Economia agro-alimentare /
Food Economy
An International Journal on Agricultural and Food Systems
Vol. 26, Iss. 2, Art. 2, pp. 31-54 - ISSN 1126-1668 - ISSNe 1972-4802
DOI: 10.3280/ecag2024oa17521

Elements of Environmental and Socioeconomic Sustainability Related to the Food System: A Meta-Synthesis

Ana Beatriz Goes Maia Marques[*,a], **Silvana Anita Walter**[a], **Eduardo Guedes Villar**[b], **Jaqueline de Paula Siqueira da Costa**[a]

[a] Western Paraná State University, Brazil
[b] Federal Institute of Santa Catarina, Brazil

Abstract

This study aims to understand how the individual elements of the food system relate to sustainability through a meta-synthesis. Changes in food production and consumption in recent decades have had a detrimental effect on human health and the environment. This study helps to explain the existing gap that affects the entire process from food production to the final consumer by discussing the elements that comprise the food system dimensions of a healthy and sustainable diet. The meta-synthesis approach makes it possible to capture elements and their relationship to each other and to generate explanations about theoretical relationships. With this in mind, searches were conducted in the Scopus database, initially selecting 1,362 studies that contained previously selected search descriptors. Subsequently, an exploratory analysis of the titles and abstracts of the articles was conducted, resulting in a set of twenty case studies centered on the topic of interest. After applying inclusion and exclusion criteria, twelve studies remained to make up this meta-synthesis. The elements that emerged from the analytical synthesis of the articles favor or hinder the transition to healthy and sustainable food systems and have an impact on four dimensions: Production, supply,

Article info

Type:
Article
Submitted:
20/03/2024
Accepted:
17/06/2024
Available online:
02/08/2024

JEL codes:
Q01, Q56

Keywords:
Sustainable development
Sustainable food systems
Transition to sustainability

* *Corresponding author*: Ana Beatriz Goes Maia Marques - Western Paraná State University, Brazil - E-mail: beatriz.goes.maia@gmail.com.

marketing and consumption, as well as on the food system as a whole. As a theoretical contribution, this study explains the elements and stressors of sustainable food systems. As a practical contribution, based on these stressors, action plans can be developed involving different stakeholders and public policies to develop public policies that promote healthy and sustainable diets.

Managing Editor: Valeria Borsellino

Introduction

The changes in the technical basis of agriculture since the 1950s, which took place during the so-called "Green Revolution", aimed to innovate agricultural practices through the use of genetically modified seeds, chemical inputs and mechanization. These changes led to the industrialization and modernization of agriculture and thus to an increase in productivity (Graziano da Silva, 2003). However, this modernization also led to environmental impacts (Coupe & Lewins, 2007; Nordborg *et al.*, 2017; Tilman & Clark, 2014). Socio-economic impacts have also been observed over time, including the concentration of property, increased exploitation of rural labor, rural exodus and greater income inequality in rural areas (Graziano da Silva, 1987).

In addition to the ecological and socio-economic effects resulting from the modernization of agriculture at the production level, some authors have also identified historical and conceptual changes in food consumption patterns. According to Fischler (2018), urbanization, the industrialization of the 1950s-1960s, the professionalization of women, the rise in living standards and education levels, as well as increasing car use and access to leisure activities, have led to more and more meals being eaten outside the home. Factors such as time and convenience, which previously had no influence on the act of eating, have become fundamental factors in food choices. Other authors point to the decline in the cost of growing and producing high-calorie foods, among other factors (Weis, 2013).

There is also evidence of changes in diet, such as the increasing availability and consumption of ultra-processed foods in several countries (Scrinis & Monteiro, 2022). This change is having a direct and negative impact on human health, leading to an increase in cases of cardiovascular disease, gastrointestinal problems, obesity and cancer (Monteiro *et al.*, 2019).

In this view, it is necessary to rethink the system of food production in order to promote a change in the eating habits of the population and link them to the environment. Authors emphasize that, in the transition to sustainable, fair and healthy agri-food systems, it is important to consider

aspects such as food and nutritional security, conservation of natural capital and climate and social justice (Bilali *et al.*, 2021; Galli *et al.*, 2020). Moreover, the importance of food systems as a contributor to several Sustainable Development Goals (SDGs), providing solutions for each of the 17 goals, is already recognized (Hawkes & Parsons, 2019).

In order to contribute to and deepen the understanding of the elements surrounding this topic, the aim of this article is to understand how the individual elements of the food system relate to sustainability by using the meta-synthesis method. This approach allows us to understand the relationships between the elements of each of the selected studies by analyzing the qualitative studies in depth. Furthermore, it enables the creation of a new and extended explanation for the analyzed phenomenon (Hoon, 2013), thus contributing to the theories on this topic.

It is worth noting that the study helps to explain the gap between food production and its arrival at the final consumer by discussing elements, including dimensions of the food system, to achieve a healthy and sustainable diet.

1. Background

This section presents the background with the themes that support this study. It is organized according to the following sub-themes: The concept of sustainable development and changes in the food system and their impacts.

The concept of sustainable development

Sustainable development, which has been on the global agenda for practically the entire second half of the 20th century and the beginning of the 21st century and was formulated by the United Nations in 1987, is one of humanity's greatest concerns and at the same time a constantly controversial concept. The United Nations Conference on the Human Environment in Stockholm in 1972 was the milestone that incorporated the environmental aspect into the concept of development. In 1984, the United Nations Environment Programme (UNEP) was established, which is considered an important milestone in the discussion on environmental issues (Gregolin *et al.*, 2019).

Sustainable development is defined as

a development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:

the concept of "needs", in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs (WCED, 1987, p. 41).

Furthermore, the concept of sustainable development presents unique conditions that are opposed to the capitalist system, as the emergence of the idea of sustainability highlights the detrimental effects that the progress of this system has brought to the planet, especially in ecological terms. According to Vizeu *et al.* (2012), the sustainable version presupposes the possibility of increasing wealth and social prosperity without implying an increase in environmental degradation and a worsening of social injustices.

