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Academic Research Papers

Evaluation of the Quality and Sustainability of Olive Oils by Taster with Different Degrees of Experience

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Abstract

Background: The olive oil supply chain is one of the main activities in Italy, boasting the richest varietal heritage of oils in the world. The European Union is the world's largest producer and exporter of olive oil, yet consumption in the EU has fallen by 17%. This contrasts with non-producing countries, which tend to appreciate it for its health benefits. The present study aims to investigate the behaviour and the habits of the consumers in relation to extra olive oil consumption, focusing on the impact, in terms of sustainability, of protected designation of origin (PDO) and EU-organic certification on purchase intention and quality perception.
Methodology: The three panels (ten experts, ten semi-experts and ten habitual consumers of olive oil) are compared in terms of general knowledge of the oil's characteristics and sensory evaluation concerning fruitiness, pungency and bitterness, and the appreciation for these three attributes. The evaluation took place in two different tasting sessions, one blind and one non-blind. The panels' performance is analysed through an ANOVA model.
Results: The answers provided during the tastings were statistically analysed and compared. The analysis demonstrated that the two more experienced groups recognized the sensory attributes as positive qualitative characteristics of the oils, while the non-experts considered the bitterness as a

defect. This highlights the ability of the expert and semi-expert panels to discriminate between the liking for the product, unlike the group of regular consumers. The participants in general were positively influenced by PDO/organic certification, demonstrating their comprehension of the sustainability of the product.
Implications: There are relatively few studies that concentrate on the perceptions of consumers regarding the ability to recognise qualitative characteristics of extra virgin olive oil. Therefore, this study aids in the valorisation of the olive oil supply chain from a qualitative and sustainability perspective. Only knowledge and experience can aid consumers to make consistent and aware choices. Information campaigns could help them to distinguish products, correctly identify food attributes and overcome their scepticism towards certified products.

Keywords – Sensory Analysis; Perceived Quality; Sustainable Production; Panel Test; ANOVA Model.

Paper type – Academic Research Paper

Sommario

Valutazione della qualità e della sostenibilità degli oli di oliva da parte di assaggiatori con diversi gradi di esperienza. – La filiera dell'olio d'oliva è una delle principali attività in Italia, che vanta il più ricco patrimonio varietale di oli di oliva al mondo. L'Unione Europea è il maggiore produttore ed esportatore mondiale di olio d'oliva, eppure il consumo nell'UE è diminuito del 17%. Questo contrasta con i Paesi non produttori, che tendono ad apprezzarlo per i suoi benefici sulla salute.
Il presente studio si propone di indagare il comportamento e le abitudini dei consumatori in relazione al consumo di olio extravergine di oliva, concentrandosi sull'impatto, in termini di sostenibilità, della denominazione di origine protetta (DOP) e della certificazione biologica UE sull'intenzione d'acquisto e sulla percezione della qualità.
I tre panel (dieci esperti, dieci semi-esperti e dieci consumatori abituali di olio d'oliva) vengono confrontati in termini di conoscenza generale delle caratteristiche dell'olio e valutazione sensoriale relativa a fruttato, piccante e amaro, e apprezzamento per questi tre attributi. La valutazione è stata condotta in due diverse sessioni di degustazione, una alla cieca e una abituale. Le prestazioni dei panel sono state analizzate attraverso un modello ANOVA.
Le risposte fornite durante le degustazioni sono state analizzate statisticamente e confrontate. L'analisi ha dimostrato che i due gruppi più esperti hanno riconosciuto gli attributi sensoriali come caratteristiche qualitative positive degli oli, mentre i non esperti hanno considerato l'amaro come un difetto. Ciò evidenzia la capacità dei panel di esperti e semi-esperti di discriminare il gradimento del prodotto, a differenza del gruppo di consumatori abituali. I partecipanti in generale sono stati influenzati positivamente dalla certificazione DOP e biologica, dimostrando la loro comprensione della sostenibilità di prodotto.
Sono relativamente pochi gli studi che si concentrano sulla percezione dei consumatori riguardo alla capacità di riconoscere le caratteristiche qualitative dell'olio extravergine di oliva. Questo studio contribuisce quindi alla valorizzazione della filiera dell'olio extravergine in una prospettiva qualitativa e di sostenibilità. Solo la conoscenza e l'esperienza possono aiutare i consumatori a fare scelte coerenti e consapevoli. Campagne informative possono aiutarli a distinguere i prodotti, a identificare correttamente gli attributi alimentari e a superare il loro scetticismo nei confronti dei prodotti certificati.

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1 Introduction

The olive oil supply chain is one of the main activities in Italy, boasting the richest varietal heritage of oils in the world. Olive trees not only protect the environment and biodiversity but also generate an economic system worth over 3 billion euros, involving around 400 thousand businesses including farms, oil mills and processing industries that produce healthy foods of great importance.

The enormous potential of olive oil is due to various and diverse factors. First and foremost, its nutritional characteristics and benefits, as well as its organoleptic properties; its historical roots in the national territory, capable of attracting buyers, tourists and investors from all over the world; its relevance to the study of environmental and sustainability issues and, therefore, the protection of ecosystems (Mendes, Rodrigues, Leandro, Şeker, & Kavdır, 2024).

Italy, after having first been the undisputed world leader and then, since the end of the 1990s, consistently the second global player behind Spain, it has now fallen to fifth place among the main producers of olive oil. Furthermore, all the other countries are strengthening their offer of a product that is increasingly widespread at a global level (+66% Spain; +114% Turkey; +70% Tunisia; +61% Greece; +37% World). Especially the Mediterranean countries have been able to create targeted sector policies. Italy is the only country in sharp decline for the 2024/2025 campaign with a decrease of 24% due to drought, totalling almost 250 thousand tons (European Commission, 2025; ISMEA, 2025).

In the previous olive growing campaigns, there has been a strong generalized production heat for all European countries due to the unpredictability of the climate and its changes. This has strongly influenced the oil market, which due to the low stocks, has seen a significant increase in prices in Italy and, consequently, a drop in consumption. Olive oil is currently sold below cost in supermarkets and not valued in restaurants, in fact producers and retailers are worried and are considering that a rethinking of the production chain may be necessary to favour the valorization of the quality of the product.

The uncertainty of the national olive oil production and the availability of cheaper alternatives from other countries have led to an increase in the consumption of lower quality olive oils. To counteract this, considering that many authors have stated that labels influence consumer purchasing choices (Paffarini, Torquati, & Cecchini, 2025), olive oil producers should give priority to origin-linked quality products that have earned the PDO (Protected Designation of Origin), PGI (Protected Geographical Indication) and/or organic label(s). Linking quality to geographical origin favours product differentiation on the market, renders the supply chain more sustainable, and aids the preservation of local heritage and culture (Spognardi, Vistocco, Cappelli, & Papetti, 2021). In particular, the European Commission (EC) has established a method that can be used to measure the environmental performance of products from a life cycle perspective, known as the Product Environmental Footprint (PEF). Various pilot projects have

been initiated to test the PEF Category Rules in the case of olive oil, in order to identify the most significant environmental impacts, processes, and elementary flows of the product cycles (Tuomisto et al., 2015).

The perception of quality and sustainability is not the same for all consumers, thus a product label could both lure or distance a consumer from purchasing. Several studies have explored the factors behind the purchase of olive oil. Petrescu, Vermeir, and Petrescu-Mag (2020) highlight that the demand for food products depends on the expected quality, and the key elements in determining this expected level are divided into quality signals and quality attributes. Quality signals can be perceived before product consumption and are related to the product's physical characteristics (intrinsic cues), such as colour and turbidity, or other characteristics that are not physically part of the product (extrinsic cues), such as price, brand, region, or country of origin (Di Vita, Zanchini, Gulisano, Mancuso, Chinnici, & D'Amico, 2021; Carzedda et al., 2021). The formation of consumer attitudes is influenced by several factors, which can be broadly classified into consumer attributes and product attributes (Singh, Arora, & Choudhry, 2022; Ndayitwayeko & Radegonde, 2024). These contributing factors include: direct observation; indirect knowledge; and positive or negative opinions shaped by variables such as personality, values, perceived risk, age, education, sociocultural position, culture, nationality, media exposure to information, and social support (Ajzen, Fishbein, Lohmann, & Albarracín, 2019).

In recent times, there has been a notable rise in consumer awareness, perception, knowledge, and consumption of agri-food products that carry quality marks, thus modifying attitudes and behaviours (Tsourgiannis, Zoumpoulidis, Papadopoulos, Florou, & Markopoulos, 2025). Concurrently, consumer acceptance of certified products has emerged as a crucial element for successful product development, strategic orientation, and market expansion.

Instead, quality attributes cannot be valued or perceived before consumption since they are linked to the product experience; they can be classified into experience and credence attributes. The former can be recognized during consumption and, in the specific context of food, includes taste, smell, and tenderness, while the latter includes the sustainability of the product, health or environmental benefits, and cannot be directly evaluated during consumption (Sgroi, Sciortino, Giamporcaro, & Modica, 2024). Both play an important role in consumer judgement. Since quality attributes are difficult to know before consuming the product, consumers use extrinsic cues to infer the degree of quality. This attitude is essential for the consumption of olive oil, considering that, in this case, the characteristics of the oil can vary (Calatayud et al., 2024).

Consumer satisfaction in the olive oil sector, is therefore the realisation that one has purchased a quality product that can be used to enrich your meals and more. In general, the average olive oil consumer is not particularly demanding and is not willing to spend too much, even to purchase a

product with a specific geographical designation. However, there are often needs that even consumers do not realise they have, and this could also be due to a lack of awareness. The process that leads a consumer to prefer one product over another is, in some ways, very hierarchical, i.e. first comes the type of oil desired – olive oil, sunflower oil, soybean oil, etc. – and then the choice of brand.

Many people think they can discriminate between positive and negative attributes of olive oil, but it is not always easy because olive oil is a complex product, and the perception of its quality depends on many characteristics (Chrysochou, Tiganis, Trigui, & Grunert, 2022). Moreover, even if the consumers are interested in healthy and nutritious foods (Jia, Li, Jin, & Zhang, 2023), many of them are not willing to sacrifice the taste. For example, despite bitterness and spiciness being associated with the presence of antioxidants in olive oil, they do not always meet the approval of consumers. Recent studies show that only few consumers know that bitterness is a positive characteristic of olive oil, as it is related to pungency (Arbeláez-Mejía, Rosas, & Ramos-Álvarez, 2025; Spognardi, Vistocco, Cappelli, & Papetti, 2021; Caracciolo, Cavallo, Del Giudice, Panico, Vecchio, & Cicia, 2020). Since olive oils characterised by mild attributes are marketed in supermarkets, consumers are convinced that EVOO must be like this. Many consumers, especially in areas where there are few local olive oil producers, think that an EVOO with very pronounced attributes is not of good quality, but paradoxically defective (Guclu, Kelebek, & Selli, 2021; Cavallo, Cicia, Del Giudice, Sacchi, & Vecchio, 2019).

In fact, sensory evaluation theory is quite critical as it serves to evaluate product quality, develop new products that meet consumer preferences, control shelf life and standardisation, and understand the relationship between chemical composition and sensory perception (Civille, Carr, & Osdoba, 2024). It is a scientific method defined by national and international standards (UNI and ISO) that indicate the methodologies to be applied for defining profiles, the protocols to be followed for conducting hedonic tests, and the guidelines for selecting and training tasters. This type of evaluation is carried out by applying the so-called “Quantitative Descriptive Analysis”, developed by Tragon Corporation in 1974, which consists of proposing a series of visual, olfactory, and gustatory-tactile descriptors to be generally evaluated on a structured scale.

Although the topic about consumer perception linked to the experience of the olive oil product is not new, not many studies have been conducted on this topic. The aim of this study is to compare the differences between the sensory profiling of three different groups of tasters (consumers, semi-expert tasters, and professional panellists) in blind and non-blind tests. The research questions are the following: Are consumers capable of recognising the quality of the certified products? What influences their willingness to buy and consume these products? Through this approach, the goal is to understand if olive oil consumers are capable of recognising the high level of quality of certified products that are associated with sustainable local production processes. In fact, in the literature there are few studies

which investigate the role of tasting and of consumer willingness to accept the qualitative characteristics of olive oil samples with PDO and EU-organic certifications (Lanfranchi, Algeri, Dimitrova, De Pascale, & Giannetto, 2024). The relationship among groups is evaluated in terms of their degree of liking and how the presence of the logos influences the perception of the quality of the EVOOs is investigated. The data will also be analysed using the ANOVA model. This analysis could serve as a tool for directing marketing efforts of the entire olive oil supply chain towards consumer preferences.

2 Methodology

2.1 Description of the panels and the sensory tasting procedure

The study involved thirty tasters recruited in the Lazio region, classified in three standardised groups: ten experts, ten semi-experts, and ten regular consumers of EVOO. Tasting panels are typically composed of a limited number of panellists which corresponds to the standard number of tasting cabinets (Arbeláez-Mejía, Rosas, & Ramos-Álvarez, 2025). The classification of olive oil as "extra-virgin", "virgin" or "lampante" is carried out through chemical-physical analysis and sensory evaluations (García-Pizarro et al., 2024). Extra-virgin olive oil (EVOO) is characterised as having a low acidity, maximum 0.8%, being absent from defects, and possessing aromatic attributes and flavours (Arbeláez-Mejía, Rosas, & Ramos-Álvarez, 2025; Jimenez-Lopez et al., 2020). Additionally, it is usually classed as intense, medium, or light depending on the intensity of the positive attributes that it possesses, which include fruitiness, bitterness and pungency (Genovese, Mondola, Paduano, & Sacchi, 2020).

The sensorial aspect is dealt with by a panel of expert olive oil tasters, accredited by EN ISO/IEC 17025 (ISO, 2017; European Accreditation, 2022), who periodically evaluate the conformity of olive oil samples with the requirements of the Regulation (EC) 640/2008 and grant awards to EVOO samples. To take part in the current study as experts, that is, professionals officially recognised by MIPAAF (Italian Ministry of Agricultural, Food and Forestry Policies), tasters must have participated in specific courses and tasting sessions on a regular basis. By "semi-experts" we refer to aspiring olive oil tasters who have already acquired the physiological suitability to perform tasting through a first level course, held according to the guidelines provided by the current European legislation. Finally, consumer panellists were chosen randomly among a group of people who were interested in the study, who have never attended training courses, and who consume olive oil on a weekly basis. Table 1 summarizes the demographic features of tasters.

Table 1 – Characterization of the panels

Parameter		%
Gender	Female	40.0
	Male	60.0
Age	18 to 29 years	30.0
	30 to 39 years	26.7
	40 to 49 years	20.0
	50 to 59 years	13.3
	60 and more years	10.0
Education	Secondary education	46.7
	Bachelor's degree or higher	53.3
Family income	Up to €25.000/year	36.6
	€25.000 to €49.999/year	50.0
	€50.000 to €74.999/year	6.7
	€75.000 and more	-
	Not received	6.7

Source: Authors' elaboration

Moreover, specific questions were submitted to the tasters, aiming to:

- understand how much the tasters knew about olive oil characteristics and properties;
- evaluate if they considered pungency, fruitiness and bitterness as defects or positive attributes of olive oils, and whether they preferred a sample characterised by these pronounced features or a product where these attributes are barely perceptible;
- assess participants' awareness of the production processes related to PDO certification and Ecocert Organic Agriculture certification (C n°834/2007).

In the second part of the research, each panellist tested three Italian olive oil samples: an EVOO without a quality certification, an EU Organic EVOO, and a PDO EVOO. All samples were produced by the same olive farm and purchased from a specialised store. Table 2 reports the physical-chemical characterization of the three EVOOs.

Table 2 – Physical-chemical characterization of the three EVOO samples

Chemycal-physical parameters	EVOO	EU organic EVOO	PDO EVOO
Acidity (%)	0,49	0,29	0,32
Peroxide	8,90	9,37	8,73
ΔK	<0,01	<0,01	<0,01
K232	<2,5	<2,5	<2,5
K270	<0,22	<0,22	<0,22

Source: Authors' elaboration

The table shows that, from the point of view of the chemical and physical characteristics, all the three samples respect the qualitative parameters. The samples were evaluated by thirty tasters in a blind test, by filling in a specific form, as seen in Appendix A.

The panellists were then asked to test the three samples of olive oil again, this time being aware of which oil they were tasting, and to compile the same evaluation form. By comparing the results from both tests, the objective of this analysis was to understand whether the PDO and EU Organic labelling could affect the flavour perception, acceptance and the liking of tasters with different levels of experience (García-Pizarro et al., 2024; Latino, De Devitiis, Corallo, Viscecchia, & Bimbo, 2022).

The tastings were carried out in the official Sensory Room of the Laboratory of Commodities and Territorial Analysis (LAMeT), located at the Department of Economics and Law of the University of Cassino and Southern Lazio (Italy). The olive oils were served in cobalt blue tasting glasses and panellists tasted them according to a randomised complete block design (Barbosa, de Oliveira, Rosado, Sakiyama, Cruz, & Pereira, 2020).

2.2 Statistical analysis of the panels' performance

The evaluation of the performance of the tasting panels was carried out through an analysis of variance. It is a widespread approach in literature, as it allows the evaluation of the influence of different effects on the final scores (Næs, Brockhoff, & Tomic, 2010; Abdi, Williams, Valentin, & Bennani‐Dosse, 2012; Abdi, Williams, & Valentin, 2013; Lê & Worch, 2018).

Let us denote with I the number of panellists, each providing intensity scores for K attributes for J products in M separate tasting sessions, the generic score being denoted with Y^{k}_{ijm}. A three-way analysis of variance accounting for product differences as well as individual differences, session effect, and random noise is a possible model for each attribute k:

$$Yijmk=k+ik+jk+m\ k+\alpha ij\ k+\beta jm\ k+ijmk$$

where $_{ijmk}$~ N(0, σ^2), i.e. the errors are assumed to be independent and normally distributed, with mean zero and constant variance σ^2. Here:

- the panellists main effects α^k_i represent differences in scoring level between participants;
- the products main effects β^k_j represent the differences between the average scores for the different tasting sessions, i.e. it corresponds to the discrimination ability of the panel among products;
- the panellist-product interaction ijk expresses differences between participants in measuring differences between products;
- the panellist-session interaction βγjmk expresses whether participants use the scale differently in different sessions;
- the product-session interaction jmk, indicates where products are perceived similarly from one session to another.

It is worth recalling that in such a model it is natural to consider the panellist and interaction effects as being random to better generalise the results. These random effects together with the fixed product effects constitute the so-called mixed model ANOVA. With respect to a panel performance assessment, obviously some effects play a more relevant role than others. In particular, the discrimination ability of the group is expected to be significant when dealing with a panel of experts. The product-session interaction measures the repeatability of the panel in the different sessions, and in this case-study corresponds to the two different tasting sessions (blinded and normal testing).

The model in equation is used to analyse the performance of each of the three groups individually: expert, semi-expert, and regular consumers. The same model is used to evaluate the differences between the three panels in terms of sensory variables (pungency, fruitiness, bitterness) and their preference for said variables.

3 Results and discussion

3.1 Evaluation of the performance of the three panels using the set of preliminary questions

Before the sensory test, the tasters were asked if bitterness, pungency, and fruitiness are positive or negative attributes of olive oil. While expert and semi-expert tasters have readily recognized the three

attributes as positive characteristics, the same is not the case for regular consumers. For only 1 out of 10 regular consumers fruitiness is not a positive quality, for 2 out of 10 the pungency is a defect, while for 6 out of 10 only bitterness is a defect. However, a high percentage of regular consumers recognize fruitiness and pungency as positive characteristics in determining the quality of the product, respectively, 90% and 80%. The participants were also asked if they would prefer to buy an olive oil in which the three above-mentioned attributes are mild or another oil in which they are rather marked. Experts and semi-experts stated that they would buy the sample whose characteristics are very strong, and only 40% of regular consumers prefer the sample with mild attributes. Apparently, this result disagrees with the one reported in Table 3, where one of the three characteristics is recognized as a defect also by some regular consumers.

Table 3 – Perception of bitterness, pungency, and fruitiness in olive oils

Panel	Fruity		Bitterness		Pungency	
	Positive attribute	Defect	Positive attribute	Defect	Positive attribute	Defect
Expert	100 %	-	100%	-	100%	-
Semi-expert	100%	-	100%	-	100%	-
Non-expert	90%	10%	40%	60%	80%	20%

Source: Authors' elaboration

The results also suggest that, although bitter taste is generally an unpleasant factor for consumers, the level of perceived bitterness can be modulated through practice, experience, and knowledge of human health benefits. According to Arbeláez-Mejía, Rosas, and Ramos-Álvarez (2025), the stability of bitterness and pungency in EVOO is associated with the presence of bioactive compounds like β-sitosterol. Their study demonstrated that EVOO possesses a robust oxidative stability and health-promoting potential thanks to the presence of these compounds in high concentrations.

A further sensory element used by European Regulations to describe the EVOO taste (i.e., Regulation (EEC) No. 2568/91 and following ones) is the "olive fruity" flavour. After presenting the samples, specifying the type of oil and price per bottle, they were asked to choose the oil of their preference among those listed in Table 4.

Table 4 – Preferences expressed by tasters

Sample			Tasters' preference		
Number	**Type**	**Price**	**Experts**	**Semi-experts**	**Non-experts**
1	Italian Organic EVOO	€ 12,00	70%	50%	-
2	Local PDO EVOO	€ 12,00	10%	10%	60%
3	Italian PDO EVOO	€ 9,50	-	10%	20%
4	Local Organic EVOO	€ 9,50	10%	20%	20%
5	Local EVOO	€ 8,00	10%	-	-
6	Italian EVOO	€ 8,00	-	10%	-

Source: Authors' elaboration

80% of expert and 70% of semi-expert tasters particularly appreciated the organic oils; while 80% of regular consumers prefer PDO samples. The labels have certainly influenced the responses and the judgement of quality. In fact, the products subjected to certification are objectively confirmed, especially by expert tasters.

This preference for the organic labelled sample demonstrates a certain degree of interest in the environmental sustainability of the olive oil production process. In fact, organic labels or "eco-certifications", are used to describe the procedure for evaluating how environmentally sustainable the company activities are following a specific protocol. Therefore, labels can be useful in the purchasing process for those consumers who are devoted to reducing greenhouse gas emissions, are quality-oriented, and price insensitive. Additionally, these "ecolabels" could benefit consumer awareness by providing more information on production emissions, allowing fair returns for the work of certified producers and encouraging societal acceptance of climate change and producer-welfare-related policies (Paffarini, Torquati, & Cecchini, 2025).

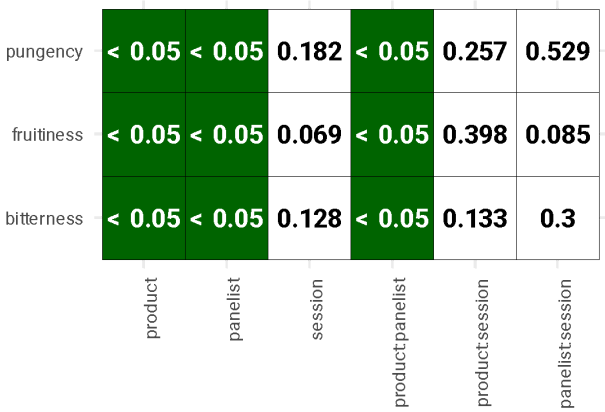
On the other hand, the preference of the consumer panel for the PDO sample also demonstrates an interest in environmental welfare. Although it is not a direct certification of environmental sustainability, like the organic label, the PDO certification encourages sustainable agricultural practices to preserve agri-food and cultural heritage, promoting the local economy and fair competition among producers (Andreghetto et al., 2025).

Recent results highlight the presence of a strong segmentation of the EVOO market, showing that the heterogeneity of preferences is particularly relevant in the case of PDO and organic productions (Carzedda et al., 2021). Data collected from the two sensory tests are available in Appendix B.

3.2 Evaluation of the performance of the three panels using ANOVA model

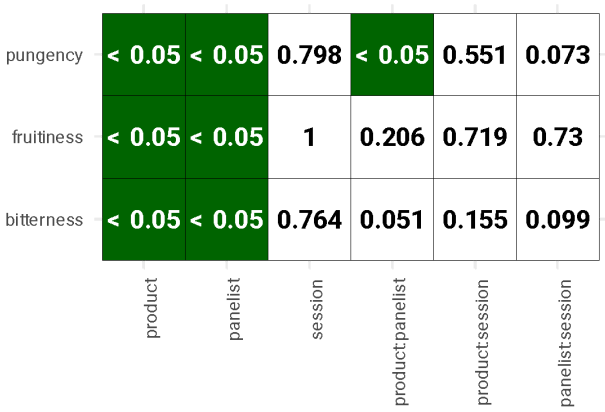
The results of the ANOVA for each group, with respect to the three sensorial variables, are shown in Figures 1, 2, and 3, for the panels of expert, semi-expert, and regular consumers, respectively. The three sensorial attributes are reported on the rows, while the columns show the different effects provided by the model.

Figure 1 – ANOVA results for the expert panel with respect to the sensory variables (non-blind test)



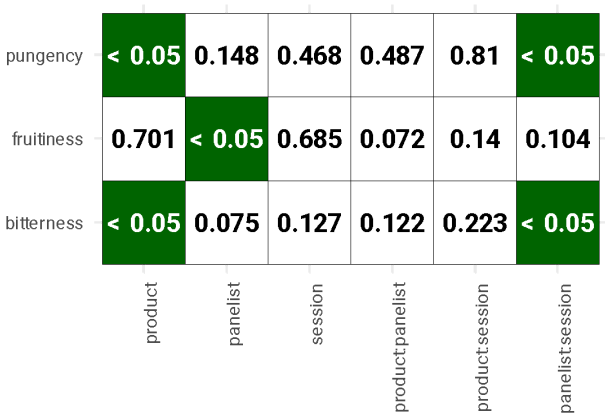
Source: Authors' elaboration

Figure 2 – ANOVA results for the semi-expert panel with respect to the sensory variables (non-blind test)



Source: Authors' elaboration

Figure 3 – ANOVA results for the non-expert panel with respect to the sensory variables (non-blind test)



Source: Authors' elaboration

Figure 1 highlights the equal performance of the panel of experts for the different sensory attributes: the product effect, the panellist effect and the product-panellist interaction are indeed all significant. For the p-value to be significant, the value must be greater than 0.05. In the case of pungency and fruitiness the values are greater, 0.529 and 0.398 respectively (see Figure 1). This suggests a good discrimination ability of the panel, but different use of the scales by the participants who also perceive the products differently (panel disagreement). Furthermore, the group consistently evaluates the products in the two sessions (not significant product-session interaction). This means that the expert panellists give the products the same score in both the blind and normal evaluations. This result is highlighted in Figures 7-9, where the evaluations for all products and for all attributes coincide (no difference).

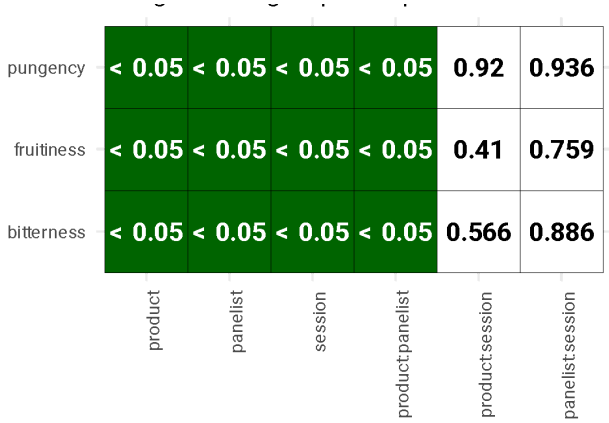
In Figure 2, the semi-expert group shows a performance very similar to that of the expert panel, except that it shows agreement on the fruitiness and bitterness attributes. As expected, a greater degree of variability is present in the case of the pungency and fruitiness p-values (see Figure 2). The non-expert participants instead demonstrate a different behaviour.

Indeed, the results in Figure 3 show the inability of the panellists to identify differences between the products for the fruitiness attribute (not significant product effect) but, on the other hand, an agreement of the panel on all attributes. The significance of the p-value is more marked in this case as the variability increases further.

A detailed analysis of the evaluations reported in Figures 7-9 shows how knowing the product information generally: a) increases the product scores concerning the pungency attribute; b) increases the scores for organic oil (bio) and decreases that for DOP and EVOO on the fruitiness variable; c)

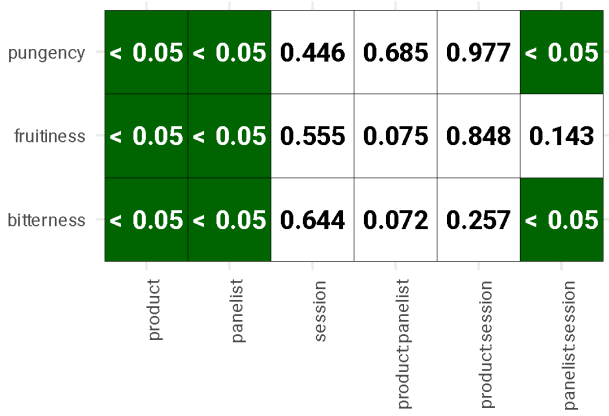
decreases the scores for all products, especially for bio, in the bitterness attribute. Results for the liking variables are organised in the same format in Figures 4 (experts), 5 (semi-experts), and 6 (non-experts).

Figure 4 – ANOVA results for the expert panel with respect to the liking variables (blind test)



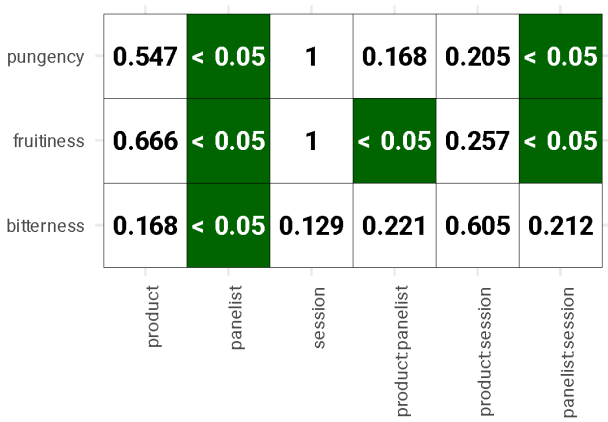
Source: Authors' elaboration

Figure 5 – ANOVA results for the semi-expert panel with respect to the liking variables (blind test)



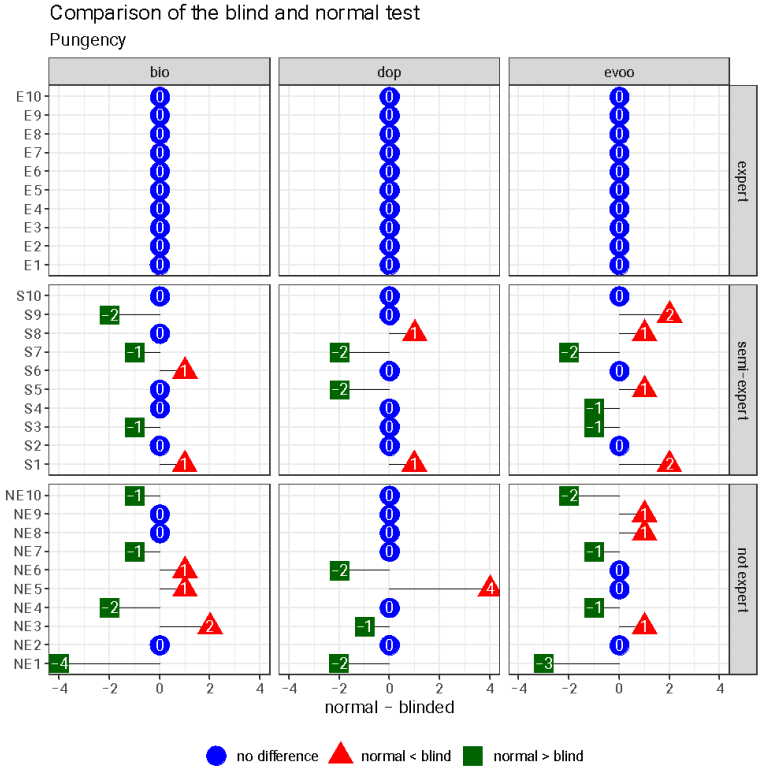
Source: Authors' elaboration

Figure 6 – ANOVA results for the non-expert panel with respect to the liking variables (blind test)



Source: Authors' elaboration

Figure 7 – Comparison of the scores of the three panels in the two different sessions (normal and blind) for the sensory attribute pungency and for each type of product

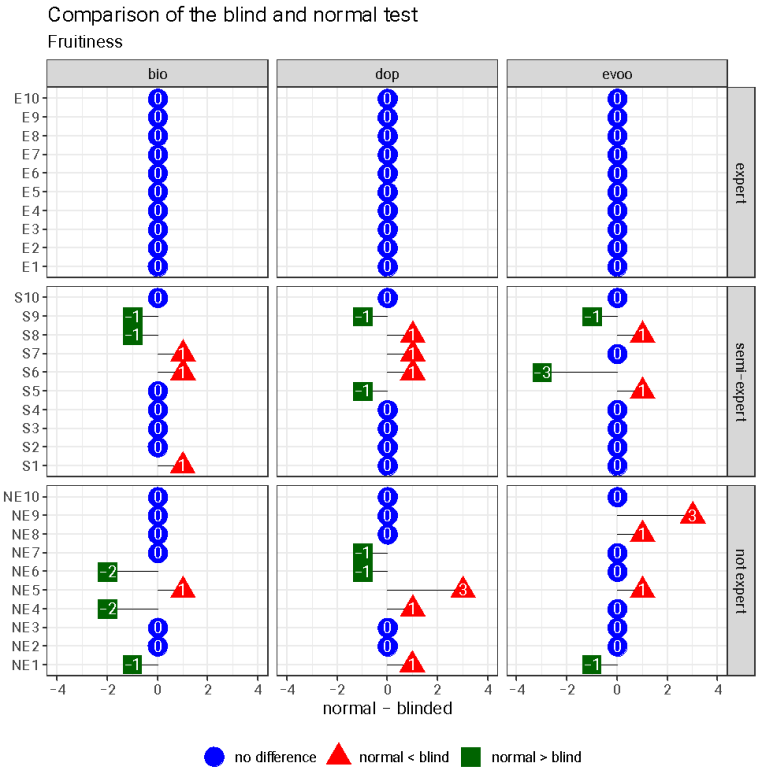


Source: Authors' elaboration

As for the liking variables, it can be seen from the Figures 4, 5, and 6 that the panel of experts and semi-experts discriminate between the liking for products while the panel of non-experts does not. Furthermore, while the semi-experts show no disagreement, the experts disagree on all attributes while the non-experts only.

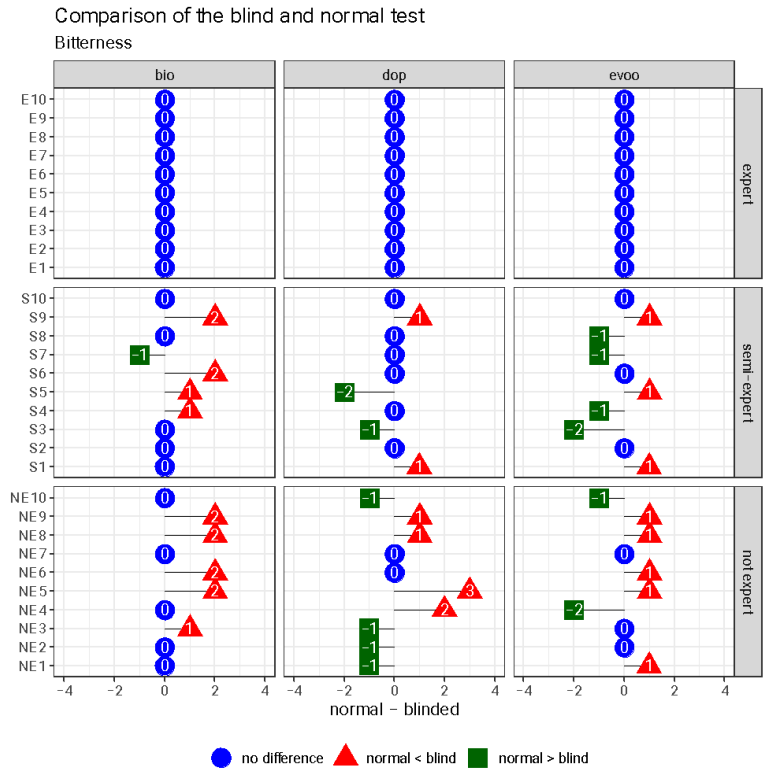
Moreover, the panel shows a consistency of the evaluation of the products in the two sessions (not significant product-session interaction). This means that the expert panellists assigned the same score to products in both the blind and normal evaluation. This result is evident graphically summarising the comparison of the blinded and normal tests with respect to pungency (Figure 7), fruitiness (Figure 8), and bitterness (Figure 9). The three rows of each figure refer to the three groups of tasters and the three columns to the three oils tested. No difference was present in the scores assigned from the experts for all three attributes. All three panels show the same liking in both blind and normal sessions.

Figure 8 – Comparison of the scores of the three panels in the two different sessions (normal and blind) for the sensory attribute fruitiness and for each type of product



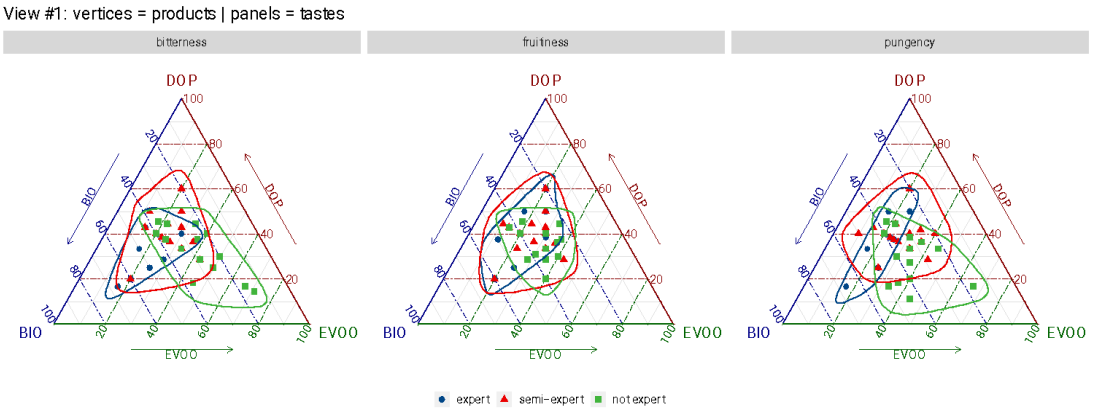
Source: Authors' elaboration

Figure 9 – Comparison of the scores of the three panels in the two different sessions (normal and blind) for the sensory attribute bitterness and for each type of product



Source: Authors' elaboration

Figure 10 – Comparison of product characterisations across products the three different olive oil samples



Source: Authors' elaboration

The results in Figure 10 allow us to compare the panel performance across the three different groups. It can be noted that the group of regular consumers provides a good characterization of the products for the fruitiness attribute, consistent with the ANOVA results (significant product effect). On the other hand, the panel of semi-experts shows a greater variability of evaluations for the pungency attribute, with numerous panelists evaluating the products in a different way as also highlighted by the results of ANOVA (significant product-panelist interaction).

A contradiction emerges in the fact that the respondents have not been able to recognise bitterness as a positive attribute of olive oil and prefer milder intensities. A possible explanation for this occurrence lies in the fact that they do not have sufficient ability to adequately quantify the intensity of each attribute as they have never participated in tasting sessions and training courses (Spognardi, Vistocco, Cappelli, & Papetti, 2021). In fact, Italian consumers often fall victim to information asymmetry and thus are not always able to distinguish higher quality products from their lower quality equivalents as they do not have the knowledge necessary to identify positive attributes and defects of these foods. Therefore a paradox emerges, as these consumers are not entirely aware of the quality of the products they are consuming (Houmani, Haidar, Assi, Hassan, & Rizk, 2024).

Furthermore, extra virgin olive oil products are increasingly affected by market dynamics, thus there is a need for a real change in the communication paradigm in order to divulge the importance of the level of quality and sustainability of these products. Therefore, future research should focus on the application of sustainable production tools, fundamental for enhancing market competitiveness, and awareness campaigns for citizens and consumers to make careful and informed consumption choices (Mavrommati, Pliakoura, & Kontogeorgos, 2024).

This research has several limitations, which suggest that future research developments should be focused on larger consumer samples which are representative of the entire population as well as taking into consideration a separate study on an international population for comparative purposes. This is fundamental to avoid encountering evaluation errors and to generate valid results that can be translated practically into realistic scenarios. The results obtained generally confirm the expectations based on existing literature and demonstrate that guidelines are needed for a sector plan that involves all the players in the supply chain, including large-scale distribution as well as consumers.

