Xin-Jean Lim**

School of Business and Economics, Universiti Putra Malaysia,  
lim.xinjean@yahoo.com

**Jun-Hwa Cheah\***

School of Business and Economics, Universiti Putra Malaysia,  
jackycheahjh@gmail.com

\*corresponding author

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## Abstract

**Purpose-** Recognizing food waste as a global issue, it has attracted scholars to conduct numerous relevant studies in the area. Growing concerns about the social and environmental impacts have intensified food waste attention to the practice of socially responsible consumption. The purpose of this study is to undertake a systematic literature review of existing knowledge to edify and provide a platform for future research.

**Design/methodology/approach-** The present study retrieved and reviewed a total of 76 articles from Web of Science database, which were published from 2011 to 2020 in food and nutrition related journals from social responsibility perspective.

**Findings-** In accordance with the proposed research questions, the findings demonstrate the publication trend, distribution of article sources, research regions, thematic classification, theoretical, and methodology framework. The findings also reveal research gaps in the literature and facilitate scholars with extensive gap-specific research directions to explore.

**Research limitations/implications-** This review is limited in its consideration of articles from Web of Science database and focused in food or nutrition related journals.

**Originality/value-** By mapping what is known in the current state of food waste research, this study identifies existing gaps and opportunities for future research in this area.

**Keywords-** Food waste, Social responsibility, Systematic literature review, Research Themes

**Paper Type-** Literature review

## 1. Introduction

Food waste is a massive global problem that has a substantial impact on environment, society and economy (Stangherlin *et al.*, 2019; Principato *et al.*, 2021). According to the Food and Agriculture Organisation (FAO, 2011), food waste accounts for up to 35% of total food produced due to improper management, making it the third largest source of greenhouse gas emissions. Given the imminent threat of the COVID-19 pandemic, the issue of food waste is growing more acute as a result of increased household food consumption (ICA Press, 2020; News Medical, 2021). According to a recent United Nations study (2021), 690 million people were affected by hunger and 3 billion are malnourished, while these numbers were exacerbated during the COVID-19 pandemic. Similarly, the Waste Index Report revealed that over 930 million (17 percent) tonnes of food have been landed in waste bins of households, retailers, restaurants and other food services since 2019 (UNEP, 2021).

Generally, food waste refers to any solid or liquid food, raw or cooked that is discarded or intended to be discarded (FAO, 2019). According to FAO (2019), five types of food waste produced in the food supply chain, including (i) agriculture production (overproduction or unexpected weather changes), (ii) post-harvest processing and storage, (iii) manufacturing (food spillage and degradation during processing), (iv) retail or wholesale distribution, and (v) consumer consumption. In response to the growing challenges of food waste on local and

global agendas, a growing number of literatures are beginning to look into how this problem might be reduced by fostering social responsibility (Salhofer *et al.*, 2008; Ting *et al.*, 2020). Some scholars have stated that the behaviour of wasting or discarding food away from consumption is unethical (Parfitt *et al.*, 2010), contributes to social inequity in food access (Edwards and Mercer, 2007), and has societal consequences (Salhofer *et al.*, 2008). One of the reputable works by Gonzalez *et al.* (2009) mentioned that ~~from the perspective of~~ social responsibility is how individuals incorporate social and environmental concerns into their food consumption. It has been reported that the globalized food systems are generally determined by the consideration about “shared responsibility” among consumer, stakeholder, and organization (Porter and Van der Linde, 1995; Coggins, 2001; Welch *et al.*, 2018) as well as awareness of environmental and social impact (Boccia and Sarno, 2019). In these debates, it is possible to underline that the significance of social responsibility behaviours cannot be overlooked in preventing food waste.

Despite the efforts made to-date to reduce food waste, the issue persists and necessitating more attention and responsibility on the part of governments, food organizations, and consumers worldwide. Thus far, academia has been exploring the phenomenon through analysing consumer (Silvennoinen *et al.*, 2014; Masson *et al.*, 2017), stakeholder (Halloran *et al.*, 2014; Goodman-Smith *et al.*, 2020) or organizational (Sert *et al.*, 2018) perspectives. Given that food waste is a complex and broad topic, as acknowledged by prior scholars (Aschemann-Witzel *et al.*, 2015; Bhattacharya *et al.*, 2021), there is a need for scholars to conduct a systematic literature review (SLR) in a specific field to summarize existing knowledge about the phenomenon of food waste, which can facilitate in bridging existing gaps (Kitchenham, 2004; Lyu *et al.*, 2020). Admittedly, there are some noteworthy SLRs of food waste made up to date, but most of the relatively recent ones have been focused in specific domains (see Table 1), such as consumer (Hebrok and Boks, 2017; Schanes *et al.*, 2018; Stangherlin and Barcellos, 2018; Principato *et al.*, 2021), supply chain (Bhattacharya *et al.*, 2021; Kafa and Jaegler, 2021; Chauhan *et al.*, 2021) as well as hospitality and food service (Dhir *et al.*, 2020) perspectives. Several other SLRs of food waste also focused on specific region such as Arab region (Abiad and Meho, 2018) and OECD countries (Redlingshöfer *et al.*, 2020). Another bibliometric review conducted by Chen *et al.*'s (2017) focused in science field journals.

**[Insert Table 1 here]**

Despite the great contributions of these SLRs on food waste, it is evident that none of the SLR has yet been explored food or nutrition related journals. Food or nutrition journals are the common target avenue for most food-related research and the appropriate platform in publishing food waste topic. Considering the potential significance of social responsibility in food waste, we developed a SLR and provided detailed insights for better understanding of the relevant literature in this area (see Figure 1).