Sachs (2009) adds that sustainable development encompasses eight dimensions: social, cultural, ecological, environmental, territorial, economic, national political and international political. Gregolin *et al.* (2019) suggest that this concept also has a multidimensional character and includes social, environmental, economic, political, cultural and territorial aspects. These authors believe that the concept should encompass both rural and urban areas and emphasize the importance of the relationship between these two spaces. It is not possible to separate them or consider them as competing spaces, which is a major challenge for public decision-makers.

Changes in the food system and their impacts

The technologies used in the modernization of agriculture, which are part of the current agricultural export model, have affected the standard of production, supply, marketing and consumption of food, as well as human and animal health. These changes have impacted the planet from a social, economic and environmental perspective (Hawkes & Parsons, 2019). Therefore, the current global food system requires radical changes.

From a production perspective, the dietary habits of the population have changed, with an increase in the consumption of increasingly processed and transformed foods (Scrinis & Monteiro, 2022), which have harmful effects on the health of the population through their intake. Monteiro *et al.* (2019) point out the link between cardiovascular disease, gastrointestinal problems, obesity and cancer and the consumption of biscuits, snacks and soft drinks. In addition, Dixon & Isaacs (2013) confirm that the current diet hardly fulfils nutritional and environmental criteria.

The current food system, based on the use of technologies from the green revolution – at the production level – and an increase in supply and demand for increasingly processed food – at the consumption level – has

also affected the production chain, lengthening it and distancing the producer from the consumer. In this way, ultra-processed foods are best suited to long supply chains as they have a longer shelf life. For a transition to sustainable food systems, on the other hand, it is necessary to mobilize territorially differentiated approaches (Dubois & Carson, 2020).

In the area of supply, short chains contribute to the transition to a healthier and more sustainable food system, as they are based on proximity between producers and consumers and can therefore promote the availability of fresh and natural food (Cavalli *et al.*, 2014). In addition, measures around food supply, such as the implementation of public policies for healthy and sustainable diets (Sanz *et al.*, 2022) and the organization of institutions (Goggins, 2018), can prioritize the purchase of food from family farms and combine environmental with socio-economic aspects.

Local marketing initiatives and alternative food networks, in contrast to large supermarket chains, can in turn help to involve farmers in the markets, promote ethical values among consumers and valorize fresh food that is part of the local food culture (Mattioni & Caraher, 2018).

In terms of consumption, it is necessary to switch to a diet that integrates environmental and nutritional aspects, such as promoting a plant-based diet, increasing the consumption of fresh foods, reducing the consumption of processed foods and eliminating ultra-processed foods, as Bach-Faig *et al.* (2022) emphasize. In addition, it is necessary to implement coordinated public policies at local, state and federal levels that include healthy and sustainable diets (Sanz *et al.*, 2022; Bach-Faig *et al.*, 2022).

The transition to a healthy and sustainable food system therefore requires radical chances that include measures to solve problems in the areas of production, supply, marketing, and consumption. Studies need to be carried out to understand what these changes are and how they are interrelated, and to understand how actors in the food system influence it.

2. Methodological procedures

In order to achieve the research objective of analyzing how the individual elements of the food system relate to sustainability, this topic describes the methodological procedures used.

The methodology used for this study was the meta-synthesis of case studies proposed by Hoon (2013). Meta-synthesis aims to develop a theory that is exploratory and inductive in nature by extracting, analyzing and synthesizing primary, empirical and qualitative data. It also aims to provide contributions that go beyond the analyzed studies (Hoon, 2013). Therefore, the present study followed the eight steps proposed by Hoon (2013), which are described in Table 1.

Table 1 - Steps for the development of meta-synthesis proposed by Hoon (2013)

Steps	Objective	Process Description
1. Formulate research question	Develop a research objective or question based on existing literature	To better understand the phenomenon, searches were conducted on sustainability integrated into the food system
2. Identify relevant research	Determine keywords and identify studies that address the study objective	Descriptors were defined, and searches were conducted in the Scopus database
3. Define inclusion/ exclusion criteria	Develop clear inclusion and exclusion criteria for studies	Criteria were developed based on the research objective and quality criteria (Hoon, 2013). Inclusion/exclusion criteria are described in Table 2
4. Extract and code study data	Develop categories for coding articles based on research results	Categorization of key points of interest in the selected studies
5. Analyze results at a specific level	Identify the main contributions of each article to the research topic	A synthesis of general and specific data for each article was developed individually
6. Synthesize results	Examine possible relationships and explanations between studies	An intersection of evidence was conducted based on synthesized data
7. Develop theory from meta-synthesis	Build theoretical concepts and explanations about the theme	Construction of a broad theoretical approach contributing to the study of the theme
8. Discuss generated theory	Discuss findings based on literature and validate aspects of research rigor	Discussion on the results of meta-synthesis was conducted, and suggestions for future research were made

Source: Developed by the authors based on Hoon (2013).

The following research question was formulated to address the first step of the meta-synthesis in view of the objective of this study: How do the components of the food system relate to sustainability in a meta-synthesis?

The second step was to identify relevant research on this topic. For this purpose, Scopus was defined as a database containing important international

academic journals. An initial search was carried out using the descriptors "sustainable diet" or "sustainable nutrition" or "sustainable food" or "wholesome diet" or "wholesome nutrition" in combination with "production" or "consumption" and yielded a total of 3,621 papers. In the second and third search steps, the terms "case study" and "qualitative" were added to the above descriptors, resulting in 1,551 and 741 works respectively. The search for the keywords "healthy diet" and "healthy nutrition" yielded few results, so it was decided to replace them with "healthy diet" and "healthy nutrition". Finally, a fourth search step was carried out with the descriptors "sustainable diet" or "sustainable nutrition" or "sustainable food" or "healthy diet" and "healthy nutrition" in combination with "production" or "consumption" and "qualitative", resulting in 1,362 papers.

The keyword search was carried out as a subject search comprising abstract, title and keywords, with the exception of "qualitative", for which a full-text search was carried out. The search was only carried out in English using the Boolean operators "and" and "or" and covered the last 10 years.

The combination of keywords, suitable methodology and the topic under investigation initially resulted in 20 articles. The inclusion and exclusion criteria were defined as described in step three of Hoon (2013) and are shown in Table 2.