4 Conclusion

This study analysed the degree of knowledge of three-panel types on some intrinsic and extrinsic characteristics of three different EVOO samples. The extrinsic characteristics concerned the different

kinds of certification, while the intrinsic ones involved three variables: fruitiness, bitterness, and pungency.

The three panels, composed of expert, semi-expert, and regular consumers, demonstrated different preferences and sensory evaluations for the three types of oils. The two more experienced panels recognized the three attributes as positive characteristics of the oil, while the non-experts considered the bitterness a defect of the oil. The group of experts and semi-experts expressed a greater preference for organic oils, while the non-experts preferred the PDO oils. The sensory evaluations and the liking of the attributes demonstrated a similar behaviour among the two more experienced groups. At the same time, the non-experts proved to be less capable of expressing an evaluation and more interested in the extrinsic information of the product.

The discrepancy between the answers given for the blind and non-blind tests, particularly in the case of the consumer group, suggests that also the factors affecting consumers' choices have to be further investigated. It is obvious that it is necessary to understand how to best promote organic and PDO olive oil production and commercialisation, in order to safeguard Italian products, known for their excellence, on the market. These issues can be resolved through further studies on strategic marketing and consumer awareness.

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Appendix A – Blinded and unblinded evaluation form for the panel test

Questions	Olive oil samples		
	EVOO	**EU Organic EVOO**	**PDO EVOO**
*How **fruity** is this sample? Choose a number between 1 and 5, where: 1-Very low; 2-Low 3-Medium; 4-High 5-Very High*	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
*How much you appreciate its **fruity?** Choose a number between 1 and 5, where: 1-Very low; 2-Low 3-Medium; 4-High 5-Very High*	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
*How **bitter** is this sample? Choose a number between 1 and 5, where: 1-Very low; 2-Low 3-Medium; 4-High 5-Very High*	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
*How much you appreciate its **bitterness?** Choose a number between 1 and 5, where: 1-Very low; 2-Low 3-Medium; 4-High 5-Very High*	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
*How **pungent** is this sample? Choose a number between 1 and 5, where: 1-Very low; 2-Low 3-Medium; 4-High 5-Very High*	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
*How much you appreciate its **pungency?** Choose a number between 1 and 5, where: 1-Very low; 2-Low 3-Medium; 4-High 5-Very High*	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

Source: Authors' elaboration

Appendix B – Results of the blind (B) and normal (N) panel tests

Note. The abbreviations: E1 to E10 correspond to the experts; S1-S10 to the semi-expert tasters; NE1-NE10 to the normal consumers. The abbreviations: O corresponds to organic EVOO; P to PDO EVOO; E to EVOO without any certification.

		Fruity (1-5)			**Liking fruity (1-5)**			**Bitterness (1-5)**			**Liking bitterness (1-5)**			**Pungency (1-5)**			**Liking pungency (1-5)**		
		O	**P**	**E**	**O**	**P**	**E**	**O**	**P**	**E**	**O**	**P**	**E**	**O**	**P**	**E**	**O**	**P**	**E**
E1	B	2	3	1	1	2	1	2	2	1	2	2	2	2	2	1	1	2	1
	N	2	3	1	1	2	1	2	2	1	2	2	2	2	2	1	1	2	1
E2	B	2	2	1	4	3	1	2	1	1	3	1	1	3	2	1	3	2	1
	N	2	2	1	4	3	1	2	1	1	3	1	1	3	2	1	3	2	1
E3	B	3	2	2	2	1	1	2	1	1	3	1	1	2	2	2	2	1	1
	N	3	2	2	2	1	1	2	1	1	3	1	1	2	2	2	2	1	1
E4	B	2	2	1	2	2	1	2	2	1	3	2	1	3	2	1	3	3	2
	N	2	2	1	2	2	1	2	2	1	3	2	1	3	2	1	3	3	2
E5	B	2	3	1	1	3	1	3	1	1	2	2	1	4	2	1	2	3	1
	N	2	3	1	1	3	1	3	1	1	2	2	1	4	2	1	2	3	1
E6	B	2	3	2	2	2	1	2	1	1	2	1	1	3	3	2	2	1	1
	N	2	3	2	2	2	1	2	1	1	2	1	1	3	3	2	2	1	1
E7	B	2	3	2	3	1	1	3	2	2	3	2	2	3	2	2	2	1	1
	N	2	3	2	3	1	1	3	2	2	3	2	2	3	2	2	2	1	1
E8	B	3	4	2	4	5	4	1	2	1	3	4	3	2	2	1	5	5	3
	N	3	4	2	4	5	4	1	2	1	3	4	3	2	2	1	5	5	3
E9	B	3	3	1	2	3	1	3	2	1	3	3	1	3	3	1	3	3	2
	N	3	3	1	2	3	1	3	2	1	3	3	1	3	3	1	3	3	2
E10	B	2	3	1	2	2	1	2	1	1	4	1	1	3	2	1	4	1	1
	N	2	3	1	2	2	1	2	1	1	4	1	1	3	2	1	4	1	1
S1	B	2	4	2	1	3	1	2	3	2	1	3	1	1	3	1	1	3	1
	N	3	4	2	2	4	2	2	4	3	3	4	2	2	4	3	3	4	2
S2	B	3	5	4	4	5	5	4	5	2	5	5	3	5	5	2	5	5	3
	N	3	5	4	4	5	5	4	5	2	5	5	3	5	5	2	5	5	3
S3	B	3	4	3	3	4	2	3	5	5	3	4	1	5	5	5	5	4	1
	N	3	4	3	2	3	2	3	4	3	2	4	2	4	5	4	3	5	4
S4	B	4	4	4	4	4	2	3	4	4	3	4	4	4	4	4	4	4	4
	N	4	4	4	4	4	3	4	4	3	4	4	4	4	4	3	4	4	3
S5	B	3	3	1	4	4	1	3	4	1	4	4	4	2	4	1	4	4	4
	N	3	2	2	3	1	1	4	2	2	3	1	1	2	2	2	1	1	1
S6	B	2	3	5	2	2	3	2	4	4	2	2	3	3	4	4	2	2	3
	N	3	4	2	3	3	1	4	4	4	3	3	1	4	4	4	3	3	1
S7	B	1	2	2	3	3	3	3	3	3	4	4	4	5	4	4	5	5	5
	N	2	3	2	2	2	2	2	3	2	2	3	2	4	2	2	4	2	2

		Fruity (1-5)			Liking fruity (1-5)			Bitterness (1-5)			Liking bitterness (1-5)			Pungency (1-5)			Liking pungency (1-5)		
		O	**P**	**E**	**O**	**P**	**E**	**O**	**P**	**E**	**O**	**P**	**E**	**O**	**P**	**E**	**O**	**P**	**E**
S8	B	4	3	2	4	3	2	4	4	4	4	4	4	3	3	3	3	4	3
	N	3	4	3	3	4	3	4	4	3	4	4	3	3	4	4	3	4	4
S9	B	3	4	4	3	3	1	1	2	1	2	2	1	3	4	1	2	2	1
	N	2	3	3	3	3	1	3	3	2	3	3	2	1	4	3	1	2	2
S10	B	3	4	2	3	4	2	3	3	2	2	2	2	3	4	2	3	3	2
	N	3	4	2	3	4	2	3	3	2	2	2	2	3	4	2	3	3	2
NE1	B	3	2	4	4	4	4	4	4	2	3	4	2	5	3	4	5	2	4
	N	2	3	3	2	3	3	4	3	3	2	4	3	1	1	1	1	1	1
NE2	B	3	4	4	3	3	4	4	4	3	2	2	4	3	3	2	2	3	4
	N	3	4	4	3	4	4	4	3	3	2	4	4	3	3	2	3	4	4
NE3	B	3	3	4	5	4	5	2	4	1	4	2	5	2	3	1	4	3	4
	N	3	3	4	3	3	4	3	3	1	2	3	5	4	2	2	2	3	4
NE4	B	4	3	3	4	4	4	4	2	3	1	1	1	5	4	3	1	1	1
	N	2	4	3	3	4	4	4	4	1	1	1	5	3	4	2	1	1	4
NE5	B	2	1	3	2	1	2	2	1	3	1	1	4	2	1	4	1	1	4
	N	3	4	4	3	3	3	4	4	4	5	5	5	3	5	4	4	5	4
NE6	B	2	3	1	4	5	2	2	3	1	4	5	2	3	4	2	4	5	2
	N	0	2	1	4	4	2	4	3	2	4	4	2	4	2	2	4	4	2
NE7	B	3	3	2	3	3	3	2	3	2	2	2	2	3	2	3	4	1	4
	N	3	2	2	3	2	2	2	3	2	2	2	2	2	2	2	2	2	2
NE8	B	3	3	1	3	3	1	2	3	1	1	1	1	3	4	2	2	1	2
	N	3	3	2	2	4	3	4	4	2	1	1	1	3	4	3	3	1	2
NE9	B	4	3	1	3	2	2	2	3	1	1	1	4	3	3	1	4	3	3
	N	4	3	4	5	4	4	4	4	2	3	3	2	3	3	2	3	4	4
NE10	B	3	4	4	3	4	3	4	4	2	2	2	3	4	4	4	3	3	3
	N	3	4	4	3	3	3	4	3	1	2	3	3	3	4	2	3	4	2

Source: Authors' elaboration

Intentionality or Identity? And Does it Matter? A Qualitative Study of Food Sustainability of Agritourism in Sardinia, Italy

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Abstract

The environmental sustainability of agritourism has been understudied in the literature. In the organisational environmentalism field, research grounded in the Theory of Planned Behaviour (TPB) has paid scant attention to the indirect variables. To bridge this gap, we contribute to the TPB applications in organisational settings by employing a qualitative lens to shed light on the indirect variables of the TPB in the context of food sustainability of agritourism in Sardinia, Italy. Based on 20 in-depth interviews, we examine the type of green food practices agritourism operators perform, the barriers they face, and the role that farmer attitudes, norms, and beliefs play in food sustainability. We also explore the link between farmers' climate change knowledge and their use of green food behaviours. Findings suggest that agritourism operators perform green food behaviours due to a deep sense of identity rather than a strong environmental concern. Thus, any policy design around sustainability must consider the powerful impact of identity and tradition on farmer behaviour. While we do not propose climate change knowledge as a permanent addition to the theory, awareness programs and education campaigns still play an important role in increasing farmer awareness of climate change.

Keywords – Green Food Practices; Food Waste; Plant-based; Climate Change Knowledge; TPB.

Paper type – Academic Research Paper

Sommario

Intenzionalità o identità? E ha importanza? Uno studio qualitativo sulla sostenibilità alimentare dell'agriturismo in Sardegna, Italia. – La sostenibilità ambientale dell'agriturismo è stata poco studiata nella letteratura. Nel campo dell'ambientalismo organizzativo, la ricerca fondata sulla Teoria del Comportamento Pianificato (TCP) ha prestato scarsa attenzione alle variabili indirette. Per colmare questa lacuna, contribuiamo alle applicazioni TCP in contesti organizzativi impiegando una lente qualitativa per far luce sulle variabili indirette del TCP nel contesto della sostenibilità alimentare dell'agriturismo in Sardegna. Sulla base di 20 interviste approfondite, esaminiamo il tipo di pratiche alimentari verdi che gli operatori dell'agriturismo svolgono, le barriere che affrontano, il ruolo che i loro atteggiamenti, norme e credenze giocano nella sostenibilità alimentare, e il legame tra le conoscenze degli agricoltori in materia di cambiamenti climatici e l'uso di alimenti ecologici. I risultati suggeriscono che gli operatori dell'agriturismo adottano comportamenti di cibo verde a causa di un profondo senso di identità piuttosto che di una forte preoccupazione ambientale. Pertanto, qualsiasi politica incentrata sulla sostenibilità deve tenere conto del forte impatto dell'identità e della tradizione sul comportamento degli agricoltori. Anche se le conoscenze sui cambiamenti climatici non sono proposte come aggiunta permanente alla TCP, i programmi di sensibilizzazione e le campagne educative svolgono ancora un ruolo importante nell'aumentare la consapevolezza degli agricoltori sui cambiamenti climatici.

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1 Introduction

Agritourism is a type of accommodation particularly relevant to sustaining rural and sustainable tourism development (Paniccia & Baiocco, 2020; Valdivia & Barbieri, 2014), a tool to protect natural resources, cultural identity, and the biodiversity of a region (Brandano, Osti and Pulina, 2018). In contrast to traditional forms of tourism, agritourism has the potential to increase biodiversity, reduce deforestation, and contribute to human health (FAO, 2020; Paniccia & Baiocco, 2020). It is often practiced in socially vulnerable settings (Sahebalzamani & Bertella, 2018), e.g., in rural parts of Sardinia, Italy, where most agritourism businesses are small and medium-sized (SME) family farms (Lupi et al., 2017). Agritourism was defined by Italian law no. 96/2006 as, "the hospitality activities practiced by agricultural entrepreneurs […] through the use of their firms in connection with the farming activities, forestry-related activities, and livestock activities," with the stipulation that "agricultural activities prevail over the agritourism activities" (Broccardo, Culasso, & Truant, 2017, p. 4).

Despite its environmental sustainability benefits, however, agritourism has not been studied thoroughly in the literature. In a systematic literature review, Rauniyar, Awasthi, Kapoor, and Mishra (2020) note that agritourism is under-researched compared with other forms of tourism. While the field is rapidly growing, farmers' environmental attitudes, values, skills, and competencies have not received sufficient attention in scholarly research (Hardesty, 2018; Paniccia & Baiocco, 2020; Roxas & Coetzer, 2012). Additionally, scholars argue that more attention should be paid to the location of respondents and their experiences with climate change (Howe, Marlon, Mildenberger, & Shield, 2019). As an island, Sardinia is more exposed to climate change, which poses a serious threat to agriculture (Trabucco et al., 2018). However, Sardinia is also under-studied as an agritourism location, as most agritourism is concentrated in the North and Centre of Italy: currently, there are 640 agritourism farms in Sardinia, compared to 20,646 in Italy overall (ISTAT, 2024). Thus, scholars recommended extending agritourism research beyond continental Italy (Broccardo, Culasso, & Truant, 2017; Palmi & Lezzi, 2020).

To bridge these gaps, we use the Theory of Planned Behaviour (TPB) (Ajzen, 1991), enhanced with an additional variable, the climate change knowledge, to analyse the environmental sustainability of agritourism farms in rural Sardinia. TPB is a psychological theory that predicts human behaviour based on several factors: attitude towards the behaviour (positive or negative feelings about performing the behaviour), subjective norm (beliefs about what people important to the person think they should do), and perceived behavioural control (perceptions about the influence people have over the factors that facilitate or impede the behaviour). These factors influence an individual's intention to perform a behaviour, which in turn, determines whether the individual will perform that behaviour and to what

extent (Ajzen, 1991). TPB was successfully used to explain pro-environmental behaviour in organisations (Blok, Wesselink, Studynka, & Kemp, 2015; Wang, 2016), but the decision-maker's knowledge of climate science was insufficiently integrated into the model thus far.

This study is unique in several ways. First, we follow the recommendations of Ajzen and Fishbein (1980) and adapt the indirect variables under study to the specific context of Sardinian agritourism. This is important, because we know from cross-cultural research that values and beliefs differ across nations and geographical contexts (Schwartz, 2003). Second, more than 80 percent of TPB studies were conducted within households (Yuriev, Dahmen, Paillé, Boiral, & Guillaumie, 2020b), with only a few being conducted in organisations (Blok, Wesselink, Studynka, & Kemp, 2015; Wang, 2016; Yuriev, Boiral, & Guillaumie, 2020a). Thus, by exploring the beliefs of the agritourism operators leading small, familial organizations, we add to the scarce empirical applications and extensions of TPB in organisations. It is important to understand how farmers form their beliefs regarding green food behaviour because understanding these mechanisms would enable researchers and practitioners to design evidence-based policies that support and encourage these behaviours.

Third, we enrich TPB with climate change knowledge, which was never previously explored in organisational environmentalism, although several applications in private environmentalism exist (Clement, Henning & Osbaldiston, 2014; Correia, Sousa, Viseu, & Leite, 2022). To our knowledge, this is the first time in the literature that the augmented TPB theory is employed to examine food sustainability in agritourism in Italy, and specifically in Sardinia. Climate change is often perceived as a distant phenomenon, as something that only affects other people, or a phenomenon that will only happen in the future (Atzeni, Kim, Del Chiappa, & Wassler, 2022), therefore, analysing farmers' beliefs with respect to climate change is key in understanding their intention to engage in green food behaviours.

Methodologically, we make an important contribution to the literature by employing qualitative research methods to understand farmers' indirect beliefs about sustainable behaviours and their link to climate change. In contrast to the theory founders' specifications, most TPB empirical studies to date focus disproportionately on measuring the direct variables quantitatively, paying scant attention to the indirect variables (Yuriev, Dahmen, Paillé, Boiral, & Guillaumie, 2020b). The interpretative power of the qualitative approach enriches the TPB theory and avoids a mechanistic application of its traditional variables and scales (Yuriev, Dahmen, Paillé, Boiral, & Guillaumie, 2020b).

We focus on the following green food practices: reducing food waste, using seasonal ingredients, producing locally, offering vegan/vegetarian dishes, practices that are insufficiently studied in the literature (Ivanova et al., 2020; Principato, Pratesi, & Secondi, 2018). Unsustainable food practices are considered important drivers of environmental problems (Moscatelli, El Bilali, Gamboni, & Capone,

2016), and farmers' attitudes and beliefs matter in determining green behaviours. Thus, our study aims to answer the following, overarching, research question: what is the role of the TPB theory, augmented with climate change knowledge, in shaping farmers' engagement in green food behaviours?

The paper is organised as follows. The first section reviews the literature on the environmental sustainability of agritourism, and the types of green food practices studied. The second section describes the theoretical framework employed, and the proposed addition to theory. The third section outlines our methodology, the fourth section describes our results, and the fifth section discusses findings in terms of theoretical and practical implications. The last section outlines our conclusions, limitations, and directions for future research.

2 Literature review

The environmental sustainability of tourism and that of small businesses such as agritourism farms, is neglected in the literature (Ammirato, Felicetti, Raso, Pansera, & Violi, 2020; Barbieri, 2019; Orefice & Nyarko, 2020; Rauniyar, Awasthi, Kapoor, & Mishra, 2020). In a systematic review of the research on green practices in the hospitality sector, agritourism was not even included (Kim, Lee, & Fairhurst, 2017), and in a literature review focused on agritourism, only six percent of articles addressed sustainable development (Rauniyar, Awasthi, Kapoor, & Mishra, 2020). This is unfortunate, because agritourism is intrinsically linked to agriculture, and globally, agriculture generates about one third of total GHG emissions (The World Bank, 2023). In Sardinia in particular, agritourism research has focused heavily on the sociological and economic aspects, and insufficiently on its environmental aspects (Arru, Furesi, Madau, & Pulina, 2019a, 2019b). Thus, scholars recommend analyzing the environmental values and beliefs of tourism operators in rural destinations (Del Chiappa, Usai, Cocco, & Atzeni, 2018).

The UN defines a sustainable food system as a system that "delivers food security and nutrition in such a way that […] it has a positive or neutral impact on the natural environment" (FAO, 2018, p. 1). Within the "food system wheel" (FAO, 2018, p. 3), this paper focuses mainly on agritourism activities related to food production, processing, and consumption, including disposal of food waste. Green food practices are summarized in Table 1.

Table 1 – Green food practices and sustainability considerations

Green food practices	Sustainability considerations
Reducing food waste	▪ Kitchen waste, due to incorrectly preparing, or spoiling food (Principato et al., 2018). ▪ Client waste, due to lack of planning, opening hours, buffet style (Pirani & Arafat, 2016). ▪ Food uses land, water, and fertilizers to grow (Katsarova, 2016; Munir, 2022).
Own production and local sourcing	▪ Farm-to-table approach reduces CO_2 emissions from transportation (Soligo, 2022).
Seasonality	▪ Using fresh ingredients does not require freezing or canning reduces CO_2 emissions (Soligo, 2022).
Plant-based dishes	▪ Vegan dishes have lower CO2 impact, generally (Benvenuti et al., 2022). ▪ Adding eggs and dairy dishes to a vegan menu increases its carbon footprint by 48%; adding red meat increases the carbon footprint by 34% (Benvenuti et al., 2022). ▪ A meat-based menu generates more food waste than a vegan/vegetarian menu (Principato et al., 2018).

Source: Authors' elaboration

Recent studies found that almost 40 percent of food produced on farms is wasted (WWF-UK, 2021). In Italy, it is estimated that restaurants waste about 21 percent of all food they produce (Coldiretti, 2017). Purchase planning, menu planning, and managing inventory carefully helps reduce food waste (Principato, Pratesi, & Secondi, 2018), but little research is conducted in agritourism. Given the importance of food waste generated by the hospitality sector, scholars agree that more research is necessary to understand the causes of food waste and how to reduce it (Dhir, Talwar, Kaur, & Malibari, 2020; Principato, Pratesi, & Secondi, 2018).

Generally, the agritourism model uses a farm-to-table approach, also called 'kilometre zero', meaning that the food has travelled zero km from production to consumption. Indeed, often, agritourism restaurants do not even have a written menu because their dishes vary with the season (e.g., farms on the Prosecco Route) (Soligo, 2022). However, not all products can be made locally (e.g., coffee, sugar, Coca-Cola), thus it would be relevant to determine whether farmers consider the distance to the country of origin in their purchasing decisions. Additionally, food menus of agritourism in rural Sardinia are traditionally meat or dairy-based (see the Agriturismo Agrisole (n.d.) menu as an example), so it would be interesting to study farmers' beliefs and intentions regarding plant-based offerings in the future.

3 Theoretical framework

A widely used theory in environmentalism (Yuriev, Dahmen, Paillé, Boiral, & Guillaumie, 2020b; Wan, Shen, & Choi, 2017), the TPB theory posits that individual behaviour is determined by seven variables, three indirect (behavioural, normative, and control beliefs), and four direct (intention, attitude, subjective norm, and perceived behavioural control; Ajzen, 1991).

Essentially, the TPB suggests that, the more favourable an individual views a certain behaviour (attitudes), the more accepted/encouraged by the society and important people in their lives (subjective norms), and the more they can control the circumstances surrounding the behaviour (perceived behavioural control), the more likely it is that they will carry out their intention. Conversely, when an individual lacks the necessary infrastructure, or when they do not feel knowledgeable enough or confident enough to engage in a certain behaviour, they will not do so (Ajzen & Driver, 1992; Davies, Foxall, & Pallister, 2002).

The theory has been supported empirically in numerous studies of ecological behaviour in organisations. Apart from being tested in different contexts, the theory has been enriched with additional variables, such as environmental awareness (Blok, Wesselink, Studynka, & Kemp, 2015), environmental values (Morgan, Hine, Bhullar, & Loi, 2015), moral norms, and habit (Klöckner, 2013). The founder himself was open to adding variables as long as they meet several criteria (Fishbein & Ajzen, 2010), and empirical studies found that enriching TPB with additional variables increased its predictive power by at least 10 percent (Yuriev, Dahmen, Paillé, Boiral, & Guillaumie, 2020b).

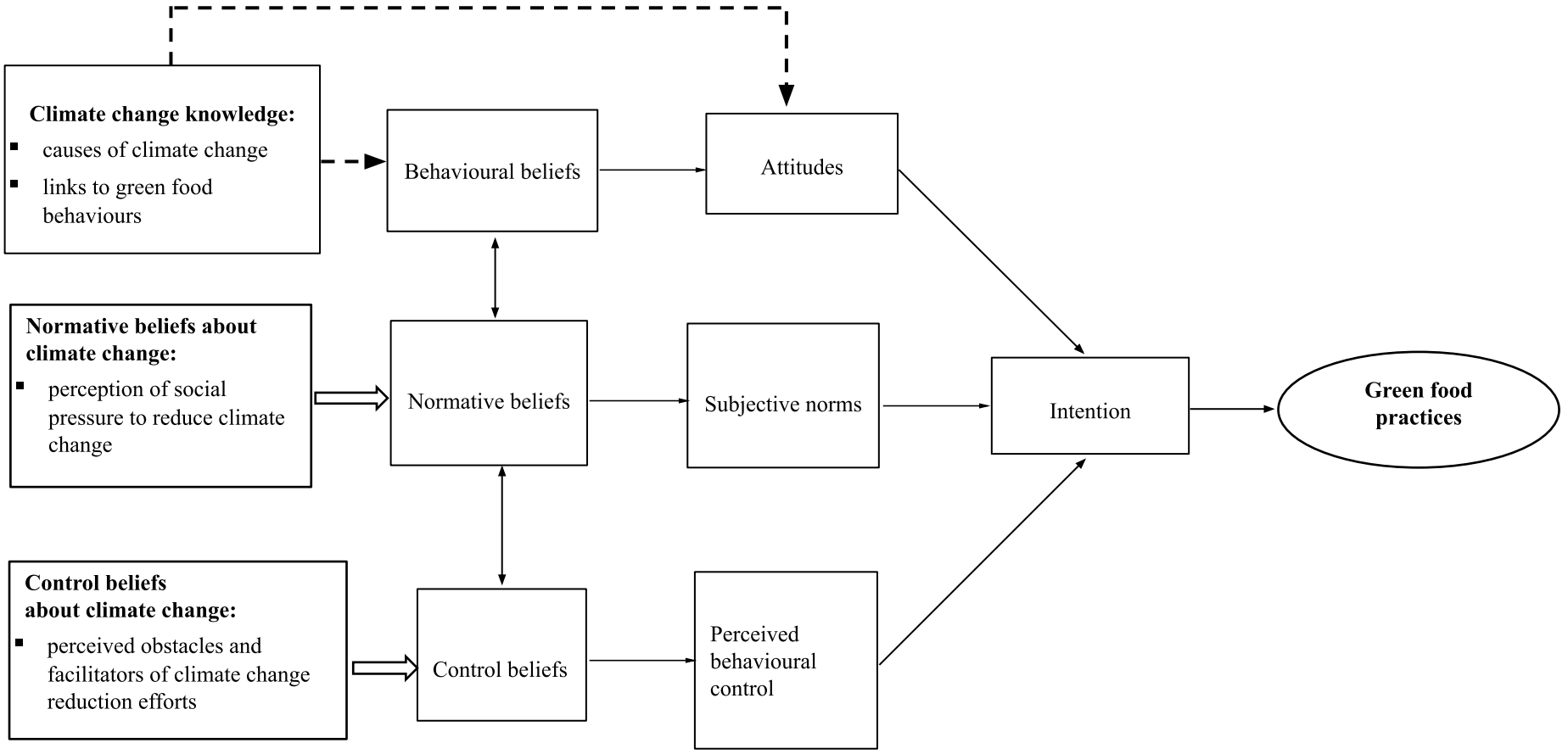
The TPB was criticized for giving too much importance to attitudes, and for not incorporating knowledge and habits, which may largely influence ecological behaviours (Stern, 2000; Yuriev, Dahmen, Paillé, Boiral, & Guillaumie, 2020b). In organisations, the TPB framework was only rarely augmented with environmental knowledge and awareness (e.g., Blok, Wesselink, Studynka, & Kemp, 2015), and this was never done in agritourism.

To bridge this gap, we extend the TPB theory with climate change knowledge, following the criteria suggested by the founder of the theory (Fishbein & Ajzen, 2010): first, the additional variables must be domain-specific, *i.e.,* compatible with the green behaviours studied (Yuriev, Dahmen, Paillé, Boiral, & Guillaumie, 2020b). Climate change knowledge is domain-specific, since climate change is a complex phenomenon that can be mitigated by a diverse set of behaviours (in the context studied here, reducing food waste, preparing a seasonal menu, buying local, etc). However, the findings with respect to the link between climate change/environmental knowledge and intention to engage in green behaviours are not conclusive. Some studies find that the more decision-makers know about environmental science, the

more they engage in green behaviours (Bradley, Babutsidze, Chai, & Reser, 2020; Latif et al., 2023), while others find weak or no correlations between knowledge and behaviour (Ajzen, Joyce, Sheikh, & Cote, 2011; Correia, Sousa, Viseu, & Leite, 2022). Despite these contradictory findings, one can conceive of climate knowledge as a factor influencing action (Yuriev, Dahmen, Paillé, Boiral, & Guillaumie, 2020b). Second, additional variables must be conceptually different than the existing TPB variables and must be related to a wide range of green behaviours (Yuriev, Dahmen, Paillé, Boiral, & Guillaumie, 2020b; Fishbein & Ajzen, 2010). Climate change knowledge meets this criterion as well, because the existing TPB variables measure attitudes, norms, and beliefs, which are conceptually different than knowledge or cognitive information. Indeed, empirical studies find that environmental knowledge and environmental attitudes are two distinct constructs, and they are barely correlated or not correlated at all (Ajzen, Joyce, Sheikh, & Cote, 2011; Clement, Henning & Osbaldiston, 2014). Thus, we aim to explore whether climate change knowledge influences farmers' beliefs about the expected consequences of green food behaviours (i.e., their behavioural beliefs), that is, if farmers attribute anthropomorphic causes to climate change, do they infer that green food behaviours contribute meaningfully to mitigating it? Conversely, if they deny anthropomorphic causes, they may conclude that performing green food behaviours may not make a difference.

We propose adding climate change knowledge to the theory, as described below. For parallelism reasons, the adapted model also includes farmers' normative beliefs about climate change, that is, their perception of social pressures from significant others to address climate change, and their control beliefs, that is their assessment of obstacles and facilitators of climate change reduction efforts. However, for model parsimony reasons, the last two variables are not tested in this study and form the basis for future research. The adapted theoretical model is shown in Figure 1.

Figure 1 – The conceptual model based on the Theory of Planned Behaviour



Note. Dashed lines represent hypothesised relationships. Relationships represented by the block arrows are not tested in this study.

Source: adapted from Ajzen and Schmidt (2020) and enriched with climate change knowledge

4 Methodology

4.1 Data collection and analysis

As recommended by Ajzen (1991) and Yuriev, Dahmen, Paillé, Boiral, and Guillaumie (2020b), qualitative data were collected via in-depth, structured, interviews, about the indirect variables of the TPB (behavioural, normative, control beliefs) and about the climate change knowledge variable. The interview questions (see *Appendix*) are based on the TPB and its applications in environmentalism (e.g., Blok, Wesselink, Studynka, & Kemp, 2015). Demographic information is presented in Appendix, Table 3. The interviews were pre-tested with two farmers, and their feedback was incorporated into the interview guide. A deductive approach was used, guided by an augmented TPB framework, which gives us a good idea of what we may expect to find (Braun & Clarke, 2006). Twenty in-depth interviews were conducted in May and September 2023. We chose these months to avoid interfering with the busy tourist season of our participants (usually summer). The participants were randomly selected from a list of agritourism operators who offer some kind of dining experience (breakfast, lunch, and/or dinner) located in northeast Sardinia. We used a snowball sampling process, where participants were invited to nominate other farmers for us to interview. Ethics approval with the IRB number 1784156-1 from the first author's institution was obtained. Since one of the authors is fluent in Italian, interviews were conducted in Italian, recorded with respondents' permission, and lasted for about 60-90 minutes. The completed interviews ensured data saturation, which occurs when repeated patterns emerge and no additional information is added by subsequent interviews (Patton, 2014). They were transcribed verbatim, translated into English, and then translated back into Italian, as it is typical in cross-cultural research (Olya, Kim, & Kim, 2024), to ensure accuracy and preserve intended meanings. The resulting transcript was subject to content analysis and initial themes were identified. The final themes were identified through an iterative content analysis process, recommended by Braun & Clarke (2006) (see Table 2).

Table 2 – Phases of analysis

Phases	Activities
First phase	▪ Transcribed interviews verbatim and checked transcripts against the audio recordings to ensure accuracy.
Second phase	▪ Actively read and re-read the data, created code categories and sub-categories, and generated themes, by combining and re-combining codes and sub-categories of codes. ▪ Paid particular attention to the internal consistency of these themes to ensure the themes are distinct from each other.
Third phase	▪ Organized codes with the help of a visual thematic map (1st order dimensions in Figure 2). ▪ Discarded some of the codes that appeared infrequently in the data or were too vague to constitute a theme.
Fourth phase	▪ Verified if themes work relative to the data excerpts and the broader data set. ▪ Defined and named overarching themes, and eliminated overlap, to make sure they accurately reflect the meaning of ideas expressed by our respondents.
Fifth phase	▪ Created a final thematic map (2nd order and aggregate dimensions in Figure 2).
Sixth phase	▪ Selected compelling examples to illustrate the themes, re-analysed the examples, related our analysis back to our research questions and literature, and wrote our findings. ▪ Used the Gioia, Corley and Hamilton (2013) method, codifying the results into three levels (Figure 2).

Source: Authors' elaboration

5 Results

5.1 Green food behaviours

Content analysis indicates that farmers reuse and repurpose kitchen scraps and uneaten client foods in the production process, they use an efficient food ordering and production process, and value seasonality and local sourcing of ingredients. They do not plan on adding more vegan and vegetarian dishes to their menu, although they respect the dietary preferences of their clients. Their attitudes and beliefs regarding these behaviours are described in more detail below, and interview quotes are presented in Appendix, Table 4.

5.2 Behavioural beliefs

As a reminder, behavioural beliefs refer to an individual's opinions about the expected consequences of performing a certain behaviour. These consequences can be positive or negative, which can affect their attitudes toward the behaviour analysed favourably or unfavourably.

5.2.1 Beliefs about food waste

Identity. Since most agritourism farms also grow animals (pigs, cows, chicken, sheep), they give the kitchen scraps and uneaten (but touched by clients) food to animals. Kitchen scraps are also composted for their vegetable garden, vegetable peels are used to make broth, and used frying oil is repurposed for making soap, donated to oil deposits, or used to power chainsaws. Farmers mentioned that this approach also reduces the direct costs associated with feeding animals or making soap. Many farmers cited the Gadda Law (n. 166/2016) as impetus for providing 'doggy bags' to clients, so they can take home leftovers. Food that is not touched by clients is given to kitchen personnel, to family members, or to poor people in the village. Farm operators who do not grow animals place their kitchen waste in organic waste bins. Farmers noted that not wasting food is a normal assumption of operation, grounded in long-standing values and identity. That is, everything that is produced goes back into the production process.

Efficiency. Many farmers mentioned that they don't have much waste to begin with because they use a careful planning process, based on years of experience. In contrast to "all you can eat" resorts, they use a fixed price menu based on a reservation system and employ analytics (although they did not call it that way), that is, they keep track of items that are not selling well and frequently revise the menu with an eye toward reducing waste.

Client responsiveness. Sometimes concerns to reduce food waste are driven by clients, who often ask what happens with the food that is not eaten. Farmers note that clients like it when farmers try to avoid wasting food by offering 'doggy bags.' The 'doggy bag', however, is often not conceived of in terms of its ecological benefits, but as an advertising form for agritourism (*#16*), or as a way to express their identity and to illustrate their aversion toward food waste.

5.2.2 Beliefs about own production and local sourcing

Stimulating the local economy. In addition to having to follow the 2015 Regional Law #11, n. 18 on Agritourism in Sardinia (see above), which many agritourism owners mentioned, they also emphasized the importance for small enterprises to support each other, to benefit the local economy. Many belong to

local agriculture associations, such as *Coldiretti*, or *Confagricoltura*, which focus on local sourcing, and enable farmers to sell excess production and purchase needed items from other farmers in the network.

Convenience. Farmers value the convenience and ease of access to a supplier network that these associations provide. Farmers also emphasized the convenience of being part of a local network of farmers, as they provide ease of access to traditional, high-quality products that they wouldn't otherwise have.

Identity. Offering local products is linked to the Sardinian culture, to their land, to their customs, to their traditions, it is *the* reason for existence, for being in business, their *raison d'être*, it is so intrinsically connected to their identity that farmers did not even conceive of alternative ways of operating. Simply put, *who* they are is embedded in *where* they are. They follow tradition, agricultural principles that were in place 60-70 years ago. Some farmers mentioned with pride that they have managed to revive in Sardinia an ancient grain, einkorn wheat, which was first recovered in France from the Fertile Crescent. While their costs are higher because they produce almost everything in-house, they also believe that doing so is worth it, because they can offer a stronger value proposition to their clients. They wouldn't have it any other way. Farmers emphasize the importance of the traditional pork roast, which is a constant offering in their agritourism.

Quality. Regarding the ingredients that are not produced on their farm, farmers mention the importance of guaranteeing quality and taste. By feeding pigs natural foods rather than industrial produced feed, the pigs have the vitamins, proteins, and fibre they need, thus the quality of the meat is going to be better. Also, purchasing ingredients from local producers in Sardinia ensures the guarantee of quality, because farmers know their suppliers well, as they have established long-standing relationships with them.

Human health. By nature of their business, farmers care about product freshness, taste, wholesomeness, and benefits to human health. They cultivate grains that are disease-resistant, which do not require medication, not even organic treatments, so they are healthy for people to consume. They must have the guarantee that they know how and where the product is grown/raised.

5.2.3 Beliefs about seasonality

Identity. The theme of identity is also reflected in farmers' focus on seasonality. Most farms don't even list dishes on the menu because the dishes change according to the seasonality of ingredients. Often, they offer a few classic dishes that are always available, and they vary the vegetable dishes with the season. As mentioned above, they offer a fixed price menu with seasonal fruits and vegetables, not a buffet, and only in an insignificant number of cases, they use ingredients from greenhouses.

Lack of variety. Grounded in their strong sense of identity, farmers make a conscious choice of seasonality over variety: For instance, they prefer to offer a small variety of fruits at breakfast (but in season) rather than a large variety of fruits (out of season). One farmer spoke with disdain of another local agritourism that did not follow the principle of seasonality (see quote from *#4* in Appendix, Table 4).

Quality. Farmers noted that seasonal ingredients are fresh, wholesome, 'better for you', and taste better than non-seasonal ingredients. Some farmers even stopped canning vegetables *(#16),* precisely to appreciate the freshness of vegetables that are in season.

Cost. Farmers noted that that their costs are lower if they produce/buy ingredients in season.

As with beliefs regarding local production, the environmental aspect of seasonality did not figure prominently in farmers' reasoning, in their arguments for using seasonal ingredients. Overall, when asked why seasonality is important to them, farmers mention three main reasons: identity (this is who we are), quality (the seasonal products taste better), and cost (seasonal ingredients are cheaper than those produced in greenhouses).

5.2.4 Beliefs about plant-based dishes

Plant-based dishes were split between vegetarian and vegan, because farmers held substantially different beliefs about them.

Vegetarian dishes. Again, the *identity* theme was evident in farmer attitudes toward vegetarian dishes. Most farmers perceive vegetarian dishes as an integral part of the Sardinian cuisine, of their identity. They did not see vegetarian cooking as a particular type of cooking, as a large part of their menu was inherently composed of vegetarian dishes.

Vegan dishes. In contrast to vegetarian dishes, vegan dishes were perceived almost as a dietary restriction to which, if one wants to stay in business, they must adapt. Indeed, farmers try to accommodate an increasing number of vegan clients. Many mentioned plant-based diets in the same breath as allergies, intolerances to gluten or lactose, and so on. Thus, the theme of *client responsiveness* is evident here.

5.2.5 Summary of behavioural beliefs

Starting from the perceived advantages and disadvantages outlined above, farmers developed favourable attitudes toward green food behaviours (the final themes are summarised in Figure 2). To sum up, farmers see mostly positive consequences of the green food behaviours analysed. Primarily, these behaviours are in line with their traditions, with their values, they are an inherent part of who they are, of their identity.

Reducing food waste by offering a reservation-based system, by entering food scraps back into the production process through animal feed, saving leftovers, providing clients with doggy bags, all ensure an efficient operation. Clients expect to see a farm where animals are free to roam around and are fed a natural diet. They expect high-quality ingredients and taste, so farmers carefully offer and preserve this image. By producing food in house, or by purchasing it from other local producers in Sardinia, whom they know and have developed a long-term relationship with, farmers ensure high quality of ingredients. While their menu may not be as varied as their competitors in the hospitality industry (e.g., 'all you can eat' resorts), and while they do not realize high margins, their focus on preserving tradition is primordial. Vegetarian dishes are an integral part of Sardinian cuisine, but vegan dishes are perceived as a burden, to which, while inconvenient, they must adapt.

Given the focus of our research, it is as important to identify the themes that emerged from farmers' beliefs about the consequences of green food practices, as well as the themes that did not. While some farmers mentioned the benefits of their farm-to-table approach in terms of reducing CO_2 emissions, environmental concerns were not strong enough or connected enough with the other themes to be able to constitute a theme. Rather, environmental considerations were mentioned more like an afterthought than as a rationale for performing green food behaviours. As a rationale to perform green food behaviours, identity was more prevalent than intentionality (*i.e.,* an intention to protect the environment).