**[Insert Figure 1 here]**

## **2. Systematic literature review method**

SLR provides a detailed and transparent protocol, which is a process that details the steps to be done (Tranfield *et al.*, 2003). It may facilitate in the identification of emerging themes and literature gaps. Particularly, a systematic review may contribute to theory development, methodological rigor, and the development of reliable knowledge for future study (Christofi *et al.*, 2017; Manoharan and Singal, 2017; Mariani *et al.*, 2018). As noted by Paul and Carido

(2020), SLRs can be categorized into three approaches including domain-based, method-based, and meta-analytical based reviews. Domain-based review usually provides an insightful information as the topic is structured based on widely used theories, methods, and constructs in the structured form, i.e., using tables and figures. Some of the popular reviews under this category including structural review and bibliometric review. Method-based review assists scholar to identify directions and effect sizes based on past studies using weighted average approaches, and contextualize the relationships by incorporating moderator variable (Klier *et al.*, 2017). Meanwhile, meta-analytical based review normally perform systematic and rigorous analysis of primary qualitative findings, resulting in a new conceptualisation of the phenomenon under consideration” (Becken, 2011). In this study, domain-based systematic review is selected to answer the proposed research objectives of the present study in order to achieve a systematicity and objectivity review.

Methodologically, there are three techniques that can be used to reviewing literature: qualitative or quantitative. Qualitative approach is frequently adopted in social science field to synthesize themes being researched but ultimately subjective (Zupic and Čater, 2015; Kim *et al.*, 2018). SciMAT, HistCite, NVivo or Leximancer are some of the common tools for this technique. While quantitative approach is commonly used in bibliometric analysis to identify gaps in the literature through a structured and comprehensive review on existing studies (Garfield, 1979). It has been identified as a more objective and reliable technique to determine the conceptual formation of a scientific area of study (Garfield, 1979; Bandara *et al.*, 2015) but sometimes it also lacks of critical analysis to comprehend the literature (Koseoglu *et al.*, 2016). Thus, a combination of both techniques (i.e., qualitative and quantitative) is getting higher attention in social science field to provide a more objective, systematic, and holistic overview of a particular academic field (Cheng *et al.*, 2018, Jin and Wang, 2016; Mehran and Olya, 2019). In this case, this study adopted a mix of technique to review the literature. A qualitative approach with bibliometric review is used to synthesize the publishing trends and distribution, followed by quantitative approach with structural review to map the conceptual and methodological framework.

## **2.1 Planning and conducting the review**

### **(i) Identification**

The data for this study was derived from Web of Science database (WoS), which is widely recognized as one of the most significant bibliographic databases and most trusted citation indexes for scholarly and scientific research (Fink, 2019; Petticrew and Roberts, 2006). Additionally, in accordance with several previous reviews (e.g., Lyu *et al.*, 2020; Chen *et al.*, 2017; Amicarelli and Bux, 2020; Macke *et al.*, 2018), whereby to rely solely on WoS as evidenced by its high-quality publications and all published works are subjected to a rigorous review process.

This study adopted the SLR protocol outlined by Tranfield et al. (2003) and Pickering and Byrne (2014). To facilitate the overall review, research questions were developed first (de Menezes and Kelliher, 2011). The main research question was: “What are the top cited articles, publication trend, distribution of article sources, thematic foci, research regions, theoretical and methodological frameworks in existing literatures, and what are the potential but overlooked gaps in the past?” For the subsequent stages, the review began with the identification of relevant keywords.

According to Pickering and Byrne (2014), the keywords applied in a SLR should consider as much relevant literature as possible while not going too far into unrelated fields. As this review is focused in food or nutrition journals, the term “food waste” or “food loss” or “food wastage” was used as the search strings. The criteria of selecting literature included peer-reviewed journal, English-language and full article type. Subsequently, the result was refined to include only food or nutrition related journal. The starting point for the time frame was set from 2011 until 2020. The rationale for targeting on this time period is that this topic began to gain academic discussion following FAO’s attention call in 2011.

### **(ii) Screening**

As of 20 January 2021, the initial search from the WoS database yielded 261 records. Typically, data retrieved from database sources cannot be directly reviewed because there is a high likelihood that they include articles which might be irrelevant or indirectly related to the area of study. The records were then screened to exclude non-related articles or non-journal publications to achieve good quality for analysis (Pickering *et al.*, 2015). At this stage, a total of 100 articles were short-listed following a thorough screening on their titles, abstracts, and keywords to ensure the quality of the data.

### **(iii) Eligibility**

We then examined the full-text of the 100 articles for eligibility in the final analysis. Considering the relevance on food waste context, a total of 24 articles were excluded because they are based on non-food waste topic, science field (i.e., ecology, nutrients, food choice/labelling experiment, dietary, and food diet/consumption) or not related to social responsibility (i.e., policy and regulations, food economy, food marketing, supply chain and safety).

In essence, a flow chart of studies screened and discarded at various stages for this study is shown in Figure 2 below, adapted from Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Moher *et al.*, 2009). PRISMA is a prominent tool in business and management studies (Huurne *et al.*, 2017; Siddaway *et al.*, 2019).

**[Insert Figure 2 here]**

## **3. Data abstraction and results**

As a result, a summary table of the 76 peer-reviewed articles was compiled and categorised based on the author, publication information (i.e., journal title, journal rank, and published year), keywords, thematic foci (i.e., consumer, stakeholder, and organizational perspectives) and research regions. Furthermore, methodological and theoretical frameworks are also discussed in the following sub-sections.

### **3.1 Overview of literature included in the review**

#### *(i) Citation rank of top 10 articles*

This review examines the citation rank in food waste discipline and specifically the most influential authors who contribute to the formation of food waste knowledge. Citation analysis is a common technique to determine the influence and impact of the research publications (Ding and Cronin, 2011). A more frequently cited article is always known as more influential and provide scholars with a reference value. The number of citations represents a benchmark of scientific significance or quality of work (Aksnes *et al.*, 2019). Based on the 76 peer-

reviewed articles, the top 11 cited articles by the authors are depicted in Table 2 below. With a total of 202 citations, Stancu *et al.*'s (2016) article has the highest citations. Mainly, this study has contributed to the understanding of psychosocial factors and food-related routines as key determinants towards food waste behaviour. Overall, it can be interpreted that the articles with high citations show a prominent contribution and influence on the food waste topic.

**[Insert Table 2 here]**

### ***(ii) Distribution of articles by year***

The number of food waste studies has grown exponentially over the years. Figure 3 shows that the number of articles published in peer-reviewed journals increased rapidly after 2016, from 6 in 2016 to 21 articles in 2020, indicating that research on food waste has attracted particular interest and has probably become one of the emerging topics in food journals. This trend is consistent with the advancement of technology in agriculture since 21st century, which has led to an increase in food waste (Stuart, 2009). Subsequently this global issue has gained attention in the World Economic Forum (2016), stating that food crises will become one of the biggest global risks in the future.