Table 2 - Inclusion and exclusion criteria for cases

Criteria	**Inclusion Criteria**	**Exclusion Criteria**
Qualitative Case Study	Specific criterion for meta-synthesis works, where results follow contributions from studies using the qualitative case study methodology	Studies using quantitative methodology or those not aligning with the qualitative case study approach
Thematic Relevance	Research directly linking sustainability with food (from production to consumption)	Studies not addressing the central focus of the research
Research Quality	Clear description of the case, detailed data collection and analysis, transparency criteria	Studies lacking clear descriptions of these aspects

Source: Developed by the authors (2023).

A preliminary analysis of the 20 papers was conducted, analyzing the abstracts, literature review, methodology, results and contributions of each

study. Using these criteria, paper #15 was excluded as it was not a qualitative case study. Papers #8 and #14 were excluded because they did not address the topic of this study. Papers #2, #10, #3, #18 and #20 were excluded because they did not fulfil the quality criteria for research. In total, 8 papers were excluded and the corpus analyzed consisted of 12 papers. Table 3 describes the title, the year of publication, the journal in which the article was published, and the criteria by which the articles were excluded.

Table 3 - List of pre-selected studies for meta-synthesis

Article	Title	Age	Journal	Inclusion/ Exclusion	Exclusion Criteria
#1	Sustainability as business strategy in Community supported agriculture: Social, environmental and economic benefits for producers and consumers	2018	*British Food Journal*	Inclusion	
#2	A seed towards a sustainable food system in health care institutions: the case of the Basque Country	2023	*Regional Studies, Regional Science*	Exclusion	Criteria 3 – Research Quality
#3	Contested diffusion of transformative innovations: Micro- and macrolevel social capital in South Tyrol	2023	*Sociologia Ruralis*	Inclusion	
#4	Hybrid food networks and Sustainability transitions: Shared and contested values and practices in food relocalisation and resocialisation	2023	*Sociologia Ruralis*	Inclusion	
#5	'What we'd like is a CSA in everytown.' Scaling Community supported agriculture across the UK	2022	*Journal of Rural Studies*	Inclusion	
#6	Motivations of Public Officials as Drivers of Transition to Sustainable School Food Provisioning: Insights from Avignon, France	2022	*Journal of Agricultural and Environmental Ethics*	Inclusion	

Article	Title	Age	Journal	Inclusion/ Exclusion	Exclusion Criteria
#7	Sustainable agriculture and multifunctionality in South Australia's Mid North region	2020	*Australian Geographer*	Inclusion	
#8	How does organic agriculture contribute to food security of small and holders: A case study in the North of Thailand	2018	*Cogent Food & Agriculture*	Exclusion	Criteria 2 – Thematic Relevance
#9	Consensus-building around the conceptualisation and implementation of sustainable healthy diets: a foundation for policymakers	2022	*BMC Public Health*	Inclusion	
#10	Promoting 'pro', 'low', and 'no' meat consumption in Switzerland: The role of emotions in practices	2020	*Appetite*	Exclusion	Criteria 3 – Research Quality
#11	Cutting through conflicting prescriptions: How guidelines inform "healthy and sustainable" diets in Switzerland	2018	*Appetite*	Inclusion	
#12	Moving towards ecologically sustainable diets: Lessons from an Italian box delivery scheme	2018	*International Journal of Consumer Studies*	Inclusion	
#13	European food quality schemes in everyday food consumption: Na exploration of sayings and doings through pragmatic regimes of engagement	2022	*Journal of Rural Studies*	Exclusion	Criteria 3 – Research Quality
#14	Consuming Location: The Sustainable Impact of Transformational Experiential Culinary and Wine Tourism in Chianti Italy	2022	*Sustainability*	Exclusion	Criteria 2 – Thematic Relevance

Article	Title	Age	Journal	Inclusion/ Exclusion	Exclusion Criteria
#15	Transforming Foodways: Sustainability Sensemaking Processes Among Finnish Food Companies	2022	*Ethnologia Fennica*	Exclusion	Criteria 1 – Qualitative Case Study
#16	Pillars of sustainable food experiences in the Luxury gastronomy sector: A qualitative exploration of Michelin-starred chefs' motivations	2020	*Journal of Retailing and Consumer Services*	Inclusion	
#17	Developing a sustainable food strategy for large organizations: The importance of context in shaping procurement and consumption practices	2018	*Business Strategy and the Enveronment*	Inclusion	
#18	I nudge myself: Exploring 'self-nudging' strategies to drive sustainable consumption behaviour	2017	*International Journal of Consumer Studies*	Exclusion	Criteria 3 – Research Quality
#19	Why sustainable and 'nutritionally correct' food is not on the agenda: Western Sydney, the moral arts of everyday life and public policy	2013	*Food Policy*	Inclusion	
#20	Drivers of Food Choice among Children and Caregivers in Post-earth quake Nepal	2021	*Ecology of Food and Nutrition*	Exclusion	Criteria 3 – Research Quality

Source: Developed by the authors (2023).

Step four involved extracting and coding the data from the papers. The coding was done in a text editor using the following categories: general information, introduction, literature review, context, method used, data collection, method of analysis and contributions.

In a fifth step, the results of the individual studies were analyzed and the most important contributions to the topic were identified. This was followed by a cross-analysis of the studies, which corresponds to step six and aims to

provide a comprehensive explanation of the topic under investigation. In the seventh step, a new theory is derived from the meta-synthesis and finally, in the eighth step, the results are discussed, whereby the meta-synthesis itself is explained in more detail. These steps are described in detail in the next section.

Due to the meta-synthesis method, the review is systematic, i.e. no study was identified that has Africa and South America as its research location. The theorization of this study therefore potentially takes place with a view to the Global North.

3. Analyses and results

In this section, the elements extracted from the main results of each item are presented with the aim of improving the understanding of the individually analyzed elements, which corresponds to Hoon's (2013) sixth step. Subsequently, the relationships between the elements of the selected articles were analyzed in order to find a new explanation for the analyzed phenomenon (Hoon, 2013). To this end, summaries were created for each work and then elements were extracted from these summaries. This made it possible to understand how the individual elements of the food system relate to sustainability. Table 4 shows the extracted elements.