5.3 Normative beliefs

According to the TPB, normative beliefs refer to farmers' perceptions of social pressures exerted by institutions or individuals. In turn, these beliefs shape farmers' perceptions about how their green food behaviours are perceived by others (subjective norms). Farmers mentioned that trade associations, EU institutions and clients, all appreciate and recognise agritourism farmers' use of traditional practices. They felt supported by Italian and European Union institutions (public administration agencies, schools, Coldiretti) who are perceived as protecting farmers' way of life and their traditions.

When asked about individuals or organisations who do not appreciate their efforts, farmers often mentioned clients. Regarding their fixed price menu, sometimes clients complain that their portions are too large, and they want to try more and smaller portions, but of a larger variety. Thus, some farmers have adjusted their behaviour in response to client concerns about food waste and prices (see quote from *#11* in Appendix, Table 4).

Other than some clients, farmers could not name any individuals or organisations who do not appreciate their use of green food practices. Overall, farmers feel supported by important constituencies in their performance of these behaviours and so, they are inclined to continue to perform them. They developed positive perceptions about how their green food behaviours are perceived by relevant entities. The final themes of farmers' subjective norms are shown in Figure 2.

5.4 Control beliefs

As described above, TPB posits that individuals' beliefs about the presence of factors that can help or hinder their engagement in green food behaviours (control beliefs) influence their belief about the capability they have over performing that behaviour (perceived behavioural control, or PBC).

5.4.1 Obstacles to engaging in green food practices

Bureaucracy. In their pursuit of offering natural products from their own production, farmers mentioned bureaucratic impediments, grant application complexity, and inspection fatigue. Although several farms do not hold the organic certification anymore, they still follow the organic standards of meat and vegetable production, the health and safety rules and regulations, veterinary norms, and use non-GMO ingredients in food production. Additionally, the regulations needed to obtain a cage-free pork certificate are perceived as very stringent and, preventing small growers from providing this certificate. Similarly, many farmers perceived health and safety rules and regulations as stifling and inefficient.

Difficulty. Regarding vegan dishes, farmers emphasised the difficulty of offering a vegan menu, in terms of time, costs, and complexity.

Regarding their capacity to reduce or eliminate these obstacles, farmers did not feel that they had this ability. Many of the rules and regulations they mentioned are imposed by the European Union. With respect to bureaucratic impediments, eliminating the middleman in grant applications would make it easier for them to access the funds available at the national and EU level.

5.4.2 Facilitators to engaging in green food practices

Identity. Many agritourism owners mentioned that it comes natural for them to use green food practices, because of the culture they grew up in, the habits they developed growing up, in terms of not wasting food, or reusing materials. While no incentives were provided to encourage local production, farmers felt that buying local was their duty (quote from *#18* in Appendix, Table 4).

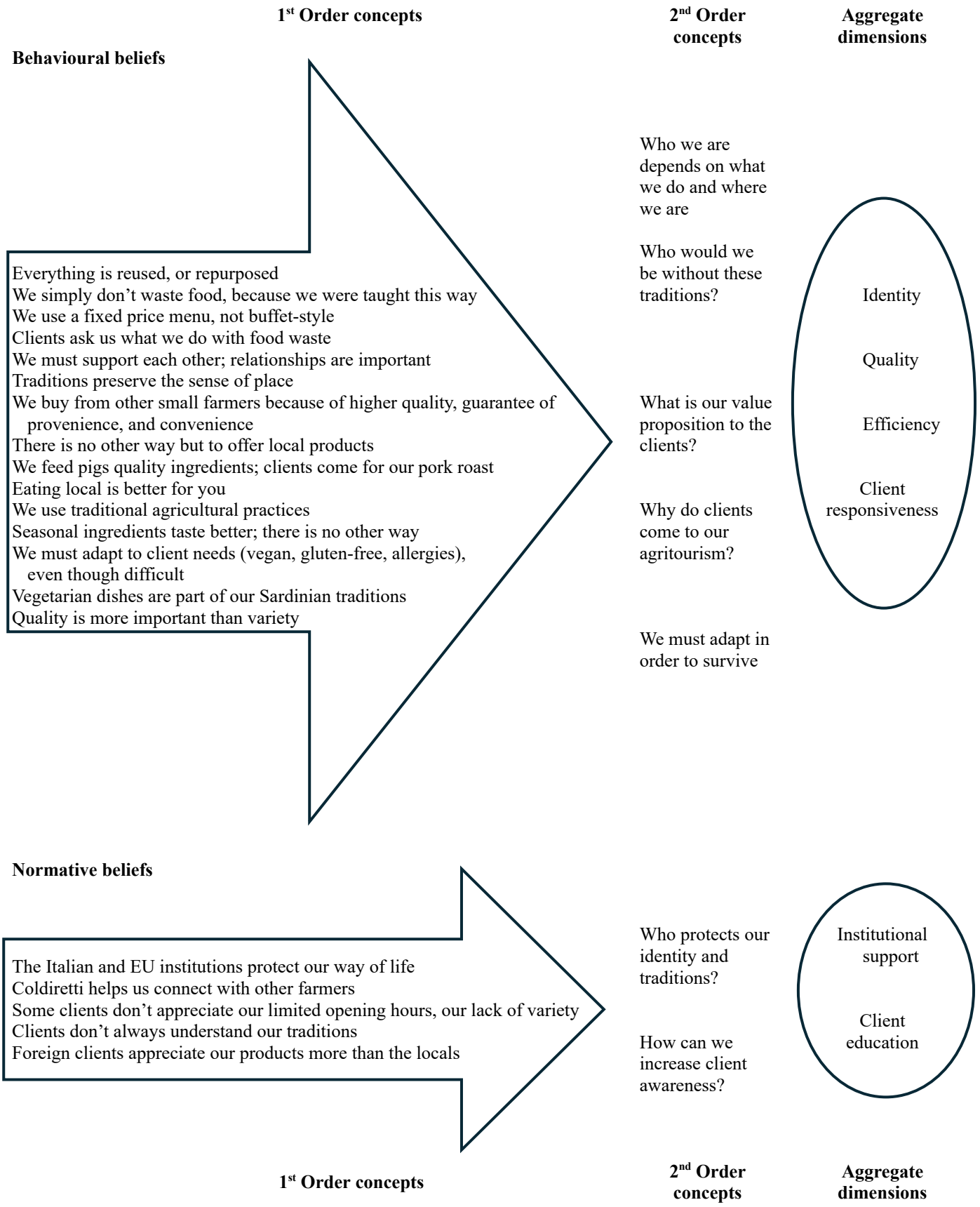
Survival imperative. Overall, farmers had a positive attitude and viewed food sustainability as a personal responsibility and an imperative for business survival.

The final themes of farmers' control beliefs are shown in Figure 2.

5.5 Climate change knowledge

When asked about the causes of climate change, some did not think it was 'a real problem'; rather, they saw it as a natural phenomenon. Others believed in a mixture of human and natural causes, yet others held an entirely anthropocentric view. Farmers who held an anthropocentric perspective blamed the careless attitude of people, especially in large cities, industrial pollution, the CO_2 emissions caused by the burning of fossil fuels and the waste of energy, and intensive agriculture. Yet others held some misconceptions regarding the cause of climate change (e.g., pollution, sprays), but most farmers seemed aware about climate change and its impact on their business. They cited the effects of climate change in Sardinia, such as, a late vegetable growing season, a more tropical climate, an intense drought, which caused them to choose between feeding their animals and watering their gardens, or to reduce their wine production due to extremely hot temperatures followed by a large amount of rain. While most farmers were unsure about the causes of climate change, they were clear about the impact of intensive agriculture on climate. This was a consistent theme in their views about climate change. The final thematic analysis is shown in Figure 2.

Figure 2 – Thematic analysis



Control beliefs

Obstacles:
- funding is available, but application process cumbersome
- health and safety regulations are stifling
- organic certification difficult/expensive to maintain/achieve
- it is difficult, timely, and expensive to cook vegan dishes

Facilitators:
- it comes natural for us to use green food practices
- it is our duty
- we need to adapt if we want to survive in business

Overcoming bureaucracy and difficulty is possible with the right mindset

Our traditions and identity help us overcome obstacles

Bureaucracy

Difficulty

Identity

Survival imperative

Climate change knowledge

Causes:
- people (industrial pollution, intensive agriculture, careless attitude, CO_2 emissions)
- volcanoes, earthquakes, natural causes
- half human activity, half natural causes
- nevertheless, negative impact (droughts, later growing season, etc)

Links with green food practices:
- cannot explain link to food waste
- food waste needs energy/resources to produce
- intensive agriculture is to blame, not us
- km 0
- not sure how local sourcing relates to climate
- eating meat is good for you
- not sure how plant-based diet relates to climate
- depends how meat is grown

Causes most likely anthropomorphic, but intensive agriculture is to blame

The climate is definitely changing

Nuanced perspective on meat versus plat-based diet

Intensive agriculture

Changing climate in Sardinia

Green food behaviors help

Source: based on Gioia, Corley & Hamilton (2013)

5.5.1 Links between green food behaviours and climate change

Food waste and climate change. Many farmers agreed that a positive link exists between food waste and climate change but could not explain this link or the mechanism by which it happens. Others explained that energy, machinery, and fertilizers had to be used to produce the food that ends up wasted, thus generating larger amounts of CO_2, "so, every time we produce and consume more than we need, it has a negative impact on the environment." (#5). They argued that the food produced in an intensive fashion tends to be more wasteful than familial, small-scale production.

Own production, local sourcing, seasonality, and climate change. Farmers correctly identified the low impact of seasonal ingredients, in-house production and local sourcing on the environment, by avoiding the carbon emissions associated with transportation. They saw traditional agricultural practices as mitigating climate change, they had a multi-faceted view of the link between local production and climate change, and they often struggled with the complexity of this link.

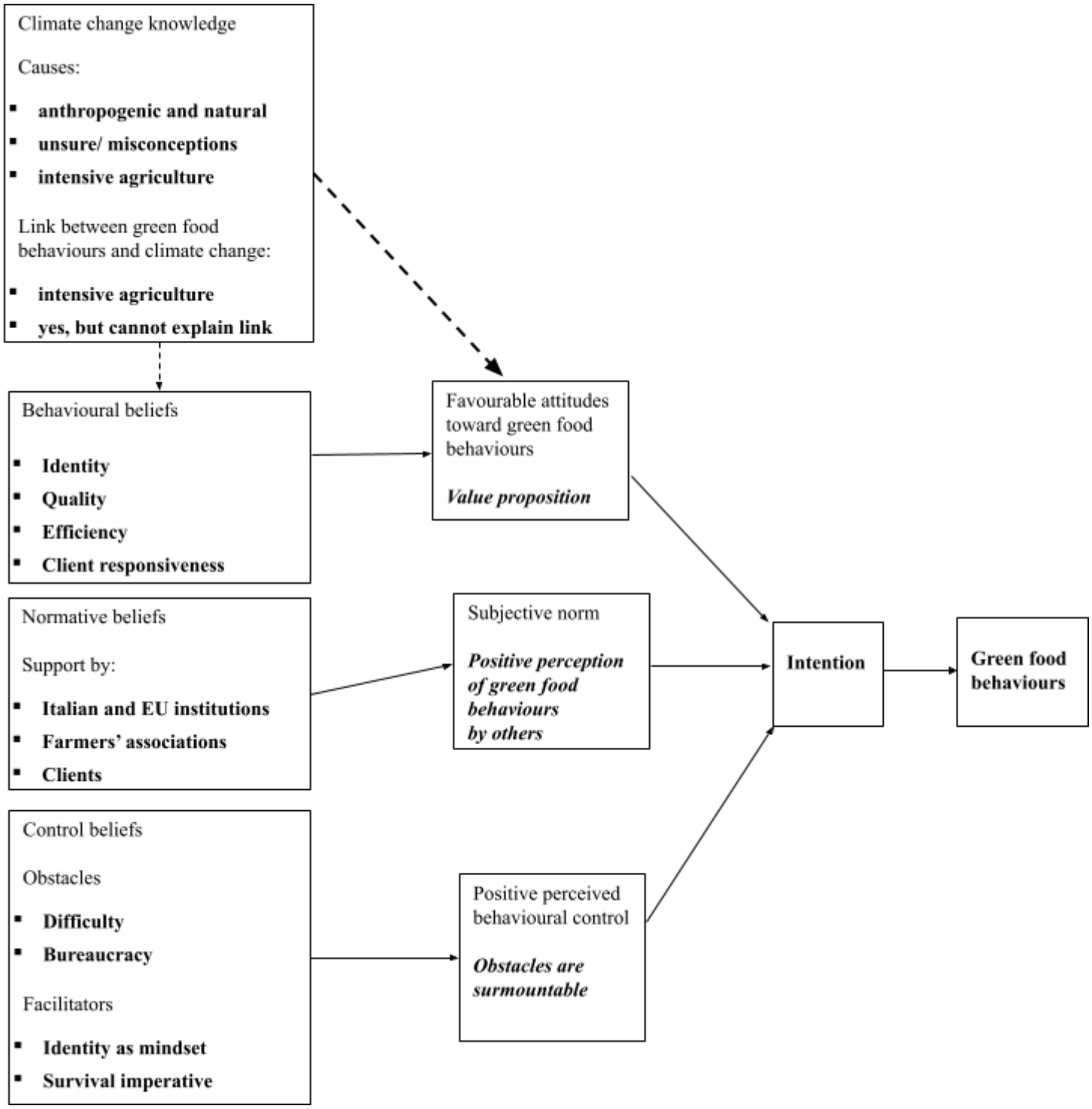
Plant-based diet and climate change. Farmers' opinions on the nature of our diet and the environment were strongly linked to their opinions related to diet and human health. Opinions ranged from "eating meat is in fact good for you," to "eating meat in moderation is good for you," to "eating less meat and more vegetables is good for you" (although very few farmers believed the latter).

Farmers explained the impact of a meat-based diet on the environment by focusing on the environmental impact of the feed needed to raise animals. Others presumed a vegan/vegetarian diet had a smaller impact on the climate, but could not explain this link, responding in a general manner (see quote from farmer #9 in Appendix, Table 4).

In general, farmers believe that meat production does not contribute in a significant way to climate change, unless the meat is produced in an intensive manner. Other farmers also (correctly) observed that vegan cooking does not always contribute less to climate change: it depends on how vegetables are grown, and it also depends on how the animals are grown (intensive manner or not). They correctly pointed out that the production methods are important, not necessarily the type of diet.

Results using the TPB framework augmented with climate change knowledge are summarised in Figure 3.

Figure 3 – Summarising findings using the framework of TPB enhanced with climate change knowledge



Note. Dashed lines represent hypothesised relationships.

Source: Authors' elaboration

6 Discussion of findings

6.1 Theoretical implications

This paper contributes to the literature on TPB and environmental sustainability of agritourism in several ways. First, in contrast to the majority of TPB studies, we focus on organisational, not private environmentalism (Yuriev, Dahmen, Paillé, Boiral, & Guillaumie, 2020b). Since many agritourism operations are family/entrepreneurial businesses, understanding the role of attitudes, beliefs, and intentions of agritourism operators in determining their environmental behaviour can help researchers refine current models of environmentalism in family business/entrepreneurship. Second, by employing qualitative research methods to explore the *indirect* beliefs of agritourism owners, this study follows the suggestions of the TPB founders for rigorous applications of theory (Ajzen & Fishbein, 1980), and differs from current applications of TPB, which focus solely on measuring the *direct* beliefs of decision-makers in a quantitative manner (Yuriev, Dahmen, Paillé, Boiral, & Guillaumie, 2020b). Further, the qualitative approach has been useful to clarify the meaning and measurement of the traditional TPB variables. We also take a rigorous approach to theory development, by adapting indirect belief variables to the unique context of Sardinian agritourism. Regarding theory extension using the climate change variable, we follow Ajzen and Fishbein's (1980) criteria for additions to theory by ensuring that climate change knowledge is a) behaviour-specific, thus following the principle of compatibility, b) directly related to the green food practices studied in terms of action, context, and time, c) conceived as a causal factor between intention and behaviour, d) conceptually different than the existing variables of the model, and e) applicable to a wide range of ecological behaviours studied in organisational environmentalism (Fishbein & Ajzen, 2010). Future research employing our TPB-enhanced model will determine whether the climate change knowledge variable will become a permanent addition to the theory in empirical applications to ecological behaviour.

Our exploratory findings do not support the addition of the knowledge of the phenomenon under study as a permanent variable in TPB. Knowing the causes of climate change or the link between green food behaviours and climate change did not matter in determining farmer behaviour. In fact, even farmers who struggled with explaining the scientific causes of climate change and the complex link between food waste and climate change, or between meat and vegetable production, performed green food practices out of a bedrock sense of tradition and identity that is connected to their place and history. In other words, identity appears to be a more powerful predictor than any sense of intentionality that may be grounded in knowledge of the phenomenon under study. This said, future studies are needed to explore this link further.

6.2 Practical implications

While the TPB framework is considered one of the most effective models for developing interventions, few interventions to stimulate ecological behaviours based on TPB have been developed in the literature (Yuriev, Dahmen, Paillé, Boiral, & Guillaumie, 2020b). Interventions should be based on assessment of indirect beliefs (Yuriev, Dahmen, Paillé, Boiral, & Guillaumie, 2020b), which are uncovered effectively by this qualitative research.

A central implication of our findings is that policymakers should consider interventions that increase farmers' PBC. These interventions could focus on reducing the strength of external obstacles (lack of funding, inspection fatigue) and of internal obstacles (increasing the sense of self-efficacy of farmers, by normalising these behaviours and making them part of operating norms). Although farmers felt supported by the relevant institutions in their pursuit of green food practices, they also felt stifled by the number of regulations impeding their operations. Government agencies may explore ways to reduce inspection fatigue, reduce the middleman in grant applications, or provide tax incentives for buying Sardinian ingredients, or increasing taxes on non-local products (Place et al., 2022).

Increasing self-efficacy could also be done by increasing farmers' knowledge and competences with respect to the impact of green food behaviours on climate change and the level of cognitive effort needed to sort out the complexity of green behaviours (Clement, Henning & Osbaldiston, 2014). While farmers were keenly aware of how dependent their livelihood is on the weather, many could not explain the causes of climate change, or held misconceptions about it. Similarly, while many presumed that a positive link exists between green food practices and climate change, they could not always articulate the mechanism underlying this process. Additionally, farmers struggle with complex issues, *i.e.,* what is more environmentally friendly, raising animals or growing vegetables, growing fish or meat, producing vegetables in an intensive manner versus producing meat in a small, familial setting, buying local meat grown with imported feed versus eating vegetables grown intensively, and so on. Thus, policymakers, tourism association, and destination marketers have an important role in clarifying the causes of climate change and the link between non-green food practices and climate change. Posting such information on the local Chamber of Commerce or trade associations websites, including it in newsletters, or social media, would help increase farmers' awareness and capacity in climate change mitigation. Awareness programs would enhance farmers' knowledge about why, how, and to what extent green food practices help reduce climate change, may reduce misconceptions, and may lead to an increased acceptance of these practices (Poltimäe & Peterson, 2021). Helping farmers and clients compare the carbon emissions of their menu in comparison with the carbon emissions of alternative menus would help reduce this uncertainty, by using food labelling, for instance (Kapała, 2021).

7 Conclusions

Given the importance of agritourism for the Italian economy, and the lack of academic attention to the environmental sustainability of agritourism in Sardinia, a qualitative study was conducted, to explore farmers' use of green food practices, barriers they experience in this effort, and their attitudes and beliefs regarding climate change. Findings suggest that farmers hold favourable attitudes toward most green food practices (reducing food waste, producing locally, sourcing seasonally), and these attitudes are grounded in a bedrock sense of identity. Overall, their sense of who they are (identity) is inextricably linked to their sense of place (where they are located) and time (seasonality of ingredients). Farmers wouldn't have it any other way, because these practices are part of their identity, their culture, of who they are. Preserving the traditional Sardinian agricultural practices and carrying them over into the future is seen as their ethical responsibility. Ultimately, farmers performed green food behaviours whether they knew the scientific causes of climate change or not. Environmental reasons were not expressed as an important rationale for conducting these behaviours. In fact, even farmers who denied the anthropomorphic causes of climate change or those who were unsure of its causes, performed green food behaviours. Rather, identity and tradition were a much stronger predictor than any kind of intentionality grounded in knowledge about the scientific phenomenon under study. While we are not proposing knowledge as a permanent addition to TPB, it is still important to study the climate change knowledge in relation to vegan offerings, both because vegan dishes represent a large departure from traditional Sardinian cuisine, and because knowledge of climate change may be a causal factor in determining intention and action with respect to this behaviour.

Regarding limitations, our study is highly site-specific, and it is based on qualitative data, thus rendering the findings hardly generalizable. Another potential limitation is that we did not measure normative beliefs and control beliefs with separate questions about each of the four behaviours analysed. Future studies may use more behaviour-specific measures of the normative and control beliefs. For instance, researchers may use our adapted TPB model to study farmers' intentions to offer a richer vegan menu.

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Appendix

Interview guide

This research project aims to study food sustainability practices of agritourism businesses in Sardinia. Examples include offering a vegan/vegetarian menu, using local ingredients (produced on own farm or purchased from other local farmers), reducing food waste, etc. There are no right and wrong answers, we are just interested in learning your opinion on these subjects. Your responses are confidential, and they will be shared only in an anonymous and aggregate manner if our study is published. This interview will be recorded solely for accuracy purposes.

Behaviours

1. Could you tell us what you do with the food scraps resulting from food preparation or with the leftover food in your restaurant?
2. When you prepare your dishes, do you try to give priority to local ingredients (even if sourced from other local farmers, not necessarily from your farm)? If yes, why is it important to do so? If not, why are you not doing it?
3. Regarding non-local ingredients/products, do you care about their source market/country of origin? If not, why? If yes, in what sense?
4. Do you consider the seasonality of the ingredients when deciding what dishes to make? If yes, why is it important to do so? If not, why not?
5. Are you inclined to offer a separate vegan/vegetarian menu, or at least to increase the number of plant-based dishes offered by your restaurant? If yes, how and why? If not, why not?
6. Beyond the practices we mentioned above (using local ingredients, reducing food waste, offering vegan/vegetarian menus) what other food sustainability practices do you use in your agritourism business?

Behavioural beliefs

7. What are the advantages and disadvantages of performing food sustainability behaviours in your agritourism?

Normative beliefs

8. Are there any individuals or groups who would approve of your actual or future food sustainability behaviours? If yes, who are they and what do they tell you regarding this topic?
9. Are there any individuals or groups who would disapprove of your actual or future food sustainability behaviours? If yes, who are they and what do they tell you regarding this topic?

Control beliefs

10. Are there obstacles or circumstances that make it difficult or impossible for you to perform food sustainability behaviours?

11. Do you have the ability to remove/reduce these obstacles? If yes, why? If not, why not?
12. Conversely, are there factors or circumstances that make it easy for you to perform food sustainability behaviours?

Climate change knowledge

13. Given the ubiquitous talk about climate change, do you think climate change is a problem that is real or not? (uncertainty)

    Yes No

    13.1. If you believe it's not, could you please explain why you believe this?

    13.2. If you believe it is real,

    a. What are the factors that cause climate change?
    b. Do you think that wasting food contributes in any way to climate change? If so, could you explain how?
    c. Do you think eating local foods helps reduce climate change? If so, could you explain how?
    d. In your opinion, does a plant-based diet (by reducing meat consumption) contribute to the reduction of the climate change phenomenon? Please provide arguments.

Demographics

Gender
Age
Highest education level
Do you have children? If yes, how many? How old are they?
# of years in agritourism:
How many people work in your agritourism?
How many of them are not related to you?
How many hectares of land do you own?
How many rooms do you have?
How many covers does the restaurant have?
What percent of the food you serve, approximately, is produced in-house?
Do you serve breakfast, lunch, and dinner, or only some of these?
Do you belong to an agritourism, agriculture, or hospitality association, such as Agrituristi, ColDiretti, etc? If yes, which ones?
Business location: _____

Table 3 – Demographic characteristics of the sample

Id #	Sex	Age	Highest education level	Has children? (number, age)	# of years in agritourism	# total employees	# family employees	# hectares	# rooms	# covers in restaurant	Food produced in-house	Opening hours	Agritourism association	Location
1	f	24	BA degree	no	2	6	4	75	6 rooms, 2 apartments	80	35-40%	Breakfast, lunch, and dinner	Coldiretti	Aglientu
2	m	65	BA degree	2 (40, 35 yrs old)	28	4	3	14	6 rooms, 1 apartment	100	80%	Breakfast, lunch, and dinner	Coldiretti	Oliena
3	m	51	Middle school	no	32	22	0	4	none	300	100%	Dinner	no	Olbia
4	f	40	BA degree	no	31	7	7	--	10 rooms	80	70%	Breakfast & dinner	Coldiretti	San Teodoro
5	m	47	High school	no	7	10 (summer) 5 (winter)	3	80	2 rooms	70	30%	Dinner (summer); lunch (winter)	CIA	Olbia
6	f	41	BA degree	no	17	8	3	60	6 rooms	120	60%	Breakfast & dinner	Confagricoltura	Olbia
7	f	41	BA degree	1	20	5	2	--	7 rooms	100	40%	Lunch & dinner	Confagricoltura	Olbia
8	m	36	High school	1 (2 yrs old)	10	4	4	80	12 rooms	100	80%	Breakfast & dinner	Confagricoltura	Tula
9	f	57	High school	1 (27 yrs old)	25	8	1	30	8 rooms	80	60%	Breakfast & dinner	Confagricoltura	Olbia

10	f	45	BA degree	1 (10 yrs old)	31	22	11	110	13 rooms	80	80%	Breakfast & dinner	Coldiretti & Terranostra	Alghero
11	f	50	High school	3 (31, 26, 15 yrs old)	26	3-4	2	45	8 rooms	30	80%	Breakfast & dinner	Coldiretti	Dorgali
12	m	53	High school	1 (9 yrs old)	18	usually 2 (5-6 depending on need)	3	30	3 rooms	90	80%	Breakfast, lunch, and dinner	no	Bonorva
13	m	28	Middle school	1	10	5	3	15	none	120	60%	Lunch & dinner	Confagricoltura	Telti
14	f	41	Masters	no	17	8	3	60	6 rooms	120	60%	Breakfast & dinner	--	
15	f	57	High school	1 (27 yrs old)	25	8	1	30	8 rooms	80	60%	Breakfast & dinner	Confagricoltura	Olbia
16	m	53	High school	1 (9 yrs old)	18	2 full-time (5-6 seasonal)	2	30	3 rooms	90	80%	Breakfast, lunch, and dinner	--	Bonorva
17	m	51	Middle school	no	32	30 (in season) (average 22)	0	4	none	300	-	Dinner	--	Olbia
18	m	28	Middle school	1 (1 yr old)	10	5	3	15	none	120	60%	Lunch & dinner	Confagricoltura	Telti
19	f	40	Masters	2 (under 2 yrs old)	5	12	7	-	8 rooms	40	80%	Breakfast, lunch, and dinner	EcoTourism Sardegna	Gergei
20	m	59	Accountant	3 (26, 22, 19 yrs old)	26	9	0	8	5 mini-apartments	250	90%	Breakfast, lunch, and dinner	Coldiretti, Consorzio Vacanze Nature	Oristano

Source: Authors' elaboration

Table 4 – Illustrative quotes, categorized by TPB category and theme

Climate change knowledge	*Causes of climate change*	Anthropocentric	▪ "Here in agriculture, we are very dependent on the weather. To give you an example, out of the seven vineyards we have, two have not produced anything this year, because we had a very hot weather that dried the vines, and then the rain came and ruined everything. […] This caused us to work twice as hard to take care of our remaining vines, which impacted our productivity in a major way." (#7)
		Natural causes	▪ "A natural evolution of the Earth, and that volcano explosions and earthquakes can affect our climate more than humans will ever do." (#2)
		Misconceptions /somewhat anthropocentric	▪ "What causes climate change? Pollution all-around, pollution of water, of soil, of air." (#20) ▪ "The problem exists, don't ask me if it's caused by sprays, smog, or other factors, because I couldn't tell you, I think no one really knows, but our climate is definitely changing. I believe it's 50-50 due to human activity as much as to natural causes. But we've had six months without any rain, and we must find solutions." (#18)
	Links between green food behaviors and climate change	Food waste and climate change	▪ "Small producers like us cause very little food waste, thus, it's a drop in the ocean; rather, the large intensive producers are to blame." (#7)
		Own production, local sourcing, seasonality, and climate change	▪ "[…] living on an island, we would have to import everything if we didn't produce it locally – the less we import, the less [CO2] we consume, and the less we pollute (because the need for transportation is lower)." (#8) ▪ "Our traditional [farm-to-table] production methods help, but it's like fighting against the windmills: it seems that our society, our eating habits, are inherently tied to the intensive production methods, which are very difficult to change." (#16) ▪ "For instance, if I don't plow one year and let only the sheep do the job, I will have a lower production next year, for sure, but I pollute less." (#5) ▪ "The first thing that comes to mind is the impact of transportation. I don't want to buy pigs from Lombardia,[1] because of the costs associated with transportation, so I buy them five kilometres from here, but I also think about the feed used to grow these pigs, which is often imported from outside Sardinia. Even the cereal mill here in Sardinia imports cereals from the United States, by ship. Our grandparents did not have mass distribution channels; thus, they led more sustainable lives, but we must deal with all these issues." (#18)

[1] A Northern region of Italy.

			▪ "If the grass doesn't grow, we have to feed our animals imported feed, which, [in turn], has a negative environmental impact." (#6)
		Plant-based diet and climate change	▪ "[…] to produce one kg of meat, you need to use several kgs of vegetable feed; thus, producing meat has a large impact on the environment; plus, it's not good for you to eat meat very often." (#12) ▪ "I think there is a link between a meat-based diet and climate change; and, if we ate less meat, it would be good not only for the environment, but from other points of view; I think little by little, we are moving toward a plant-based diet." (#9) ▪ "Eating less meat at our small level, it's too small to have an impact; it's the intensive producers of meat that have more of an impact: if everyone produced meat the way we do (cage-free, etc.), in a familial way, the impact would be much smaller." (#8) ▪ "Vegan diets are not always better for the environment than meat-based diets. […] Organic avocados that travel from South Africa or from South America have a worse environmental impact than the meat that we produce locally." (#19) ▪ "They say that the tomatoes grown in a greenhouse in the Netherlands have a larger impact on the environment than the meat I am producing here in Sardinia." (#11)
Behavioural beliefs	*Food waste*	Identity	▪ "we don't waste food, first, because it is simply a shame to do so, and second, because food waste has a cost" (#5) ▪ "[…] our respect for food is primordial, it is fundamental." (#7)
		Efficiency	▪ "Our approach of careful planning based on reservation numbers helps reduce inventory and thus costs associated with food waste" (#4). ▪ "We used to have two meat-based dishes on the menu. But we noticed that clients came here specifically to eat the pork roast, so we decided to discontinue the other dish, which was generally not eaten here but taken away, thus reducing the costs associated with both the doggy bags and producing that dish." (#14) ▪ "[…] the doggy bags have a cost, as we have to purchase them, and this cost is not insignificant." (#7) ▪ "The pork roast requires a raw ingredient that is costly and non-reusable, so we cannot prepare this dish for 50 people and then we only have 30 clients, so we must optimize the relationship between the number of reservations and menu preparations." (#15)
		Client responsiveness	▪ "The type of client that chooses to stay in an agritourism wants to be immersed in nature and prefers to eat simple but delicious products." (#14)

Own production and local sourcing	Stimulating local economy	▪ "We are members of *Terranostra*,[2] which has the rule of using Sardinian-only products." (#11)
	Identity	▪ "We always have the pork roast on the menu, because we know that clients come to an agritourism for this traditional dish." (#14)
	Quality	▪ "We try to get to know our suppliers and their production methods very well, because when we serve the product to the client […], we are the ones who must guarantee the quality of the product; thus, we try to have few but carefully selected suppliers, so we visit them so we can develop a direct knowledge and understanding that they work in line with our values, and make a product that is the most natural possible." (#14) ▪ "When using mostly local products, you can be sure of the provenience of ingredients. I visit local farms, and I taste their cheese, and I choose those with the highest quality." (#17) ▪ "The main dish of Sardinia is pork roast; but in August you cannot find Sardinian pigs anymore, so there are pigs coming from the Netherlands and you can tell the difference; in Sardinia we don't grow pigs in an intensive manner, you can taste the difference, quality is important." (#8) ▪ "I don't raise pigs, so I buy them from my neighbor, because I know he raises them like I would. In general, whenever I can, I buy from local rather than from multinational companies." (#18)
Seasonality	Identity	▪ "We always have four dishes on the menu, regardless of season: the gnocchi, the ravioli, the Gallurese soup, and the pork roast, while the vegetable starters are seasonal, for instance, in the summer, we offer grated zucchini, while in the winter, we have mushrooms or cauliflower; basically, we cook the product that is offered by our land and the season" (#14).
	Lack of variety	▪ "My sister went to an agritourism here in Sardinia, I won't name names, who served watermelon at breakfast, in November/December! (laughs). We, instead, prefer to serve just a few kinds of fruits but in season." (#4) ▪ "[…], compared to our competitors, our menu is not very varied or exotic." (#19) ▪ "By June, cows are not milked anymore, thus, it is difficult to find fresh ricotta." (#17)
	Quality	▪ "A tomato produced in the greenhouse can never taste as good as a tomato produced in its natural stage of the season." (#11)
	Cost	▪ "[…] Also, eating tomatoes out of season is costlier, both from an economic perspective and from a human health perspective." (#11)

[2] *Terranostra* is a branch of *Coldiretti* focused on agritourism, local region, and the environment. Source: https://www.agriturismo.it/it/extra/terranostra,-da-noi-l-ospitalita-e-una-tradizione-antica-365

	Plant-based dishes	Identity	▪ "[…] we always have vegetarian dishes, as they are an integral part of the Sardinian cuisine, which is often erroneously perceived as "all meat based." Our mothers and grandmothers told us that in the past, meat was eaten in Sardinia only on holidays or special occasions; it has entered the Sardinian cuisine only recently, as people became wealthier and could afford it." (#11) ▪ "We always have vegetarian dishes, that is not a problem. And we can always substitute meat with cheese." (#4) ▪ "[…] we have returned to traditional ways of eating in our families, which was primarily based on vegetables, and eating meat only on holidays or special occasions. This being said, pork roast is always present in our agritourism." (#16)
		Client responsiveness	▪ "We are 'constrained' to offer vegan and vegetarian dishes. It's impossible not to offer vegetarian dishes, because, at every table, there are always two or three vegetarians; vegans, a bit fewer; not to speak of other types of allergies/intolerances." (#20) ▪ "[…] with enough of a notice, we prepare vegan, vegetarian, gluten-free, lactose-free dishes, to make sure we accommodate clients with any allergy, intolerance, etc." (#7) ▪ "It is not easy to offer a vegan menu, because it requires more space; also, we are a traditional agritourism, so we include cheese even in desserts, but we try to be responsive to client needs and various intolerances, such as gluten sensitivities." (#4)
Normative beliefs	*Supporters*		▪ "I think no wants to come here in Sardinia and tell us to eat grasshoppers instead of pork roast! (laughs)" (#2) ▪ "We are founding members of the network Eco Tourism Sardinia, which share our values, so this network definitely appreciates our efforts" (#19) ▪ "Coldiretti is an organization that protects our interests, that follows our work and advertises it." (#11)
	Detractors		▪ "Sometimes clients are upset because we are closed, but we only open based on reservations, and if we don't have reservations, we are closed. We don't re-heat food already prepared; we prepare it based on demand." (#8) ▪ "Some of our clients, especially those who do not share our eco-values, feel that our offerings are too limited, and below their expectations." (#19) ▪ "Some clients do not appreciate the surplus that require us to use doggy bags. These are ignorant people who don't understand the philosophy behind it." (#18)

Control beliefs	*Obstacles*	Difficulty	▪ "To produce a vegan sour cream, you have to start from rice milk and recreate it to obtain a product that is similar to our traditional sour cream; this requires a very complex and elaborate process." (#15) ▪ "For vegan customers, I need advance notice to prepare." (#11) ▪ "Vegan dishes are more complex, both because they are more time-intensive, and because require a different way of thinking. To make a traditional Sardinian dish in a vegan version, you have to reinvent it, substituting soy milk or oat milk, for instance, for regular milk, and that is very complex. […] Sometimes we need an entire morning to prepare a vegan menu, and sometime the vegan customers cancel, which causes us to waste a lot of time and money, because the vegan substitutes are costly" (#9).
	Facilitators	Identity	▪ "I am lucky because I've seen these practices implemented in my family (so growing up, there was no alternative), so it becomes a habit […]." (#11) ▪ "If I buy my prosciutto from Fonni [Sardinian producer] rather than from Parma, it's not like I get a tax discount of 10 percent from the government, or anything, they don't care. It is my choice to buy local, because it is my philosophy." (#18)
		Survival imperative	▪ "Obstacles are not insurmountable; they can be eliminated/reduced if you have a positive attitude: the idea is that one must adapt to a changing world." (#6) ▪ "We have to ensure that the traditions remain, but we have to also look to the future and change with the times." (#15) ▪ "You have to conduct a thorough analysis of your business and evaluate your weak points. You have to stay abreast of the outside trends because the world changes, and if you want to stay in business, you have to change with it; sometimes, you have to be prepared to change your objectives daily." (#14)

Source: Authors' elaboration

Corporate Sustainability Reporting Directive (CSRD) Following its First Application: A Bibliometric Analysis

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Abstract

The transition from the Non-Financial Reporting Directive (NFRD) to the Corporate Sustainability Reporting Directive (CSRD) stimulated research on the implications of this sustainability reform. The discussion began far before the first application of the directive and spanned transversal sectors (e.g., management, accounting, economics, and finance). Studies on this topic aimed to explore both the requirements and the implications of the CSRD. Given this picture, the aim of this paper is to analyze the scientific production on the CSRD relying on a bibliometric analysis of the literature from the first paper published on this topic to date. To do so, I employed a bibliometric analysis on a sample of 117 papers addressing the CSRD, analysing them through co-citation analysis, bibliographic coupling, and keyword analysis. The cluster analysis of the keywords revealed a great attention to severe themes (i.e., sustainability, stakeholders, climate change, regulation, management perspectives, sustainable development, corporate sustainability, sustainability reporting, biodiversity, indicators, and performance). Following the analysis and discussion, this paper highlights the key features of studies on CSRD and provides insights and implications for both scholars and companies. To the best of my knowledge, this is the first comprehensive work on a systematic analysis of the literature on the CSRD.

Keywords – Bibliometric Analysis; Corporate Sustainability Reporting Directive; CSRD; Sustainability.

Paper type – Literature Review

Sommario

La Direttiva sulla Rendicontazione di Sostenibilità Aziendale (CSRD) dopo la sua prima applicazione: un'analisi bibliometrica. – La transizione dalla Direttiva sulla Rendicontazione Non Finanziaria (NFRD) alla Direttiva sulla Rendicontazione di Sostenibilità Aziendale (CSRD) ha stimolato la ricerca sulle implicazioni di questa riforma della sostenibilità. La discussione è iniziata ben prima della prima applicazione della direttiva e ha attraversato settori trasversali (ad esempio, management, contabilità, economia e finanza). Gli studi su questo argomento hanno mirato a esplorare sia i requisiti sia le implicazioni della CSRD. In questo contesto, l'obiettivo del lavoro è analizzare la produzione scientifica relativa alla CSRD, facendo affidamento su un'analisi bibliometrica della letteratura dal

primo articolo pubblicato su questo tema fino ad oggi. A tal fine, è stata impiegata un'analisi bibliometrica su un campione di 117 articoli che affrontano la CSRD, analizzandoli attraverso l'analisi di co-citazione, il *bibliographic coupling* e l'analisi delle parole chiave. L'analisi a cluster delle parole chiave ha rivelato una forte attenzione a temi cruciali (ovvero sostenibilità, stakeholder, cambiamento climatico, regolamentazione, prospettive di management, sviluppo sostenibile, sostenibilità aziendale, rendicontazione di sostenibilità, biodiversità, indicatori e performance). A seguito dell'analisi e della discussione, il lavoro evidenzia le caratteristiche chiave degli studi sulla CSRD e fornisce spunti e implicazioni sia per gli studiosi sia per le aziende. Per quanto a conoscenza dell'autore, questo è il primo lavoro completo su un'analisi sistematica della letteratura sulla CSRD.