**[Insert Figure 3 here]**

### ***(ii) Distribution of articles across journal***

Identifying the distribution of articles can help in finding out the leading journal in food waste research. These 76 articles were published across eight food and nutrition journals. As shown in Table 3, the contribution of *British Food Journal* is also noteworthy, as it was the one that published the most articles on food waste (37 papers, 48.7%), followed by *Journal of Appetite* (13 papers, 17.1%) as well as *Food quality and Preference* (9 papers, 11.8%).

**[Insert Table 3 here]**

### ***(iv) Thematic Foci***

The globalized food systems are always determined by the concern of “shared responsibility” among consumers, stakeholders, and organizations (Porter and Van der Linde, 1995; Coggins, 2001; Welch *et al.*, 2018). As the focus of this review mainly to understand food waste literatures from the perspective of social responsibility, thematic analysis was chosen to review the full articles. The research themes of the 76 extracted studies have been classified accordingly (*see Appendix A1 and Table 4*). The results indicate that there is a highest number of articles in the consumer perspective (60 articles or 78.9%), followed by stakeholder, (13 articles or 17.1%), and organizational (3 articles or 3.9%). Figure 4 depicts the yearly progression of the publications in each perspective. The upward trend of consumer perspective reveals a growing interest among scholars in household food waste.

**[Insert Table 4 here]**

**[Insert Figure 4 here]**

## **(v) Research Regions**

From on the selected 76 peer-reviewed articles, the context of research samples are came from 33 countries (*see Appendix A1*). It is also worth noting that studies in European countries received more focus, with the majority of studies coming from northern Europe. Among these, 12 studies (15.8%) were found conducted in Italy, followed by 11 studies (14.5%) from Germany, 9 studies (11.8%) from Denmark, and 8 studies (10.5%) from the Netherlands. The high number of food waste studies in European countries could be due to the increased government initiatives and policies in recent years, including a resolution issued by the European Parliament in 2012 to target food waste reduction. The European Commission has set a goal of reducing by 50% before 2025 hence pushing all the European Union members have a role to play (EC, 2012).

The research samples were primarily focused on developed countries (64 publications), with only 11 studies focusing on developing countries, and one article studying both developed and developing countries. Despite the fact that 33 countries (16.9% of the total number of countries around the globe) contributed to the overall figures, the geographical distribution was shown unevenly. Based on the foregoing discussion, Figure 5 depicts an overall representation of the highlighted country of research samples.

**[Insert Figure 5 here]**

### **3.2 Methodological framework**

Particularly, all 76 peer-reviewed articles examined were empirical papers, without any non-empirical or conceptual papers found (*see Appendix A1*). To address the proposed objectives, 20 papers adopted qualitative approach, 45 used quantitative approach, and the remaining 11 used mixed methods approach.

As interviews, discussion or case study largely made up of the most popular qualitative research methods, thematic analysis has also shown the most commonly used technique for qualitative data analysis (*see Table 5*). Meanwhile, questionnaires and surveys were the most popularly used quantitative research methods. Remarkably, most of the quantitative studies utilized factor analysis and structural equation modeling based on covariance (CB-SEM). Among the mixed method studies, most studies acquired data using interviews and questionnaires, and further explored using thematic analysis. Apart from these, scholars have also started conducting experimental studies since 2017. As presented in Table 5, there was an upward trend in the use of quantitative methods in the last period (2019-2020). This could be due to the growing interest in consumer perspective study, which usually draw a quantitative approach to investigate.

**[Insert Table 5 here]**

### **3.3 Theoretical framework**

Among the 76 studies, 47 (61.8%) did not apply theory in their studies, whereas only 29 (38.2%) are theory-driven studies. From the 29 theory-driven studies, there were a total of 18 theories or models, which were either cited or applied to explain the food waste phenomenon (*see Appendix A1 and Table 6*). The most predominant theoretical lens adopted in these studies was the theory of planned behaviour (10 articles).

The theory of planned behaviour (TPB) has been a popular theory applied in social science research to examine the effects of attitudes, subjective norm and perceived behavioural control on behavioural intention (Ajzen, 1991). In this case, numerous scholars are using this theory in predicting the occurrence of individual's food waste behaviour or exploring possible factors from the consumer perspective (Graham-Rowe *et al.*, 2015; Stancu *et al.*, 2016; Stefan *et al.*, 2013). A majority of existing studies examine attitudes and behaviours towards food waste associated with specific aspects, i.e., eating behaviour, household food waste behaviour, food shopping routines, and etc, all of which contribute to better understand the food waste phenomenon (Stefan *et al.*, 2013; Janssens *et al.*, 2019; Lorenz *et al.*, 2017). The grounded theory by Glaser and Strauss (1969) was the most commonly used theory that adopted in qualitative studies (Nonomura, 2019; Chammas and Yehya, 2020; Rosenlund *et al.*, 2020), in which a series of processing, detailed and comparative analysis were carried out in their research methodology. Interestingly, the theory of food waste has been extended by the study of Knezevic *et al.* (2019) to investigate the consequences of awareness and knowledge level on the food waste problem from consumer perspective. The theory suggests that individuals' waste reduction behaviour is also determined by their level of knowledge.

**[Insert Table 6 here]**

#### **4. Discussion of gaps and directions for future research**

##### **4.1 Thematic gaps**

A variety of themes (e.g., consumer, stakeholder, organizational) has been observed in this review which leads to better understanding of the phenomenon, but it was discovered that the majority of the articles focused on the consumer perspective, particularly at the household level.

Despite the fact that food organizations play a significant role in food waste reduction, the number of research that looked into the impact of organizations has been limited. For example, organizations have better knowledge on the food waste minimisation by implementing more effective operational practices in food logistics, providing trainings to workers, therefore, can minimise their costs of waste disposal (Papargyropoulou *et al.*, 2014). For more viable mitigation, food workers who are constantly in contact with consumers must educate and engage them in order to raise public awareness of food waste, encourage more responsible consumer food choice and enable preventative behaviour (Filimonau and Delysia, 2019; Lim *et al.*, 2019).