Table 4 - Elements of the selected articles for meta-synthesis

Author (s)/Year	**Elements**
#1 Matzembacher & Meira (2018)	Strategic integration of sustainability
#3 Holtkamp (2023)	Niche actors promote transformative innovations, while regime actors hinder transformative innovations in the food system
#4 Zollet (2023)	Hybrid food networks promote the inclusion of conventional farmers through resocialization and relocalization of food, excluding organic farmers
#5 Bonfert (2022)	Expansion and socioeconomic and structural diversification of the CSA network, challenges related to financial instability, dependence on external allies, and social trends and strategies for expansion and overcoming niche status
#6 Sanz *et al*. (2022)	Changes in public officials' practices based on ethical values and changes at the federal and municipal levels

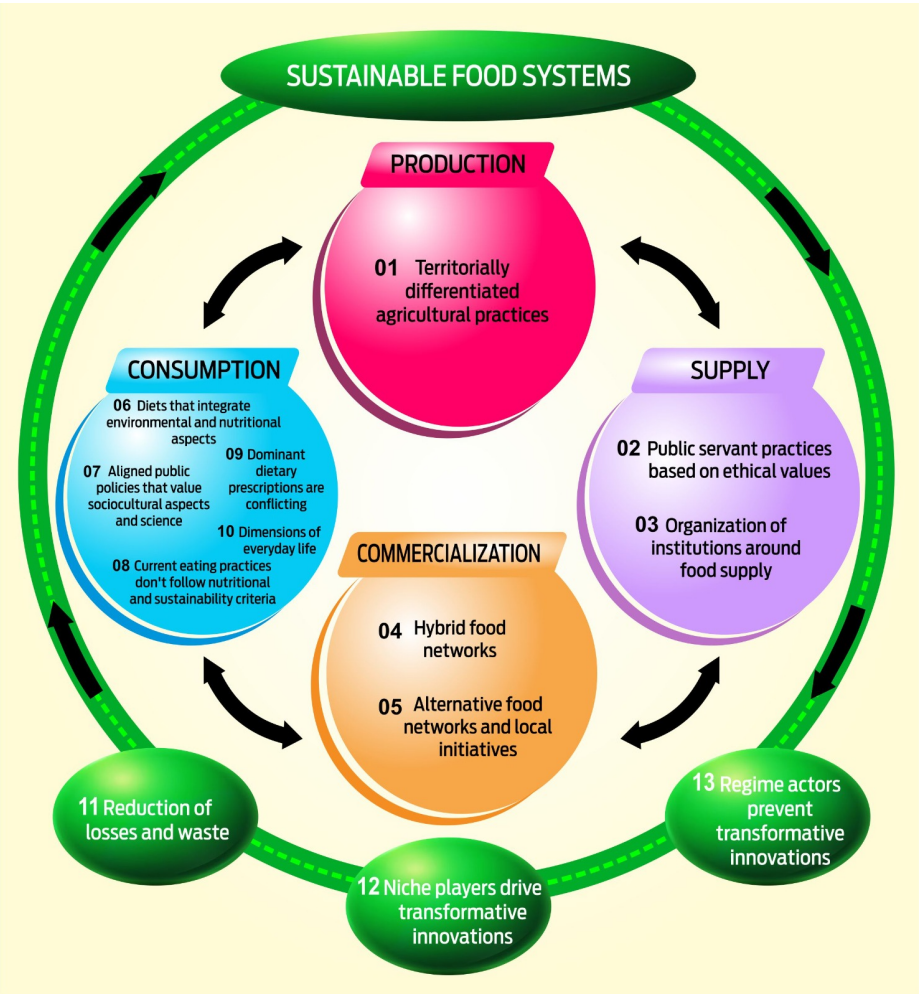
Author (s)/Year	Elements
#7 Dubois & Carson (2020)	Sustainable food transitions require the mobilization of territorially differentiated approaches
#9 Bach-Faig *et al.* (2022)	Healthier and more sustainable diets and food systems must consider scientific evidence, a shift in current dietary patterns, reduction of losses and waste, ensuring food security, and considering socioeconomic aspects
#11 Godin & Sahakian (2018)	Dominant prescriptions around healthy and sustainable diets coexist without a clear hierarchy and in tension, and everyday life dimensions can facilitate or hinder the implementation of healthy and sustainable diet prescriptions
#12 Mattioni & Caraher (2018)	Local food initiatives promote or hinder the transition to more sustainable diets
#16 Batat (2020)	Luxury gastronomy integrates sustainability actions based on intrinsic and extrinsic motivations
#17 Goggins (2018)	The primary function, size and scale, contractual agreements and food procurement practices, organizational food culture, and infrastructure of large institutions influence the supply of healthier and more sustainable foods
#19 Dixon & Isaacs (2013)	Current dietary practices often overlook nutritional and sustainability aspects

Source: Prepared by the authors (2023).

Based on the meta-synthesis produced, a theoretical framework was outlined on how the elements that permeate environmental and socio-economic sustainability influence the food system. It was found that these elements can favor or hinder the transition to healthy and sustainable food systems, in four dimensions: Production, Supply, Marketing and Consumption, and across the food system as a whole, as shown in Figure 1.

As far as food Production is concerned, achieving sustainable change in the agri-food sector requires the mobilization of territorially differentiated agricultural practices (01) that can either favor or hinder such change. Favorable aspects include: a) more conservative agricultural management practices adopted by farmers to prevent soil erosion, increase biodiversity and avoid soil and water contamination, such as Crop rotation, reduced use of fertilizers, combined crop and animal husbandry with rotational grazing, introduction of no-till farming; b) increased resource efficiency through the use of manure as an efficient substitute for chemical fertilizers, planting trees to protect springs and conserve soil moisture, conversion to organic farming;

Figure 1 - Meta-synthesis of qualitative cases



Source: Prepared by the authors (2023).
Figure Credit: Kato Digital Marketing.

and c) the role of regional actors, highlighting the importance of mobilizing and applying scientific knowledge in adapting agriculture to climate change through the coordination and funding of initiatives to promote sustainable agricultural practices, educational activities and the discussion of scientific knowledge on the subject.

However, there are also forms of land use that can hinder the transition to sustainability, such as the increase in large farms favoring monocultures, land

purchased or inherited by non-farmers, the decoupling of land management and ownership, and a low proportion of protected areas (e.g. Dubois & Carson, 2020).