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1 Introduction

The European Union's Corporate Sustainability Reporting Directive (CSRD) (Directive 2022/2464/EU) represents the most comprehensive reform to corporate disclosure in the Union since the introduction of the Non-Financial Reporting Directive (NFRD) a decade earlier (Venturelli, Caputo, Leopizzi & Pizzi, 2019). The NFRD (Directive 2014/95/EU) aimed to enhance transparency by mandating that certain large public interest entities disclose information on environmental, social, and employee matters, respect for human rights, and anti-corruption measures. While it marked an important first step, its limited scope (entities with more than 500 employees), reliance on high-level, non-binding guidance, and heterogeneous national transpositions produced data that were often incomplete, incomparable, and of uneven quality. These shortcomings set the stage for a substantive legislative change with the adoption of the CRSD in December 2022. The CSRD reconfigures the architecture of sustainability reporting around scope expansion, standardization, assurance, and digitization (Martinčević, Primorac & Dorić, 2024). First, the directive expands the population of reporting entities beyond the NFRD to include all large EU entities and listed SMEs. Second, it replaces the NFRD's principle-based approach with mandatory European Sustainability Reporting Standards (ESRS), developed through a formalized process with the European Financial Reporting Advisory Group (EFRAG) and adopted by the Commission as delegated acts. Third, it requires publication within the management report in a machine-readable, digitally tagged format, introducing limited assurance and thereby elevating sustainability information to a status closer to financial reporting. Crucially, the CSRD codifies the "double materiality" perspective, obliging undertakings to report on both how sustainability matters affect the firm and the firm's impacts on people and the environment (Dyczkowska & Szalacha, 2025).

To operationalize this shift, the Commission adopted a set of cross-cutting and topical ESRS. These standards address disclosure on strategy, governance, impacts, risks, and opportunities across environmental (including climate), social, and governance themes (Leal Filho et al., 2025). The ESRS are intended to both improve the consistency and comparability of data and enable the digital tagging required by the CSRD.

In the original schedule, undertakings previously subject to the NFRD began applying CSRD for financial years starting in 2024 (reporting in 2025), followed by other large entities (financial year 2025; reporting in 2026), and listed SMEs (financial year 2026; reporting in 2027).

After that, in February 2025, the Commission tabled an "Omnibus" simplification package aimed at reducing administrative burdens and right-sizing the scope and sequencing of sustainability obligations (Nicolo, Zampone, Sannino, & Polcini, 2025). The package included a "stop-the-clock" measure to

postpone the application dates for certain CSRD cohorts, as well as a set of targeted measures. In April 2025, the Parliament and Council adopted the "stop-the-clock" directive, which deferred the application of the CSRD for other large entities to 2028 and for listed SMEs to 2029. The Commission also signalled a strategic intention to reduce ESRS datapoints and clarify requirements, thereby cutting recurring costs while preserving decision-useful information for investors and stakeholders.

In this context, management and accounting research explored the CSRD both before and after the first implementation. The aim of this paper is, therefore, to map these studies through a bibliometric analysis (Donthu, Kumar, Mukherjee, Pandey, & Lim, 2021), evidencing the main features of the research and their relevant findings. The remainder of the paper is structured as follows: Section 2, Methodology; Section 3, Findings; Section 4, Keywords analysis; Section 5, Discussion and concluding remarks.

2 Methodology

I performed a bibliometric analysis in this paper (Das, Di Virgilio & Puccio, 2024; Zilia, Zanderighi & Orsi, 2024; Secinaro, Dal Mas, Brescia, & Calandra, 2022), as it aligns with the research aim. Indeed, bibliometric analysis helps answer the research questions, as it represents a rigorous method for exploring large volumes of data (Donthu, Kumar, Mukherjee, Pandey, & Lim, 2021). The subsequent sections present the sample selection process and the sample analysis process.

2.1 Sample selection

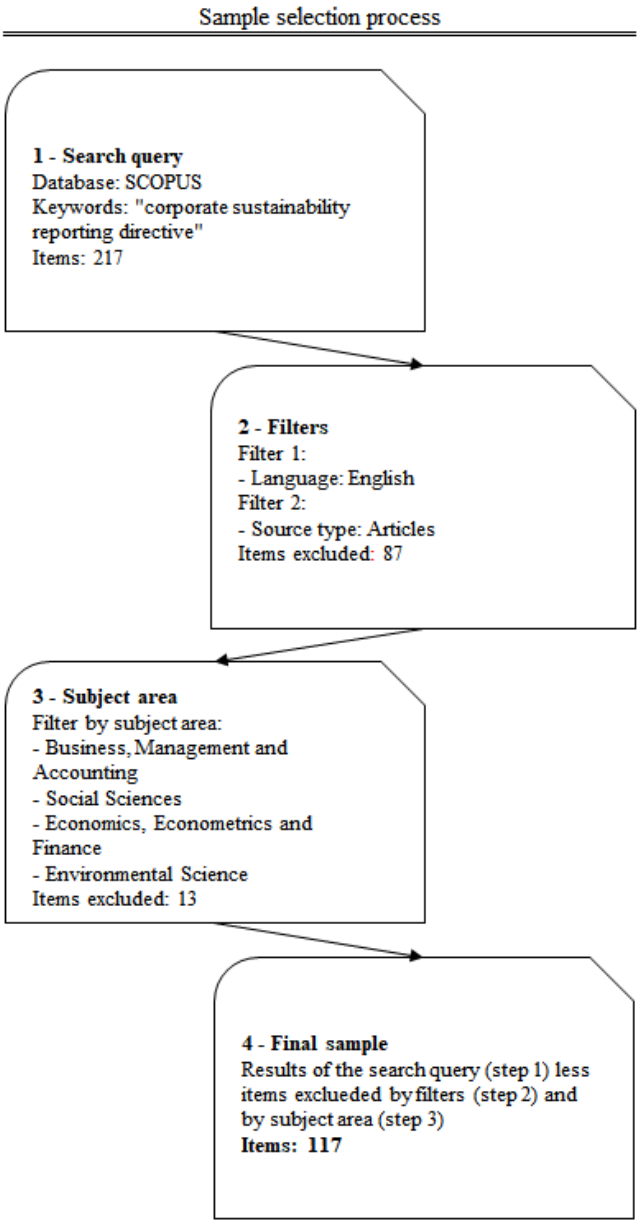
To select the sample for the analysis, I relied on the Scopus database, widely used by authoritative literature to conduct bibliometric analysis in the management and accounting field (Camilli, Mechelli, & Coronella, 2024; Pizzi, Caputo, Corvino & Venturelli, 2020). The sample selection was conducted in September 2025. To define the most suitable sample for the research (Linnenluecke, Marrone & Singh, 2020), I followed the logical steps presented below.

The search query consisted of "corporate sustainability reporting directive" and was searched within the article title, abstract, and keywords on the Scopus database. This search query led to an initial result of 217 documents. Then, I applied the filters to the sample, i.e., document type and language (only articles written in English were selected). After these filters, 130 documents were found.

Finally, I applied the last filter by subject area, selecting only "business, management, and accounting" and areas somehow related to this, i.e., "social sciences", "economics, econometrics and

finance", and "environmental science". The decision to limit the subject area to better address the research question is a technique used in bibliometric analyses (Rosato, Caputo, Valente & Pizzi, 2021). Following this final filter, 117 documents were selected, representing the final sample. Figure 1 presents the logical steps followed to define the sample.

Figure 1 – Logical steps of the sample selection process



Source: Author's elaboration

2.2 Sample analysis

The sample is explored through bibliometric analysis, which consists of a performance analysis (publication-related metrics, citation-and-publication-related metrics), science mapping (citation analysis, co-citation analysis, bibliographic coupling), and a network analysis (keywords analysis, clustering) (Donthu, Kumar, Mukherjee, Pandey, & Lim, 2021). Specifically, the main analyses are co-citation analysis, bibliographic coupling, and keywords co-occurrence analysis.

Co-citation analysis is a bibliometric method that examines how frequently two documents are cited together by subsequent publications. The underlying assumption is that if two works are repeatedly co-cited, they are likely to share a conceptual or thematic connection, even if they do not cite each other directly. This analysis helps map the intellectual structure of a research field, identifying seminal works and tracing the development of scientific paradigms over time.

Bibliographic coupling is a bibliometric analysis that assesses the similarity between two documents based on the extent to which they share common references. Two publications are considered bibliographically coupled when they cite one or more of the same sources. Finally, keyword co-occurrence analysis investigates the frequency with which specific keywords appear together in the same documents. By analyzing these co-occurrence patterns, it is possible to identify central themes, conceptual linkages, and interdisciplinary connections within a research topic. I used this approach to identify the thematic clusters discussed in the cluster analysis.

The visualization of the results is provided through Bibliometrix (Aria & Cuccurullo, 2017) and VOSviewer (Van Eck & Waltman, 2010) tools.

3 Findings

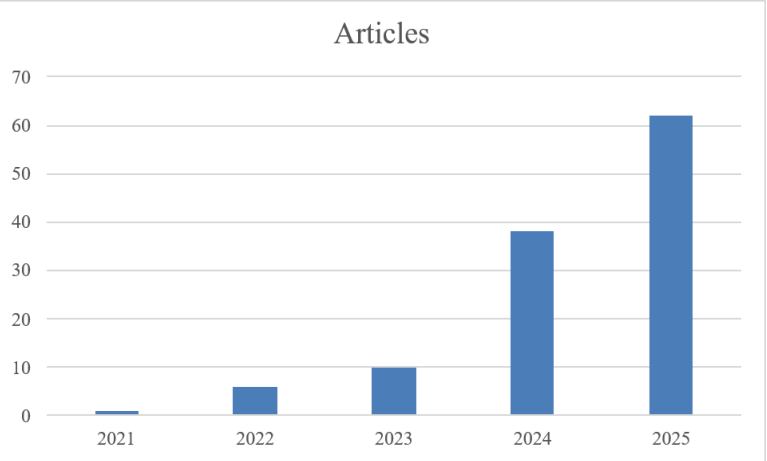
3.1 Overview

The sample spans from 2021 to 2025 and consists of 117 papers. Figure 2 presents the annual production.

As can be seen, production began in 2021, the year the European Commission presented the draft of the CSRD to replace the NFRD. At that time, only 1 paper was published about CSRD, as there was still no evidence to be observed. This is also true for the subsequent years from 2022 to 2023, but the increasing interest in the topic led to an increase in the annual production (6 papers in 2022 and 10 papers in 2023), especially following the approval of the directive in 2022. 2024 marked the first year of

the application and was characterized by the production of 38 papers. Finally, 2025 is not only the year of the first reports but also the year of the adoption of the Omnibus package, further stimulating research on the topic, with scientific production reaching 62 papers as of September 2025.

Figure 2 – Annual scientific production



Source: Author's elaboration

Table 1 – Most prolific authors

Authors	Frequency
Krasodomska, J.	3
Zarzycka, E.	3
Zieniuk, P.	3
Aboud, A.	2
Eliwa, Y.	2
Greiling, D.	2
Macuda, M.	2
Mezzanotte, F. E.	2
Novicka, J.	2
Pizzi, S.	2
Păunescu, M.	2
Saleh, A.	2
Traxler, A. A.	2
Velte, P.	2
Zülch, H.	2

Source: Author's elaboration

Table 1 shows the most relevant authors (as per paper published), who are Krasodomska, Zarzycka, Zieniuk, Aboud, Eliwa, Greiling, Macuda, Mezzanotte, Novicka, Pizzi, Păunescu, Saleh, Traxler, Velte, Zülch.

Regarding sources, the most relevant are *Sustainability (Switzerland)*; *Management Decision*; *Sustainability Accounting, Management and Policy Journal*; *Business Strategy and the Environment*; *European Business Law Review*; *Accounting in Europe*; *Corporate Social Responsibility and Environmental Management*; *European Company and Financial Law Review*; *Business Ethics and Leadership*; *Euromed Journal of Business*; *International Journal of Law and Management*; *Journal of Applied Accounting Research*; *Journal of Risk Finance*; *Meditari Accountancy Research*; *Sustainable Development*. Table 2 presents the most relevant sources, along with the total number of papers published.

Table 2 – Most relevant sources

Sources	Frequency
Sustainability (Switzerland)	15
Management Decision	10
Sustainability Accounting, Management and Policy Journal	5
Business Strategy and the Environment	4
European Business Law Review	4
Accounting in Europe	3
Corporate Social Responsibility and Environmental Management	3
European Company and Financial Law Review	3
Business Ethics and Leadership	2
Euromed Journal of Business	2
International Journal of Law and Management	2
Journal of Applied Accounting Research	2
Journal of Risk Finance	2
Meditari Accountancy Research	2
Sustainable Development	2

Source: Author's elaboration

These sources highlight a wide interest in the topic, which is transversal, as the most relevant sources are from different sectors, i.e., management, accounting, ethics, finance, and economics. The sample is also composed of high-rated journals (3 ABS) (CABS, 2024), *Accounting, Auditing and*

Accountability Journal; *Business Strategy and the Environment*; *Ecological Economics*; *Foundations and Trends in Accounting*; *International Journal of Accounting*.

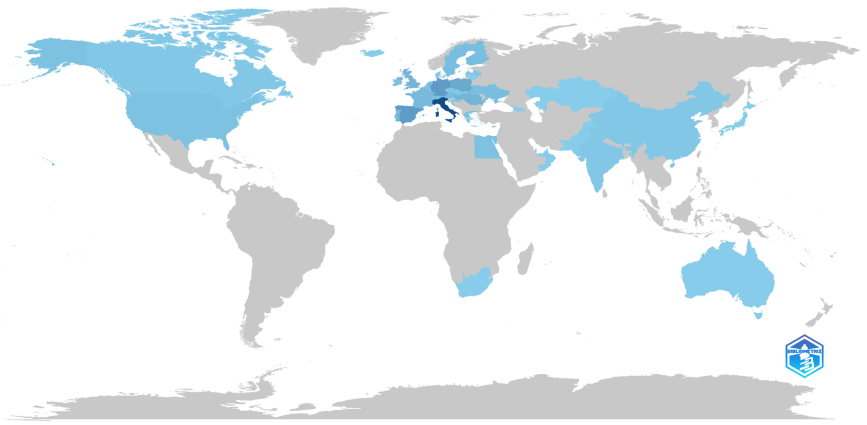
The most cited articles of the sample are presented in Table 3.

Table 3 – Most cited articles

Articles	Total citations
Hummel & Jobst (2024)	79
Ottenstein, Erben, Jost, Weuster & Zülch (2022)	69
Fiandrino, Gromis di Trana, Tonelli & Lucchese (2022)	48
Posadas, Ruiz-Blanco, Fernandez-Feijoo & Tarquinio (2023)	41
Balogh, Srivastava & Tyll (2022)	40
Velte (2023)	39
Aboud, Saleh & Eliwa (2024)	34
Oliver Yébenes (2024)	31
Hristov & Searcy (2025)	29
Songini, Pistoni, Comerio & Tettamanzi (2023)	28

Source: Author's elaboration

Figure 3 – Country scientific production



Source: Author's elaboration

The five most cited articles are: Hummel and Jobst (2024), who studied sustainability disclosure legislation and major standard-setting initiatives; Ottenstein, Erben, Jost, Weuster, and Zülch (2022) and Posadas, Ruiz-Blanco, Fernandez-Feijoo, and Tarquinio (2023), who both studied the effects of the

NFRD on firms' sustainability reporting practices; Fiandrino, Gromis di Trana, Tonelli, and Lucchese (2022), who explored the disclosure quality of non-financial information; and Balogh, Srivastava, and Tyll (2022), who investigated the relevance of ESG disclosure factors.

Finally, Figure 3 highlights the country's scientific production, where Italy is leading with 50 papers, followed by Germany (18), Spain (18), Poland (14), United Kingdom (10), Hungary (9), Romania (9), France (7), Portugal (7), Austria (6), Finland (6), Netherlands (6), Sweden (6), and Ukraine (6).

3.2 Co-citation analysis

3.2.1 Articles

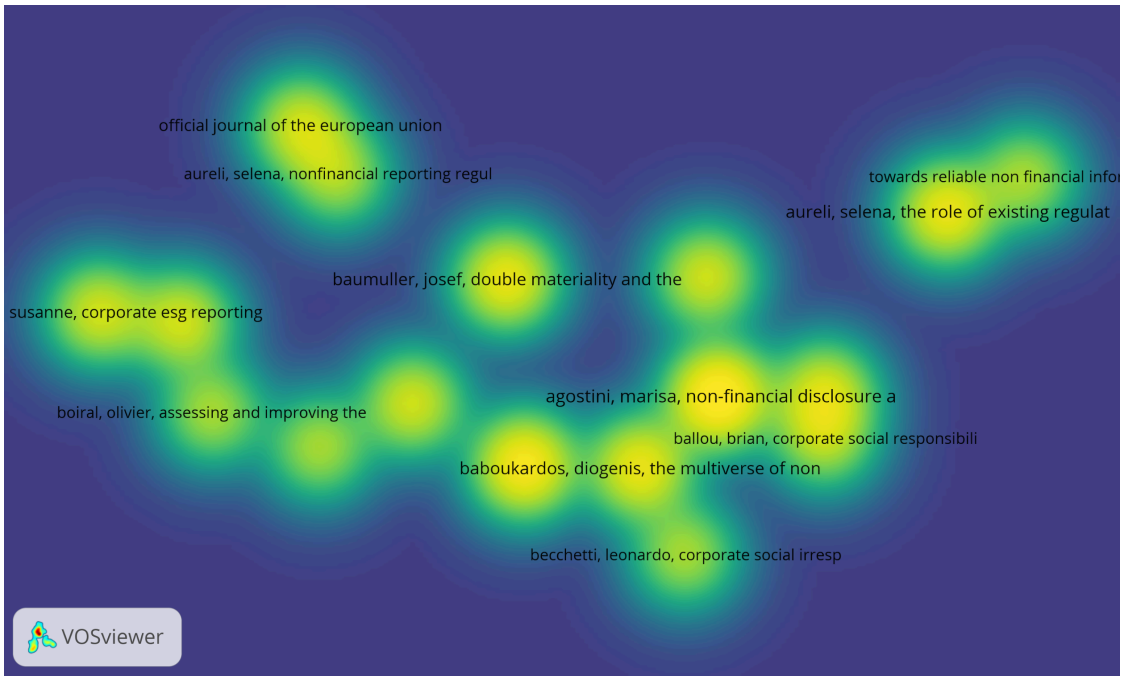
The sample of 117 papers cited 940 references. 20 references had at least 3 citations. The most cited papers are:

- Agostini, Costa, and Korca (2022). Non-financial disclosure and corporate financial performance under directive 2014/95/EU: Evidence from Italian listed companies. *Accounting in Europe*, *19*(1), 78-109.
- Albu, Albu, Apostol, and Cho, (2021). The past is never dead: the role of imprints in shaping social and environmental reporting in a post-communist context. *Accounting, Auditing & Accountability Journal*, *34*(5), 1109-1136.
- Albu, Albu, Cho, and Pesci (2023). Not on the ruins, but with the ruins of the past - Inertia and change in the financial reporting field in a transitioning country. *Critical Perspectives on Accounting*, 96. https://doi.org/10.1016/j.cpa.2022.102535
- Atif, Hossain, Alam, and Goergen (2021). Does board gender diversity affect renewable energy consumption? *Journal of Corporate Finance*, 66. https://doi.org/10.1016/j.jcorpfin.2020.101665
- Atkins and Maroun (2018). Integrated extinction accounting and accountability: building an ark. *Accounting, Auditing & Accountability Journal*, *31*(3), 750-786.
- Aureli, Magnaghi, and Salvatori (2019). The role of existing regulation and discretion in harmonising non-financial disclosure. *Accounting in Europe*, *16*(3), 290-312.
- Aureli, Salvatori, and Magnaghi (2020). A country-comparative analysis of the transposition of the EU non-financial directive: An institutional approach. *Accounting, Economics, and Law: A. Convivium*, *10*(2), 1-30.

- Baboukardos, Gaia, Lassou, and Soobaroyen (2023). The multiverse of non-financial reporting regulation. *Accounting Forum*, *47*(2), 147-165.
- Baumüller and Sopp (2022). Double materiality and the shift from non-financial to European sustainability reporting: review, outlook and implications. *Journal of Applied Accounting Research*, *23*(1), 8-28.
- Beske, Haustein, and Lorson (2020). Materiality analysis in sustainability and integrated reports. *Sustainability Accounting, Management and Policy Journal*, *11*(1), 162-186.

The density analysis presented in Figure 4 shows that, apart from papers, institutional references (such as the official journal of the European Union) and factsheets (i.e., *Towards Reliable Non-Financial Information Across Europe* by Accountancy Europe, 2020) are also included. Co-citation is weighted by the number of citations in the graphical presentation.

Figure 4 – Density analysis of the co-citation of the articles



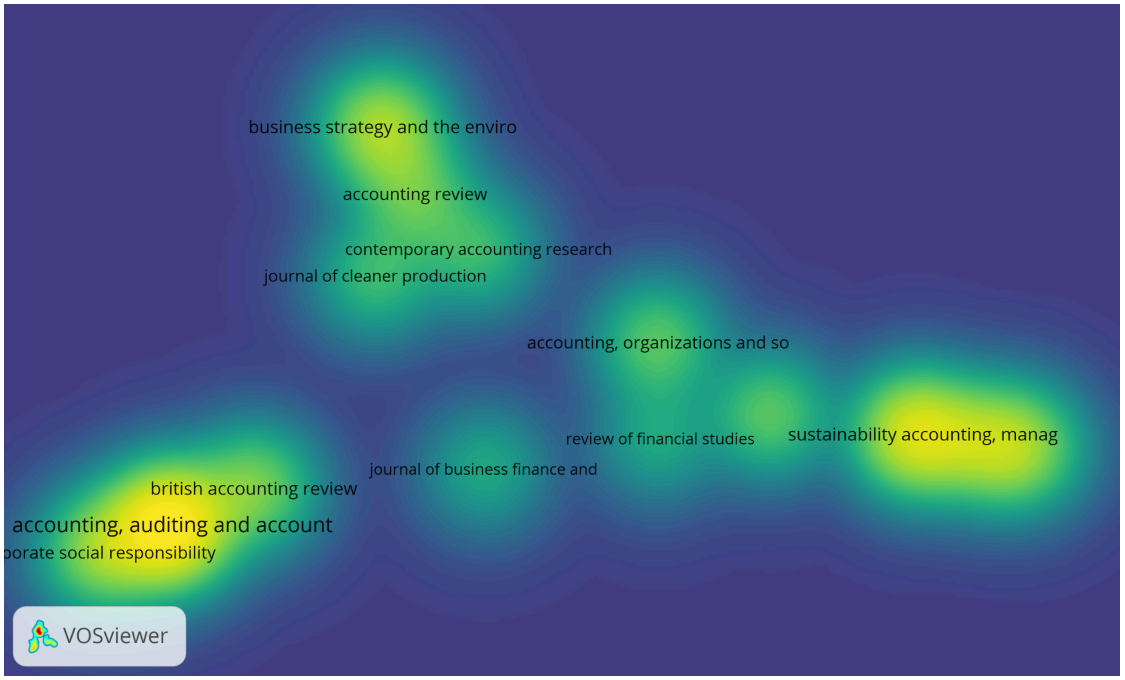
Source: Author's elaboration

3.2.2 Journals

Following the co-citation analysis for the journals, 15 sources are cited at least 3 times. The density diagram (Figure 5) shows that the central journals in the debate are *Accounting, Auditing and*

Accountability Journal; *Business Strategy and the Environment*; *Accounting, Organizations and Society*; *Sustainability, Accounting, Management and Policy Journal*. Co-citation is weighted by the number of citations in the graphical presentation.

Figure 5 – Density analysis of the co-citation of the journals



Source: Author's elaboration

The other journals that emerged from the co-citation analysis are *Corporate Social Responsibility and Environmental Management*; *British Accounting Review*; *Journal of Business Finance & Accounting*; *Accounting Review*; *Contemporary Accounting Research*; *Journal of Cleaner Production*; *Review of Financial Studies*; *Accounting in Europe*; *Business and Society*.

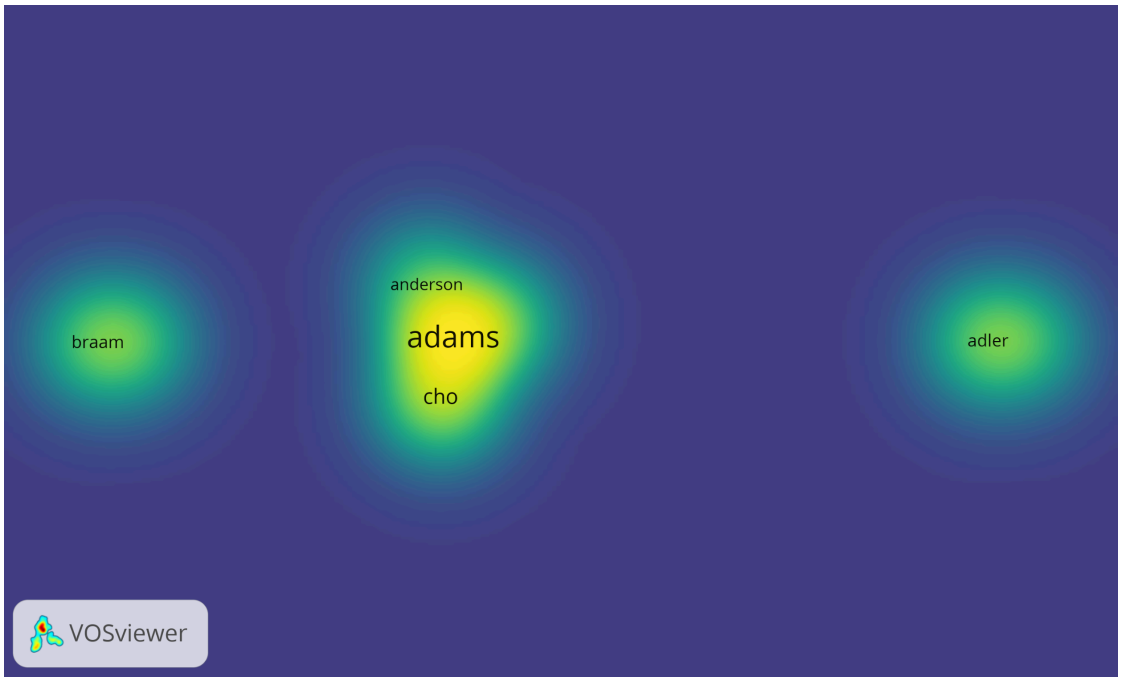
3.2.3 Authors

The co-citation analysis for the authors highlights that 10 authors are cited more than three times. The most cited authors are Carol Adams, Ralph W. Adler, Geert Braam, and Charles Cho. These are some of the most important and influential scholars in the field of sustainability and environmental reporting, with highly relevant studies (Adams, 2002; Braam, de Weerd, Hauck & Huijbregts, 2016;

Cho & Patten, 2007; Milne & Adler, 1999) that continue to represent the theoretical foundation for research in the field.

Figure 6 shows the co-citation density diagram for the authors. Co-citation is weighted by the number of citations in the graphical presentation.

Figure 6 – Density analysis of the co-citation of the authors



Source: Author's elaboration

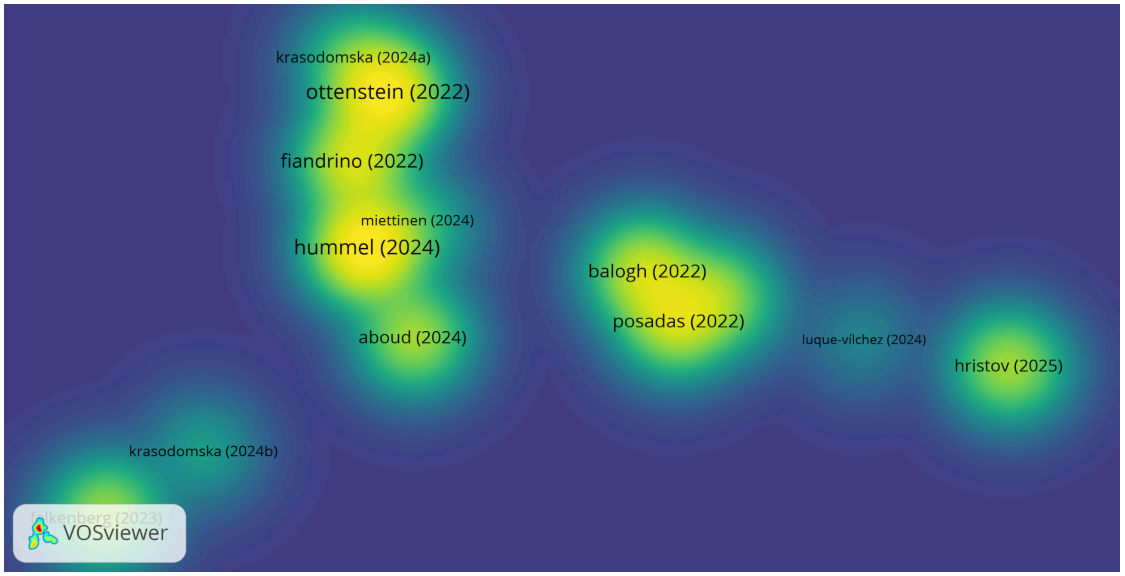
3.3 Bibliographic coupling

3.3.1 Articles and journals

The analysis conducted through the bibliographic coupling highlights that at least 2 citations are shared by 41 articles, which represent 35% of the sample, highlighting a strong interconnection between the studies and a solid foundation of the topic in the literature. These results are even more significant if we consider that the topic has been studied only in recent years (mainly 2024 and 2025), showing that a strong theoretical basis is being built around CSRD in the literature. The most relevant papers in this sense are from the first years of the sample, i.e., Balogh, Srivastava and Tyll (2022), Posadas, Ruiz-Blanco, Fernandez-Feijoo, and Tarquinio (2023), Ottenstein, Erben, Jost, Weuster, and Zülch (2022), Fiandrino, Gromis di Trana, Tonelli, and Lucchese (2022), and Songini, Pistoni, Comerio, and

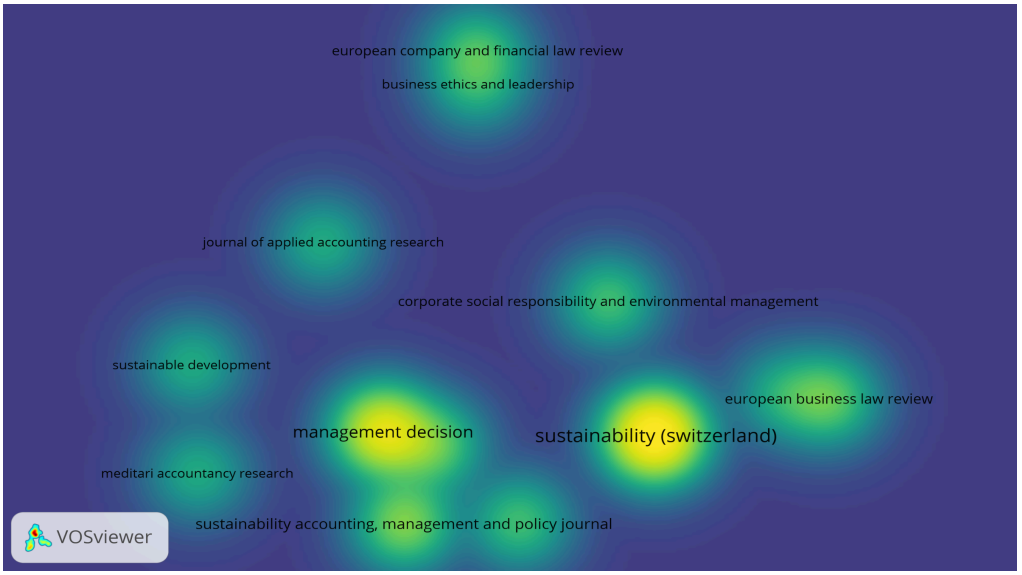
Tettamanzi (2023); but there are also some exceptions, i.e., Hummel and Jobst (2024) and Hristov and Searcy (2025), which means that that studies evolve rapidly and take into account also the latest evidence. Figure 7 shows the density diagram of the bibliographic coupling of the articles.

Figure 7 – Density diagram of the bibliographic coupling of the articles



Source: Author's elaboration

Figure 8 – Density diagram of the bibliographic coupling of the journals



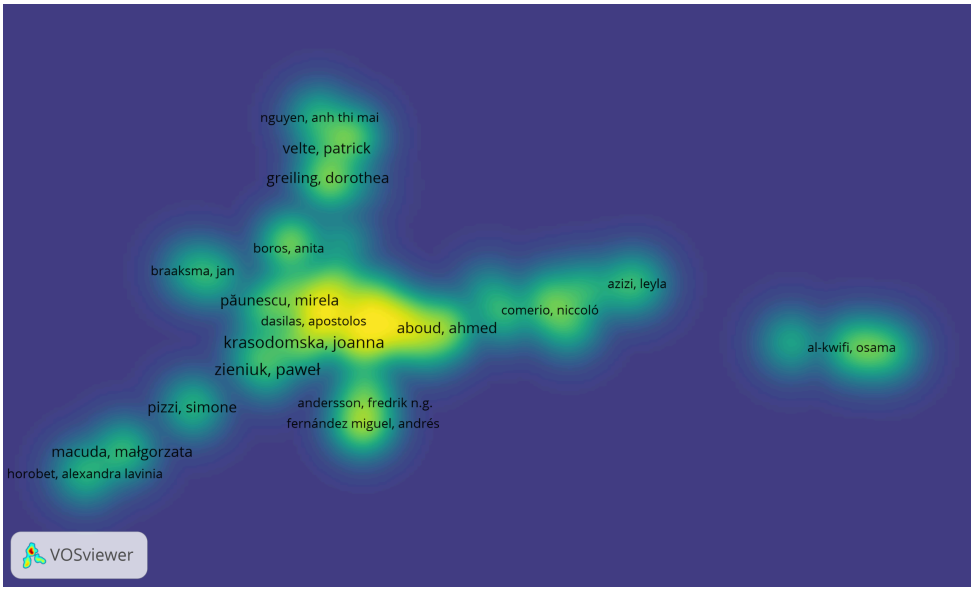
Source: Author's elaboration

Finally, the density diagram of the bibliographic coupling of the journals (Figure 8) shows that the topic is explored transversally, as sources from different sectors refer to each other. The total number of journals that share at least 2 citations is 16 (which corresponds to 23% of the sample). *Management Decision*, *Sustainability (Switzerland)*, and *Sustainability Accounting, Management and Policy Journal* show the highest index of bibliographic coupling (5 citations).

3.3.2 Authors

The bibliographic coupling analysis of the authors reveals that there are still no scholars who represent a definitive point of reference among others on the topic; this is likely due to the novelty of the topic, which still lacks the necessary maturity. Indeed, the authors with at least one publication and a minimum number of citations equal to 2 are 114; however, if we consider authors with at least two publications and a minimum number of citations equal to 2, only 11 authors meet the thresholds. Finally, only three authors published at least three papers with a minimum number of citations equal to two in the sample. Figure 9 shows the density diagram of the bibliographic coupling of the authors.

Figure 9 – Density diagram of the bibliographic coupling of the authors



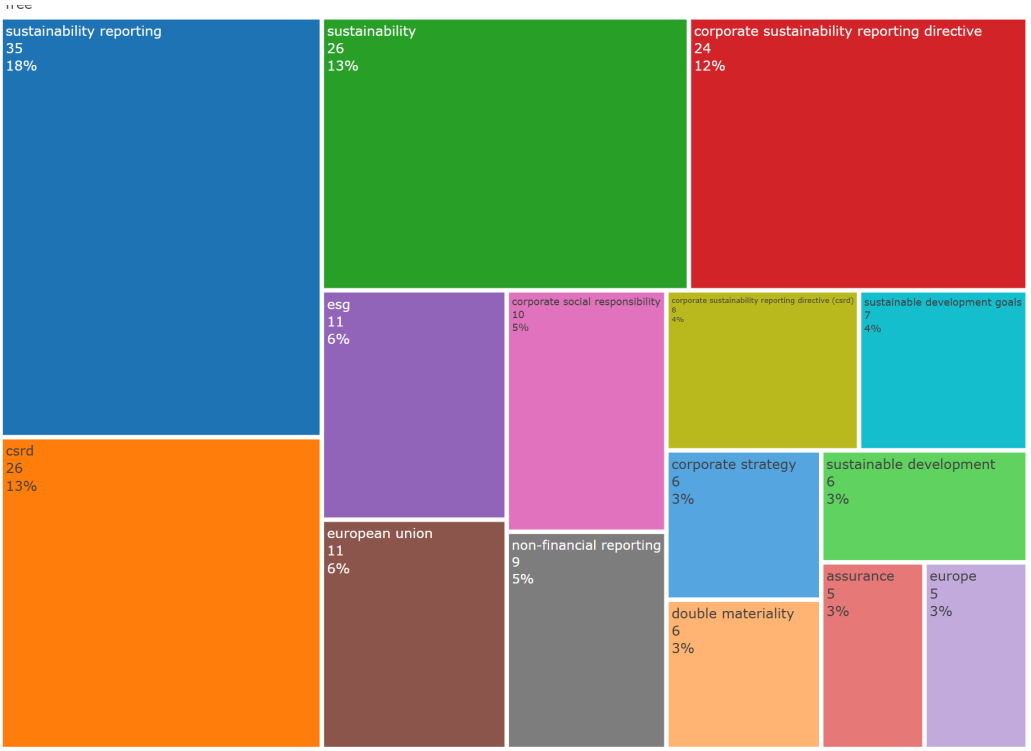
Source: Author's elaboration

4 Keywords analysis

The keyword analysis is conducted using both Bibliometrix and VOSviewer tools. More precisely, Bibliometrix is used to observe the world cloud, the tree map and the thematic map, which give an overview of the keywords of the sample. Then, VOSviewer is used to identify the clusters related to the keywords and analyze them.

Figure 10 presents the word cloud, which displays the most representative keywords in the sample. The most important terms are "CSRD" (16% of the sample, represented by either the terms "CSRD" and "Corporate Sustainability Reporting Directive", for a total count of 50) and "sustainability reporting" (11% of the sample, for a total count of 35). Other representative keywords include "sustainability" (8%), "ESG" (4%), "European Union" (4%), "corporate social responsibility" (3%), and "non-financial reporting" (3%).

Figure 10 – Keywords tree map



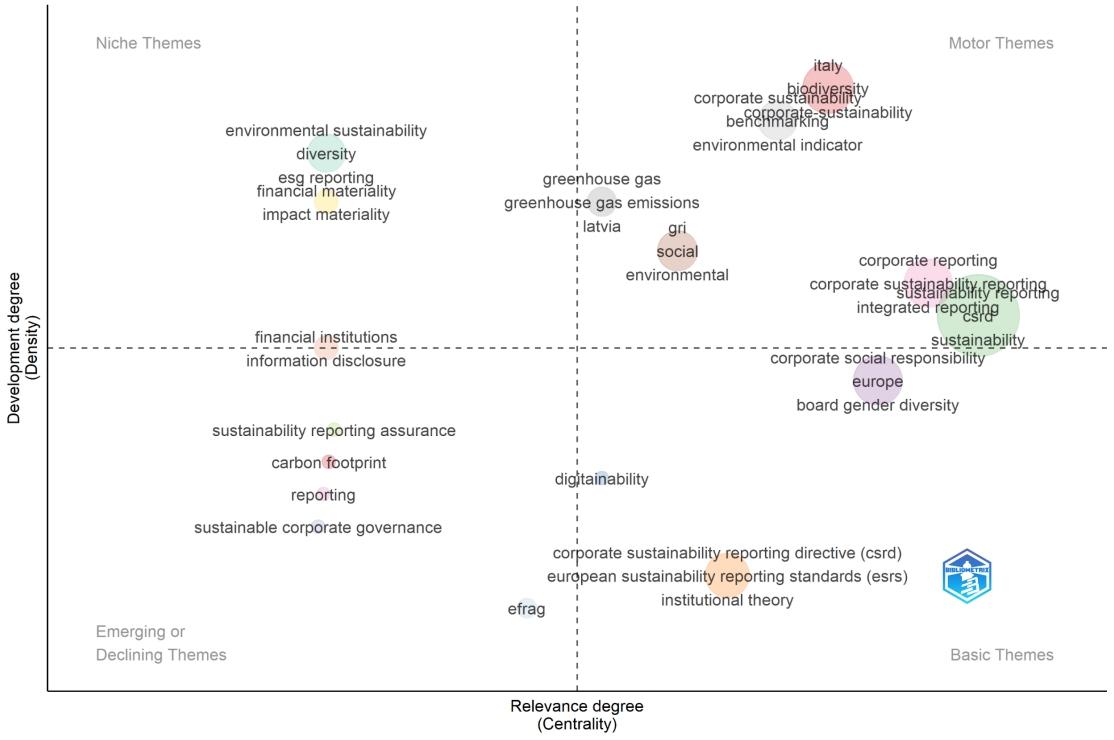
Source: Author's elaboration

Figure 11 presents the word cloud of the keywords.