Aside from food organizations, the roles of various stakeholders such as government can also promote the willingness of organizations to mitigate food waste. For instance, in the case of food donations, legislation fails to safeguard food donors, making them responsible for any illness caused by the food they donated (Thyberg and Tonjes, 2016). Food businesses in the UK, for example, have been deterred from donating their unsold food due to the risk of liability for food donations (Deloitte, 2014).

As each theme is interrelated with the others, researchers may consider combining them according to their research interest to extend the knowledge in food waste research (Lyu *et al.*, 2020). Future studies can consider more dimensions to develop knowledge of the topic. It is also worth pointing out that other themes which has social aspects such as governance or monitoring, could be extended to the research stream in the future.



## **4.2 Research region**

The location of research samples of food waste research is distributed unevenly around the globe. Previously, it was assumed that the problem of food waste was only getting attention in developed countries. According to the World Economic Forum (2016), food waste is a global risk that is not restricted to developed countries. Food waste has been discovered at the retail and consumer stage in developed countries. Differing from the situation in developed countries, food waste occurs at processing level in developing countries (FAO, 2015).

As the food waste research is overwhelmingly concentrated in the developed countries (64 articles), particularly European countries, developing countries should be brought into the picture. Many studies have also revealed that cultural and socio-economic differences across different countries play a major role on food waste behaviours (Quested *et al.*, 2013; Parizeau *et al.*, 2015; Setti *et al.*, 2018). There is a need for research with inclusion of more samples from non-Western or developing countries such as Asian or African countries. In Asia, for example, more than half of world food waste has been recorded (FAO, 2021).

## **4.3 Theoretical and methodological**

The review has observed that only 29 are theory-driven studies and the use of combination from different theories also scarce. Despite the fact that food waste is a practical issue, Ekström (2015) suggests that understanding and interpreting the phenomenon requires use of theory. Future research should consider other theories to study behaviour in addition to the theory of planned behaviour, as the construct of intention is not always predicting on actual behaviour, especially in the scenario where the behaviour is purely under volitional control (Stancu *et al.*, 2016). Notably, rather than focusing solely on one theory or model, studies might be of greater theoretical contribution if integrating multiple theories or models (Williams *et al.*, 2018; Whetten, 1989). Human responses to food waste are also varied and complex (Quested *et al.*, 2013), thus, future study may elucidate the food waste topic by integrating other theory related to the role of social responsibility. For instance, future research could look into value-based norm theory (Stern, 2000) as one of the key theories to explain both responsible and sustainable behaviour of individuals, which considers different individual values such as biospheric value, altruistic value, and egoistic value (Kiatkawsin and Han, 2017).

While existing research has facilitated various techniques and analyses, this study proposes that the recent methodologies such as big data or machine learning can be effectively applied in future research. It has the ability to process large amounts of data without being hindered by researcher subjectivity (Antons *et al.*, 2018; Leung *et al.*, 2017) or predetermined measurements (Muller *et al.*, 2016). Apart from these, experimental research could also be conducted to determine the effectiveness on how strategies and policies implemented by the governments can facilitate in resolving food waste issues. It also seems evident that more conceptual and qualitative studies are needed to clarify how various cultural and socioeconomic aspects influence food waste problem.

**[Insert Figure 6 here]**

## **5. Limitations, future study and conclusion**

This review has illuminated the state of food waste from the perspective of social responsibility across food or nutrition related journals. However, there are also limitations in this study. First, the authors only considered English-language journal articles available in the WoS database but it can be viewed as a trade-off for the review to maintain a high level of quality in the

findings. Future SLRs can assimilate the studies published in other language or other academic databases like Google scholar or Scopus. Second, the scope of present SLR was limited to journals in food or nutrition field to achieve the research objectives. Thus, this may serve as a stepping stone and indicate avenues for future SLR studies to extend the investigation into other field of journals such as sociology, environmental science, or biomedical.

Despite these limitations, the present SLR makes valuable effort by presenting with the development trend of food waste based on publication year and distribution of article sources, followed by research regions, thematic foci, theoretical and methodology framework. Despite the fact that there have been a considerable number of studies on food waste, the findings revealed that the approach of exploring stakeholder and organizational perspectives is not well-established. More discovery of the combined effect of these domains will assist to extend the comprehension of entire system. There are also opportunities to contribute to the body of theory related to food waste's social responsibility, as well as more methodologies to understand and predict the behaviour. By indicating the research gaps and avenues for future research, scholars will be able to contribute further to this emerging topic.