In the area of food Supply, as Sanz *et al.* (2022) emphasize, the individual motivation of public servants (02) is the most important driver for the successful implementation of sustainable public food procurement policies. This motivation is driven by social justice and a sense of duty to provide children from low socioeconomic backgrounds with access to healthy food by increasing the consumption of fresh food and reducing the consumption of highly processed food.

The organization of institutions around food supply (03) can either help or hinder the achievement of healthy and sustainable diets (Goggins, 2018). Key elements include: (a) the primary function, size and scope of the institution – institutions may have high/low turnover, diverse audiences, education levels, length of stay and whether catering is an additional service, which primarily impacts on the quantity, quality and expectations of the food provided; b) contractual agreements and food procurement practices that take food sustainability into account can provide opportunities for organizations to improve their sustainability performance; c) the existence of an organizational food culture that fosters connections between consumers, organizations and the food service and educates staff on the sustainability attributes of food; and d) adequate infrastructure for sourcing, receiving and delivering healthier and more sustainable food, such as the adoption of various measures to reduce food waste. E.g. the adoption of various measures to reduce food waste, the introduction of technological innovations (e.g, temperature-controlled food trolleys) and the provision of suitable premises for food preparation and delivery of food.

In the commercialization of healthier and more sustainable food through hybrid food networks (04), conventional actors exploit ideological commonalities with alternative actors in the context of food resocialisation and relocalisation by promoting the creation of direct food sales spaces and bringing consumers and producers closer together. This proximity can be achieved by: promoting actions to deepen people's relationship with local food in order to protect local agriculture, food culture and the natural environment; creating direct sales spaces; including the producer's photo and name on each product, customizing the packaging; providing a brief description of the farm or recipe cards written by the farmers next to the product; creating certifications and brands that indicate the origin of the food and the amount of pesticides and fertilizers used (e.g. Zollet, 2023).

On the other hand, hybrid food networks promoted by conventional farmers lead to the exclusion of organic farmers, as these markets do not take into account the quality of organic food. These markets are geared towards

the purchase of local food and do not allow farmers to label their products as organic (possibly because this would constitute an element of unfair differentiation). As a result, there is a search for other marketing spaces that value organic food, leading to a displacement of these farmers, as Zollet (2023) emphasizes.

Mattioni & Caraher (2018), in turn, point out that alternative food networks and local marketing initiatives (05) are of considerable socio-economic importance for the farmers involved, as they secure income and promote regional development. Moreover, these spaces are seen as crucial in providing people with the necessary guidance for a transition to sustainability. This is done through visits to farms, seminars on food poverty, cooperative economic models and the fight against racism in agriculture, as well as through advisory programmes on how to finance the acquisition of land or to consume a particular food. However, the relative lack of access to material resources in these spaces highlights their dependence on favorable external conditions such as public attention and support from external allies. In addition, socio-economic trends such as the pandemic, which stimulated the search for food of known origin, can increase the demand for local food. On the other hand, it makes these spaces dependent on these trends.

From a food Consumption perspective, there is a need to promote a diet that integrates nutritional and environmental aspects (06), favoring a plant-based diet, reducing the consumption of processed foods, moderating portion sizes and promoting the consumption of local products.

Another element that can contribute to the sustainability of the food system in terms of consumption is a set of coordinated and coherent public policies at different levels of government (07) that develop a cross-sectoral and multidisciplinary approach. To this end, it is necessary to look for several solutions, as a single solution is not sufficient. This includes monitoring current consumption and its impact, as well as changes over time and the regulation of food prices.

In addition, these public policies must take into account socio-cultural and economic aspects, social and cultural acceptance of dietary habits, food accessibility and distributive justice as essential factors for a healthy and sustainable diet. It is emphasized that the cost of food must be taken into account in order to avoid inequalities and that specific guidelines must be drawn up for different population groups.

In this context, the need to regulate media campaigns to limit the advertising of unhealthy and unsustainable foods and promote healthy eating habits was also emphasized. Food labelling is also considered important for public policy by introducing labels that make it easier for consumers to recognize the environmental impact of food, as well as information on nutritional composition and health claims.

However, as an element hindering the transition to healthier and more sustainable food systems, Dixon & Isaacs (2013) point out that current dietary practice (08) pays little attention to aspects of nutrition and sustainability, with a high consumption of meat and its derivatives and ultra-processed foods.

In terms of dietary prescriptions for health and sustainability (09), seven have been identified by Godin & Sahakian (2018) as most dominant among prescribers and consumers, co-existing without a clear hierarchy, often in tension with each other. The first is eating for pleasure: the pleasure people should feel in preparing and sharing a meal that is part of a communal practice. Pleasure is seen as essential to a healthy diet. The second is a nutritionally balanced diet, which is seen as important for a healthy and sustainable diet. Organic and natural eating and local and seasonal eating are emphasized as overlaps between the dietary recommendations. When it comes to eating local, seasonal, organic or "natural" foods, health and sustainability are often confused: If a food is considered environmentally sustainable, eating it is also considered healthier for people in terms of health.

There is a difference between those in favor of "less and better meat consumption" and those in favor of a vegetarian and vegan diet: for those in favor of less but better meat consumption, consumers should choose quality over quantity. Eating less and better meat is presented as the answer to the health problems associated with the high consumption of red meat, but also to the potential harmfulness of antibiotics for animals as well as pesticides in their food. Reducing meat consumption is also presented as beneficial for the environment. Proponents of vegetarian and vegan diets, on the other hand, believe that killing and eating animals is wrong as they are not necessary for our survival. Finally, there are weight loss diets, where a slim body has become synonymous with a healthy body.

The dimensions of daily life (10) can both help and hinder the promotion of a healthy and sustainable diet. Buying, planning, cooking, storing and managing food requires a considerable amount of time and the acquisition of culinary skills.

Mobility and access to food influence the scenario addressed, because the way people move around on a given day affects the food they buy and where they buy it, or the decision to eat out. Even more than proximity to home, access to a shop as part of daily transit seems to be the dominant time and space in which people purchase food.

The social dynamics inside and outside the house have the following effects: Who cooks for whom and who eats with whom are areas that influence the types of meals prepared and the intentions associated with them. An adult may not pay as much attention to the flavor or quality of the

food when eating alone, but may take care to prepare a tasty and balanced meal when cooking for their family. Or parents may choose not to buy certain foods that they know their children won't eat, favoring processed foods that are considered less healthy and sustainable.