Figure 11 – Keywords word cloud

Source: Author's elaboration

Figure 12 – Keywords thematic map



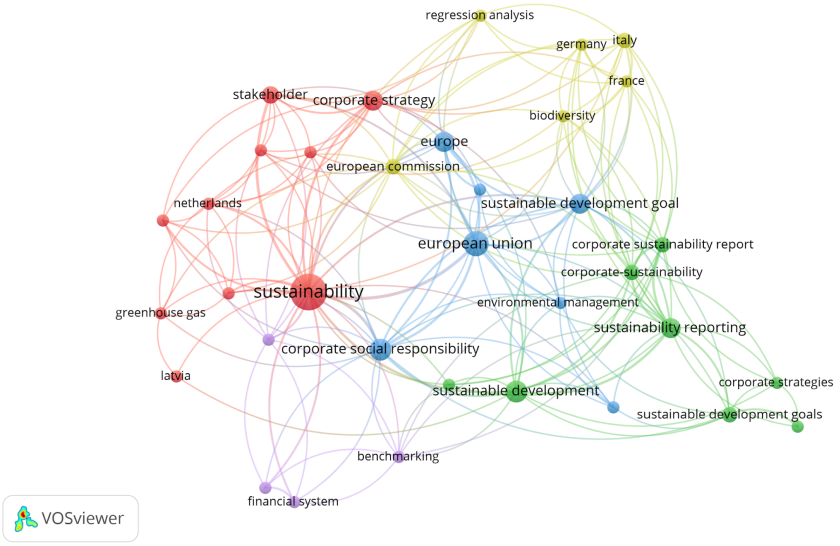
Source: Author's elaboration

The thematic map (Figure 12) classifies keywords based on the degree of topic development (density) and the degree of topic relevance (centrality). This allows us to identify the motor themes (highly developed and central), of which the more relevant are “corporate reporting”, “corporate sustainability reporting”, and “sustainability reporting” linked to CSRD. The niece themes (highly developed but not central) are mainly “environmental sustainability”, “diversity”, “financial materiality”, and “impact materiality”. “Board gender diversity”, “corporate social responsibility”, and “European sustainability reporting standards” represent the basic themes (high relevance but still underdeveloped), which are fundamental themes that could be further explored. Finally, the underdeveloped and less central themes are “carbon footprint”, “sustainability reporting assurance”, and “sustainable corporate governance”.

4.1 Cluster analysis

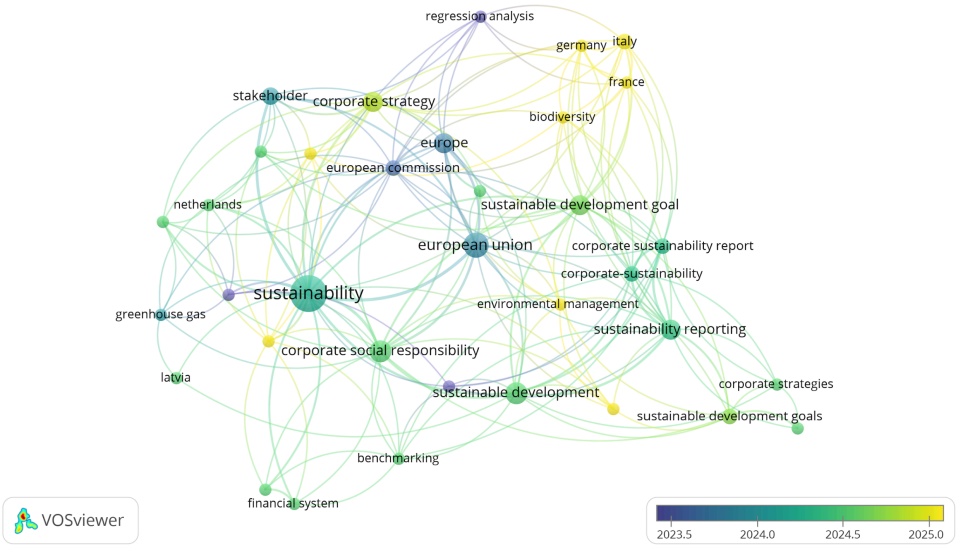
To conduct the cluster analysis, this paper relies on the co-occurrence network diagram (created using VOSviewer), which is displayed in Figure 13. To build the diagram, I selected only the keywords that occurred at least twice to highlight the most frequently discussed themes.

Figure 13 – Keywords co-occurrence network diagram



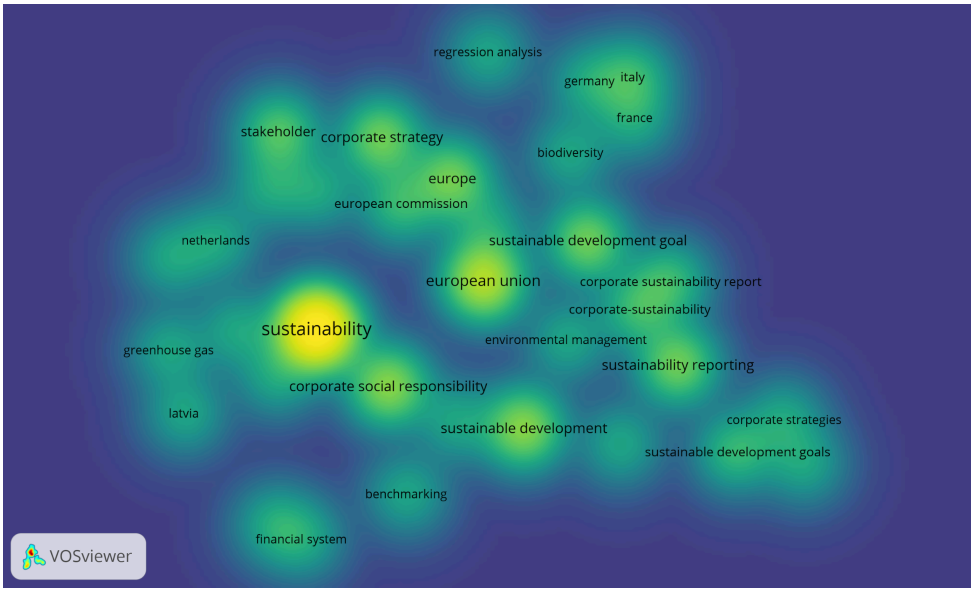
Source: Author’s elaboration

Figure 14 – Keywords co-occurrence overlay diagram



Source: Author's elaboration

Figure 15 – Keywords co-occurrence density diagram



Source: Author's elaboration

The diagram identifies five clusters: the red cluster (sustainability, CSR, stakeholder, climate change), the blue cluster (Europe, EU, governance, regulation), the green cluster (sustainable

development, corporate sustainability, reporting), the yellow cluster (biodiversity, countries), and the purple cluster (indicators, benchmarking, performance). These clusters will be analyzed in the subsequent sections.

Figure 14 shows the overlay of the clusters based on average citation (showing the most relevant keywords), while Figure 15 highlights the density of the keywords.

4.1.1 Red cluster

The red cluster refers to sustainability, stakeholders, and climate change. The main keywords are "sustainability", "stakeholder", "climate change", "corporate strategy", and "greenhouse gas".

Using 2017–2022 data and a 2SLS/Heckman design, Schneider, Kayser, Retsch, Thun, and Zülch (2025) highlight that an "integrative understanding of sustainability" (i.e., embedding it in strategy, the business model, and the top management team) improves bottom-line metrics (e.g., ROA) but not necessarily top-line growth. The strongest effects occur when all three anchors are present. The study aligns with CSRD emphases and adds causal rigor to the nexus between sustainability and performance.

Analyzing European Commission consultation data through Innovation Resistance Theory and the normativity lens, Damiano and Valenza (2025) find both psychological and functional barriers depress acceptance of the transition from NFRD to CSRD. Conducting a content analysis of 17 Euronext Growth Milan SMEs, Paoloni, Modaffari, and Piedepalumbo (2025) show that few disclosures are ESRS-aligned; climate coverage is often "substantive" descriptively but omits financial impact assessments, i.e., the double-materiality financial side is largely absent.

A comparison across seven standards (namely, European Sustainability Reporting Standards, UNI 11919, Global Reporting Initiative, Sustainable Development Goals Disclosure Recommendations, International Integrated Reporting Council Framework, Sustainability Accounting Standards Board Standards, Task Force on Climate-related Financial Disclosures standards) conducted by Bux et al. (2025) finds that EFRAG, UNI, and GRI are the most complete and least discretionary. Following this, the authors propose common steps to improve comparability, which are stakeholder mapping, topic and risk identification, thresholds, matrix, disclosure, monitoring, and engagement. A lexicon study conducted by Oliveros Fontaine, del Campo, and Urquía-Grande (2024) from 2014 to 2022 reveals that the increasing separate use of investor is not statistically associated with a richer sustainability vocabulary, suggesting that, prior to the CSRD, investor discourse did not systematically deepen in sustainability. This could represent a basis for future studies following CSRD application. Sharma (2025) conducted interviews with 20 experts and portrayed CSRD as both a catalyst and a compliance challenge. Indeed, listed firms adapt faster, and non-listed firms and SMEs struggle with resources and

complexity. Moreover, the mandatory assurance is framed as a strategic investment and standardization is expected to enhance comparability and stakeholder trust.

Bartolacci, Del Gobbo, and Soverchia (2025) observed that two large Italian family businesses emphasize financial materiality over impact materiality. The authors argue that stewardship-oriented stakeholder relationships can expand awareness and balance both sides of double materiality over time.

Finally, surveying 75 large organizations preparing for their first CSRD reports, Novicka (2025) shows that digital sustainability reporting mediates the relationship between sustainability and business performance, and big-data analytics capability is a key enabler.

4.1.2 Blue cluster

The blue cluster refers to regulation and management perspectives. The main keywords are “European Union”, “corporate social responsibility”, “sustainable development goal”, “management practice”, and “environmental management”.

Aboud, Saleh, and Eliwa (2024) used a propensity score matched difference-in-differences (EU and US) targeting the NFRD implementation and found that mandating disclosure mitigates ESG decoupling. Effects are weaker when ESG information is independently audited, stronger in non-controversial industries, and not moderated by national enforcement strength, suggesting regulation itself constrains disclosure performance gaps. These findings are also important for CSRD, which replaced NFRD.

Pisano, Lepore, Nastari, and Al‐Gamrh (2025) analyzed 728 European firms (2017-2023) and documented systematic under-reporting of environmental actions but a decline in decoupling by 2023. Board independence, gender diversity, and the presence of a CSR committee are associated with reduced environmental decoupling. Moreover, CSR committees have the most significant impact on increasing disclosure. The temporal pattern is consistent with tightening requirements under the CSRD, improving alignment.

Tsalidis (2024) introduced an Occupational Health and Safety Potential (OHSP) midpoint indicator for social life cycle assessment, enabling product-level quantification using hours (preferred) or monetary proxies. The approach is framed as responsive to CSRD data needs, helping firms disclose OSH across their supply chains with clearer attribution of life-cycle hotspots. Novicka and Volkova (2025) conceptualized digital sustainability reporting, arguing that ESRS and value-chain disclosures mandated by CSRD push firms toward integrated digital systems; they offer managerial guidance for building capabilities that satisfy double materiality and structured tagging at scale. Tănase et al. (2025) presented a managerial model that links the usage of accounting information systems to the

quantification of CSR indicators and a composite CSR index, suggesting that accounting information systems can bridge the implementation gap between regulatory intent and decision-useful, auditable metrics.

Becchetti, Mancini, and Solferino (2024) exploited Italy's size threshold with a regression-discontinuity design and found that mandatory non-financial reporting increases waste management, the use of recycled inputs, pollution control, and emission reduction, providing evidence of an environmental response to disclosure mandates.

Finally, Lin (2022) contrasted the EU's CSRD path with the UK's post-Brexit framework, highlighting the UK's reliance on NFRD-style regimes and proposing an industry-based, risk-responsive approach tailored to the UK's institutional specifics, signalling emerging regulatory fragmentation across Europe.

4.1.3 Green cluster

The green cluster refers to sustainable development, corporate sustainability, and reporting. The primary keywords are "sustainable development", "corporate sustainability", "sustainability reporting", and "corporate sustainability report". This is the most populated cluster of the sample.

Studies on pre-application of the CSRD focused on different themes. Pizzi and Caputo (2025) studied how non-EU firms (specifically US corporations) reacted ex-ante to the EU CSRD in their statutory filings, finding that only a minority of US firms (which tend to have more sophisticated governance systems) disclose forward-looking CSRD-related information. Raimo, L'Abate, Sica, and Vitolla (2025) studied the extent to which pre-CSRD integrated reports complied with ESRS disclosure requirements and what drives compliance. The authors found that ESRS compliance was low, and that larger firms and environmentally sensitive industries exhibited higher alignment.

Regarding firm values, Huang, Mirza, Umar, and Horobet (2025) observed that disclosing environmental factors is consistently and positively associated with firm value, suggesting markets price transparency around environmentally material practices; results are robust across valuation approaches. Mahmood, Mehmood, Terzani, De Luca, and Djajadikerta (2025) studied whether the ESG disclosure contributes to firm value in the transition from NFRD to CSRD, and found that the post-CSRD-issuance period shows lower average ESG scores and lower average firm value in univariate comparisons, and that there is a positive association between ESG disclosure and firm value overall.

Severe studies addressed the materiality issue. Morganho, Milánes-Montero, and Pérez-Calderón (2025) conducted a content analysis of 45 Portuguese and Spanish firms (from 2018 to 2022) to build a composite materiality-assessment disclosure index. The authors found that governance and sectoral

effects are determinant, as industry and board size significantly predict disclosure depth. Mezzanotte (2024) argued that the impact materiality was adopted by the EU following alignment with EU Green Deal and GRI-style sustainable development framing, strengthening accountability via due diligence and impact management, and supporting sustainable-investment markets.

Regarding performance, Li, Zhao, and Taghizadeh-Hesary (2025) found that CSRD significantly improves the financial performance of enterprises in the EU, with stronger effects in firms with older boards, smaller size, and higher female representation.

There are also practical contributions, like Operato, Gallo, Marino, and Mattioli (2025), who proposed a framework to derive science-based, ESRS datapoint-level metrics that are auditable first under limited, and assurance; and Farkas and Matolay (2024) argue for embedding CSRD within existing management system logics (planning, control, continuous improvement) and building Decision Support Systems that operationalize materiality, target-setting, and performance integration. Hristov and Searcy (2025) proposed a Sustainability Balanced Scorecard framework with four stages (i.e., material theme identification, initial assessment, strategy and actions, and reporting) explicitly tying ESRS requirements to governance processes and indicators. Fragidis and Papafloratos (2025) proposed a structured information architecture that treats ESRS datapoints as atomic units.

4.1.4 Yellow cluster

The yellow cluster refers to biodiversity and countries. The main keywords are “biodiversity”, “regression analysis”, “Germany”, “France”, and “Italy”.

Research on biodiversity, sustainability reporting, and nonfinancial disclosure provides complementary insights into how policy, culture, finance, and corporate practices intersect. Erhart, Menyhért, Erhart, and Hagyo (2025) develop a novel methodology that links industrial pollutant data from the European Pollutant Release and Transfer Register with the geographic locations of Natura 2000 protected areas. The authors demonstrate that numerous sites are vulnerable to significant risks of eutrophication and ecotoxicity, particularly in highly industrialized regions such as the Benelux countries, southern Germany, northern Italy, and southwestern France. With hundreds of industrial facilities located within 500 meters of sensitive areas, the study underscores the urgent need for improved monitoring and coordinated international action to protect biodiversity.

Turning from ecological risks to financial practices, Azizi, Scope, Ladusch and Sassen (2025) investigate how major European financial institutions disclose biodiversity-related risks and impacts. Using institutional theory and content analysis of non-financial reports, the study finds that disclosure remains low and inconsistent across institutions, although regulatory frameworks such as the EU

Taxonomy, the Sustainable Finance Disclosure Regulation, and the CSRD are encouraging improvements. The authors emphasize that financial institutions, given their capital allocation role, are crucial mediators for biodiversity protection but currently fall short of transparent and comprehensive reporting.

Casciello, Maffei, and Zampella (2025) examine the cultural context of sustainability reporting in Germany, Spain, France, and Italy between 2018 and 2023. Using Hofstede's cultural dimensions and regression models, the authors show that in cultures with higher power distance, individualism, masculinity, and indulgence, nonfinancial disclosure tends to be less relevant to investors. By contrast, in countries with stronger uncertainty avoidance and long-term orientation, sustainability information is more valued in capital markets. These findings underscore the importance of regulators and companies considering cultural traits when designing and evaluating disclosure policies.

Öhlinger and Lehner (2025) critique the alignment between European biodiversity policy and scientific evidence. Using a teleological approach to interpret the European Green Deal's legal framework, the authors show that EU biodiversity policy places too much emphasis on pollution control, while underrepresenting other major drivers of biodiversity loss, particularly land-use change. They argue for stronger land-use policies, improved enforcement mechanisms, and better integration of biodiversity considerations into agriculture and sectoral policies.

Focusing on assurance practices, Vander Bauwhede and Van Cauwenberge (2022) studied over 1,800 firm-year observations from European listed companies after the Non-Financial Reporting Directive. The results indicate that larger firms, those with stronger ESG performance, and firms in certain industries are more likely to adopt assurance of their sustainability reports. Crucially, assurance is positively associated with stock market value, suggesting that investors reward verified information. This supports the European Commission's move toward mandatory assurance under the upcoming Corporate Sustainability Reporting Directive.

Posadas, Ruiz-Blanco, Fernandez-Feijoo, and Tarquinio (2023) investigate how institutional pressures influenced sustainability reporting before and after the implementation of Directive 2014/95/EU. The study shows that normative (professional and societal expectations) and mimetic (imitation of peers) mechanisms improved the quality of reports, whereas coercive pressure from the regulation itself had a minimal effect. The findings suggest that cultural and professional norms, as well as competitive dynamics, may be more effective drivers of reporting quality than regulation alone. Institutional pressures are also investigated by Pizzi and Coronella (2024), who investigate whether listed SMEs are prepared for the CSRD. The authors apply institutional theory to examine the isomorphic pressures that drive SMEs' disclosure practices. Using a dataset of 174 Italian listed SMEs between 2017 and 2021, and employing panel logistic regression, they assess whether sectoral and

geographical dynamics influence the voluntary adoption of sustainability reports. The findings reveal a strong presence of mimetic isomorphism, where SMEs tend to imitate the sustainability reporting practices of larger, listed firms and competitors within the same industry. However, geographical proximity does not appear to influence disclosure behaviour, suggesting that listed SMEs are more oriented toward national and international competitive pressures than local dynamics.

4.1.5 Purple cluster

The purple cluster refers to indicators, benchmarking, and performance. The primary keywords are "environmental indicator", "benchmarking", "financial system", and "industrial performance".

Monteiro, Roque, and Faria (2024) investigate large Portuguese companies and the extent to which the publication of sustainability reports influences financial performance. Using both univariate and multivariate analyses, the authors demonstrate that there is no statistically significant difference between firms that disclose sustainability information and those that do not. This finding challenges the often-assumed immediate financial benefits of reporting and instead suggests that the value of sustainability disclosure may lie in long-term legitimacy and compliance with international frameworks such as the NFRD and the CSRD.

Morosan-Danila, Grigoras-Ichim, Jeflea, Filipeanu, and Tugui (2025) developed an econometric model tailored to the construction sector in Romania. By integrating financial, social, and environmental indicators into a composite sustainability score, the study reveals that financial resilience (particularly variables such as return on assets, debt ratio, and equity structure) strongly influences both financial and environmental performance. In contrast, the social dimension remains less clearly explained by financial indicators, underscoring the difficulty of operationalizing social sustainability within quantitative models. Importantly, the model aligns with the CSRD and ESRS requirements, offering a replicable framework for sector-specific sustainability evaluation.

Niemann, Morssinkhof, van der Linden, and de Vries (2025) focused on SMEs in the Netherlands, analyzing the indirect effects of the CSRD through value-chain data requests. Based on a representative survey and qualitative interviews, the findings reveal that while a majority of SMEs have not yet been approached for sustainability data, those integrated into international supply chains already face significant reporting pressures. These demands, particularly related to environmental metrics such as carbon emissions, often exceed the resources and digital capacities of SMEs. The study, therefore, highlights a tension: while sustainability data requests can promote competitiveness and innovation, they also risk imposing disproportionate burdens on smaller firms unless adequate support mechanisms are introduced.

Finally, Schneider, Woerle, Kagermeier, Zaeh, and Reinhart (2024) introduce a methodological innovation in the field of manufacturing risk assessment by combining Life Cycle Assessment with Failure Mode and Effects Analysis. This hybrid framework enables a bottom-up identification of transitory sustainability risks (emerging from regulatory change and shifting market expectations). The case study application demonstrates that this approach provides manufacturers with robust, quantitative insights, allowing them to benchmark sustainability performance, enhance resilience, and ensure alignment with evolving European standards.

5 Concluding remarks

CSRD serves as a central driver in the EU's reshaping of reporting practices, governance, and strategy. In this study, I conducted a bibliometric analysis of the literature on CSRD to identify the main trends in the research field and the practical implications of the directive.

Evidence points to measurable bottom-line benefits when sustainability is truly integrated into strategy, the business model, and top management; persistent execution gaps (especially around double materiality and climate-related financial effects) among SMEs and even early adopters; heterogeneous stakeholder resistance rooted in both psychological and functional barriers; and promising implementation levers (data capability, digital reporting readiness, and operational design propositions) that translate policy into performance.

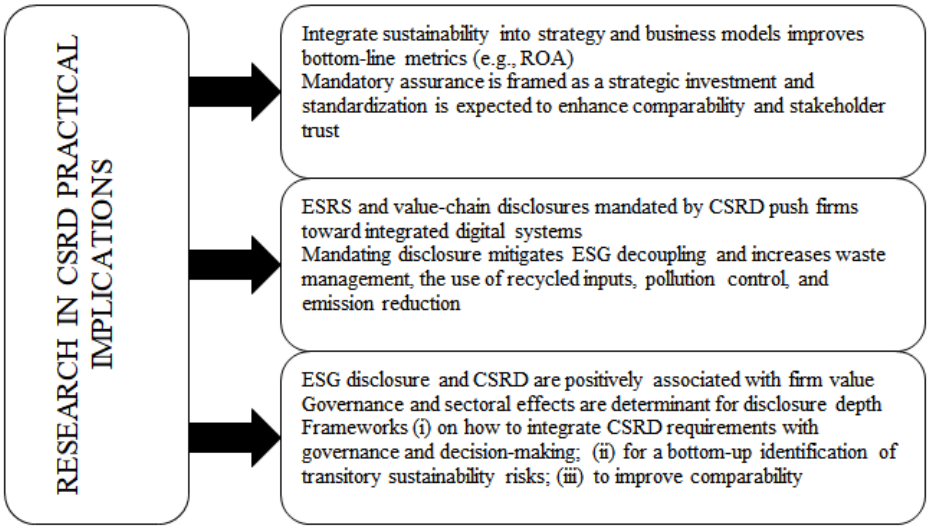
Biodiversity risks remain high and insufficiently addressed by both policy and financial institutions. Cultural contexts, institutional pressures, and assurance mechanisms significantly shape how nonfinancial information is disclosed, perceived, and valued. The studies underscore the need for integrated approaches that combine strong regulation, cultural awareness, financial accountability, and scientific evidence in order to effectively advance biodiversity protection and sustainability reporting in Europe.

The financial benefits of sustainability reporting are not immediate and depend heavily on contextual, sectoral, and temporal factors. Robust assessment frameworks must integrate financial, social, and environmental indicators, while also acknowledging the relative difficulty of measuring social sustainability. Moreover, SMEs, though not always directly regulated, are increasingly embedded in reporting ecosystems through their participation in value chains. Methodological innovations, such as the integration of Life Cycle Assessment and Failure Mode and Effects Analysis, offer practical tools for managing sustainability risks in a dynamic regulatory environment.

Materiality assessment is seen as the primary driver of reporting content and quality. Impact materiality is normatively justified but operationally demanding, given the risks of discretion and data quality. Board size and industry context shape the depth of materiality disclosures, indicating an interplay between governance capacity and sector salience. Moreover, it has been observed that reduced disclosure–performance gaps occur after the implementation of mandatory disclosure rules, suggesting that disclosure rules can catalyze not only transparency but also behavioral change. Finally, disclosures are framed not only as compliance duties but also as levers for strategic advantage.

To outline the practical implications of CSRD, I present in Figure 16 an interpretive framework that captures the contributions to practice emerging from the literature.

Figure 16 – Interpretative framework for practical implications of CSRD research



Source: Author's elaboration

This paper has both theoretical and practical implications as it is the first to systematically analyze the literature on a novel sustainability regulation (i.e., CSRD) that will affect EU member states, evidencing the areas of study, the topic of interest, and the major findings, including practical insights for firms. Moreover, future research could delve further into understudied topics, as evidenced by the analysis, e.g., board composition.

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Toward Healthier and Sustainable Diets: Factors Influencing Chinese Consumers' Olive Oil Purchasing Behavior

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Abstract

With China's economic growth, rising living standards, and the government's strong promotion of healthy eating habits, the demand for healthier foods such as olive oil has surged, improving the overall quality of life in the country. Despite this significant increase in consumption, the factors driving Chinese consumers' olive oil purchases remain underexplored.

This study adopted an exploratory research design. Based on identified gaps in the literature, a bespoke consumer purchasing decision model was developed. During the data collection phase, 514 valid responses were analyzed using logistic regression to identify the key determinants of purchasing behavior.

The analysis showed that higher monthly income (OR = 1.84–1.99), health-related motivation (OR = 2.06), and previous tasting experience (OR = 1.90) significantly and positively influenced the likelihood of purchasing olive oil. Age did not show a significant effect on purchasing behavior.

The findings provide valuable insights for foreign olive oil producers targeting the Chinese market. Marketing strategies should prioritize middle- and high-income groups, emphasize health benefits, and promote sensory marketing through tasting experiences to enhance consumer acceptance of olive oil.

Keywords – Healthy Diet; Olive Oil Consumption; Consumer Purchasing Behavior; Chinese Market.

Paper type – Academic Research Paper

Sommario

Verso diete più sane e sostenibili: determinanti del comportamento d'acquisto di olio d'oliva tra i consumatori cinesi. – Con la crescita economica della Cina, l'aumento del tenore di vita e la forte promozione di abitudini alimentari salutari da parte del governo, la domanda di alimenti più sani, come l'olio d'oliva, è aumentata, contribuendo a migliorare la qualità della vita nel paese. Tuttavia, nonostante questo significativo incremento dei consumi, i fattori che influenzano gli acquisti di olio d'oliva da parte dei consumatori cinesi rimangono poco studiati.

Il presente studio ha adottato un disegno di ricerca esplorativo. Sulla base delle lacune individuate in letteratura, è stato sviluppato un modello specifico per la decisione d'acquisto del consumatore. Durante la fase di raccolta dei dati, sono state analizzate 514 risposte valide mediante regressione logistica, al fine di identificare i principali determinanti del comportamento d'acquisto.

I risultati dell'analisi indicano che un reddito mensile più elevato (OR = 1,84-1,99), la motivazione legata alla salute (OR = 2,06) e l'esperienza di degustazione precedente (OR = 1,90) influenzano in maniera significativa e positiva la probabilità di acquistare olio d'oliva. L'età, invece, non ha mostrato un effetto significativo sul comportamento d'acquisto. Questi risultati forniscono indicazioni preziose per i produttori stranieri di olio d'oliva interessati al mercato cinese. Le strategie di marketing dovrebbero concentrarsi sui gruppi di reddito medio-alto e alto, enfatizzare i benefici salutistici dell'olio d'oliva e promuovere il marketing sensoriale attraverso esperienze di degustazione, al fine di incrementare l'accettazione del prodotto da parte dei consumatori.

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1 Introduction

Healthier living and well-being have become mainstream topics in recent years. Many scholars have emphasized the importance of sustainable and organic eating patterns. Some researchers have also explored the significance of traditional food consumption (Pashova, 2020) and regional dietary habits. The Mediterranean diet is one of the five major dietary patterns worldwide and is considered among the healthiest by many authoritative journals and scholars. According to Baidu Encyclopedia, it refers to the dietary habits of France, Greece, Spain, southern Italy, and other regions along the Mediterranean Sea. This diet is primarily based on vegetables, fruits, fish, grains, legumes, and olive oil. After studying seven Mediterranean countries, La Verde et al. (2018) found that the mortality rates from cardiovascular, cerebrovascular, and cancer-related diseases in these regions were 1.3% lower than in other areas.

In 2025, *U.S. News & World Report*, the third-largest news magazine in the United States, ranked the Mediterranean diet as the most effective and healthiest among dozens of dietary patterns (U.S. News, 2025). Similarly, Menotti and Puddu (2015) and Mari, Capozza, Falvo, and Hichy (2007) demonstrated that olive oil offers protective effects against numerous diseases influenced by behavioral factors, particularly in populations adhering to traditional diets high in fat and animal protein, which can contribute to various health conditions.

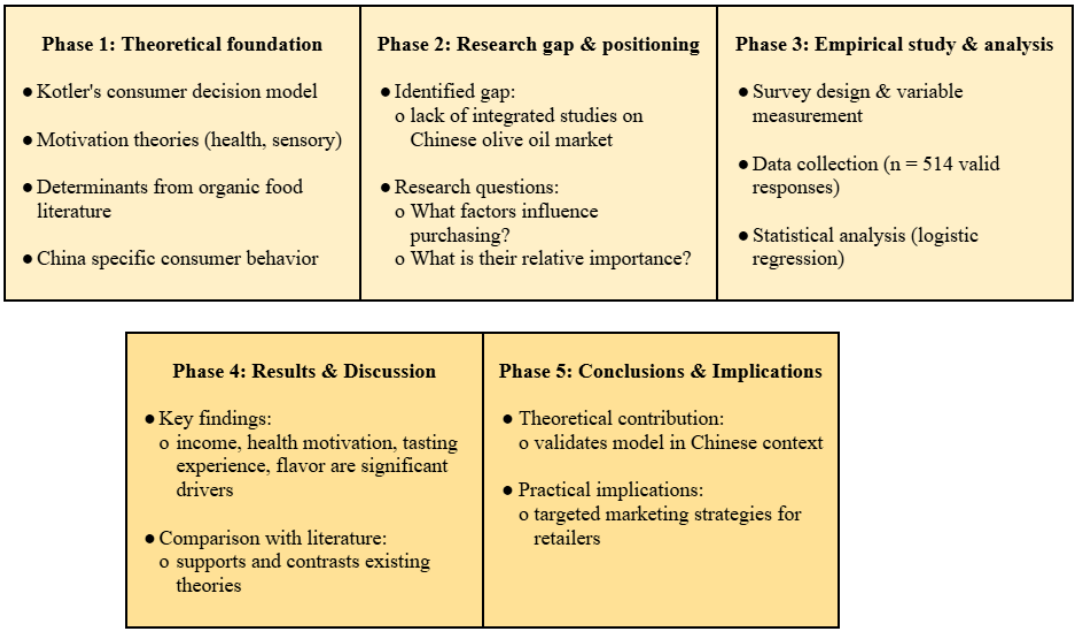
The fifth edition of the *Dietary Guidelines for Chinese Residents*, published in 2022, updated its principles to reflect advances in nutritional science and changes in dietary structure, nutrition, and health. To address the evolving nutritional and health needs of Chinese residents, the Guidelines recommend complementing traditional Chinese diets with elements of the Mediterranean diet, in which olive oil plays a vital role.

According to data from the International Olive Council (IOC), China's olive oil consumption increased from 12,000 tons in 2008 to 53,000 tons in 2024, while imports rose from 12,000 to 44,000 tons during the same period. Currently, about 34 olive oil brands are available on the Chinese market, with products from Spain, Italy, and Greece dominating (IOC, 2025). Therefore, understanding the factors influencing Chinese consumers' olive oil purchasing behavior is essential for Italian companies seeking to expand further into the Chinese market.

The purpose of this study is to identify the factors influencing Chinese consumers' olive oil purchasing behavior, thereby enabling foreign companies to better understand consumer motivations and develop effective marketing strategies in China. The main beneficiaries are foreign producers of extra virgin olive oil who export, or intend to export, to the Chinese market.

This study follows a classic research design and process (Figure 1). First, we conducted a comprehensive literature review integrating existing theories, including Kotler's consumer purchasing decision model, motivation theory, and the determinants of organic food purchasing behavior, while also considering the unique characteristics of the Chinese consumer market. Previous studies clearly reveal a research gap regarding olive oil purchasing behavior among Chinese consumers. Therefore, we designed a questionnaire (n = 514) and tested the hypotheses using logistic regression analysis. The results and discussion sections explain the findings and relate them to the existing literature. Finally, the study summarizes its theoretical contributions and provides practical marketing implications for the industry.

Figure 1 – Research conceptual framework



Source: Authors' elaboration

2 Theoretical basis and literature review

2.1 Core theoretical foundations

Consumer purchasing behavior is a process shaped by complex interactions among psychological, social, and personal factors. This study is primarily based on Philip Kotler's integrated consumer purchasing decision model (Kotler, Keller, & Chernev, 2022), which provides a comprehensive

framework for analyzing the influence of cultural, social, personal, and psychological dimensions on consumer choices. The model outlines a five-stage decision-making process: need recognition, information search, alternative evaluation, purchase decision, and post-purchase behavior. This study focuses on the various factors that affect the decision-making stage in olive oil purchasing.

To operationalize this framework, we drew on well-established motivation theories. The Protection Motivation Theory (Rogers, 1975) and the Health Capital Theory (Grossman, 2017) offer a theoretical foundation for understanding *health motivation*, suggesting that consumers' purchase of health-related products such as olive oil serves both as a protective response to health risks and as an investment in long-term well-being.

Meanwhile, Sensory Marketing Theory (Krishna & Schwarz, 2014) and related neurocognitive research (Damasio, 1996) highlight the crucial role of sensory experience. They provide a rationale for including *taste experience* and *flavor preference* as key variables, since sensory interactions can generate emotional memories that shape consumer decision-making.

Furthermore, classic socio-economic models (Bourdieu, 1984; Drewnowski & Specter, 2004) underscore the fundamental role of income in high-end food consumption, directly supporting our inclusion of income as a determinant of purchasing power. Collectively, these theoretical pillars form the conceptual foundation for selecting and interpreting the independent variables in this study.

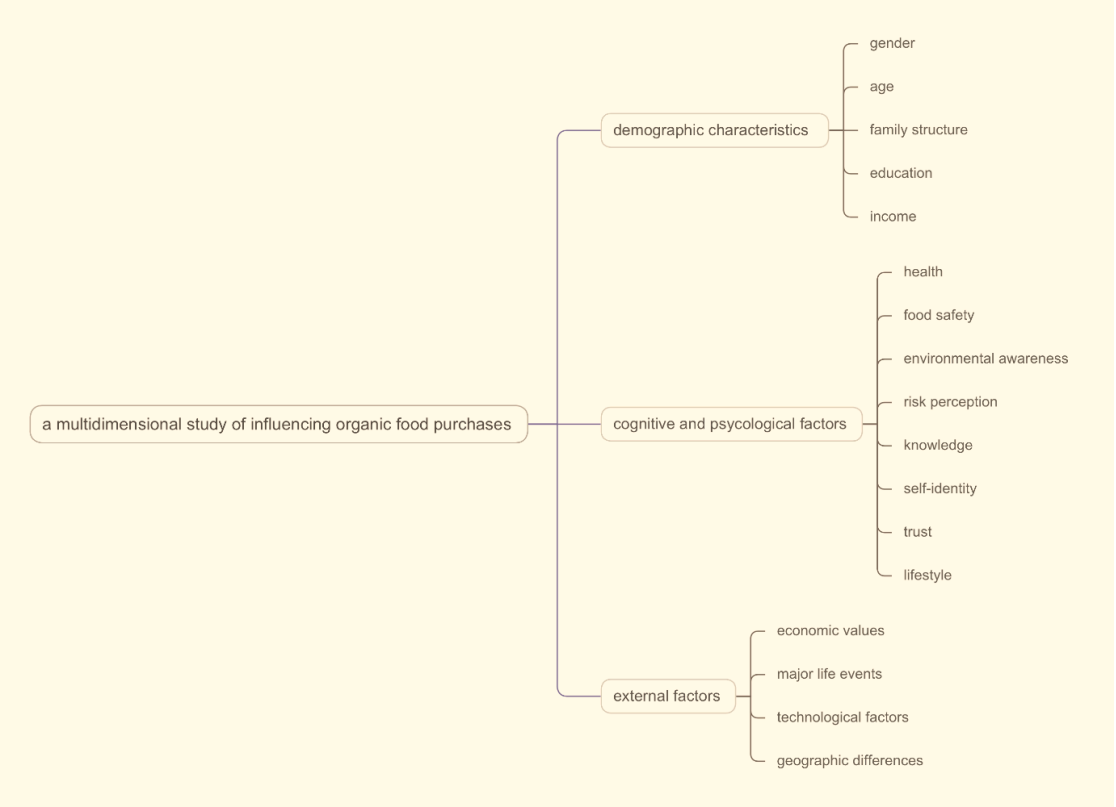
2.2 Key influencing factors in organic food research

As a high-end, health-oriented food product, olive oil shares many similarities with organic foods in terms of the factors driving consumer behavior. Therefore, the extensive body of literature on organic food purchasing provides valuable insights for identifying potential influencing factors. Empirical research consistently indicates that health and safety concerns are the primary motivations for organic food consumption (Michaelidou & Hassan, 2008; Hsu, Chang, & Lin, 2016). Socioeconomic factors – particularly higher income and education levels – have also been repeatedly shown to be strong positive predictors of purchasing behavior (Drewnowski & Specter, 2004; Peng, 2024).

In addition, product knowledge and positive sensory experiences are essential for building consumer trust and forming favorable attitudes, which in turn translate into stronger purchase intentions (Barnes, Vergunst, & Topp, 2009; Nautiyal & Lal, 2022). The effects of demographic variables, such as gender and age, are often subtle and context-dependent. Although several studies have found that women tend to hold more positive attitudes toward organic food (Chetioui, Butt, Fathani, & Lebdaoui, 2022), other research suggests that men may exhibit a higher willingness to pay (Wang, 2008; Sujaya, Salins, & Frederick, 2022). These mixed findings indicate the need to test such relationships within the specific context of olive oil consumption in China.

Overall, this body of literature provides a reliable foundation for the present study to examine both the correlations and the relative importance of various influencing factors on olive oil purchasing behavior (Figure 2).

Figure 2 – Impact of consumers' food purchasing behavior



Source: Authors' elaboration

2.3 Health-oriented consumer behavior in China

Applying global consumer behavior models to the Chinese market requires full consideration of its unique socio-cultural and economic context. China's rapid economic growth has given rise to a middle class with increasing disposable income, creating fertile conditions for the import and consumption of high-end foods such as olive oil. The Chinese government actively promotes healthy dietary patterns through the *2022 Dietary Guidelines for Chinese Residents*, which explicitly incorporate elements of the Mediterranean diet, thereby significantly enhancing public health awareness.

This evolving context has shaped distinctive consumer motivations. Unlike Western consumers, who may emphasize environmental sustainability, Chinese consumers tend to prioritize health and food safety as the primary drivers of high-end food consumption (Yin, Wu, & Chen, 2008). Moreover, the perception of imported olive oil as a premium product or a prestigious gift – reflecting the notion of "face-saving consumption" – adds a unique social dimension to its purchase, although the magnitude of this effect may vary.

Finally, the digital ecosystem led by platforms such as WeChat, Tik Tok, and Xiaohongshu profoundly influences how consumers acquire product information, develop perceptions, and make purchasing decisions. These contextual factors underscore the need for a targeted examination of olive oil purchasing behavior within the Chinese market.

2.4 Identification of the research gap

To sum up, the existing literature provides a solid theoretical foundation and valuable insights through Kotler's consumer decision model and empirical studies on organic food purchasing behavior. However, a significant research gap remains: most studies either apply generalized theoretical models developed in Western contexts or focus on the consumption of general organic food products, while paying limited attention to the specific category of olive oil. More importantly, there is a lack of systematic empirical research examining the factors influencing Chinese consumers' olive oil purchasing behavior within an integrated analytical framework.

Therefore, this study seeks to bridge this gap by developing a comprehensive analytical framework that integrates Kotler's consumer decision model, key determinants identified in organic food research, and the distinctive characteristics of the Chinese consumer market. Specifically, the study aims to address the following research questions:

- which factors – including income, health motivation, taste experience, flavor preference, and demographic variables – significantly influence Chinese consumers' olive oil purchasing decisions?

- what is the relative importance of these factors in shaping purchasing behavior?
- what practical implications do the findings have for olive oil producers and marketers targeting the Chinese market?