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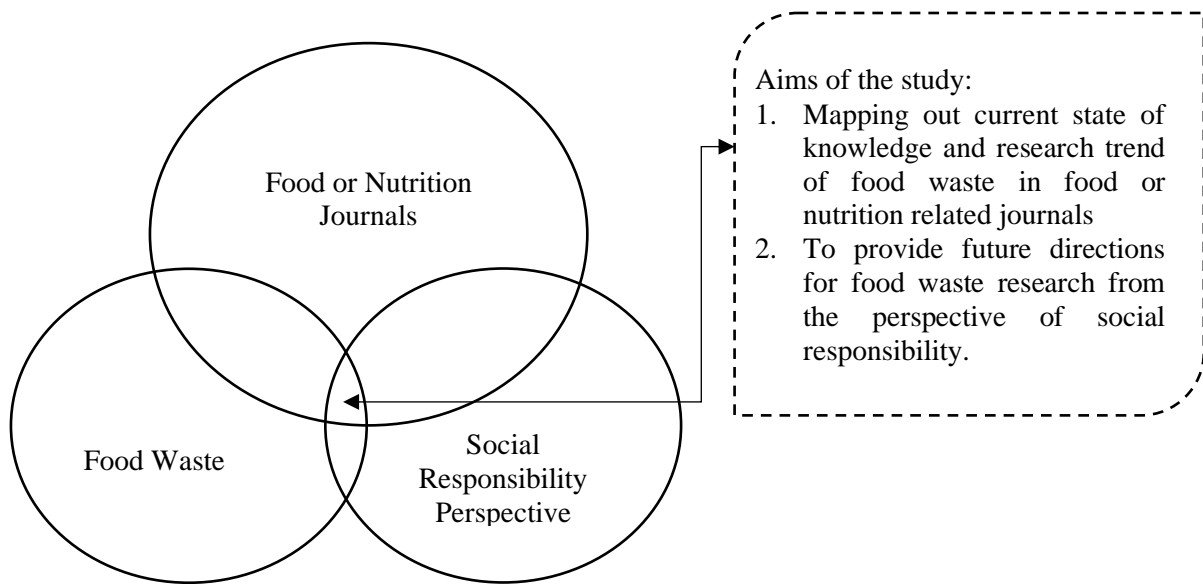
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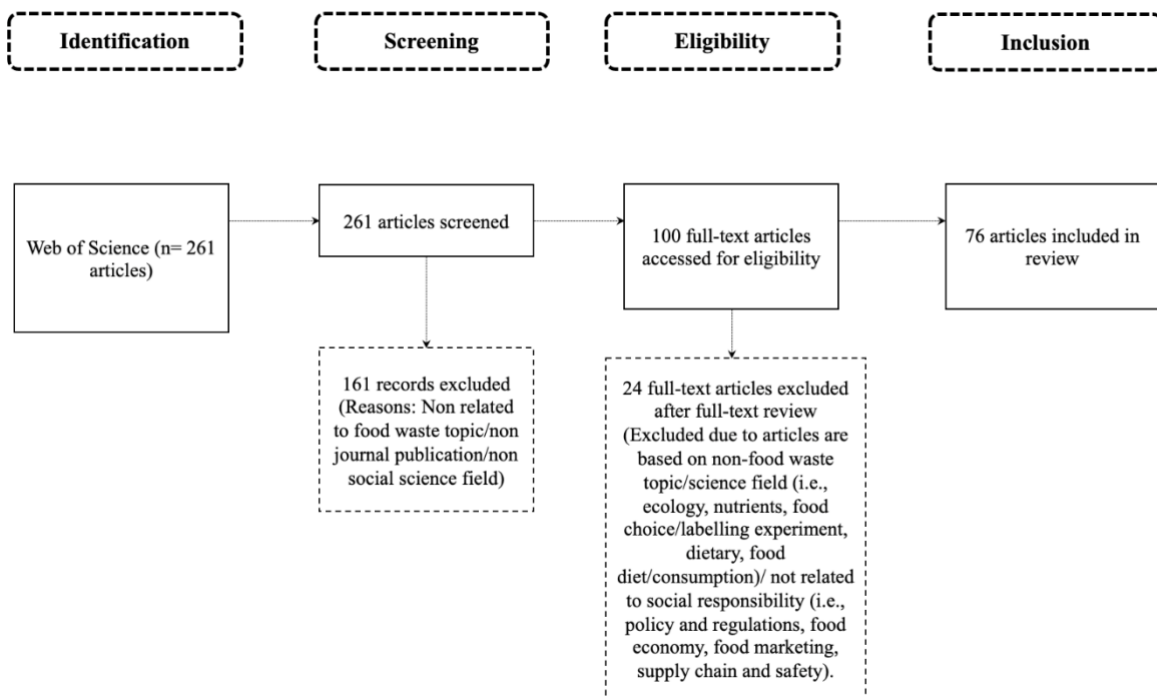
Appendix

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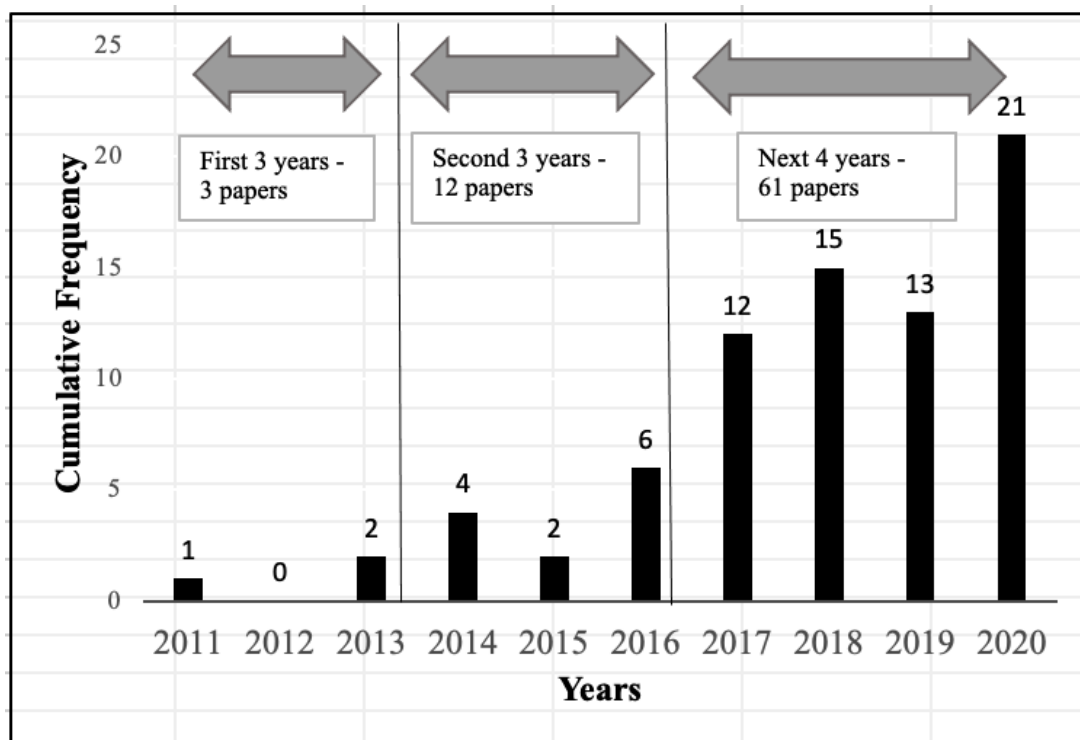