As for the socio-economic aspects, they have the effect that the more conscious consumers belong to the middle class, which shows that for lower-income socio-economic groups, the cost of a healthy and sustainable diet can be a barrier to its implementation (Godin & Sahakian, 2018).

In addition to the elements that make up these four dimensions (production, supply, marketing and consumption), three other elements were mentioned in the cases that can influence the entire food system. The first relates to the reduction of food loss and waste (11) throughout the food system, both at home and in restaurants, in production, storage and delivery logistics.

The other element concerns the promotion of transformative social innovations by (alternative) niche actors (12) with the aim of initiating sustainable change in local food systems. Raising awareness, legitimizing the movement and changing the local power structure can be done through self-organization to promote a change in the legal structure and enable citizen referendums; organizing a local referendum on the ban of pesticides; environmental and health education on the harms of pesticides; raising awareness among citizens through a protest and strengthening the legitimacy of the movement by claiming a farmer as the leader of the movement. This can be achieved by organizing a citizens' cooperative, establishing alternative food networks such as an organic farmers' market, an organic valley and a community-supported dairy to change local food consumption and production practices (Holtkamp, 2023).

On the other hand, actors in the conventional regime can hinder transformative innovations (13) and instead gradually promote innovations in their favor, as Holtkamp (2023) shows. These actors can take advantage of the existing coalition, organizational integrity and top-down connections by joining forces with other conventional producers from neighboring communities in an association and production cooperative to initiate a legal process with the aim of banning the referendum and a corresponding implementation norm for the pesticide ban. If, for historical reasons, the region has a high degree of organizational integrity within the conventional regime, which means that the majority of the population trusts the official government institutions, new regulations for the use of technological innovations to reduce pesticide drift can be enforced with the help of the government.

It is also possible that new regulations are enforced through a dialogue between government actors and regime actors to gradually encourage

innovation. For example, if the government has convinced many organic farmers involved in the movement and their association to consider the problem of pesticides as less urgent.

The production, supply, marketing and consumption of food are so interconnected that a healthy and sustainable food cannot be produced without the supply, marketing and consumption favoring these characteristics of being healthy and sustainable. In other words, for a healthy food to be produced sustainably, pass through the supply chain, be marketed and consumed, the entire food system needs to be planned in a way that favors these conditions. They are therefore inextricably linked. In Figure 1, these links are represented by arrows between the dimensions.

Based on the synthesized meta-analysis, suggestions were formulated for each stage of the food system on the path to sustainability, as shown in Table 5.

Table 5 - Propositions in the scope of food production, supply, commercialization, and consumption towards sustainability

P1 – Production: In the transition to a sustainable food system, it is necessary to consider territorial agricultural practices that reduce environmental impact, such as crop rotation, rotational grazing, no-till farming, the use of organic fertilizers, and organic production.
P2 – Supply: Ethical values-based practices of public officials engaged in environmental causes are necessary for successful implementation of sustainable food supply public procurement policies; **P3 – Supply**: The organization of institutions, through contractual agreements and appropriate infrastructure, favors the acquisition, receipt, and provision of healthier and more sustainable food.
P4 – Commercialization: Conventional actors in hybrid food networks enable the resocialization (revival of local food culture) and relocalization of food (local food marketing initiatives); **P5 – Commercialization**: Alternative food networks and local marketing initiatives promote regional development and serve as formative spaces for consumers.
P6 – Consumption: To achieve a sustainable food system, it is necessary to promote a diet that integrates nutritional and environmental aspects; coherent and aligned public policies at various levels of government that also consider sociocultural and economic aspects; **P7 – Consumption**: A set of coherent and aligned public policies at various levels of government, using a multisectoral and multidisciplinary approach and involving all sectors of different disciplines, are fundamental aspects to achieve a sustainable food system;

P8 – Consumption: Current dietary practices give little consideration to nutritional and sustainability aspects, prioritizing high consumption of meats and their derivatives and ultra-processed foods;
P9 – Consumption: Dominant dietary prescriptions on health and sustainability coexist without a clear hierarchy, often in tension with each other, hindering the transition to a sustainable food system;
P10 – Consumption: Everyday life dimensions can both contribute to and hinder the promotion of a healthy and sustainable diet.

P11 – Food System: Reducing food losses and waste is necessary in all dimensions of the food system to achieve sustainability;
P12 – Food System: To transform consumption and production practices, it is essential to encourage transformative social innovations by niche actors (alternatives) through sharing competencies, building trust among these actors and consumers, and deepening common values and beliefs;
P13 – Food System: Actors in the regime (conventional) can hinder transformative social innovations and promote gradual innovations in their favor in the transition to a sustainable food system.

Source: Prepared by the authors (2023).

The information summarized here thus supports the decision-making of public, private or civil society actors who strive for a healthy and sustainable food system for present and future generations. One aspect that has become clear is the role of local actors, who have proven to be essential in creating initiatives that promote the transformation of the food system into a healthier and more sustainable form. However, these initiatives can experience discontinuity and disruption due to actions or actors that reproduce and are part of the conventional food system. Therefore, it is emphasized that actions by the state are fundamental, such as the creation of food-related public policies, which have already proven useful in regulating the food system (Rosseti *et al*., 2016; Camargo *et al*., n.d.).

Conclusions

A meta-synthesis study was carried out with the aim of understanding how the individual elements of the food system relate to sustainability. It was hypothesized that in the transition to a sustainable food system, there may be disruptions that contribute to or hinder this transition, both in the areas of production, supply, marketing and consumption and in the food system as a whole.

Elements that influence, prevent or promote sustainability in the food system were identified as a contribution to research. Elements that influence, hinder or promote sustainability in the food system were identified as a contribution to research. Elements that hinder the transition to sustainable food systems include

i. environmentally harmful territorial agricultural practices;
ii. institutional organization hindering the acquisition, receipt, and supply of healthy and sustainable food;
iii. exclusion of organic farmers from hybrid food networks;
iv. lack of resources, dependence on external allies, and socioeconomic trends affecting alternative food networks and local marketing initiatives;
v. current dietary practices disregarding nutritional and sustainability aspects;
vi. dominant conflicting dietary prescriptions;
vii. dimensions of daily life, such as time constraints, mobility restrictions, and access to food, family concerns, and socioeconomic context; and
viii. actors in the conventional system obstructing transformative social innovations aiming for a healthy and sustainable diet.