3 Methodology for studying Chinese consumers' olive oil purchase behavior

Data for this study were collected using a random sampling approach. The nationwide survey was conducted via Wenjuanxing, the largest online survey platform in China, between October 26 and November 2, 2024, yielding a total of 514 valid responses.

The questionnaire design and variable selection were guided by the four main dimensions of Philip Kotler's consumer purchase decision model – cultural, social, personal, and psychological factors – combined with insights from previous research on the determinants of organic food purchasing behavior (Table 1) and an analysis of the pricing, packaging, and advertising content of 34 major olive oil brands available in the Chinese market.

Table 1 – Philip Kotler's consumer purchasing decision model

Cultural Factors	Social Factors	Psychological Factors	Personal Factors
Social class	Social culture	Purchase motivation	Gender, age
National culture	Status role	Cognitive learning	Education
Regional culture	Reference groups	Beliefs, occupation	Income
Religious culture, etc.	Family structure	Attitude, etc.	Personality traits, etc.

Source: Kotler, Keller, and Chernev (2022)

The dependent variable in this study was olive oil purchasing behavior, while the independent variables included experiential learning (tasting experience and flavor preference), gender, income, age, purchase motivation (categorized as none, health-related, cognitive, lifestyle habits, or social status), and price preference.

The survey collected data on demographic characteristics (gender, age, income), purchasing behavior, experiential learning, and price preferences. Multiple-choice questions were used to capture the various motivations underlying purchase decisions.

The collected data were analyzed using logistic regression, as the dependent variable – olive oil purchase behavior – was binary. This method allowed us to assess the significance and relative strength of each predictor, including experiential learning, purchase motivation, demographics, and price

preference. Odds ratios (ORs) and 95% confidence intervals were calculated to quantify the effect of each factor. All analyses were conducted using SPSS 20.0, and the results were interpreted in light of Kotler's consumer decision model and previous research on organic and high-end food consumption.

Regarding income classification (Table 2), this study adopted the quintile standards for urban residents' income in 2021, as reported by the National Bureau of Statistics of China. The analysis focused on the middle- and high-income groups (middle-low, middle, and middle-high income), which together account for approximately 60% of total urban income.

Table 2 – Per capita disposable income of urban residents by income quintile (unit: yuan)

Income quintile	Per capita disposable income (yuan)						
	2015	2016	2017	2018	2019	2020	2021
Low-income families	12230.9	13004.1	13723.1	14386.9	15549.4	15597.7	16745.5
Lower-middle-income families	21446.2	23054.9	24550.1	24856.5	26783.7	27501.1	30123.6
Middle-income families	29105.2	31521.8	33781.3	35196.1	37875.8	39278.2	42498
Upper-middle-income families	38572.4	41805.6	45163.4	49173.5	52907.3	54910.1	59005.2
High-income families	65082.2	70347.8	77097.2	84907.1	91682.6	96061.6	102595.8

Source: National Bureau of Statistics of China

To simplify the analysis, the high-income group was merged with the middle-high group (>59,800 yuan/year), and the low-income group was merged with the middle-low group (<30,123 yuan/year), resulting in three monthly income ranges: <3,000 yuan ($ 390), 3,000-5,000 yuan ($ 390-650), and >5,000 yuan ($ 650). These ranges correspond to the average monthly disposable income of the lower-, middle- and high-income segments.

Statistical analyses were conducted using SPSS 20.0. Both univariate and multivariate logistic regression analyses were performed, with independent variables including age, gender, monthly income, experiential learning (tasting olive oil, flavor), and purchase motivation (none, health-oriented, special flavor preference, dietary habits, status symbol).

Since the dependent variable – olive oil purchasing behavior – is binary, logistic regression was employed to examine the factors influencing consumers' likelihood of purchase. The logistic regression model is expressed as:

$$logit^{P}=\beta_0+\sum_{i=1}^{k}\beta iXi \quad (1)$$

The logistic regression formula (1) expresses the relationship between the probability P of a binary event – here, the probability of purchasing olive oil – and the independent variables. By transforming the probability into a logit (the logarithm of the odds), the linear effects of the predictors can be estimated. In the model, β_0 represents the intercept, which corresponds to the logit of the probability of purchase when all independent variables are equal to zero.

In formula (1), the dependent variable is binary (0 = no, 1 = yes). The independent variables (Xi) represent the factors potentially influencing purchasing behavior, including tasting experience, gender, income, age, purchase motivation (none, health-oriented, special flavor preference, dietary habits, status symbol), and price preference.

All questionnaire responses (Table 3) were initially treated as potential independent variables. Univariate logistic regression analysis (Table 4) was first conducted to identify variables potentially associated with olive oil purchasing behavior. Subsequently, multivariate logistic regression (Table 5) was performed to control for interactions among predictors and to determine the variables that truly influence purchase decisions. Only variables with $P<0.05$ were considered statistically significant in the multivariate analysis.

Interpretation of the results was based on the odds ratios (ORs) derived from the multivariate regression analysis, providing a quantitative measure of each factor's effect on the likelihood of purchasing olive oil.

4 Results and discussion

4.1 Results

4.1.1 Disaggregation of results by gender

The sample consisted of 182 men (35%) and 332 women (65%) (Table 3). Linear regression analysis confirmed that gender is a significant factor influencing olive oil purchasing behavior. Specifically, the odds of men purchasing olive oil were 1.657 times higher than those of women, suggesting that men are more responsive to purchase-influencing factors (Table 5).

These findings align with previous research. For instance, Wang (2008) found that men in Beijing were more likely to purchase organic food than women. Similarly, Wang (2014) reported that men exhibited a higher willingness to pay for organic food in Wuhan; M. Guo, Tang, & X. Guo (2025) identified gender as a factor influencing willingness to purchase organic food in Beijing. This

consistency may be due to the general tendency of Chinese male consumers to be more willing to spend than female consumers.

Given that olive oil is a premium health product, men may make purchase decisions more instinctively and with fewer concerns, potentially due to certain personality traits. Furthermore, the lower number of men in our sample may be partially amplifying their apparent responsiveness to the purchase-influencing factors. Further research should explore male consumers' consumption habits, specifically focusing on their information acquisition and purchasing channels, to inform more effective promotional strategies for olive oil products.

4.1.2 Disaggregation of results by age cohort

The sample was divided into three distinct age groups, structured to reflect key stages in China's education system and working life. The first group (15-25 years), primarily composed of students, represented 17% of the sample; the second group (25-36 years), including working-age adults, represented 38%; and the third group (>36 years), consisting of individuals with stable jobs and incomes, represented 45% (Table 3). The multivariate logistic regression model (Table 5) did not include age as a significant predictor, indicating that it is not a statistically significant factor influencing olive oil purchases. Previous studies on consumer behavior present mixed results regarding the role of age. For instance, Li (2020) suggests older consumers are more health-conscious and willing to buy organic food, whereas younger consumers prioritize taste and convenience. Furthermore, Guang-Wen, Akter, Siddik, & Masukujjaman (2021) note young consumers are influenced by social media and novelty, while Yu, Qu, Wu, Song, & Wen (2019) find older consumers perceive organic food as healthier. Crucially, other studies, such as Yin, Wu, & Chen (2008), and Wang (2008), report that age is not a consistently significant determinant, a finding that aligns with our results. In conclusion, based on this analysis, age does not appear to determine olive oil purchase behavior among Chinese consumers.

4.1.3 Disaggregation of results by household income

Following the five-level income classification established by the National Bureau of Statistics of China, the sample was categorized into lower-middle, middle, and upper-middle income groups (Table 2). Among respondents, 19% reported earning less than $ 390/month, 35% earned between $ 390 and $ 650, and 46% earned more than $ 650 (Table 3).

Statistical analysis confirmed that income is a statistically significant factor: the odds of purchasing olive oil were 1.842 times higher for the $ 390-650 group and 1.985 times higher for those earning

above $ 650, when compared with the <$ 390 group (Table 5). Therefore, income positively influences olive oil purchasing behavior.

This is consistent with prior research, which suggests that higher-income consumers are more likely to purchase expensive healthy foods, including organic food and olive oil. This is generally attributed to greater affordability and a higher sensitivity to product quality (Bourdieu, 1984; Drewnowski & Specter, 2004; Darmon & Drewnowski, 2008; Michaelidou & Hassan, 2008).

The analysis of price preference revealed that, among 34 major imported olive oil brands in China, 80% of respondents favored products priced between $ 4 and $ 20. Only 11% accepted prices below $ 4, and 9% accepted the $ 20-65 range (Table 3).

Although the multivariate analysis did not identify price as an independent influencing factor, it remains relevant, given its high correlation with income. Since high-income consumers represent a key target group, future efforts should focus on understanding their consumption habits, brand knowledge, and loyalty to optimize market strategies for olive oil in China.

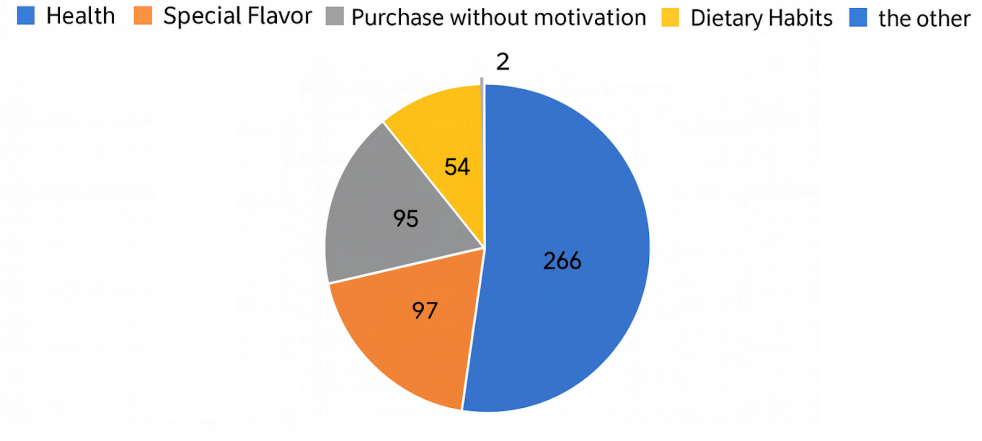
4.1.4 Disaggregation of results by motivational factors

Health was the most frequently cited reason for olive oil purchase, with 51.7% of consumers motivated by health benefits. This was followed by 18.8% motivated by flavor, 10.5% by dietary habits (habitual consumption), 0,3% by social status or gifting, and 18.4% who purchased randomly (Table 3).

The multivariate analysis confirmed these factors as significant predictors. Relative to consumers who purchased randomly (occasionally), the odds of purchase were: 2.05 times higher for those motivated by health benefits; 7.26 times higher for those motivated by flavor; and 5.43 times higher for those motivated by habitual consumption (Table 5).

These results strongly align with prior research emphasizing health awareness as a key driver of healthy food consumption (Grossman, 2017; Roitner-Schobesberger, Darnhofer, Somsook, & Vogl, 2010; Liu & Qiao, 2011; Yin, Wu, & Chen, 2008). This trend is further supported by the growing interest in the Mediterranean diet and increased health consciousness across China in recent years (Figure 3).

Figure 3 – Distribution of the main motivations behind Chinese consumers' olive oil purchases



Source: Authors' elaboration

Table 3 – Statistics of factors influencing olive oil purchases

Variable	Number of respondents	%
Purchased olive oil (purchasing behavior):		
yes/no	186/328	36.187/63.813
Tried the olive oil (learning, cognition):		
yes/no	443/71	86.187/13.813
Gender: male/female	182/332	35.409/64.591
Age:		
15-25 years	87	17
26-36 years	198	38
> 36 years	229	45
Monthly income:		
<390 dollars	97	18.872
390-650 dollars	178	34.630
>650 dollars	239	46.498
Price prefer:		
0-4 dollars	57	11.090
4-20 dollars	411	79.961
20-65 dollars	46	8.949
Purchase reason:		
purchase without motivation	95	18.482
health	266	51.751
special flavor of olive oil (learning)	97	18.872
dietary habits	54	10.506
symbol of identity (social status)	2	0.389

Source: Authors' elaboration

4.1.5 Disaggregation of results by prior experience

Eighty-six percent of respondents reported prior tasting experience with olive oil (Table 3). The multivariate analysis confirmed the significance of this variable: the odds of purchasing olive oil were 1.89 times higher among consumers who had previously tried it compared with those who had not (Table 5). This result demonstrates that tasting experience significantly influences purchase behavior.

This finding is consistent with prior studies which confirm that learning and tasting experience foster product recognition and positively influence subsequent purchase decisions (Damasio, 1996; Caporale, Policastro, Carlucci, & Monteleone, 2006; Barnes, Vergunst, & Topp, 2009; Delgado & Guinard, 2011; Krishna & Schwarz, 2014; Panas, Thrasidi, Halkiopoulos, & Gkintoni, 2022). Specifically, improved sensory education and greater familiarity with the product's flavor profile enhance consumer satisfaction, increase repurchase intention, and elevate the willingness to pay for quality olive oil.

However, despite high tasting experience (86%), only 36% of respondents had actually purchased olive oil. This lower purchase rate may reflect the perception of olive oil in China as a premium gift item rather than a daily culinary staple. The existence of consumers who have tasted the product but not purchased it directly suggests significant opportunities to expand market penetration through targeted distribution and promotional channels (Table 3).

Table 4 – Univariate logistic regression analysis of factors influencing olive oil purchase behavior

Independent variable	B	SE	Wald	OR (95% CI)	P
Tried olive oil (learning, cognition)	0.673	0.295	5.204	1.959 (1.099-3.492)	0.023
Gender: male	0.587	0.190	9.503	1.798 (1.238-2.610)	0.002
Monthly income:					
390-650 dollars	0.655	0.281	5.431	1.925 (1.110-3.341)	0.020
> 650 dollars	0.661	0.270	5.995	1.973 (1.141-3.290)	0.014
Age:					
26-36 years	0.550	0.284	3.761	1.733 (0.994-3.022)	0.045
> 36 years	0.533	0.279	3.666	1.705 (0.987-2.943)	0.046
Purchase reason:					
health	0.915	0.311	8.739	2.505 (1.363-4.604)	0.003
special flavor of olive oil (learning)	2.028	0.349	33.796	7.600 (3.836-15.058)	0.000
dietary habits	1.748	0.392	19.928	5.744 (2.666-12.374)	0.000
symbol of identity (social status)	1.674	1.442	1.348	5.333 (0.316-90.027)	0.246

B = regression coefficient; SE = standard error; Wald = Wald χ^2 statistic; OR = odds ratio; CI = confidence interval; P = p-value.
OR (95% CI) represents the odds ratio and its 95% confidence interval. Statistical significance was set at $P < 0.05$.

Source: Authors' elaboration

Table 5 – Multivariate logistic regression analysis of factors influencing olive oil purchase behavior

Independent variable	B	SE	Wald	OR (95% CI)	P
Tried olive oil (learning, cognition)	0.640	0.319	4.019	1.897 (1.014-3.548)	0.045
Gender: male	0.505	0.206	6.007	1.657 (1.106-2.482)	0.014
Monthly income:					
390-650 dollars	0.655	0.315	4.316	1.842(1.045-3.557)	0.025
> 650 dollars	0.945	0.320	8.746	1.985 (1.347-3.843)	0.012
Purchase reason:					
health	0.722	0.319	5.127	2.058(1.102-3.843)	0.024
special flavor of olive oil (learning)	1.983	0.363	29.823	7.267(3.566-14.808)	0.000
dietary habits	1.692	0.407	17.308	5.432(2.447-12.507)	0.000

B = regression coefficient; SE = standard error; Wald = Wald χ^2 statistic; OR = odds ratio; CI = confidence interval; P = p-value.
OR (95% CI) represents the odds ratio and its 95% confidence interval. Statistical significance was set at $P < 0.05$.

Source: Authors' elaboration

Table 6 – Factors Influencing Consumer Olive Oil Purchasing Behavior
(Odds ratios with 95% confidence intervals)

Predictor Variables	OR (95% CI)	Scale
Flavor motivation	■	7.27 (3.57-14.81)
Habit motivation	■	5.43 (2.45-12.51)
Health motivation	■	2.06 (1.10-3.84)
Income (>$ 650)	■	1.99 (1.35-3.84)
Tasting experience	■	1.90 (1.01-3.55)
Income ($ 390-$ 650)	■	1.84 (1.05-3.56)
Male gender	■	1.66 (1.11-2.48)

Note. This table displays the odds ratios (ORs) and 95% confidence intervals (CIs) from a multivariate logistic regression analysis. The reference line at OR = 1 indicates no effect.
Key findings:

- *Sequence of influencing factors*: flavor motivation (OR = 7.27) is the strongest driver of olive oil purchasing behavior, followed by habit motivation (OR = 5.43) and health motivation (OR = 2.06).
- *Other significant factors*: income level and taste experience also show significant positive associations with purchasing behavior.
- *Statistical significance*: the 95% confidence intervals of all factors do not include 1, indicating that all effects are statistically significant ($p < 0.05$).

Element description: ■ represents the estimated odds ratio (OR) point.
The horizontal lines represent the 95% confidence intervals, and the reference line at OR = 1 indicates no effect.

Source: Authors' elaboration

4.2 Discussion

This study found that income, health motivation, and taste experience are the key factors influencing Chinese consumers' olive oil purchasing behavior. These findings are consistent with, and expand upon, the existing theoretical framework and empirical research.

The strong positive correlation between income and purchase likelihood indicates that higher disposable income reduces the budget constraints associated with high-quality products such as olive oil (Grossman, 2017). This confirms that olive oil is regarded as a normal good with positive income elasticity in China, similar to findings in Western contexts (Michaelidou & Hassan, 2008).

Health motivation emerges as a powerful driving factor (OR = 2.058), which can be explained by the Protection Motivation Theory (Rogers, 1975). Given the growing awareness among Chinese consumers of public health initiatives and chronic diseases, an increasing number of people view olive oil consumption as a positive health investment, consistent with the recommendations in the *Dietary Guidelines for Chinese Residents* (2022).

The importance of taste experience (OR = 1.897) underscores the role of sensory cognition in consumer decision-making (Damasio, 1996). Direct sensory interaction with products can serve as a powerful quality cue influencing consumers' purchasing behavior. This finding highlights the importance of firms shifting from informational marketing to experiential marketing in the Chinese market.

Regarding gender, our model indicates that male respondents are more likely to purchase olive oil. However, since the sample consists mainly of female respondents (65%), these results should be interpreted with caution. This may reflect a specific subgroup of male consumers who are more engaged in purchasing premium health foods; however, further research with balanced samples is needed to draw definitive conclusions.

Unlike some studies on organic foods (Li, 2020), age is not a significant predictor in our model. This suggests that the appeal of olive oil in China spans different age groups, and that its main driver is general health concern rather than the lifestyle of specific cohorts.

One key advantage of this study is its grounding in the fundamental framework of consumer theory and the use of robust statistical methods suited for binary outcomes. However, one limitation of this study lies in the ratio of event variables, which may affect estimation stability. Future research with larger samples should apply bootstrap validation and other techniques to improve robustness. Moreover, the cross-sectional design precludes causal inference.

5 Conclusions

This study suggests that the decision to purchase olive oil in China is primarily driven by economic capacity (income), health awareness motivation, and positive sensory experiences. The findings validate the applicability of Kotler's consumer purchasing decision model in this specific context, highlighting the interaction among personal (income), psychological (health motivation), and experiential (taste) factors.

Theoretically, this study integrates classical consumer behavior models with the distinctive characteristics of the contemporary Chinese market. Practically, the results provide marketers with clear strategic guidance: target consumers in middle and high-income urban areas, communicate credible health benefits of olive oil, and create sensory experience opportunities through in-store promotions and tasting activities. If effectively implemented, these strategies could substantially increase consumers' purchase conversion rates.

Future research could further examine the interactions among the factors identified in this study – such as income and health perception – and incorporate cultural or demographic variables (e.g., middle and high-income segments). This would deepen the understanding of the psychological mechanisms underlying China's precision consumer market.

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Educational Poverty and Educating Communities: Strategies of Welfare Interventions in Italy

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Abstract

The topic of educational poverty has seen an acceleration and deepening in sociological studies in recent years, renewing a theoretical, methodological and pragmatic interest in the humanities and social sciences. In the italian context of social policies and parternship welfare, we can identify the renewed importance of Public Entities and Third Sector as an activation engine to find planning, economic, social and human resources in order to mobilize and implement the new model of the "educating community", assuming a shared and participated responsibility among all subjects and actors involved into the protection of children and minors.
The contemporary perspective about educational poverty's studies is moving towards the recognition of its multidimensional nature; therefore, this work proposes to clue some of these topics, specifically related to social, political and institutional agency that links together family, school, social services and the territory or community, in an attempt to show and explain the emergence and increasingly visible affirmation of a collective strategy of social intervention capable of promoting innovative actions to combat child educational poverty, through the integrated co-design and implementation of public-private welfare services, to optimize the quality of education, to reduce school dropout and abandonment, to support families and institutions involved in the territorial process, to increase the opportunities of the cultural and educational offer of young people.

Keywords – Social Work; Social Policies; Educational Poverty; Educating Community; Partnership Welfare; Third Sector

Paper type – Academic Research Paper

Sommario

Povertà educativa e comunità educanti: strategie per interventi di welfare in Italia. – Il tema della povertà educativa ha beneficiato, negli anni più recenti, di un rinnovato interesse teorico – a livello teorico, metodologico e pragmatico – nelle scienze umane e sociali. Nel contesto italiano delle politiche sociali e del *partnership welfare*, è possibile riconoscere l'importanza strategica della coprogettazione sociale integrata tra Enti Pubblici e di Terzo Settore come motore di attivazione per individuare risorse progettuali, economiche, sociali e umane al fine di mobilitare e implementare il nuovo modello della "comunità educante", assumendo una responsabilità condivisa e partecipata tra tutti i soggetti e gli attori coinvolti nella tutela dei bambini e dei minori.
La prospettiva contemporanea degli studi sulla povertà educativa si sta orientando verso il riconoscimento della sua natura multidimensionale; pertanto, questo lavoro si propone di approfondire alcuni di questi temi, specificamente legati all'azione sociale, politica e istituzionale che collega insieme famiglia, scuola, servizi sociali e territorio o comunità, nel tentativo di mostrare e spiegare il progressivo emergere e l'affermazione ormai visibile di una strategia collettiva di intervento sociale, in grado di promuovere azioni innovative per combattere la povertà educativa infantile, attraverso la realizzazione ed attuazione integrata di servizi di *welfare* pubblico-privato, per ottimizzare la qualità dell'istruzione, ridurre l'abbandono scolastico, sostenere le famiglie e le istituzioni coinvolte nel processo territoriale, aumentare le opportunità dell'offerta culturale ed educativa dei giovani.

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1 Overall introduction and methodological perspectives

Studies and research conducted so far have observed and verified a close correlation between material poverty and educational poverty, of which the latter in fact represents a particular complementary aspect of the former; moreover (especially in relation to the analysis of family and educational contexts, i.e. levels of education), educational poverty reveals its dynamics of socio-cultural disruption and dysfunction, to the point of raising new questions and research needs at the level of the human and social sciences, such as the famous capacitation theory (Nussbaum, 2014).

Therefore, in order to respond to these socio-political and economic issues raised by the above-mentioned evidence and distributed in the various local criticalities at national and regional level, innovative forms of community action have been developed, tested and implemented with the aim to combat educational poverty and create new opportunities for families and children, as well as to promote the social development of new generations (Cervia, 2015; Gregori & Gui, 2012; Salmieri, 2021 and 2022; Curti & Fornari, 2022; De Gaetano & Grado, 2022; Giancola & Salmieri, 2023). As we will better see further on, the methodological and operational approach regarding these forms of community action has been developed and implemented directly in the territories, where situations of marginalization and social and economic family poverty exist, with the training of personnel resident in the place where the intervention strategies are subsequently implemented, according to a line of innovation that allows the permanence not only of the positive effects, but also and above all of the actors responsible for the direct operation on the territory.

The main research questions arising from the assumption of these challenges, responding to specific methodological approaches of investigation on the territory, as will be reported and documented in this chapter, are the following:

How to reduce the social impact of poverty, especially in its educational dimension to protect the most vulnerable, such as children?

Which chances for action can best correspond to the socio-economic dinamics of the origin and spread of educational poverty, such as combating the phenomenon of early school leaving?

Is it possible to act at a local level, implementing techniques and opportunities for social learning on the part of local actors, so as to promote greater empowerment and improved effectiveness of planned interventions?

At first, the mobilisation of the social actors was not an easy undertaking, as it was necessary for them to overcome their initial physiological mistrust of the professionals and operators involved in the

implementation of the projects, especially with regard to the needs and expectations that did not match the opportunities and possibilities for the emancipation of the subjects, whose knowledge and skills had yet to be built.

Afterwards, through the organisation of meetings and workshops held directly on site in the very territories where the social distress of minors and families was manifested and with their involvement in the intervention strategies, also with the logistical support and relational help of social service professionals and educational institutions, it was possible to observe the birth and gradual development of a participatory, shared and generative social and institutional cooperation between civil society organizations, private social actors amd the welfare system, capable of building and achieving even ambitious goals, since it is not tied to exclusively formal or political top-down dynamics, but produced starting from the contexts and from the people who have needs and social rights of citizenship and protection.

All this has strongly favoured the creation of an "educating community", i.e. a territory that is aware and self-governing in its own characteristics and ambitions for improvement, using a well known methodological approach related to participative and relational social co-programming, as so far widely used in the recent years among the local social planning practice involving both public and private subjects at institutional level, in order to build a responsibly shared governance and a effective result in applying social policies (De Ambrogio & Guidetti, 2016).

At international level, the United Nations Development Programme (UNDP) has also chosen to use, as an internal reference, the Multidimensional Poverty Index (MPI), created for the purpose of representing the simultaneous and overlapping experiences of deprivation experienced by people, in the coexistence of various causal factors and the gradual intensity with which the phenomenon of poverty is perceived: in fact, this new multidimensional connotation of poverty does not only entail material deprivation, mainly linked to the lack or scarcity of income-to, but also the onset of various forms of marginalisation and social exclusion, with the consequent impossibility for individuals and family groups to access social services or housing, to adequately protect their health or provide for their education, as in the specific case of educational poverty, both in the form of opportunities and of self-awareness at a personal level: in this case, we speak of relational poverty (Pasotti, 2020; Duflo, 2021).

For such reason, measures to combat poverty represent one of the most important kind of actions for the effectiveness of social and socio-welfare policies, in their preventive and improvement purposes with respect to situations of difficulty and socio-economic hardship of people and families (Bramanti & Carrà, 2021; Saraceno, Morlicchio, & Benassi, 2022), thanks to the identification and provision of community and territorial resources, as well as the tendency towards optimization of services with a

view to the structurality of interventions with respect to the plurality and non-homogeneity of resources and social spending (Ferraresi, 2018; Ranci Ortigosa, 2018), as appropriately recalled in the National Plan for Interventions and Social Services 2021-2023.

These measures represent even specific forms of institutional and professional actions and intervention carried out by social workers, aimed to answer the challenges launched by the issue of poverty; this is the main contribution of Social Work to the fight against multidimensional poverty in formal and informal terms of coping and direct relationship with the users, made up of people in different age groups and life cycles. The topic of the "educating community", read in its methodological dimension, responds to all these socio-cultural, economic and professional issues seen by those residing in the territories where situations of emergency insist such as to require a structural intervention and not occasional or limited in time, as is usually the case in the context of network services in the system of usual social work, which do not provide for precisely in any case a duration longer than the moment relating to the offer and provision of services and interventions. Therefore, an attempt is made to overcome the extemporaneous logic, in order to obtain a medium-to long-term investment, both at the human-social level and at the socioeconomic level, thanks to the positive lever of activation of local resources set in motion by the strategy of the educating community, capable of building dynamic interactive networks capable of evolving and adapting to the changes that gradually arise in the environmental context of reference.

We can preliminarily define an educating community as a strongly localised network, made up of relations of solidarity, mutual participation and collaboration, created not by outsiders, but by those who reside and live in a specific territory and who identify with its cultural and social dynamics and share them together. Everyone is therefore called upon to make their own contribution, committing themselves to the creation and educational and socio-cultural development of children, young people and families residing in the same context. To this end, the community is always open to supporting and promoting an informal, collaborative, engaging dialogue also with respect to the different ages and generations involved in the project, with the participation of plural actors among which, in addition to families and schools, we can include voluntary associations, sports and religious organisations and, more generally, Third Sector and civic solidarity actors.

According to the Chart of Educating Communities (the outcome of numerous meetings and reflections resulting from the participatory processes of activation, animation and co-design carried out within the project strategy "Fuoricentro: let's cultivate the peripheries" between 2019 and 2021 in the territories of the Paganella Plateau, Val di Fassa and Valsugana and Tesino in the italian Trentino-Alto Adige region), the fields of action of the educating community concern the following points:

- making children, girls and boys, adolescents and youths the main actors;

- promoting schools open to the community;
- supporting the leading role of families;
- making the territory alive;
- taking care of the common goods;
- experiencing nature, fostering sport;
- recognising and connecting projects and initiatives.

Each of the above points may constitute a focus element in project practice, if it is understood as a specific type of community action; or it could be intended in a dynamical interaction with the other points of focus, according to an activating and integrated social logic on different levels and dimensions for the best possible result in terms of social integration and development on the territory.

2 Material and educational poverty in Italy: preliminary outlook and renewed approach to the topic

On the occasion of the celebration, on November 20, of the International Day of the Rights of Children and Adolescents, the Italian Fund for the Contrast of Child Educational Poverty promoted and implemented an important public initiative (lasting three days, from November 18 to 20, 2024), on the theme of child educational poverty, specifically dedicated to the forms of adolescent distress and the protagonist drives of the new generations, as can be observed and evaluated in the actions and interventions of the so-called "educating communities", together with other public and institutional, professional and social private figures involved: a strong signal of presence and willingness to do one's best to combat situations of marginalization and social exclusion due to educational poverty.

Previously, on April 29, 2016, as a precursor and inspiring event, the Italian Government, in the person of the President of the Council of Ministers, in implementation of Law no. 208 of 28 December 2015, signed a Memorandum of Understanding for the establishment and management of a Fund for the Fight against Child Educational Poverty, together with the Minister of Economy and Finance, the Minister of Labour and Social Policies, the President of ACRI *Associazione di Fondazioni e Casse di Risparmio* (Association of Banking Foundations and Savings Banks), and representatives of the National Third Sector Forum. This Fund, of central importance for the topic we are discussing, will prove essential with respect to the dynamics of implementing interventions for the protection of minors and adolescents, since it has allowed the implementation throughout the national territory of 353 projects, promoted by the Social Enterprise "Con i Bambini" (recipient of the Fund by the ACRI Association), for an initial amount for the three-year period 2016-2018 equal to 360 million euros, then

extended for a further three-year period 2019-2021 with 255 million euros; again, in 2021 it saw the institutions confirm their commitment to a further extension for the two-year period 2022-2023, and finally, in 2022 the Budget Law n. 234/2021 allowed the renewal of the Fund for 2024, for a total value of over 800 million euros. At present time (Budget Law 2025), it does not appear that the Italian Government has extended the agreement. According to the Social Enterprise "Con i Bambini", over 500,000 children and young people with their families have been involved in their projects, and over 9,500 Third Sector organizations, schools and public and private bodies, in the logic of the "educating community" into the territories.

This premise appears useful to introduce and present the topic that we will address in this chapter, dedicated to the social welfare intervention strategies implemented in Italy to fight against child educational poverty and proactively involve territorial realities at regional and local level into complex projects of a community nature, according to a logic of integrated and participatory systems, made of social and institutional subjects that are part of networks and areas characterized by unity and collective identity, on whose ethical values to leverage to produce an authentic and tangible shared effort to create effective actions of resilience and social creativity, aimed at eliminating or reducing the risks of marginalization and discrimination linked to poverty in both its material and educational dimensions.

In relation to this, the most recent Istat (*Italian National Statistical Institute*) data confirm a dramatic situation: in 2023, the percentage of minors in the 0-17 age group in absolute poverty stood at 13.8%, a figure far higher than the national average of 9.7%, due to particular conditions such as, for example, single-parent families, or those with parents with a low level of education or a single income, or families affected by the Covid19 emergency or by inflation and the increase in consumer prices (+6.5% on an annual basis in 2023). Families in absolute poverty are just over 2.2 million, or 8.4% of the total number of resident families; in detail, we have the highest incidence among families in the South (10.2%), followed by that of families in the North-West (8.0%), and North-East (7.9%), while in the Center we find the lowest values (6.7%). Among the largest families (with 5 or more children), we have an incidence of absolute poverty higher than 20% (20.1%). The situation is even more serious in the South, with a percentage share of 15.5% of minors.

Along with with this situation, Istat notes that the percentage of Italian municipalities where the share of low-income people has increased is equal to 19.3%, confirming the general trend of the last 15 years, that is, that as age decreases, the incidence of absolute poverty increases; therefore, minors remain the age group most affected, exceeding the traditional poverty bracket which mainly concerned, at least until the beginning of the first decade of the 2000s, the older people. In general terms, in 2023 almost 1.3 million minors will live in absolute poverty, with an incidence of 14%, with higher values than the national average for both 18-34 year-olds (11.9%) and 35-44 year-olds (11.8%).

Considered on a chronological level in the period 2014-2023, the situation of individual absolute poverty increased by 2.9 percentage points, with an incidence of individual poverty among employed people of 2.7%, going from 4.9 in 2014 to 5.3 in 2019, to reach 7.6% in 2023. Tables 1, 2 and 3 illustrate the above, detailing the breakdown of the regional contexts within which poverty was measured in Italy in the years 2022-2023, according to household, personal and residential indicators with respect to the overall percentage composition, incidence and intensity of poverty measured.

At European level, Eurostat data are not much more encouraging: in 2023, the risk of poverty directly affected 16.2% of the entire European population. In particular, 10 regions showed a risk higher than 30%, with peaks of 38% and 40.6% in Sicily and Calabria respectively (Eurostat, 2024); in 2022, the percentage of minors at risk of poverty or social exclusion stood at around 24.7%, or almost one in four minors, in circumstances related to indigence or material deprivation, as shown in Figure 1.

Table 1 – Absolute poverty indicators by geographical distribution: Northern Italy
(estimates in thousands of units and percentage values)

Categories	North		North-West		North-East	
	2022	2023	2022	2023	2022	2023
Absolute values						
Poor families	939	998	531	585	408	413
Resident families	12,533	12,556	7,337	7,350	5,196	5,206
Poor persons	2,298	2,412	1,259	1,423	1,003	990
Resident persons	27,136	27,165	15,694	15,713	11,442	11,452
Composition (%)						
Poor families	42.9	45.0	24.3	26.4	18.7	18.6
Resident families	47.6	47.6	27.9	27.9	19.7	19.7
Poor persons	40.5	42.4	22.8	25	17.7	17.4
Resident persons	46.4	46.5	26.8	26.9	19.5	19.6
Poverty incidence (%)						
Families	7.5	7.9	7.2	8.0	7.9	7.9
Persons	8.5	8.9	8.2	9.1	8.8	8.6
Poverty intensity (%)						
Families	17.6	18.6	18.5	19.0	16.5	18.0

Source: Istat (2024)

Table 2 – Absolute poverty indicators by geographical distribution: Central and Southern Italy
(estimates in thousands of units and percentage values)

Categories	Central Italy		Mid South		South	
	2022	2023	2022	2023	2022	2023
Absolute values						
Poor families	342	360	906	859	630	572
Resident families	5,349	5,359	8,439	8,446	5,614	5,621
Poor persons	874	918	2,502	2,363	1,780	1,609
Resident persons	11,626	11,617	19,780	19,701	13,408	13,360
Composition (%)						
Poor families	15.6	16.2	41.4	38.7	28.8	25.8
Resident families	20.3	20.3	32.1	32.0	21.3	21.3
Poor persons	15.4	16.1	44.1	41.5	31.4	28.3
Resident persons	19.9	19.9	33.8	33.7	22.9	22.8
Poverty incidence (%)						
Families	6.4	6.7	10.7	10.2	11.2	10.2
Persons	7.5	7.9	12.6	21.0	13.3	12.0
Poverty intensity (%)						
Families	17.1	18.0	19.3	17.8	19.0	18.6

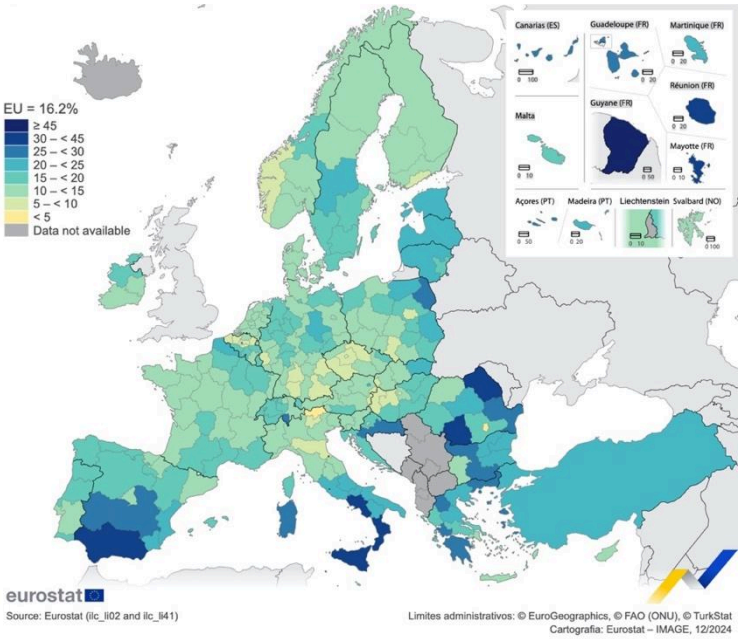
Source: Istat (2024)

Table 3 – Absolute poverty indicators by geographical distribution: Islands and total Italy
(estimates in thousands of units and percentage values)

Categories	Islands		Italy	
	2022	2023	2022	2023
Absolute values				
Poor families	276	287	2,187	2,217.2
Resident families	2,825	2,826	26,320	26,360.8
Poor persons	722	754	5,674	5,693.8
Resident persons	6,372	6,340	58,542	58,482.4
Composition (%)				
Poor families	12.6	12.9	100.0	100.0
Resident families	10.7	10.7	100.0	100.0
Poor persons	12.7	13.2	100.0	100.0
Resident persons	10.9	10.8	100.0	100.0
Poverty incidence (%)				
Families	9.8	10.2	8.3	8.4
Persons	11.3	11.9	9.7	9.7
Poverty intensity (%)				
Families	20.0	16.2	18.2	18.2

Source: Istat (2024)

Figure 1 – Risk of poverty among European regions

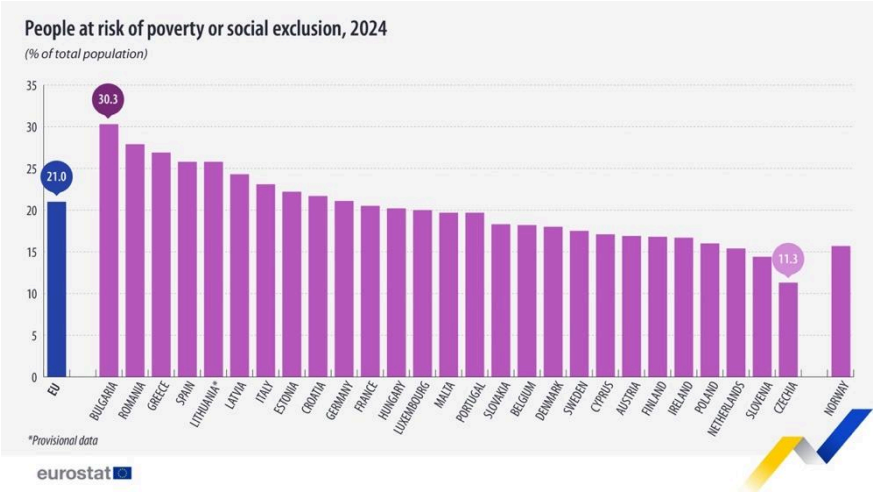


Source: Eurostat (2024)

These elements exist for 28.5% of Italian minors, together with those of Romania (41.5%), Bulgaria (33.9%) and Spain (32.2%). Also in this case, the absolute numbers for the analysis of minors at risk of poverty and social exclusion are not very comforting: the Italians are 2.66 million, the Germans 3.49 million, the French 3.75 million, the Spanish 2.60 million, the Romanians 1.49 million, the Greeks 0.49 million (Eurostat, 2024).

About the nowadays situation, we can read on Eurostat updated data: 93.3 million people in the EU (21.0% of the population) were at risk of poverty or social exclusion, which means they lived in households experiencing at least 1 of 3 poverty and social exclusion risks: risk of poverty, severe material and social deprivation, and living in a household with very low work intensity. Compared with 2023, there was a slight decrease of 0.3 percentage points (21.3%) of the population, 94.6 million people» (Eurostat, 2024). Below (Figure 2) the related map of poverty / social exclusion's risk distribution is reported.