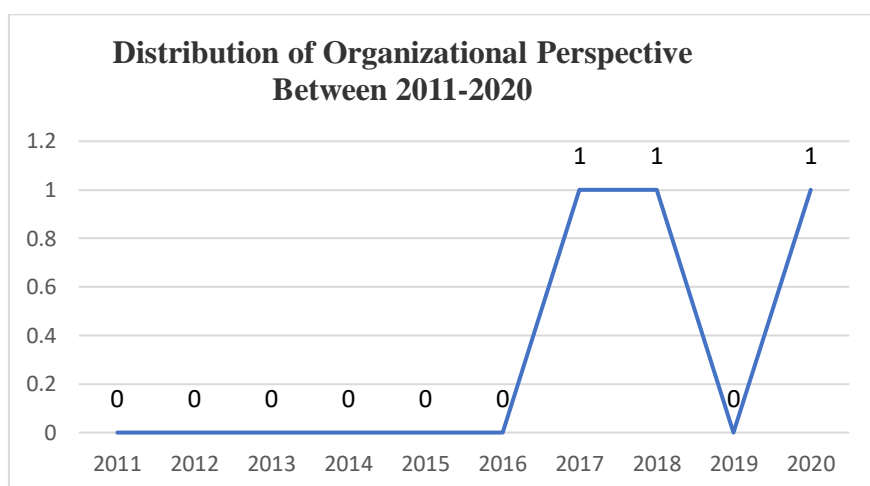
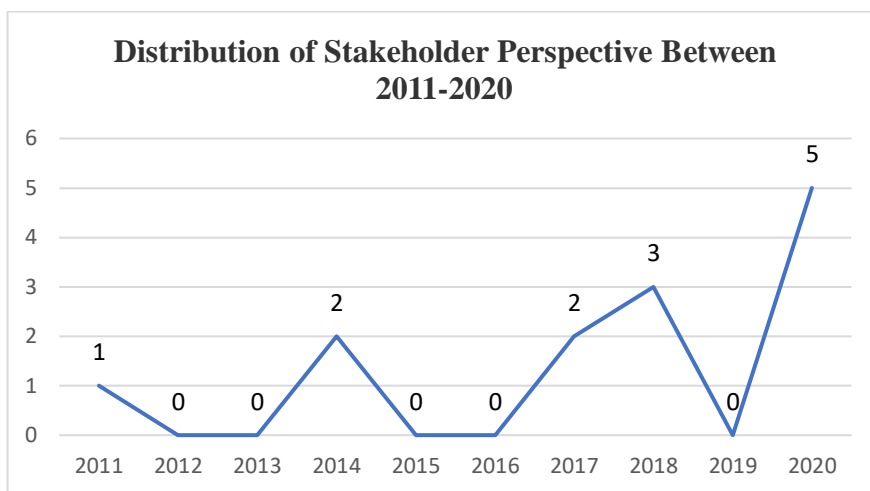
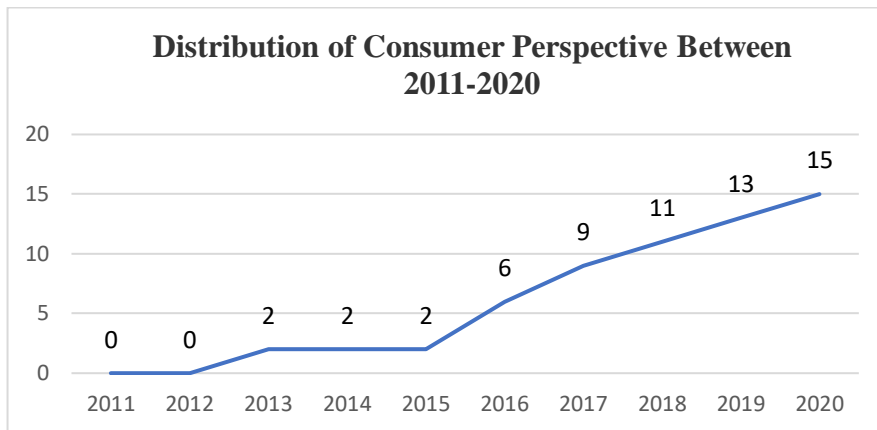
**Fig 1.** Aims of the study



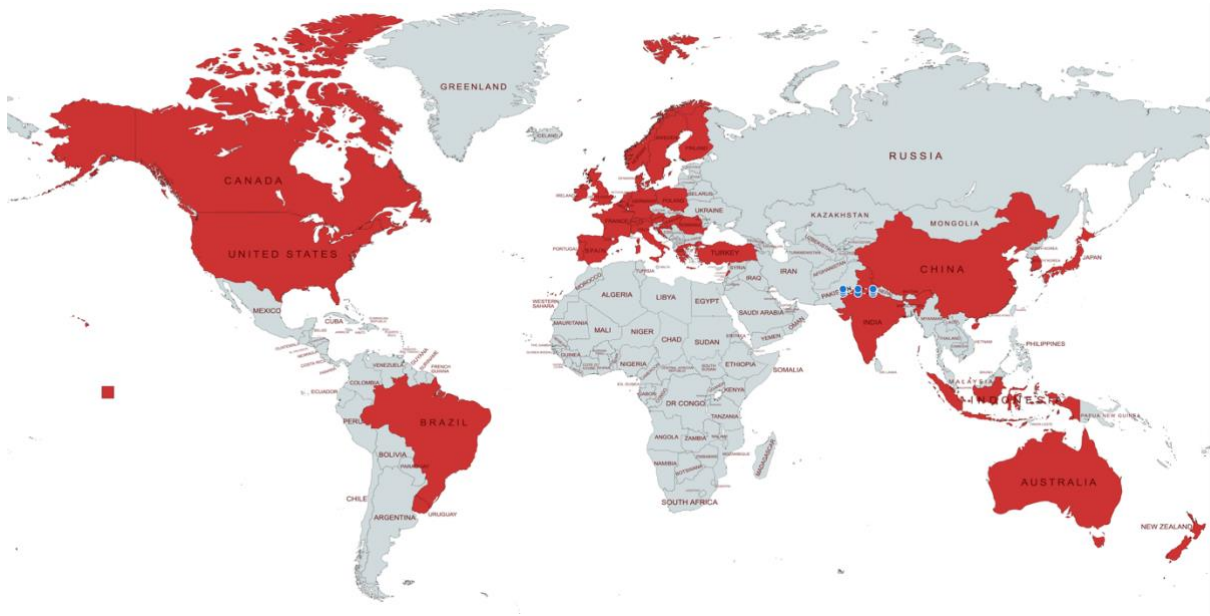
**Fig. 2.** A PRISMA flowchart adapted from Moher et al. (2009)