Additionally, enabling elements for the transition to sustainable food systems also emerged in the research, including:

i. territorially differentiated sustainable agricultural practices;
ii. changes in public servants' practices based on ethical values;
iii. institutional organization supporting the acquisition, receipt, and supply of healthy and sustainable food;
iv. hybrid food networks supported by re-socialization and relocation practices implemented by conventional farmers;
v. alternative food networks and local initiatives, of significant socioeconomic importance promoting interaction between producers and consumers;
vi. the need for a diet fully integrating nutritional and environmental aspects;
vii. aligned public policies at various government levels considering sociocultural aspects and scientific evidence;
viii. dimensions of daily life, such as available time, mobility, and access to healthy and sustainable food, family care, and a favorable socioeconomic context;
ix. reduction of losses and waste; and
x. niche actors promoting transformative innovations towards healthy and sustainable diets.

It has become clear that farmers, whether conventional or organic, policy makers, public and private sector actors and consumers can all play a part

in the transition to a sustainable food system. However, it is important to emphasize the role of the state as a regulator and facilitator of public policies that promote and raise awareness of the transition to a sustainable food system.

As a theoretical contribution, this study explains the elements and drivers of the sustainable food system. As a practical contribution, it is possible to develop action plans from the tensioners that involve different stakeholders and government actions for public policy development.

In terms of developing future research, it is suggested that this phenomenon be studied in the light of interpretative approaches, such as the theory of social action (Weber [1864-1920] 2013), in which social engagement is analyzed as meaningful, which requires its understanding through the creation and determination of causal relationships that enable the interpretation of the meaning of the action.

Due to the methodological limitations of the present study, further research notes were emphasized. The first is that studies using qualitative methods that consider the Global South, including research on sustainable, fair and healthy agri-food systems in this location, could perhaps examine the reality of the Global South, as this study examines the Global North in a more accentuated way. This would be relevant as a large proportion of food production takes place there.

Secondly, since the meta-synthesis aims at a theoretical synthesis for different realities, the differences between the development models present in the case studies were not taken into account, research can be carried out to detail these differences as well as the differences between countries in the elaboration of public policies for the food system.

References

Bach-Faig, A., Wickramasinghe, K., Panadero, N., Fabregues, S., Rippin, H., Halloran, A., Fresan, U., Pattison, M., & Breda, J. (2022). Consensus-building around the conceptualisation and implementation of sustainable healthy diets: a foundation for policymakers. *BMC Public Health*, *22*(1480). Doi: 10.1186/s12889-022-13756-y.

Batat, W. (2020). Pillars of sustainable food experiences in the luxury gastronomy sector: a qualitative exploration of Michelin-starred chefs' motivations. *Journal of Retailing and Consumer Services*, *57*, 102255. Doi: 10.1016/j.jretconser.2020.102255.

El Bilali, H., Strassner, C., & Ben Hassen, T. (2021). Sustainable agri-food systems: Environment, economy, society, and policy. *Sustainability*, *13*(11), 6260. Doi: 10.3390/su13116260.

Bonfert, B. (2022). 'What we'd like is a CSA in every town'. Scaling community supported agriculture across the UK. *Journal of Rural Studies*, *94*, 499-508. Doi: 10.1016/j.jrurstud.2022.07.013.

Camargo, R.A.L. de, Baccarin, J.G., & Silva, D.B.P. da. (s.d.). O papel do Programa de Aquisição de Alimentos (PAA) e do Programa Nacional de Alimentação Escolar (PNAE) no fortalecimento da agricultura familiar e promoção da segurança alimentar. *Revista UNESP*. -- Available in: www.fcav.unesp.br/Home/departamentos/economiarural/josegiacomobaccarin1559/artigo-temas-versao-publicada.pdf. Access at: mar. 2024.

Cavalli, S.B., Melgarejo, L., Soares, P., Martinelli, S.S., Fabri, R.K., Ebone, M.V., & Rodrigues, V.M. (2014). Planejamento e operacionalização do fornecimento de vegetais e frutas pelo Programa de Aquisição de Alimentos para a alimentação escolar. In J.V.Q. Cunha, A.R. Pinto, R.M. Bichir, & R.F.S. Paula, *Avaliação de políticas públicas*: reflexões acadêmicas sobre o desenvolvimento social e o combate à fome (pp. 184-204). MDA: Brasília.

Coupe, S. & Lewins, R. (2007). *Negotiating the seed treaty*. UK: Pratical Action.

Dixon, J. & Isaacs, B. (2013). Why sustainable and 'nutritionally correct' food is not on the agenda: Western Sydney, the moral arts of everyday life and public policy. *Food Policy*, *43*, 67-76. Doi: 10.1016/j.foodpol.2013.08.010.

Dubois, A. & Carson, D. (2020). Sustainable agriculture and multifunctionality in South Australia's Mid North region. *Australian Geographer*, *51*(4), 509-534. Doi: 10.1080/00049182.2020.1813960.

Fischler, C.A. (2018). "McDonaldização" dos costumes. In J. Flandrin, & M. Montanari, *História da alimentação* (pp. 841-862). Trad. Guilherme J. de F. Teixeira and Luciano V. Machado. São Paulo: Estação Liberdade, 9ª ed.

Galli, F., Prosperi, P., Favilli, E., D'Amico, S., Bartolini, F., & Brunori, G. (2020). How can policy process remove barriers to sustainable food systems in Europe? Contributing to a policy framework for agri-food transitions. *Food Policy*, *96*, 101871. Doi: 10.1016/j.foodpol.2020.101871.

Godin, L. & Sahakian, M. (2018). Cutting through conflicting prescriptions: how guidelines inform "healthy and sustainable" diets in Switzerland. *Appetite*, *130*, 123-133. Doi: 10.1016/j.appet.2018.08.004.

Goggins, G. (2018). Developing a sustainable food strategy for large organizations: The importance of context in shaping procurement and consumption practices. *Business Strategy and the Enveronment*, *27*, 838-348. Doi: 10.1002/bse.2035.