Figure 2 –People at risk of poverty or social exclusion



Source: Eurostat (2025)

3 Fighting educational poverty: models and actions

The Fund for the Fight against Child Educational Poverty is particularly important in the panorama of organizational innovations and institutional measures, mainly for two reasons.

The first one concerns the topic – which is an integral part of this chapter – of "educating communities", since it put to center – as a methodological and operational focus of the local context – the relationship between school, families and territory, intended as a guideline for the promotion and activation of formal and informal institutional networks capable of mutually assuming a great participatory responsibility in the development of social projects and interventions. From this point of view, it is plausible to define the same educational communities as structured sets of collaborative networks, nourished from within through the active participation of the inhabitants themselves, in a sort of "residential identity" (Pasotti, 2011) capable of recognizing and protecting interests and rights for the complete realization of the well-being and healthy development of minors and adolescents. This is why, as can be easily seen, local welfare is strongly involved in the process of implementing the educational community, for its morphogenetic strategy of valorization and promotion of community and personal resources and tools.

The second reason officially opens and legitimises – for the purposes of appropriateness and completeness in the analysis of the results and of the effectiveness/efficiency/quality of the actions undertaken within the network interventions – the practice of "impact evaluation", which represents a fundamental tool for the deep and exhaustive understanding of the complexity of the design and programming elements defined by the projects (Scardigno, 2020). In fact, we can rightly believe that the Fund for the Fight against Child Educational Poverty has undoubtedly contributed, in its dynamics of innovative and participatory planning and programming (according to the partnership welfare model also legitimized by the directives of the European Union), to foster the practice of evaluation, as an instance of analysis and understanding of the objectives and results expected and obtained with respect to the initiatives that are the object of the various funding, with the consequent awareness of the need for a generative and cultural transformation on the theme of social policies under the responsibility of political, socio-economic and social actors involved in various capacities in the realization of an innovative concept of evaluation, intended as a structured and recognizable form of learning and widespread knowledge of common goods, with respect to which citizens and stakeholders in general are called to express themselves.

This awareness is also clear when considering the results of the first round of projects related to the theme of the Fund, namely the 2017 Early Childhood Call, where 80 projects aimed at minors in the 0-6 age group were funded. As the President of the "Con i Bambini" Foundation himself states, in the *Introduction* to the Report:

> « (...) the Fund has established, since the very first calls, that each individual project financed should include an evaluation of the impacts produced, ensuring that each impact evaluation was carried out by qualified and competent bodies, suitable for this task. And right from the start the Fund and "Con i Bambini" wanted to involve the entire Italian scientific and impact evaluation community in this challenge, mobilizing over 100 evaluation bodies for the Fund's projects, from 2016 to today. So much so that now the construction sites activated thanks to the Fund represent the largest evaluation arena beyond public schools. It was and is a powerful innovative challenge whose initial results are positive. In a country, in fact, where evaluation by those who operate struggles to become ordinary and shared, precisely in the areas of great social suffering and often painful exclusion, a real sharing of the "culture of results" by organizations and operators in action in situations of social and educational empowerment is significantly strengthening. Evaluating initiatives to combat educational poverty in its various and complex dimensions has progressively become an "ordinary" dimension of the work of those in the field and the figures of those who evaluate have become part of the scene, which involves sharing a perspective and a working method, a lexicon and co-constructing a common feeling» (Fondazione "Con i Bambini", 2024).

In recent years, a decisive interest in the study and theoretical exploration of the issue of educational poverty has raised, especially on the part of the humanities and social sciences, due to the new and different meanings and definitions with which this important phenomenon has been investigated (Sen, 1992; Chakravarty & D'Ambrosio, 2006; Gregori & Gui, 2012; Robeyns, 2017; Di Profio, 2020; Chiusaroli, 2021; Curti & Fornari, 2022; Sottocorno, 2022; Saraceno, Benassi, Morlicchio, 2022; Patera, 2022; Salmieri, 2023; Giancola & Salmieri, 2023; Di Genova, 2023; Finetti, 2023; Armenise,

Corlianò, 2024; Morsanuto, Peluso Cassese, 2024; Gabrielli, 2024). These studies have identified and analyzed in detail educational poverty, allowing to highlight its structural connection with economic or material poverty (rightly considered to be dangerous for the new generations, due to the risk of compromising a solid and integral human, personal and social development of minors); this latter aspect is of great relevance for the definition of the complexity of the theme, mainly on issues considered transversal to different humanistic disciplines, such as the theory of capabilities proposed by Sen (1999) and by Nussbaum (2011).

The fight against educational poverty is mainly perceived as a planning tool for the implementation of welfare services and improving the quality of education or cultural offerings; however, educational poverty appears to be an extremely multifaceted and complex concept, especially after the recent revisions and analytical updates carried out by the scientific community that has redefined and expanded its definitions, roles, functions and indicators for the purposes of applied research. Educational poverty constitutes a further "focus" of the theme of poverty, an interesting subject for deeper sociological reflections, along with the definition of the "new poverties" (Bauman, 2018).

It has been possible to identify the value of education as an effective strategy to combat the educational poverty of minors and families (Chiusaroli, 2021), with a view to the promotion of social, relational and affective dimensions adequately developed in the family and community context also from a pedagogical perspective (Gnocchi, Mari 2016). Social services themselves have realised the importance of offering minors and young people in difficulty more and better educational perspectives through an innovative partnership practice introduced and promoted by forms of local collaboration between the public and the private social sector.

The analysis of the characteristics of educational poverty is contextualised starting from the post-industrial era and the season of "transition policies", aimed at combining educational needs with those of the labour market, in the historical and political space of reference known as the "half-century compromise" (Habermas 1999). A period of contradictions and innovative welfare thrusts, towards the affirmation of the "European Social Model" with its Social Investment Approach and the foundation of a properly european political space (Costa, 2012; Pasotti, 2019), capable of overcoming the welfare state conception, proposing a new "generational pact" thanks to the theses on the social investment approach elaborated, among others, by Esping-Andersen (2010). Reconciliation policies develop a proactive relationship between citizens and institutions: thus, the aim of social services is to promote and apply every social policy oriented to protect citizens, especially when they are in poverty, according to the theory of capability approach intended as a potential tool for combating educational poverty.

The Italian Social Service and Social Work have always represented a valuable protection for communities, citizens and families with difficulty, offering them, within the field of its specific

functions (in addition to interventions and benefits), different types of money transfers and economic support, according to a line that anticipated the practice of minimum incomes implemented in Italy, unfortunately only starting from 2016, initially with the Support for Active Inclusion (*Sostegno per l'Inclusione Attiva*, SIA), subsequently with the Inclusion Income (*Reddito di Inclusione*, ReI) and then with the Citizenship Income (*Reddito di Cittadinanza*, RdC) (Salmieri, 2021). Therefore, these latest measures constitute a further regulatory and socioeconomic evolution of the necessary responses – in terms of sustainability and innovation of social policies – to the challenges represented by new social risks (Bonoli, Natali, 2012).

Factors capable of directly affecting the onset of educational poverty are to be found in the diminished social protection traditionally represented by the family system, due to circles such as demographic ageing and female employment and to the increased economic vulnerability caused by flexibility and job pre-security, a phenomenon exploded within the apparent emancipatory perspectives of the technocratic and global society (Beck, 2000), with increasing numbers of individuals and households falling into temporary, if not permanent, poverty (Saraceno, 2015).

In the field of italian Social Service and Social Work, the term "generative welfare" is a well known expression, indicating precisely those stimuli and proactive attitudes capable of promoting potentialities, capacities, tools and resources understood as an investment for people, groups, communities and institutions, further emphasising the trifocal value of the "capacitating" reading of the social world. Only a "capacitating" behaviour can positively generate a profit or investment endowed with social value, in an anti-utilitarian perspective, towards the proposal of a well-being understood as the availability of opportunities and capacitations (Nussbaum, 2014) able to provide the person with those "functions" of investing one's own propensities, with a positive amplification effect due to the simultaneous increase of economic development and social progress (Sen, 1992).

4 Actors and pathways of social innovation against educational poverty in Italy

As can be seen from the previous paragraph, the initiatives and institutional projects produced to combat material and educational poverty constitute a collective and common patrimony of assets, knowledge and skills translated into terms of activation of resources and overall strategies of community mobilisation at the local level. Therefore, we can affirm that, in the context of such realities, there is undoubtedly a specific logic of action, based on the integrated and multi-level participation of different actors and stakeholders, who, in order to optimise the synergy, effectiveness and efficiency of the objectives set by their project interactions place themselves in a relational reciprocity aimed at the

construction and implementation of enlarged partnerships, moreover following a historical Italian and European trend oriented towards the welfare partnership model, capable of exalting and enhancing the dynamics of co-planning and public-private governance (Pasotti, 2017).

In fact, in addition to the national initiatives put in place, starting with the already mentioned Fund for Combating Child Poverty in 2016 and passing through the "Educare in Comune" Notice of the Department for Family Policies to finance intervention projects at municipal level in 2020, and the funding line activated by the Ministry of Education, aimed at projects against school drop-out in schools in 2021, the European Union's Next Generation EU (called in Italy PNRR, "Piano Nazionale di Ripresa e Resilienza", National Recovery and Resilience Plan) also ushers in an era of important investments on the issue of educational poverty, introducing structural intervention logics in southern Italy to support Third Sector Entities, new protagonists on the social and economic scene of the welfare partnership, with calls for projects by the national Territorial Cohesion Agency.

In recent years, the Third Sector has seen the development and affirmation of partnership initiatives for the co-design of services (De Ambrogio & Guidetti, 2016), with a decisive re-evaluation of its importance at the territorial level, committing itself jointly with the professional social service and public institutions in the design of various initiatives in favour of childhood and adolescence, with the development of projects, paths, synergies, along an ideal line of development of policies oriented by a systemic and integrated strategy on the territory. In this way, the Third Sector becomes a true protagonist of innovation in the field of social policies at the local level, redefining and updating the classical expression – formerly argued by Achille Ardigò (1981) – of "intermediate body" or that strategic element of connection between individual civil actors (citizens understood as recipients and beneficiaries of policies) and welfare institutions (mainly public); the latter have developed, after the crisis of the welfare state, various forms of collaboration and interaction with these intermediate bodies, which in the meantime have become institutions of a private nature, but specifically dedicated to the design and implementation of social welfare services and support to public bodies, in a dialogue that is gradually becoming more and more intense and decisive for the destiny of the new Welfare Partnership, now fully acquired as an interactive way of designing and developing networks of services and interventions in the regional territories (Bassanini, Treu, & Vittadini, 2024).

From the perspective of its own reform Law (2016 Act, n. 106/2016), the Third Sector is considered as an engine of innovation for the integrated planning and co-design of services in partnership forms, thus re-evaluating its strategic importance both at the local level and in the public institutional contexts of implementation of welfare policies and social intervention in the territories. A survey carried out by the CNEL, Consiglio Nazionale dell'Economia e del Lavoro (National Economy and Labour Council), with the "Astrid" Foundation and the Foundation for Subsidiarity, about the presence and spread

throughout the italian territory of Third Sector bodies and actors (Bassanini, Treu, & Vittadini, 2021) made it possible to identify 375.000 territorial entities (social firms, voluntary associations, foundations, etc.), with over 10 million people, involved in various ways in activities directly planned and co-designed by the Third Sector. Approximately 65% of these organisations are involved in sports, cultural and recreational activities. The pandemic would not have prevented, but enhanced instead, and amplified the fundamental role of the Third Sector in Italy, since it has supported, with participatory and partnership strategies and actions, public intervention, especially in particularly relevant fields, such as social assistance and health.

The main purpose of these innovation paths and strategies is appropriately represented by the fight against poverty in its different forms and expressions, including the educational and/or relational one, for the support of which the Ministry of Labour and Social Policies has allocated the measures and amounts set forth in the National Plan for Inclusion and the Fight against Poverty 2021-2027, preceded respectively by the National Plan for Social Interventions and Services or Poverty Plan 2021-2023, and the National Poverty Fund 2018-2020. Beyond the economic-financial aspects, it seems opportune to highlight the operational structure of the 2021-2027 National Plan for Inclusion and the Fight against Poverty, characterised according to four different lines of intervention with specific objectives, namely:

- support for social inclusion and fight against poverty;
- EU Childhood Guarantee;
- fight against material deprivation;
- infrastructural interventions for socio-economic inclusion.

The objectives of the 2021-2027 programming are as follows: a) the widening of the aims of intervention and its specification by target; b) the financing of innovative services and activities; c) coordination and synergic collaboration with social services interventions; d) governance as a form of structural management of interventions. Moreover, the adoption of the *Child Guarantee* by the European Union in 2021 brings together the fight against child poverty – through access to a wide range of educational, nutritional, housing and social services – and the fight against child educational poverty, promoting the realisation of community and national projects with public policies aimed at the identification and multidisciplinary treatment of the phenomenon, with a view to its effective reduction.

A glance at the most recent italian Budget Law 2025-2027 can help to give some overall hints about the regulatory developments and evolutions and on the economic-financial conditions of the resources allocated to social policies; it therefore represents a litmus test with respect to the consideration of the priorities attributed by the government to the most relevant social and sociomedical urgencies and emergencies, as well as to the role and importance attributed to the Third Sector, for the purposes of

institutional support aimed at promoting and implementing the welfare partnership and maintaining social cohesion.

In particular, we can list, if only by way of example:

- Fund for Non-self-Sufficiency (Law 296/2006), progressively increased especially from 2020 onwards, with an endowment of more than 1 billion euros to cover the needs of this type of citizen, with further regulatory legitimacy thanks to the promulgation of Delegated Law 33 of 2023 and Legislative Decree 29 of 2024 the so-called "Older People Decree";
- Universal Civil Service Fund (the latter included in a structural manner in the Third Sector Reform Law 106/2016), which saw an increase in its financial endowment to more than double the previous endowment (from 140 to 320 million euros for each year);
- Fund for Third Sector Entities, which suffers a 10% linear cut from its previous allocation, amounting to € 56 million;
- Fund for Fighting Poverty (Law 386/2016), which has undergone several contractions and cuts over time, falling from more than € 1.7 billion in 2017 to just € 617 million for the three-year period covered by the Budget Law. This reduction is mainly to be attributed to the government's adoption of different instruments and supports than in the past, such as to entail a greater selectivity of the conditions of access and thus a significant decrease in the number of citizens entitled, but this strongly impacts the persistent dramatic socio-economic situation of the population, due to the combined and repeated effects of various emergencies and critical situations, including the Covid-19 pandemic, the energy crisis, and the Russian-Ukrainian war, which, together with the financial reduction, have made it even more difficult for social policies to respond to the needs of the most vulnerable population, with the obvious result of high inequality. Support for Training and Employment (linked to the Poverty Alleviation Fund) also suffers a linear cut from EUR 1.1 billion to just EUR 606 million;
- Child Educational Poverty Contrast Fund (Law 208/2015), which undoubtedly represents the focus of governmental, political and institutional attention towards the issue we are dealing with, fuelled as we have already pointed out at the beginning with resources from foundations of banking origin and managed together with government representatives and delegates of the Third Sector Forum. As mentioned, the implementer of the Fund is the Social Enterprise "Con i Bambini". This Fund, although so important and trategic, has inexplicably seen a total reset in the last Budget Law 2025-2027.

Alongside government measures to combat poverty, the reform Act of the Third Sector reaffirms its centrality in community and participatory projects and interventions in public-private, markedly solidarity-based and territorial forms. The objective is to harmonise what has been previously legislated,

with the presence on the territories of heterogeneous actors: professionals, volunteers, experts, organised in groups or single individuals, according to a convergence capable of implementing and expanding a key principle of the scientific literature on welfare and social services: the role of empowerment, having as its purpose that of restoring to individuals, groups and organisations the fundamental relational capacitation, implemented through the implicit and explicit dynamics of the helping profession and the relational practice between professional and user.

Regarding empowerment, we can mention the topic of opportunities highlighted in the 5th National Plan of Action and Interventions for the Protection of the Rights and Development of Persons of Evolving Age 2022-2023 (Osservatorio Nazionale per l'Infanzia e l'Adolescenza, 2022). The Plan identifies empowerment as a real area of participation and intervention, to which actions and policies for its implementation are consequently connected. An element of certain interest is the construction and strengthening of the educating communities, intended as preferential contexts of manifestation, expression, and practice of participatory logics and social and normative integration for the improved and synergic programming of the systems (information, social and health) for the implementation of empowerment. As part of the planning, the National Plan envisages specific experimental strategies for combating child educational poverty, in response to various points and objectives of the UN (1.4 and 10), the European Strategy on the Rights of the Child 2021-2024 (2 and 6) and the European Guarantee for Children (2).

5 The Educating Community in action: the SPOT project against early school leaving and educational poverty in the city of Naples

In Italy, "Con il Sud" Foundation, together with the Social Enterprise "Con i Bambini", has activated project, economic, structural and human resources over the last few years, in order to mobilise the educating community to a shared responsibility towards the achievement of the well-being of minors. The main intention is to counteract the educational poverty of minors and to foster the social inclusion of young people, at the very least by creating a basis for further possibilities for families and minors in Naples. The project's aim was to invest in deprived neighbourhoods, activating theatre expression courses, sports and school support activities in the afternoon hours, creating a network of actors, whose contribution goes beyond the project commitment and instead becomes a mission: assuming a direct responsibility by the educating community towards the new generations.

The SPOT project – *Sport and Theatre and After-School* for the cultural growth of young people in Naples' disadvantaged neighbourhoods (urban districts of Scampia and Rione Sanità) is co-funded by

"Con il Sud" Foundation and two other funding bodies, with the aim of combating educational poverty and school drop-out. The activities started in 2020, with a three-year duration plan; the responsible entity is the "Alessandro Pavesi Onlus" Foundation, which was established in 2008 and has long been active in identifying activities for young people in cooperation with other local authorities. The aim of the project is to offer opportunities for social and professional emancipation in neighbourhoods where poverty and social hardship create a dangerous alliance with the underworld and criminal organisations: the young people who live there often learn (and are attracted to) life models that create dissonance and dystonias, which the school and sport – understood not only as organisational and physical structures, but also and above all as a dense fabric of strong and binding social relations – attempt to counteract.

The converging principles between school and sport is to make adolescents and young people work and "train" on their fragilities and disidentities in order to overcome them, fomenting new energy and awareness for further chances of social and professional emancipation. The project followed three main lines:

- *sport activities*, with a commitment to the completion of the renovation of a gymnasium in a disused former school in Scampia, and with the presence of other associations in the area;
- *theatrical expression workshops*, conducted by specialised operators, recognised by the MUR (italian University and Research Ministry), in curricular and school activities;
- *daily after-school activities*, conducted in the Sanità district by volunteers.

Overall, the activities involved the inclusion and participation of 530 minors. In fact, in the two territorial realities, the numbers were somewhat higher, since the involvement involved families, school directors and teachers, as well as the proactive role of volunteers and external actors, interested in reading the experiences gained from the project, understood as a focused and circumscribed community work, capable of mobilising the consciences of those who in various ways can contribute to creating a better reality.

The three lines of work conducted in the two Neapolitan neighbourhoods complemented each other perfectly, creating continuity, since sport certainly represented an important "social lever".

Regarding the first line adopted, the participating minors began to frequent a contextualising place of relational activities in which they experienced and fortified a sense of respect for community, collective and solidarity-based values and the care of shared physical spaces, both of which they felt were assets to be preserved. The age range considered is from four years old up to the age of majority. For some of the participants, opportunities to develop a competitive career have also been created. This specifical aspect, has allowed them to participate in sports activities not as a moment of just simple aggregation, but rather as learning opportunities for the construction of new future opportunities, even

of a value-based nature, as in the case of the choice of sports disciplines, among dance or karate, which are characterised in a pronounced way by very marked practices of respect for the adversary.

The second line adopted with the SPOT project are theatre workshops. It should be emphasised that these are the first workshops to take place as part of school curricular activities, recognised by MUR (Ministry of University and Research). In fact, this second line was reinforced with the SPOT project, but it is an action that the Pavesi Foundation had planned and implemented many years before, in collaboration with 10 schools in Naples, becoming over time an indispensable subject for children between the ages of 10 and 13, in view of the fact that minors in this age group are vulnerable. For this reason, efforts are made to work on improving the expressive abilities, self-realisation and affirmation of each individual child, as well as to empower and accustom them to a multicultural vision.

The third line concerns support for compulsory school education through after-school activities in the Sanità district of Naples, where a space has been set up where minors can spend hours studying with volunteers. The aim is to guarantee not only scholastic support but also material support in daily life.

The SPOT project certainly represents an important step towards the refinement of social intervention lines in the field of combating educational poverty among minors, in anticipation of future investment actions by the Alessandro Pavesi Onlus Fondation and the other partners who will eventually decide to take part in it. As things stand, it is not the only project that has focused its social investment on the enhancement of sport; however, the positive impact it has received over the years makes it possible to assess an effective synergy between the main educational agencies, and has made it possible to contribute to combating school drop-out, educational poverty and social exclusion.

6 Final considerations

In conclusion, we would like to emphasise the scientific value of a strategy of action (the one concerning the fight against material and educational poverty) implemented through the construction of an integrated relational approach on the territories, defined as an “educating community”, which has proved to be very effective, despite the financial and economic difficulties due to the contingent socio-historical situation (Covid19, Russian-Ukrainian war) that has compromised the consistency and operativeness of Italian social policies: it is an important innovation in the intervention of the services but also of the territories, in line with a methodology that rediscovers and reactivates community resources and the reciprocal belonging of actors and institutions, according to a pragmatic articulation of aspects and subjects in various capacities involved in a network of shared responsibility and capacitating relations, capable of producing awareness of the dynamics of social and cultural promotion

of the territory, thus functioning as a local lever for overall development and for the protection of environments and people, especially younger ones. In fact, as recalled in the Chart of Educating Communities, and as we have seen about the SPOT project, the real protagonists of the interventions are not the operators and professionals engaged in the field, although fundamental in their formative and relational importance in the context of the project actions and communicative exchange with the resident population: they are the indeed the local citizens and institutions, with their networks, interactions, promotions and activations that embody the essence of conscious change that can only be reasonably guided and oriented in the directions desired by the project by a responsible community.

At this point, we can try and address some final considerations and figure out some theoretical-methodological outcomes to the research questions reported at the beginning of the chapter, where we had wondered if and how it was possible to successfully face the challenges posed by the integrated and participatory design of social intervention projects capable of responding to the dynamics of innovation and emergence of the phenomenon of material and educational poverty, especially when these projects are implemented directly within the territorial contexts of reference and managed not only by external personnel, but also learnt and taken on board by private and public local institutional actors.

In order to be adequately and effectively combated, juvenile educational poverty requires medium to long timeframes, since it is oriented towards the enhancement and strengthening of capacities, aptitudes and social propensities in the light of a long-term vision: in fact, a lever for the success of the projects must be identified precisely in the creative actions of a different and better social reality, built together in an integrated manner by the subjects in the educating community, with the aim to create opportunities for cultural development and socio-economic emancipation for the new generations.

Certainly, one of the most important results with respect to the theme of combating educational poverty is that represented by the social innovation resulting from the assumption of a participative and generative paradigm of local welfare, realised thanks to the involvement of actors and resources external and internal to the socio-geographical area considered by the new social planning of co-projecting. From this perspective, it is evident the achievement of objectives that without it would have remained only on paper: the emancipation of the beneficiaries of protection services and interventions, implemented and empowered through their protagonism in the choice and coordinated management of strategic residential and territorial actions, which allowed for a decisive optimisation of the processes of social integration and subsequent evaluation.

As we could detect and deduce from the experience of the SPOT project in the city of Naples, the synergy between social activities, family and community resilience, knowledge and symbolic-cultural practices of exercising reciprocity and sharing entails a series of positive consequences among minors who grow within a perimeter of values and awareness capable of overcoming degradation and reversing

the course of present and future expectations. Even at the level of values, we can affirm that there is a "cultural welfare", capable of involving, understanding and welcoming individuals and groups well beyond the separations and segregations imposed by traditional dystopic schemes that instead reproduce inequalities and discrimination: this welfare model may represent a resource to be activated also for the territorial and community social service, to regenerate, innovate and promote new strategies of environmental empowerment and human development.

On the other hand, one of the major limitations highlighted by the experimentation of such educating community processes, lies in the duration and persistence of the development conditions triggered at the time of co-designing, once the latter has become an integral part of the resilience and awareness of the local actors: will these actors be capable of regenerating, renewing and adequately promoting the instances and strategies of inclusion and contrast in a definitive manner? this question can only be answered over time, by means of an adequate feedback and social evaluation process to measure central indicators such as the impact, quality, efficiency and effectiveness of the interventions implemented.

Moreover, complex dynamics such as active involvement, participation, inclusion and integration, and social exchange, which are central to the theory and practice of social service as a safeguard and protection of citizens, are perfectly aligned and harmoniously coincide with the collaborative and participative values and activities of educating communities, with a view to a theoretical and value-based coherence and contingency that effectively promotes individual and collective empowerment for the promotion of psychophysical and social well-being.

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Sustainable Urban Food Policies: Financial Approaches for Lasting Impact

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Abstract

Urban Food Policies (UFPs) play a key role in promoting public health, social inclusion, sustainability, and resilience in cities. Despite their increasing adoption and implementation on a global scale, many UFPs remain reliant on short-term, project-based funding, limiting in this way their long-term impact and institutional stability. This study addresses the overlooked issue of sustainable financing of UFPs by analysing how cities can secure long-term, resilient funding, closing a notable gap in the field of research. Using a qualitative comparative case study approach, followed by a normative one, based on five different evaluation criteria, this article analyses five cities (Milan, Toronto, Paris, Belo Horizonte, and Barcelona) drawing on policy documents, budget reports, and literature. The analysis identifies five main financing models: internal municipal funding, cross-departmental integration, green/climate funding and EU support, donor and philanthropic dependence and transition risks, and participatory and procurement-based models. Key enabling factors include early integration of food goals in cities' food policy, cross-sectoral coalitions, and an adaptive governance model, opting for a blended financing model as the most sustainable one. The findings underline that sustainable financing is inherently political; it does require strategic alliances and institutional reforms to include food policies within lasting urban governance structures, and in this way, to advance food justice.

Keywords – Urban Food Governance; Financial Sustainability; Normative Analysis

Paper type – Academic Research Paper

Sommario

Politiche alimentari urbane sostenibili: strumenti finanziari per effetti a lungo termine – Le politiche alimentari urbane (*Urban Food Policies*, UFPs) svolgono un ruolo fondamentale nella promozione della salute pubblica, dell'inclusione sociale, della sostenibilità e della resilienza nelle città. Nonostante la loro crescente adozione e implementazione su scala globale, molte UFPs restano dipendenti da finanziamenti a breve termine e basati su progetti, il che ne limita l'impatto di lungo periodo e la stabilità istituzionale.
Questo studio affronta il tema, finora poco considerato, del finanziamento sostenibile delle UFPs, analizzando come le città possano garantire risorse resilienti e di lungo periodo, colmando così una lacuna rilevante nella letteratura. Utilizzando un approccio qualitativo di ricerca comparata per casi di

studio, seguito da un'analisi normativa basata su cinque diversi criteri di valutazione, l'articolo prende in esame cinque città (Milano, Toronto, Parigi, Belo Horizonte e Barcellona), basandosi su documenti di *policy*, bilanci e letteratura scientifica.
L'analisi individua cinque principali modelli di finanziamento: finanziamento municipale interno; integrazione interdipartimentale; fondi verdi/climatici e supporto UE; dipendenza da donatori e filantropia con rischi di transizione; modelli partecipativi e basati sugli appalti pubblici. Tra i principali fattori abilitanti emergono: l'integrazione precoce degli obiettivi alimentari nelle politiche urbane, le coalizioni intersettoriali e un modello di governance adattivo, orientato verso un finanziamento ibrido come quello più sostenibile. I risultati evidenziano come il finanziamento sostenibile sia intrinsecamente politico: esso richiede alleanze strategiche e riforme istituzionali per includere le politiche alimentari all'interno di strutture di governance urbana stabili e durature, avanzando così il principio di *food justice*.

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1 Introduction

Urban Food Policies (UFPs) have emerged as important and coherent tools for modern cities to foster sustainable development, promote public health, ensure social inclusion, and enhance urban resilience. As urbanisation increases, cities increasingly recognise the importance of formulation, design and governance of their food systems, to potentially address multiple overlapping challenges, regarding inequality, environmental degradation, and public health crises (Moragues-Faus & Morgan, 2015; Morgan & Sonnino, 2010). Food, once seen as a peripheral issue to urban planning and governance, is now considered and located at the intersection of sustainability transitions, social justice movements, and climate action strategies (Ilieva, 2016).

The increasing implementation of UFPs worldwide reflects a strategic and needed shift also in municipal governance, whereby cities are not only addressing food security but are also leveraging food policies as levers for broader systemic change (Sonnino, 2016). Initiatives such as the Milan Urban Food Policy Pact, which now has over 260 signatory cities globally, are an example of the expanding commitment to integrating food policy within urban governance frameworks (MUFPP, 2025). However, what comes after UFPs reflects a persistent fragility in their institutionalisation, particularly regarding their financial sustainability.

Despite their strategic importance, many urban food initiatives remain precariously dependent on project-based, short-term, or donor-driven funding models (Barling, 2008; Carey, Caraher, Lawrence, & Friel, 2016). This reliance on unstable financial resources constrains the ability of UFPs to achieve systemic impacts or to be included as an organic component within municipal governance structures. As a result, UFPs often risk remaining marginal, vulnerable to political cycles, funding fluctuations, and shifting priorities (Morgan, 2015).

The long-term financing of UFPs poses both technical and political challenges. Technically, integrating food initiatives into municipal budgets requires navigating complex administrative and fiscal systems not originally designed to accommodate cross-sectoral food policies. Politically, securing continuous financial support demands coalition-building, strategic framing of food policy benefits, and sometimes, confrontation with complex sectoral interests (Hawkes & Halliday, 2017). Without durable funding mechanisms, the transformative potential of UFPs is compromised, and their contribution to urban sustainability transitions is weakened.

Addressing the financial sustainability of UFPs is therefore an important, yet underexplored, dimension of urban food governance. While substantial scholarship has documented the emergence and evolution of UFPs (e.g., Ilieva, 2016; Moragues-Faus & Morgan, 2015; Morgan & Sonnino, 2010),

relatively little attention has been paid to the concrete financial mechanisms that support or hinder their long-term viability.

This study seeks to fill this gap by investigating how cities can finance UFPs sustainably over the long term. The main research question guiding this work is:

RQ1: How can cities finance Urban Food Policies sustainably over the long term?

Two complementary sub-questions support the main research line:

RQ1a: How are UFPs currently financed across different global cities?
RQ1b: What mechanisms and strategies enable the transition from short-term, project-based funding to sustainable, institutionalised financial models?

The study aims to advance both conceptual and practical understanding of sustainable financing for UFPs, highlighting innovative approaches, typologies of financing models, and enabling strategic principles. By doing so, it contributes to broader debates on urban sustainability transitions, fiscal innovation, and food justice. The objective is not limited to a descriptive one, but also normative: to extract lessons that can support cities in including food policies within durable budgetary and governance frameworks, ensuring that food systems transformation is sustained over time.

The paper proceeds as follows. Section 2 reviews the conceptual framework on urban food governance, public finance mechanisms, and sustainability transitions, highlighting gaps related to the financing dimension. Section 3 presents the methodology, detailing the comparative case study approach, the normative analysis of five chosen cities: Milan, Toronto, Paris, Barcelona, and Belo Horizonte. Section 4 discusses the results, identifying the main types of financing models and the strategic principles observed across successful cases. Conclusions conclude the article.

2 Conceptual framing

2.1 Urban food governance and local public finance

Urban food governance has emerged as a critical domain within urban policy, reflecting the growing recognition of cities' roles in shaping sustainable food systems. Traditionally, food policy was considered the purview of national governments; however, the increasing urbanisation of populations and the localised nature of food-related challenges have positioned municipalities as an important actor

in food system governance (Morgan & Sonnino, 2010). This shift acknowledges that urban areas are not merely consumption hubs but also sites of innovation and intervention in food policy.

The governance of urban food systems includes a range of activities (i.e., the development of food strategies, the establishment of food councils, and the implementation of programs aimed at improving food access and sustainability). These initiatives often require coordination across various sectors and levels of government, as well as engagement with civil society and private stakeholders (Moragues-Faus & Morgan, 2015). The complexity of urban food governance necessitates robust institutional frameworks capable of managing cross-cutting issues such as health, environment, and social equity.

A central challenge in the implementation of UFPs is securing sustainable financing. Many urban food initiatives rely on short-term funding sources, such as grants or pilot project funds, which can hinder their long-term viability and integration into municipal budgets (Carey, Caraher, Lawrence, & Friel, 2016). The lack of stable financial mechanisms often results in fragmented efforts and limits the scalability of successful programs. Integrating food policies into existing municipal financial structures requires navigating bureaucratic processes and competing budgetary priorities, underscoring the need for innovative financing approaches that align with the goals of urban food governance (Barling, 2008).

2.2 Sustainability transitions and institutional lock-in

The concept of sustainability transitions provides a valuable framework for understanding the systemic changes required to achieve sustainable urban food systems. Sustainability transitions refer to long-term, multi-dimensional, and fundamental transformation processes through which established socio-technical systems shift to more sustainable modes of production and consumption (Geels, 2002). In the context of urban food systems, this translates into reconfiguring existing practices, infrastructures, and institutional arrangements to support sustainable food production, distribution, and consumption.

A significant barrier to sustainability transitions is institutional lock-in, a condition where existing institutions, policies, and practices become entrenched, making it difficult to implement transformative changes. Lock-in can result from various factors, including path dependency, vested interests, and the high costs associated with changing established systems (Unruh, 2000). In urban food systems, institutional lock-in may manifest in the persistence of industrial food supply chains, regulatory frameworks favouring large-scale producers, or cultural norms that resist dietary changes.

Addressing institutional lock-in requires deliberate strategies to disrupt existing systems and foster innovation. Transition management, a governance approach that emphasises participatory processes and

long-term visioning, offers a pathway to overcome lock-in by engaging diverse stakeholders in the co-creation of sustainable futures (Loorbach, 2007). This approach involves iterative cycles of experimentation, learning, and adaptation, enabling cities to navigate the complexities of sustainability transitions in their food systems.

Recent studies have highlighted the importance of multi-level governance in facilitating sustainability transitions. The multi-level perspective conceptualises transitions as interactions between three analytical levels: niches (spaces for radical innovation), regimes (dominant practices and rules), and landscapes (broader socio-economic and political contexts) (Geels & Schot, 2007). In urban food systems, niches may include community-supported agriculture or urban farming initiatives, regimes encompass conventional food supply chains, and landscapes involve global trends such as climate change or economic globalisation. Effective transition strategies must consider dynamics across these levels to identify leverage points for change.

Moreover, the role of local governments is crucial in enabling or constraining sustainability transitions. Municipalities can act as intermediaries, facilitating connections between grassroots innovations and broader policy frameworks. They can also implement policies that create supportive environments for sustainable practices, such as zoning regulations that permit urban agriculture or procurement policies that favour local food producers (Sonnino, 2016). However, local governments may also face constraints due to limited authority, resources, or political will, highlighting the need for capacity-building and institutional support.

In conclusion, the integration of urban food governance with local public finance is essential for the sustainability and scalability of food policies. Understanding the dynamics of sustainability transitions and institutional lock-in provides insights into the challenges and opportunities for transforming urban food systems. By adopting governance approaches that promote innovation, stakeholder engagement, and systemic thinking, cities can advance toward more sustainable and equitable food futures.

3 Methodology

This research employs a qualitative, comparative case study methodology to explore how Urban Food Policies (UFPs) are financed across different city contexts over time. Given the complexity and institutional structure of urban food governance, a qualitative design was considered the most appropriate approach to identify the contextual nuances, path dependencies, and political-economy dynamics that shape financing strategies in practice.

3.1 Case study selection

Case study methodology is particularly well-suited to policy domains like food governance, where multi-scalar interactions, institutional diversity, and cross-sectoral objectives converge (Yin, 2014). The study focuses on five cities – Milan, Toronto, Paris, Barcelona, and Belo Horizonte – each of which has demonstrated a longstanding commitment to developing, implementing, and evolving UFPs. These cities were purposively selected based on three main criteria: (i) their international recognition as frontrunners in food policy innovation (e.g., Milan through the Milan Urban Food Policy Pact); (ii) evidence of sustained institutionalisation efforts beyond short-term project cycles; and (iii) the availability of relevant documentation and scholarly analysis.

Importantly, the five cities represent a diverse spectrum of governance typologies, political histories, and welfare regimes, spanning Southern and Western Europe, North America, and Latin America. This geographic and institutional variation allows for cross-contextual learning and the identification of generalisable mechanisms and constraints in financing urban food governance.

3.2 Data sources

The study draws on secondary data sources, emphasising publicly available and verifiable documentation:

- scholarly publications from urban governance, food systems, and public finance disciplines;
- evaluative reports from international organisations (C40 Cities, 2024; FAO, 2024);
- case studies from peer networks such as the Milan Urban Food Policy Pact and the Urban Food Futures platform (MUFPP, 2025; School of International Futures, 2025).

3.3 Analytical strategy

The analysis proceeds along two complementary methodological dimensions: a comparative analytical approach and a normative evaluative one.

Comparative Approach. Data from each city was analysed. Common themes were then synthesised into a typology of financing models across the five case studies. The typology includes models based on internal municipal funding, interdepartmental integration, climate and green finance channels, reliance on philanthropic and donor support, and participatory financing mechanisms. The models are not mutually exclusive and often appear in hybrid forms within single cities, which is accounted for.

Normative Approach. The second analytical lens evaluates the cases based on normative principles derived from food justice, fiscal resilience, and urban sustainability transition literature. This involves

assessing whether the financing models facilitate long-term, system-wide transformation or reinforce fragmented and short-lived interventions.

Five guiding criteria were developed to assess the depth and durability of financing arrangements:

(1) Stability and duration of funding streams (e.g., single-year grants vs. multi-year municipal allocations).

(2) Level of institutional inclusion, such as whether food governance bodies are housed in core departments or remain peripheral.

(3) Degree of cross-sectoral integration, translated into collaborative budgeting or shared mandates between health, environment, education, and food departments.

(4) Transparency and stakeholder involvement in decision-making over resource allocation.

(5) Alignment with overarching municipal strategies, including climate action plans, social inclusion frameworks, and economic development programs.

Each city's financing model was assessed against these criteria to identify enabling factors and barriers achieving financially sustainable urban food systems.

3.4 Methodological considerations and limitations

Given the qualitative and exploratory nature of the study, the aim is not statistical generalisability but rather analytical generalisation (Flyvbjerg, 2006). The intention is to extract lessons and insights that can inform other cities facing similar fiscal and institutional challenges, while acknowledging that specific configurations will vary by context. One limitation of the study is the reliance on publicly available documents, which may underrepresent informal practices, political negotiations, or internal administrative dynamics. Moreover, cities' food policies often intersect with regional or national funding programs in complex ways that are not always transparent. Future research could benefit from elite interviews with policymakers and budget officials, as well as participatory methods that include civil society actors involved in food governance.

3.5 Contribution of the methodology

The dual methodological framework – comparative and normative – enables a rich and situated understanding of how UFPs are not only designed but financially sustained. By tracing the role of funding mechanisms, institutional embedding, and political economy dynamics, the study contributes to recent calls in urban studies and food systems literature to move beyond "plans and visions" toward an analysis of what makes urban food governance truly durable (Moragues-Faus & Morgan, 2015) Through its in-depth focus on five city-level experiences, the study also advances methodological

innovation in the comparative analysis of policy implementation and fiscal embedding, offering a guide for other scholars and practitioners interested in financial sustainability within complex, cross-cutting urban agendas.

4 Results

4.1 Comparative case analysis: city-by-city insights on long-term financing

4.1.1 Milan (Italy) – A model of institutionalised urban food governance

Milan represents a pioneering example in the European Urban Food Policies landscape, thanks to its Milan Urban Food Policy Strategy, launched in 2015 under the leadership of the city administration and in parallel with the Milan Urban Food Policy Pact (MUFPP). The city's strategy has since evolved into a structured, multi-year policy agenda aimed at making the local food system more sustainable, equitable, and resilient (City of Milan, 2025). Two major programs are the essence of the Milan Food strategy:

(1) Public procurement reform for sustainable school meals, which promotes healthy eating and environmental sustainability across public schools. The policy emphasises organic food, seasonal menus, and reduction of meat consumption, contributing to both health and climate goals (Mazzocchi et al., 2024).