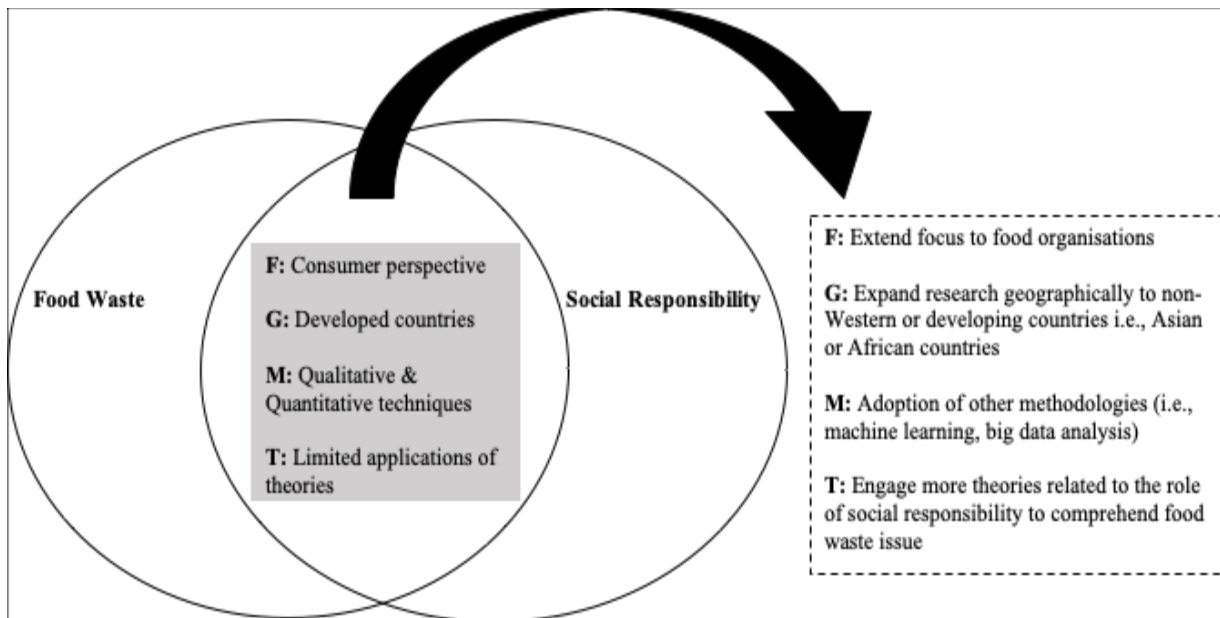
**Fig 3.** Yearly publishing trends between 2011 to 2020



**Fig 4.** Distribution of yearly output by thematic classification



**Fig 5: Location of research samples**



F: Thematic Foci; G: Geographical focus; M: Methodology; T: Theoretical

**Fig 6: Mapping the research gaps from existing literatures and recommendations for future studies.**

**Table 1 Past Systematic Literature Reviews on Food Waste Topic**

<b>Authors (Published Year)</b>	<b>Title</b>	<b>Reviewed Period</b>	<b>Domain</b>
Chen, H., Jiang, W., Yang, Y., Yang, Y., & Man, X. (2017)	State of the art on food waste research: a bibliometrics study from 1997 to 2014	1997-2014	Food waste research in science field/science journal
Hebrok, M., & Boks, C. (2017)	Household food waste: Drivers and potential intervention points for design - An extensive review	2000-2015	Food waste at household level from a consumer perspective.
Schanes, K., Dobernig, K., & Gözet, B. (2018)	Food waste matters - A systematic review of household food waste practices and their policy implications	1980-2017	Food waste at household level from a consumer perspective
do Carmo Stangherlin, I., & de Barcellos, M. D. (2018)	Drivers and barriers to food waste reduction	2010-2018	Food waste at household level from a consumer perspective.
Abiad, M. G., & Meho, L. I. (2018)	Food loss and food waste research in the Arab world: a systematic review	2007-2016	Food waste in the Arab region
Redlingshöfer, B., Barles, S., & Weisz, H. (2020)	Are waste hierarchies effective in reducing environmental impacts from food waste? A systematic review for OECD countries	2005-2018	Food waste in OECD countries
Amicarelli, V., & Bux, C. (2020)	Food waste measurement toward a fair, healthy and environmental-friendly food system: a critical review	2000-2020	Empirical studies of food waste
Dhir, A., Talwar, S., Kaur, P., & Malibari, A. (2020)	Food waste in hospitality and food services: A systematic literature review and framework development approach	1983-2020	Food waste in the hospitality and food services
Principato, L., Mattia, G., Di Leo, A., & Pratesi, C. A. (2021)	The household wasteful behaviour framework: A systematic review of consumer food waste	2000-2018	Consumer level food waste
Bhattacharya, A., Nand, A., & Prajogo, D. (2021)	Taxonomy of antecedents of food waste: A literature review	2007-2020	Antecedents and Consequences of food waste across all supply chains
Kafa, N., & Jaegler, A. (2021)	Food losses and waste quantification in supply chains: a systematic literature review	2000-2019	Food waste in in supply chain context
Kaur, P., Dhir, A., Talwar, S., & Alrasheedy, M. (2021)	Systematic literature review of food waste in educational institutions: setting the research agenda	1977-2020	Food waste in educational institutions
Chauhan, C., Dhir, A., Akram, M. U., & Salo, J. (2021)	Food loss and waste in food supply chains. A systematic literature review and framework development approach	2001-2020	Food waste in food supply chains