Graziano da Silva, J. (1987). Mas, qual reforma agrária? *Revista da ABRA*, 17(1).

Graziano da Silva, J. (2003). *Tecnologia e Agricultura Familiar*. Porto Alegre: Editora UFRGS, 2ª ed.

Gregolin, G.C., Gregolin, M.R.P., Triches, R.M., & Zonin, W.J. (2019). Desenvolvimento: do unicamente econômico ao sustentável multidimensional. *Revista Eletrônica de Humanidades do Curso de Ciências Sociais da UNIFAP – PRACS*, *12*(3), 51-64. Doi: 10.18468/pracs.2019v12n3.p51-64.

Hawkes, C. & Parsons, K. (2019). *Brief 1*: Tackling Food Systems Challenges: The Role of Food Policy. London: Centre for Food Policy.

Holtkamp, C. (2023). Contested diffusion of transformative innovations: micro- and macrolevel social capital in South Tyrol. *Sociologia Ruralis*, *63*, 20-44. Doi: 10.1111/soru.12389.

Hoon, C. (2013). Meta-synthesis of qualitative case study: an approach to theory Building. *Organizational Research Methods*, *16*(4), 522-556. Doi: 10.1177/1094428113484969.

Mattioni, D. & Caraher, M. (2018). Moving towards ecologically sustainable diets: lessons from an Italian box delivery scheme. *International Journal of Consumer Studies*, *42*, 430-438. Doi: 10.1111/ijcs.12437.

Matzembacher, D.E., & Meira, F.B. (2018). Sustainability as business strategy in community supported agriculture: social, environmental and economic benefits for producers and consumers. *British Food Journal*, *121*(2), 616-632. Doi: 10.1108/BFJ-03-2018-0207.

Monteiro, C.A., Cannon, G., Lawrence, M., Costa-Louzada, M.L., & Pereira-Machado, P. (2019). *Ultra-processed foods, diet quality, and health using the NOVA classification system*. Rome: FAO.

Nordborg, M., Davis, J., Cederberg, C., & Woodhouse, A. (2017). Freshwater ecotoxicity impacts from pesticide use in animal and vegetable foods produced in Sweden. *Science of The Total Environment*, 581-582, 448-459. Doi: 10.1016/j.scitotenv.2016.12.153.

Rosseti, F.X., Silva, M.V. da., & Winnie, L.W.Y. (2016). O Programa Nacional de Alimentação Escolar (PNAE) e o desafio da aquisição de alimentos regionais e saudáveis. *Revista Segurança Alimentar e Nutricional (UNICAMP)*, *23*(2). Doi: 10.20396/san.v23i2.8647528.

Sachs, I. (2009). *Caminhos para o desenvolvimento sustentável*. Rio de Janeiro: Garamond.

Sanz, E.S., Cardona, A., & Napoléone, C. (2022). Motivations of Public Officials as Drivers of Transition to Sustainable School Food Provisioning: insights from Avignon, France. *Journal of Agricultural and Environmental Ethics*, *35*(6). Doi: 10.1007/s10806-022-09880-9.

Scrinis, G., & Monteiro, C. (2022). From ultra-processed foods to ultra-processed dietary patterns. *Nat Food*, *3*, 671-673. Doi: 10.1038/s43016-022-00599-4.

Tilman, D., & Clark, M. (2014). Global diets link environmental sustainability and human health. *Nature*, *515*(7528), 518-522. Doi: 10.1038/nature13959.

Vizeu, F., Meneghetti, F.K., & Seifert, R.E. (2012). Por uma crítica ao conceito de desenvolvimento sustentável. *Cadernos EBAPE.BR*, *10*(3). Doi: 10.1590/S1679-39512012000300007.

WCED – World Commission on Environment and Development (1987). *Our Common Future*. UK: Oxford University Press.

Weber, M. [1864-1920] (2013). *Economy and Society*: *An Outline of Interpretive Sociology*. CA: University of California Press.

Weis, T. (2013). The meat of the global food crisis. *The Journal of Peasant Studies*, *40*(1), 65-85. Doi: 10.1080/03066150.2012.752357.

Zollet, S. (2023). Hybrid food networks and sustainability transitions: shared and contested values and practices in food relocalisation and resocialisation. *Sociologia Ruralis*, *63*, 117-139. Doi: 10.1111/soru.12391.

Ana Beatriz Goes Maia Marques
Western Paraná State University, Brazil
Pernambuco Street, 1777 – 85960-000 Paraná, Brazil
E-mail: beatriz.goes.maia@gmail.com
She is a PhD candidate and holds a Masters in Sustainable Rural Development from the Federal University of the Southern Frontier. Her research interests include sustainable and healthy nutrition, agrifood systems, family farming and agroecology.

Silvana Anita Walter
Department of Administration, Western Paraná State University, Brazil
Pernambuco Street, 1777 – 85960-000 Paraná, Brazil
E-mail: silvanaanita.walter@gmail.com
She holds a degree in Administration (Paraná, 1996) and a doctorate in Administration (Paraná, 2010). Associate Professor at the State University of Western Paraná since 2013, her current research interests include studies using quantitative methods (structural equation regression and other multivariate techniques), social network analyses and qualitative methods.

Eduardo Guedes Villar
Federal Institute of Santa Catarina, Brazil
Fahdo Thomé Avenue, 3000 – 89500-000 Santa Catarina, Brazil
E-mail: eduardogvillar@gmail.com
He holds a degree in Administration (Santa Catarina, 2006) and a PhD in Administration (Paraná, 2019). Professor at the Federal Institute of Santa Catarina since 2022. Current research interests: Processual and relational ontologies, organisational sociology, theories of social practise, decision-making processes, strategy, performativity and radical innovation in the food production value chain.

Jaqueline de Paula Siqueira da Costa
City Hall of Cruzmaltina Paraná, Brazil
Father Gualter Farias Negrão Avenue, 40 – 86855-000 Paraná, Brazil
E-mail: jaqueline.solucao@hotmail.com
She holds a degree in Accounting Sciences (Paraná, 2004) and a Master's degree in Accounting from the Western Paraná State University (Paraná, 2022). Professor at the Faculty of Engineering of Vale do Ivaí and accountant at the City Hall of Cruzmaltina Paraná *48*.