**Table 2 Top 11 authors according to citation rank**

<b>Authors (Year)</b>	<b>Total Citations</b>	<b>Journal</b>
1. Stancu, Violeta; Haugaard, Pernille; Lahteenmaki, Liisa (2016)	202	APPETITE
2. Stefan, Violeta; van Herpen, Erica; Tudoran, Ana Alina; Lahteenmaki, Liisa (2013)	198	FOOD QUALITY AND PREFERENCE
3. Secondi, Luca; Principato, Ludovica; Laureti, Tiziana (2015)	139	FOOD POLICY
4. Halloran, Afton; Clement, Jesper; Kornum, Niels; Bucatariu, Camelia; Magid, Jakob (2014)	105	FOOD POLICY
5. Principato, Ludovica; Secondi, Luca; Pratesi, Carlo Alberto (2015)	90	BRITISH FOOD JOURNAL
6. de Hooge, Ilona E.; Oostindjer, Marije; Aschemann-Witzel, Jessica; Normann, Anne; Loose, Simone Mueller; Almlı, Valerie Lengard (2017)	86	FOOD QUALITY AND PREFERENCE
7. van der Horst, Hilje; Pascucci, Stefano; Bol, Wilma (2014)	82	BRITISH FOOD JOURNAL
8. Silvennoinen, Kirsi; Katajajuuri, Juha-Matti; Hartikainen, Hanna; Heikkila, Lotta; Reinikainen, Anu (2014)	76	BRITISH FOOD JOURNAL
9. Wilson, Norbert L. W.; Rickard, Bradley J.; Saputo, Rachel; Ho, Shuay-Tsy (2017)	64	FOOD QUALITY AND PREFERENCE
10. Mallinson, Lucy J.; Russell, Jean M.; Barker, Margo E. (2016)	61	APPETITE
11. Aschemann-Witzel, Jessica; Jensen, Jacob Haagen; Jensen, Mette Hyldeoft; Kulikovskaja, Viktorija (2017)	61	APPETITE

Note: As of 20 January 2021

**Table 3 Distribution of articles across journal**

<b>Journal Title</b>	<b>n</b>	<b>(%)</b>
1. APPETITE	13	17.1%
2. BRITISH FOOD JOURNAL	37	48.7%
3. FOOD CONTROL	2	2.6%
4. FOOD POLICY	5	6.6%
5. FOOD QUALITY AND PREFERENCE	9	11.8%
6. FOODS	6	7.9%
7. FRONTIERS IN NUTRITION	1	1.3%
8. NUTRIENTS	3	3.9%
<b>TOTAL (8 JOURNALS)</b>	<b>76</b>	<b>100.0%</b>

**Table 4 Distribution of Thematic Foci**

<b>Perspective</b>	<b>n</b>	<b>(%)</b>
Consumer	60	78.9%
Stakeholder	13	17.1%
Organizational	3	3.9%
Total	76	100.0%

**Table 5 Distribution of Research Method for Empirical Articles**

Approaches (No. of Articles)	Frequency	%	2011-2012	2013-2014	2015-2016	2017-2018	2019-2020
<b>Qualitative Approach (20)</b>		26.3%					
<b>Instrument/Technique</b>							
Case study/Interview/Discussion (focus group, semi-structured)	17			3	3	4	7
Survey/Questionnaire	3					2	1
<b>Analysis</b>							
Thematic Analysis				1	1	2	4
Content analysis						3	1
Cross-case analysis							1
Two-step cluster analysis							
Factor Analysis							2
Content analysis							
Regression analysis				1			
Data envelopment analysis					1		
Deductive analysis				1			
Coding technique					1		
<b>Total</b>			<b>0</b>	<b>3</b>	<b>3</b>	<b>5</b>	<b>8</b>
<b>Quantitative Approach (45)</b>		59.2%					
<b>Instrument/Technique</b>							
Questionnaire/Survey	43			3	5	13	22
Focus Group Study	1					1	
Experiment	1					1	
<b>Analysis</b>							
ANOVA Test					1	4	2
Econometric Analysis							1



Factor Analysis			1	4
Cluster Analysis		1	1	3
Covariance-Based Structural Equation Modeling	1	1	1	6
Partial Least Square-Structural Equation Modeling				1
Generalized Maximum Entropy Estimation				1
Moderation Analysis			1	1
Multivariate Analysis				1
Path Analysis			1	
Descriptive Analysis			2	3
Inferential Analysis				1
Sensitivity Analysis				1
Regression Analysis	1	1	3	3
Multilevel Analysis			1	
Principal Component Analysis				1
Waste Sorting Analysis			1	
Decision Matrix Analysis			1	
Mediated Moderation Analysis				1
Taxonomic Analysis				1
Correspondence Analysis			1	
Comparative Analysis			1	
Covariance Analysis			1	
Cross Tabulation Analysis	1	1	2	2
Reliability Analysis				1
Kruskal-Wallis Test			1	
Confirmatory Factor Analysis			1	1
Exploratory Factor Analysis			1	1
Waste Compositional Analysis			1	
<b>Total</b>	<b>0</b>	<b>3</b>	<b>9</b>	<b>36</b>

<b>Mixed Method Approach (11)</b>	<i>14.5%</i>			
<b>Instrument/Technique</b>				
<b>Interview/Case study; Survey/Questionnaire</b>	1		6	4
<b>Analysis</b>				
Thematic Analysis				4
Covariance-Based Structural Equation Modeling			1	
Cluster Analysis			1	
Descriptive Analysis			1	1
Content Analysis			1	1
Mann-Whitney Test			1	
Kruskal-Wallis Test			1	
Deductive–inductive Qualitative Approach				1
Stepwise Linear Regression			1	
Factor Analysis				1
Exploratory Factor Analysis			1	1
Confirmatory Factor Analysis				1
Axial Coding			1	
Two-step Cluster Analysis			1	
Cross Tabulation Analysis	1		1	
ANOVA Test				1
Coding Analysis			1	
Binary logistic Regression Model			1	
<b>Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>13</b>
				<b>11</b>

**Table 6 List of adopted theories, frameworks & models**

<b>Theories (16)</b>	<b>Frameworks &amp; Models (2)</b>
Theory of Planned Behavior (10)	Categorical regression (CATREG) model (1)
Grounded theory (3)	Competence learning model (1)
Practice theory (2)	
Theory of self-image congruity (1)	
Message framing theory (1)	
Corporate philanthropy theory (1)	
Motivation theory (1)	
Self-Determination Theory (1)	
Theory of Reasoned Action (1)	
Theory of interpersonal behaviour (1)	
Socio-ecological consciousness theory (1)	
Theory of Psychic Numbing (1)	
Prospect theory (1)	
Prototype theory (1)	
Schwartz's theory (1)	
Theory of food waste (1)	