(2) A robust food waste reduction program, implemented in collaboration with NGOs and third-sector partners. The program includes "Food Waste Hubs" that collect surplus food from supermarkets, school canteens, and companies, redirecting it to people in need through a local circular system (Arcuri, 2019; The Earthshot Prize, 2021).

What sets Milan apart is the institutionalisation and stability of its financing model. Unlike project-based or ad hoc urban food initiatives, Milan ensures continuity through: (i) a dedicated budget line within the municipal budget, making food policy a structural part of city governance (Monciardini & De Melo Cartaxo, 2023); (ii) active leveraging of European Union funding, including programs like URBACT and Horizon (2020), which support innovation, pilot projects, and international knowledge exchange (Food Trails, 2025); (iii) the creation of a Food Policy Office, embedded within the city administration and directly reporting to the Deputy Mayor for Food Policy. This institutional structure guarantees coordination across departments (e.g., education, environment, health) and long-term strategic planning (Monciardini & De Melo Cartaxo, 2023).

Milan's case illustrates the importance of institutional inclusion and cross-departmental integration in financing sustainable urban food systems. By aggregating internal municipal resources with external project-based funds, Milan has been able to implement multi-year planning and resilient partnerships. Moreover, the city acts as a trans-national policy entrepreneur, hosting international events and sharing good practices through the MUFPP, thus scaling local innovation globally (Moragues-Faus & Morgan, 2015).

4.1.2 Toronto (Canada) – A hybrid governance model through public health integration

Toronto stands out as one of the earliest North American cities to adopt a structured food policy approach through its Toronto Food Strategy, initiated in 2010 under the guidance of Toronto Public Health. Unlike many food policies driven by environmental or agricultural departments, Toronto's approach uniquely situates food as a determinant of health, aligning it with social equity, public well-being, and community resilience (Mah & Thang, 2013). The Toronto Food Strategy is centred on creating an equitable and sustainable food system that addresses both access and health. Among its most significant interventions are:

- the development of Community Food Hubs, which provide integrated services including food education, local food production, distribution of affordable fresh food, and social programming (Rideout, Riches, Ostry, Buckingham, & MacRae, 2007);
- support for urban agriculture initiatives, particularly in marginalised neighbourhoods, helping communities grow their food, build social cohesion, and increase environmental awareness (Andrée, Clark, Levkoe, & Lowitt, 2020);
- food access programs, such as the Mobile Good Food Markets and subsidies for healthy food in underserved areas, further enhance food security and combat nutrition-related diseases.

Toronto's food strategy illustrates a hybrid financing approach, combining public sector support and private philanthropy:

(1) Partially embedded within the budget of Toronto Public Health, the strategy benefits from its alignment with health equity objectives. Staff positions and baseline programming are funded through the municipal health budget, ensuring continuity and institutional legitimacy (City of Toronto, 2015; Toronto Public Health, 2010).

(2) Additional funding is secured through foundations and philanthropic partnerships, including collaborations with organisations like the Metcalf Foundation (Metcalf Foundation, 2010) and the United Way. These sources allow for piloting innovative programs and extending services beyond what is covered by public budgets.

(3) Cross-departmental collaboration, particularly with planning, housing, and community services departments, provides support and policy coherence across different city units.

This blend of funding sources provides both flexibility and stability, allowing the city to test new models while embedding core activities into a permanent governance framework (Fridman & Lenters, 2013; MacRae & Donohue, 2013). Toronto's case is instructive for cities aiming to advance food systems change within a public health frame, especially in contexts with limited standalone food policy offices. The co-location within a health department facilitates integrated approaches to nutrition, social equity, and chronic disease prevention. Moreover, the reliance on philanthropic co-financing encourages innovation but also requires strategic planning to avoid over-dependence on external actors (Blay-Palmer, Santini, Dubbeling, Renting, Taguchi, & Giordano, 2018). The resilience of Toronto's model lies in its cross-sectoral governance, allowing food policy to remain adaptive and politically durable across administrations.

4.1.3 Paris (France) – Institutionalising sustainable food through public procurement

Paris has emerged as a leader in including food sustainability goals into its municipal governance framework, particularly through its Plan Alimentation Durable (Sustainable Food Plan), adopted as part of the city's broader climate and health strategies. Introduced in 2015 and revised in subsequent years, this plan focuses on transforming the city's food system by leveraging public procurement and long-term institutional commitments (Ville de Paris, 2019; 2024). The Plan Alimentation Durable is anchored in two main commitments:

(1) Achieving 100% sustainable food in school canteens by 2027, including 50% organic and 100% seasonal and local ingredients (Ville de Paris, 2024). This goal is implemented through progressive targets and supplier criteria that favour agroecological practices and food quality certifications.

(2) Supporting peri-urban agriculture by facilitating land access, technical assistance, and infrastructure development for farmers operating within and around the Île-de-France region. This initiative aims to re-localise food supply chains, reduce carbon footprints, and boost economic resilience in nearby rural areas (Tornaghi & Dehaene, 2020)

Paris's approach is distinctive for its integration of food spending into core municipal service budgets, rather than relying on short-term projects or donor funds:

- a significant portion of the municipal education budget is allocated to school meals, enabling long-term investments in food quality, kitchen equipment, and staff training;

- the city has restructured its public procurement system to support its sustainability goals. Through multi-year contracts with producers and food service providers, Paris ensures stable demand for organic and agroecological products, thereby fostering supply-side transformation;
- this approach is enabled by the city's commitment to "green budgeting", aligning food-related spending with environmental and social performance metrics.

Paris demonstrates how cities can use existing service delivery infrastructure – such as school canteens – to institutionalise sustainable food systems. By embedding food goals into education and environmental policy, the city achieves policy coherence and budgetary stability. The reliance on long-term procurement tools reduces vulnerability to political cycles and supports the transformation of regional food economies. Moreover, the integration of sustainability indicators into procurement evaluations ensures ongoing accountability and performance tracking (Blay-Palmer, Santini, Dubbeling, Renting, Taguchi, & Giordano, 2018).

Paris's case underscores that UFPs can be a lever for systemic change when linked with durable municipal functions and funding flows. The city's experience provides a model for institutionalising food sustainability within broader public service and climate agendas.

4.1.4 Belo Horizonte (Brazil) – Institutional pioneering in urban food security

Belo Horizonte has long been considered a global pioneer in local food governance. Since the 1990s, the city has demonstrated a proactive and holistic approach to tackling food insecurity, creating one of the earliest examples of an institutionalised UFPs framework. The cornerstone of its strategy was the establishment of the Municipal Secretariat for Food and Nutritional Security (SMASAN), which integrated food policy across multiple domains, including social protection, public health, and rural development (Rocha & Lessa, 2009).

Belo Horizonte's approach combined diverse mechanisms to improve access to food while supporting local producers:

(1) Price-regulated markets and public retail outlets (Sacolões Populares), which sold fruits, vegetables, and staple items at government-subsidised prices, making nutritious food more affordable for low-income residents.

(2) Subsidised public restaurants (Restaurantes Populares) providing balanced meals at a low cost to vulnerable populations, with a strong emphasis on dignity and nutrition.

(3) Support to smallholder farmers, especially from the surrounding rural areas, through public procurement contracts, technical assistance, and infrastructure development. These measures helped

ensure stable markets and prices for producers, encouraging local agroecological transitions (Grisa & Schneider, 2014).

Belo Horizonte's food policy was predominantly financed through municipal budget allocations, with key support from federal programs in its early years, particularly under the broader national framework of Fome Zero (Zero Hunger). Funding covered infrastructure (e.g., food distribution centres, kitchens), staffing, and procurement contracts:

- the institutionalisation of SMASAN ensured that food policy had a permanent home within city governance, which allowed it to coordinate across sectors and programs;
- early alignment with national policies, including conditional cash transfer programs and rural development schemes, facilitated intergovernmental co-financing during the 2000s.

However, political turnover at both municipal and national levels in the 2010s exposed the vulnerability of this model. As federal support weakened and priorities shifted, the continuity and scale of Belo Horizonte's food programs were significantly challenged (FAO, IFAD, WFP, 2014).

Belo Horizonte illustrates the potential of including food policy within a dedicated city department to coordinate and sustain food systems interventions. It is one of the first cities to treat food security as a public good, rather than solely a welfare issue, and to connect it explicitly with urban planning and citizenship. At the same time, the Belo Horizonte experience highlights that even the most institutionally advanced models remain dependent on political will, fiscal stability, and multilevel governance support. Resilience in UFPs requires not only local leadership but also institutional safeguards and adaptable funding mechanisms.

4.1.5 Barcelona (Spain) – Leveraging climate innovation for UFPs

Barcelona stands out as a European city that has strategically aligned its UFPs with broader agendas on sustainability, climate innovation, and the circular economy. With the launch of its City Food Strategy 2030, Barcelona formalised a long-term vision focused on promoting an agroecological transition, fostering healthy and sustainable school meals, and embedding food circularity into urban metabolism (Ajuntament de Barcelona, 2020).

The City Food Strategy emphasises five pillars: food justice, sustainable production and distribution, health and culture, governance, and resilience. Notable initiatives include:

(1) Agroecological transition programs that support local, small-scale producers and aim to reduce the city's ecological footprint from imported and industrial food.

(2) School meal reforms that introduce seasonal, organic, and locally sourced ingredients, implemented through public procurement guidelines.

(3) Food circularity and waste reduction, via composting programs and partnerships with food recovery networks, which promote re-use and low-emissions systems.

Barcelona's leadership during its tenure as the World Capital of Sustainable Food in 2021, under the Milan Urban Food Policy Pact (MUFPP), catalysed to consolidate these actions and gain international visibility and institutional momentum (MUFPP, 2021).

Barcelona adopts a blended financing model, combining resources from:

- EU Green Deal and Horizon Europe funds, particularly those targeting climate innovation and urban resilience;
- municipal budget allocations, coordinated through the Climate Emergency and Food Policy units within the City Council;
- climate innovation funding mechanisms, including collaborations with the Barcelona Institute for Global Health and urban innovation platforms.

Barcelona also capitalised on its 2021 global role to attract international funding and stimulate co-investment from public-private partnerships. This has enabled the city to scale up pilots and institutionalise food policy within climate adaptation frameworks.

Barcelona exemplifies the introduction of food into climate and innovation agendas, demonstrating how food can be leveraged not only for health and equity but also for climate mitigation and economic transformation. The city shows how EU-level funding instruments can be harnessed to embed food systems within long-term urban planning and governance.

Barcelona's case also illustrates the importance of political framing: food is not treated as a niche welfare issue, but rather as a strategic lever for cross-cutting urban transitions – from environmental sustainability to education and economic innovation.

4.2 Normative case analysis (five criteria)

This normative evaluation applies five criteria to assess the depth, durability, and institutional coherence of UFPs financing in five global cities: Milan, Toronto, Paris, Belo Horizonte, and Barcelona (Table 1).

These criteria are:

Stability and duration of funding streams:

- Milan (strong) offers a stable multi-source funding model, combining a dedicated budget line with multi-year EU project funding (like Horizon 2020, URBACT). The balance between local and EU funds reduces dependency on political cycles.

- Toronto (moderate): Toronto shows a hybrid model, with core municipal health funding, but dependency on philanthropic sources (e.g., foundations like United Way) makes funding partially unstable and subject to external donor priorities.
- Paris (strong): Paris is highly stable, including food policy in public service budgets (especially through school canteens), secured by multi-year procurement contracts and green budgeting, ensuring long-term durability.
- Belo Horizonte (declining): Belo Horizonte pioneered stable funding with municipal and federal support, but recent political shifts risked stability, showing how governance turnover can threaten financial continuity.
- Barcelona (strong): Barcelona combines municipal funding with EU climate funds (e.g., Horizon Europe), achieving resilience but with some dependency on external European funds, which could fluctuate in future cycles.

Level of institutional inclusion:

- Milan (strong): It features a dedicated Food Policy Office reporting to the Deputy Mayor, showing deep institutional integration at a high political level.
- Toronto (moderate): Food policy is included in Toronto Public Health, offering legitimacy and stability, though a lack of a separate food unit could limit visibility and scope.
- Paris (strong): Paris avoids fragmentation by integrating food policy into core city services, especially education and environment, enhancing operational coherence.
- Belo Horizonte (strong): It pioneered a model via SMASAN, a dedicated secretariat coordinating food governance across sectors like social welfare and rural development.
- Barcelona (moderate): Includes food within the Climate Emergency and Food Policy units, aligning thematically but without a unified, autonomous food department, which could limit authority.

Degree of cross-sectoral integration:

- Milan (strong): Cross-sector integration ranges from education, health, environment, to social inclusion, ensuring food policies contribute to multiple urban objectives.
- Toronto (strong): Toronto excels at budgetary and programmatic integration across housing, planning, and public health, fostering whole-city approaches.
- Paris (strong): It uses public procurement strategically to link food with climate, health, and education, making food policy a lever for systemic change.

- Belo Horizonte (declining): Historically strong with public health and rural linkages, but cuts in recent years weakened cross-sector coordination.
- Barcelona (strong): It integrates food with climate action, circular economy (urban metabolism), and education, leveraging food policy for broader urban sustainability goals.

Transparency and stakeholder involvement:

- Milan (moderate): Engages NGOs in delivery (e.g., Food Waste Hubs) but lacks detailed participatory governance mechanisms, making citizen involvement less structured.
- Toronto (strong): It promotes structured civil society partnerships, blending public-philanthropic collaborations, offering inclusive, multi-stakeholder governance.
- Paris (moderate): It focuses on contractual relationships with suppliers and uses sustainability metrics, but co-governance and community engagement appear limited.
- Belo Horizonte (declining): Early participatory success (e.g., food councils) has declined, reducing civil society's formal role in governance.
- Barcelona (strong): It combines international leadership, local co-investment platforms, and network mobilisation, fostering a strong participatory environment.

Alignment with priority municipal strategies:

- Milan (strong): Aligns food with climate action, equity, and global commitments (e.g., Milan Urban Food Policy Pact), promoting international leadership.
- Toronto (strong): It integrates food policy with public health (chronic disease prevention) and social equity agendas, embedding food in health-driven policy frameworks.
- Paris (strong): it includes food policy in the Sustainable Food Plan, tightly connected to climate, health, and social goals, reinforcing inter-sectoral alignment.
- Belo Horizonte (strong): Historically aligned with Fome Zero (Zero Hunger) and poverty alleviation programs, tying local food policy to national development goals.
- Barcelona (Strong): It links food initiatives with the EU Green Deal, climate emergency responses, and urban innovation policies, ensuring food policy supports city-wide transformations.

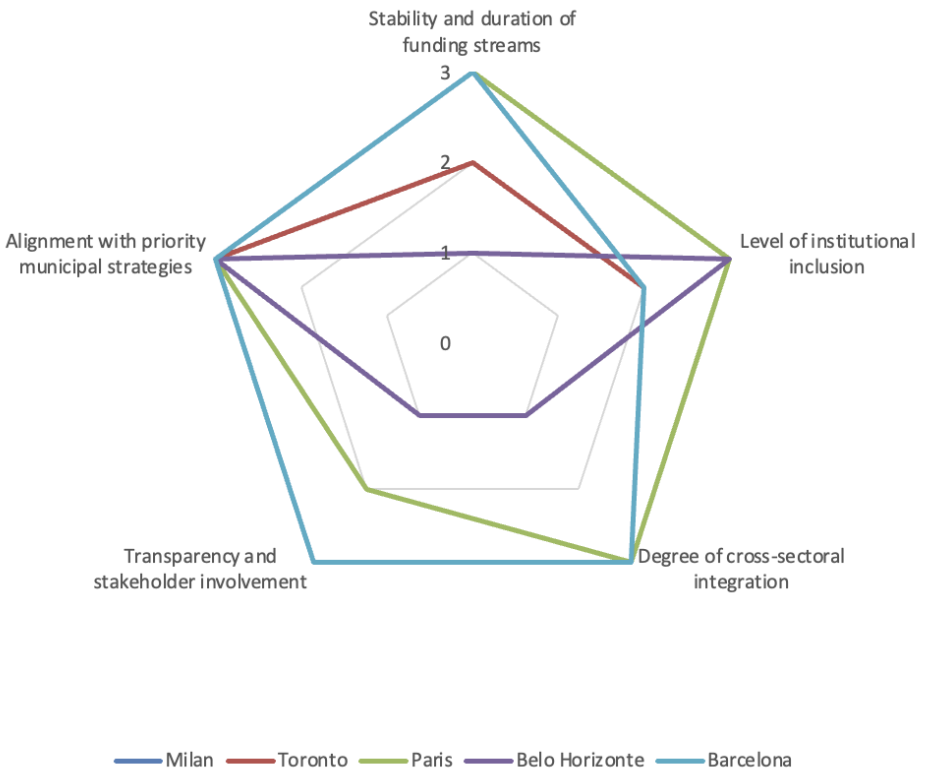
Summarised, these results are represented graphically in Figure 1.

Table 1 – Results of the normative case analysis

Criteria	Milan	Toronto	Paris	Belo Horizonte	Barcelona
Stability and duration of funding streams	**S – strong** It demonstrates a highly stable financing model, combining a dedicated municipal budget line with multi-year EU funds (e.g., Horizon 2020, URBACT).	**M – moderate** It adopts a hybrid model: core funding is embedded in the municipal health budget, but significant reliance on philanthropic grants introduces some instability.	**S – strong** It excels by integrating food into long-term public service budgets (notably school canteens), backed by multi-year procurement contracts and green budgeting practices.	**D – declining** It relied on municipal and federal funds during its peak years, but political turnover weakened funding continuity, highlighting the model's vulnerability.	**S – strong** It blends local funding with strategic EU climate financing (e.g., Horizon Europe), offering a resilient yet somewhat externally contingent structure.
Level of institutional inclusion	**S – strong** It features a Food Policy Office directly reporting to the Deputy Mayor, indicating full integration within city governance.	**M – moderate** It embeds food governance in Toronto Public Health, ensuring legitimacy but lacking a standalone food department.	**S – strong** It integrates food into core municipal units, notably education and environmental services, avoiding fragmentation.	**S – strong** It pioneered this model with SMASAN, a dedicated secretariat coordinating across social and rural domains.	**M – moderate** It coordinates through the Climate Emergency and Food Policy units within the City Council, ensuring thematic alignment but not a unified food department.
Degree of cross-sectoral integration	**S – strong** It coordinates food with education, health, environment, and social sectors coordinates food with education, health, environment, and social sectors.	**S – strong** It exemplifies integrated budgeting and program delivery across housing, planning, and public health.	**S – strong** It uses procurement to align food with climate, health, and education goals.	**D – declining** It connected food to public health and rural development, though recent cutbacks reduced integration.	**S – strong** It explicitly links food with climate, urban metabolism, and education.
Transparency and stakeholder involvement	**M – moderate** It involves NGOs in implementation (e.g., Food Waste Hubs), but governance processes are less detailed.	**S – strong** It features structured partnerships with civil society and philanthropy (e.g., United Way), encouraging participation.	**M – moderate** It employs supplier contracts and sustainability metrics, though community co-governance is less emphasised.	**D – declining** It initially enabled civil society engagement but has seen declines in participatory mechanisms.	**S – strong** It mobilises networks through international leadership and aligns programs with co-investment platforms.
Alignment with priority municipal strategies	**S – strong** It aligns food policy with climate, equity, and international diplomacy (MUFPP).	**S – strong** It integrates food into chronic disease prevention and social equity.	**S – strong** It embeds food into its Sustainable Food Plan, part of its broader climate and health agenda.	**S – strong** It aligned with Fome Zero and national poverty reduction plans.	**S – strong** It links food policy with the EU Green Deal, climate emergency, and innovation.

Source: Author's elaboration

Figure 1 – Graphic representation of normative case analysis results



Source: Author's elaboration

Paris looks quite strong and consistent. It reaches the outer edge (3) across most axes and has strong, balanced performance. Belo Horizonte has shorter lines towards the centre (closer to 1), showing weaker or declining performance on most criteria. Toronto seems moderate in most areas, peaking in cross-sector integration but falling short in institutional embedding and funding stability. Milan and Barcelona are strong across most dimensions, with some specific dips (e.g., Milan in stakeholder involvement, Barcelona in institutional embedding). More generally, Southern European cities (Milan, Barcelona) show strong political and financial embedding, but Barcelona has more external dependence. Toronto performs well on social equity and participation, but funding volatility remains a weakness. Paris demonstrates systemic institutionalisation, especially via public procurement. Belo Horizonte represents a declining case, illustrating risks when political changes disrupt food governance.

4.3 Typology of financing models

Urban Food Policies (UFPs) face persistent challenges in achieving long-term financial sustainability. Their implementation often begins with small pilot projects or time-bound programs, dependent on soft money and external donors. This section lists typologies of financing models observed across cities of this analysis.

4.3.1 Internal municipal funding

A growing number of cities have succeeded in including food policy into their core municipal operations, allocating dedicated resources within departmental budgets. Milan is one of the leading examples in this category. Since launching its food policy in 2015, the city has progressively integrated food-related activities into the budgets of departments such as environment, education, and social services. In Paris, the Department of Clean Water (Direction de la propreté et de l'eau) contributes budget lines to the food strategy.

4.3.2 Cross-departmental integration

Toronto represents a sophisticated case of cross-departmental integration. The Toronto Food Strategy is housed within Toronto Public Health, reflecting the city's framing of food as a determinant of health. Rather than functioning as a standalone unit, the food strategy coordinates programs across health, social services, and community development, and leverages budget allocations from these departments.

4.3.3 Green/climate funding and EU support

With the increasing alignment between food systems and environmental policy, some cities have tapped into climate-related or EU sustainability funding streams to support food initiatives. Barcelona has leveraged climate adaptation funding to promote agroecology and local supply chains through its municipal action plan. Similarly, Milan has accessed EU Green Deal and cohesion policy funds to support school food procurement reform and urban agriculture initiatives.

4.3.4 Donor and philanthropic dependence and transition risks

In many global South cities, UFPs have emerged with the strong support of international donors and philanthropic actors. While these efforts created a positive start, cities often face difficulties sustaining activities once the initial funding ends.

4.3.5 Participatory and procurement-based models

Some cities are pioneering participatory models that align food policy financing with community engagement and procurement reforms. Paris has launched multi-year procurement contracts that favour local, organic producers and create stable markets for agroecological food. These contracts are not only financial instruments but also tools for advancing social and environmental objectives. Participatory budgeting initiatives have enabled communities to allocate small but meaningful resources toward food projects.

The typology presented above illustrates the range of financing pathways available for UFPs. Each model offers distinct advantages and trade-offs, influenced by local political economy, institutional maturity, and the framing of food in urban governance. Cities may adopt hybrid approaches, combining internal funding, external grants, and participatory tools to build resilient financing architectures.

5 Conclusions

Urban Food Policies have emerged as important tools for cities aiming to address intersecting challenges of sustainability, health, equity, and resilience. The experiences of Milan, Toronto, Paris, Belo Horizonte, and Barcelona provide rich empirical insights into the enabling conditions that allow these policies to mature and scale. Across all cases, three institutional features – strong political sponsorship, legal formalisation, and competent administrative structures – are consistently associated with more stable and sustainable food policy financing. These features allow cities to leverage hybrid funding models that combine municipal budgets with external funds (e.g., EU or philanthropic support), while including food governance in long-term urban planning.

Milan, Paris, and Barcelona are examples of how internal budget lines and legal structures can create durable frameworks, while Toronto and Belo Horizonte demonstrate the risks and adaptive potential of less formal or more decentralised models. The comparative lesson is clear: financial

sustainability in UFPs is not just about where money comes from, but about how institutional structures shape the capacity to attract, allocate, and sustain it over time.

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Yes, it is Insects: Psychological and Sensory Determinants of Consumer Responses to Insect-Based Pasta

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Abstract

The ecological issues associated with traditional farming practices underscore the need for creative alternatives that can reliably meet food demand while reducing environmental impact. Currently, insect-based food production offers a sustainable alternative to traditional livestock farming due to their minimal resource requirements and lower greenhouse gas emissions. However, the success of such alternatives depends not only on their sustainability but also on consumer willingness to accept them. To enrich the existing literature on consumer acceptance of insect-based foods, this study aimed to identify the key psychological and sensory factors influencing consumer attitudes and behaviors, using a structured questionnaire administered to a sample of 755 Italian consumers. The results showed that expected taste is the main driver of desire to eat insect-based products. Perceived healthiness also increases willingness to try, while perceived risk and food neophobia reduce interest in these products. The results provide useful insights into the factors that drive positive attitudes toward entomophagy and the psychological barriers that influence consumer choice. In particular, presenting insect-based foods in ways that emphasize their taste appeal could be fundamental in promoting their consumption. Moreover, addressing safety concerns and educating consumers on the nutritional and environmental benefits of the product reduces adoption resistance based on food neophobia.

Keywords – Insect-based Food; Consumer Acceptance; Food Neophobia; Risk; Expected Taste.

Paper type – Academic Research Paper

Sommario

Sì, sono insetti: fattori psicologici e sensoriali alla base delle risposte dei consumatori sulla pasta a base di insetti – Le problematiche ecologiche legate alle pratiche agricole tradizionali evidenziano la necessità di soluzioni creative in grado di soddisfare in modo efficace la domanda alimentare, riducendo al contempo l'impatto ambientale. Attualmente, la produzione alimentare a base di insetti rappresenta un'alternativa sostenibile all'allevamento tradizionale, grazie al limitato fabbisogno di risorse e alle minori emissioni di gas serra. Tuttavia, il successo di tali alternative dipende non solo dalla loro sostenibilità, ma anche dalla disponibilità dei consumatori ad accettarle. Per arricchire la letteratura esistente sull'accettazione dei cibi a base di insetti da parte dei consumatori, questo studio si propone di individuare i principali fattori psicologici e sensoriali che influenzano atteggiamenti e comportamenti dei consumatori, attraverso un questionario strutturato somministrato a un campione di 755 consumatori italiani. I risultati mostrano che il gusto atteso è il principale fattore che determina il desiderio di consumare prodotti a base di insetti. Anche la percezione di salubrità aumenta la disponibilità a provarli, mentre la percezione del rischio e la neofobia alimentare riducono l'interesse verso questi prodotti. I risultati offrono indicazioni utili sui fattori che favoriscono atteggiamenti positivi nei confronti dell'entomofagia e sulle barriere psicologiche che influenzano le scelte dei consumatori. In particolare, presentare i cibi a base di insetti in modi che ne evidenzino l'attrattiva gustativa potrebbe essere fondamentale per promuoverne il consumo. Inoltre, affrontare le preoccupazioni legate alla sicurezza e informare i consumatori sui benefici nutrizionali e ambientali del prodotto contribuisce a ridurre la resistenza legata alla neofobia alimentare.

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1 Introduction

In recent years, the consumption of insects has become an increasingly discussed topic for the future of the global food system. As the global population continues to rise, projected to reach nearly 10 billion by 2050 (Gu et al., 2021), leading to a consequent increase in food demand (Van Dijk, Morley, Rau, & Saghai, 2021), the need for sustainable and efficient food production methods has never been more urgent. A key factor responsible for resource depletion and environmental degradation is represented by conventional agriculture methods which rely on significant water and soil use, fossil fuel consumption and monocropping practices (Carlsen, 2024; Foley et al., 2011; Tilman et al., 2001; Woods, Williams, Hughes, Black, & Murphy, 2010). Numerous studies have shown that existing farming techniques are unsustainable, underscoring the need for creative alternatives that may reliably provide food demands while having a lower environmental impact (Garnett et al., 2013; Searchinger et al., 2019; Steffen et al., 2015). To this regard, insect farming has been pointed out as an interesting and viable solution to these issues (Bless, Bastian, Gould, Yang, & Wilkinson, 2024).

Recent literature showed that insects offer a sustainable source of protein that can help diversify and improve a less environmentally degrading food production thanks to their high rates of reproduction, quick development cycles and ability to be raised in both urban and rural environments (Specht, Zoll, Schümann, Bela, Kachel, & Robischon, 2019; Verner et al., 2021). In particular, insect farming requires significantly fewer resources compared to traditional food production, with minimal land use, water consumption, and greenhouse gas emissions thus providing a compelling alternative option for food production (Van Huis, 2013; Van Huis, 2020; Van Huis & Oonincx, 2017). In contrast, livestock farming is known for its substantial contributions to greenhouse gas emissions, deforestation, loss of biodiversity, and water resource depletion (Abbasi & Abbasi, 2016; Henchion, Hayes, Mullen, Fenelon, & Tiwari, 2017; Van Huis & Oonincx, 2017). For example, producing one gram of cricket protein requires approximately 23 liters of water, a stark reduction compared to the 112 liters needed to produce the same amount of beef protein (Miglietta, De Leo, Ruberti, & Massari, 2015). Moreover, the crude protein content of edible insects exceeds that of both animal and plant protein sources (Hasnan, Feng, Sun, Parraga, Schwarz, & Zarei, 2023; Pereira & Vicente, 2013). Insects are also rich in essential amino acids, omega-3 and omega-6 fatty acids, iron, zinc, and dietary fiber, positioning them as a nutritionally valuable food source (Nowakowski, Miller, Miller, Xiao, & Wu, 2022). Lastly, 80% of an insect's body weight is edible, which is double that of cattle (Nakagaki & Defoliart, 1991). Another key factor to consider is the versatility of insect-based foods which further highlights their potential for a more widespread adoption. In fact, insects can be processed into powders or pastes for incorporation into a diverse range of food products, from snacks and protein bars to more traditional dishes like pasta

(Melgar-Lalanne, Hernández-Álvarez, & Salinas-Castro, 2019). Based on these evidence, one can confidently suggest that increasing the consumption of insects in global diets could significantly help in reducing the negative environmental impact of traditional farming while also improving the nutritional security of communities (Van Huis, 2013).

Currently, insect consumption is a common practice for at least 2 billion people across 128 countries (Omuse et al., 2024; Tang et al., 2019) with more than 2.000 edible species worldwide (Henchion, Hayes, Mullen, Fenelon, & Tiwari, 2017). Insect-eating traditions are deeply embedded in Asia, Africa, and Latin America populations for centuries (Florença et al., 2022; Henchion, Hayes, Mullen, Fenelon, & Tiwari, 2017), as they represent a perfect nutritious and sustainable alternative to traditional food sources (Costa-Neto, 2015; Smith, Stull, Patz, & Myers, 2021). On the contrary, in many Western countries, the concept of eating insects or insects-based products is often met with skepticism or outright rejection, largely due to the perception of such products as not being part of cultural traditions (Herbert & Beacom, 2021; Raheem et al., 2019) or because of food neophobia (the fear of trying new foods) and feelings of disgust (Wendin & Nyberg, 2021). The factors mainly identified as contributing to the disgust toward insects are varied, encompassing their sensory properties such as texture, as well as the perception of potential harm and the societal stigma to consuming insects (Ardoin & Prinyawiwatkul, 2021).

Although not all consumers are willing to embrace insect-based food (Puteri, Oehlmann, & Jahnke, 2024; Sogari, Menozzi, Hartmann, & Mora, 2019), in recent years the environmental advantages of entomophagy have received more attention. Producers are particularly focused on developing products based both on the mere use of simple raw materials (e.g., dried whole insects) and on more sophisticated foods items (such as protein bars, crackers, bread) (Melgar-Lalanne, Hernández-Álvarez, & Salinas-Castro, 2019), and regulations have been supporting their integration in European countries (Mancini, Sogari, Espinosa Diaz, Menozzi, Paci, & Moruzzo, 2022; Papastavropoulou, Xiao, & Proestos, 2023). The European Food Safety Authority (EFSA) has taken steps to regulate the introduction of insects into the food market under its “novel food” framework, which comprises products with no significant history of consumption in the European Union prior to May 15, 1997. These regulations aim to ensure consumer protection while fostering innovation in the food industry by requiring rigorous safety assessments for such insect-based products attempting to spread their presence in European diets.

In view of the intricacy of insect food consumption decisions, investigating the psychological and sensorial factors underlying such decisions is a crucial area of study beneficial for the academic, industrial and retail segments. To address this issue, an empirical research was carried out to assess both positive and negative factors which could influence consumers’ attitudes and aversion toward

insect-based pasta. The proposed structural model has been developed to encompass several key dimensions that can encourage or hinder the consumer behavior toward food, which are integrated into a flow of causal relationships: product perceived healthiness and quality, expected taste, food neophobia, perceived risk, desire to eat, and purchase intention.

The risk associated with the consumption of a specific food, as well as the aversion to novel foods, have been pivotal elements in numerous studies that have sought to identify which variables influence behaviors related to food consumption. Food neophobia, a personality trait, manifests as an unwillingness to consume unfamiliar foods, consequently decreasing one's desire for them. (Dematte, Endrizzi, & Gasperi, 2014; Dovey, Staples, Gibson, & Halford, 2008; Stoica & Alexe, 2016). Neophobia has several implications for dietary diversity and nutrition as it restricts the adoption of new food sources, thus limiting the range of nutrients in the diet (Cooke, Wardle, & Gibson, 2003; Galloway, Lee, & Birch, 2003; Lafraire, Rioux, Giboreau, & Picard, 2016; Siegrist, Hartmann, & Keller, 2013). This tendence of neophobic consumers to exhibit negative attitudes and less pleasure in relation to new products (Barrena & Sánchez, 2013), can also be observed in the case of insect-based foods (Padulo, Carlucci, Balsamo, & Fairfield, 2022); high food neophobia can decrease an individual willingness to consume these products as they challenge traditional eating patterns and make it harder for consumers to accept them. Similarly, consumers could be generally less inclined to purchase insect-based products when they perceive them as linked to health or contamination risks. In other words, higher levels of perceived risk are expected to deter consumers from purchasing insect-based products. Perceived risk is a cognitive process that has attracted significant attention due to the crucial role it plays in different contexts, including the purchase decision-making context (e.g., Hunter-Jones, Jeffs, Smith, 2008; Kwun & Oh, 2004; Pillai, Kim, Haldorai, & Kim, 2022; Stone & Grønhaug, 1993). The existing literature has demonstrated that the association of a product with a high risk of poor quality or healthiness can, in fact, exert a negative influence on individuals' purchasing behavior (e.g., Bhukya & Singh, 2015; Hornibrook, McCarthy, & Fearne, 2005; Nguyen, 2019). Considering these reasonings, it is hypothesized that food neophobia and the risk associated with insect-based foods act as deterrents to the consumption of such foods. Moreover, a direct relationship between neophobia and risk is expected: the greater the general aversion to trying new or unfamiliar foods, the greater the perception that new products such as those based on insect flour generate tension and concern, which in turn results in a greater attribution of risk. More formally, the following hypotheses are formulated:

H1. Perceived risk toward insect-based foods negatively impacts purchase intention.

H2. Food neophobia negatively impacts the desire to eat insect-based foods.

H3. Food neophobia increases perceived risk toward insect-based foods.

The other set of antecedents of behavioral intention toward insect flour-based foods concerns the consumers' judgment of quality, healthiness and taste of these products.

Perceived quality measures the consumer's assessment of the overall excellence or superiority of a product (Anselmsson, Johansson, & Persson, 2007; Grunert, 2005; Zeithaml, 1988). Literature has highlighted that the quality expectation associated with different alternatives of a product is an important factor in the choice process, which positively influences purchase intention and customer satisfaction (e.g., Narasimhan & Sen, 1992; Saleem, Ghafar, Ibrahim, Yousuf, & Ahmed, 2015; Steenkamp & Van Trijp, 1996; Tsiotsou, 2006). On the contrary, a negative relationship has been observed between perceived product quality and perceived risk (Beneke, Flynn, Greig, & Mukaiwa, 2013). In light of these considerations, if a high perception of risk associated with the use of a new food product reduces the purchase intention, perceived quality may work in the opposite direction, favoring the choice process. Therefore, it is expected that a higher perceived quality of insect-based products will lead to greater interest and consumption intention, positively influencing consumers' willingness to try them. On the contrary, higher judgments of product quality are expected to lower the risk consumers associate with consumption.

H4. Perceived quality positively impacts the desire to eat insect-based products.

H5. Perceived quality negatively impacts perceived risk with regard insect-based foods.

Perceived healthiness underlies the idea that a product offers nutritional advantages promoting the general well-being (Howlett, Burton, Bates, & Huggins, 2009; Plasek, Lakner, & Temesi, 2020). It has a significant impact on consumer acceptance (de Mello Marsola, de Carvalho Ferreira, Medina, & da Cunha, 2025; Lähteenmäki et al., 2010; Temesi, Bacsó, Grunert, & Lakner, 2019): foods that are perceived to make a positive contribution to health are expected to reduce the sense of risk associated with their consumption. Consequently, when consumers perceive a product as healthy, they are more likely to express an interest in trying it. For instance, insect-based foods, which are rich in protein, vitamins, and minerals, and low in saturated fat, may reduce risk perceptions if they are seen as a healthy alternative to other traditional animal protein sources. A study from Hartmann and Siegrist (2016) suggested that the perception of nutritional benefits of insect-based foods may encourage health-conscious individuals to try them. In the present study, it is expected that higher judgments of the healthiness of insect-based foods will reduce consumers' risk perceptions and increase their propensity to try these products. Therefore, the following hypotheses are proposed:

H6. Perceived healthiness reduces perceived risk toward insect-based foods.

H7. Perceived healthiness positively impacts the desire to eat insect-based foods.

Food expected taste is defined as a sensory attribute that incorporates the chemical senses of taste and olfaction, as well as the oral perception of texture (Drewnowski, 1987; Moskowitz, 1978). Previous research has suggested that sensory expectation exerts a significant influence on food choices (Chen & Antonelli, 2020; Clark, 1998; Drewnowski, 1997; Li, Wang, Ruan, Pan, & Huang, 2024; Piqueras-Fiszman & Spence, 2015). For instance, Paakki, Kantola, Junkkari, Arjanne, Luomala, and Hopia (2022) and Raghunathan, Naylor, and Hoyer (2006) demonstrated that consumers having a strong "unhealthy = tasty" belief are less likely to choose healthy food. This association between taste expectation and consumption decisions is expected to be particularly important when investigating novel products such as insect-based foods, where preconceived ideas about flavor and texture can greatly influence the willingness to purchase and try such products (Halonen, Uusitalo, Levänen, Sillman, Leppäkoski, & Claudelin, 2022; Kane & Dermiki, 2021). Consequently, the next hypothesis assumes a direct and positive relationship between taste expectation and purchasing and consumption intention.

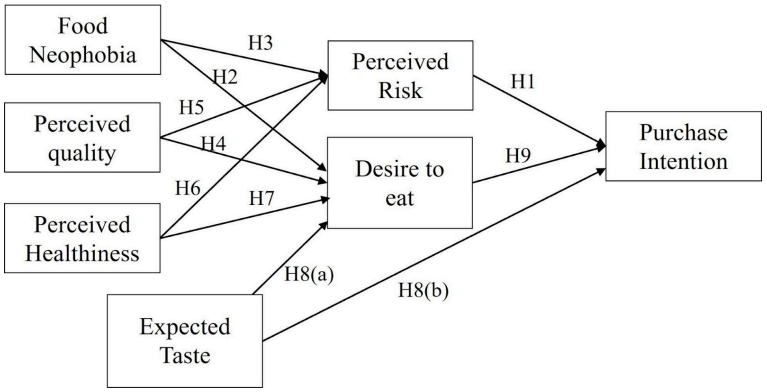
H8. A better taste expectation of insect-based foods has a positive impact on both (a) the desire to eat the product and (b) purchase intention.

Finally, a direct relationship has been hypothesized between the desire to taste the product and the intention to purchase. Motivation and curiosity often drive consumers to buy the products they are interested in (Ajzen, 1991) thus enthusiasm for trying insect-based foods may signal openness to incorporate them into purchasing habits. Therefore, it is expected that when consumers express a strong willingness to try insect-based foods, they are more likely to buy them.

H9. The desire to eat the product positively influences purchase intention toward insect-based foods.

The proposed theoretical model is illustrated in Figure 1.

Figure 1 – Conceptual model and research hypotheses



Source: Authors' elaboration

2 Methodology

The empirical analysis is based on a structured questionnaire administered to a sample of Italian consumers who do not adhere to a vegan or vegetarian diet and with no prior experience with insect-based foods. The interest in this country is motivated by the fact that, although the EU has approved the sale of insects for human consumption, nowhere in Europe is there more resistance to eating insects than in Italy (PanoramItalia, 2023).

The survey was created using the Google Forms platform and launched in May 2024. Respondents were recruited through an informative post on selected social network accounts and instant messaging platforms such as Facebook, Instagram, and WhatsApp. A total of 755 consumers were reached (62% female, 38% male; mean age = 32; age range = 18 – 86). The majority of individuals are graduates (56%), 37% have a high school diploma while 7% attended primary and secondary schools. Informed consent was obtained in accordance with ethical standards set out by the Declaration of Helsinki and with the guidelines for scientific research of the authors' University. After giving their consent to the study, participants were first shown a package of pasta made with insect flour. In order to reduce potential bias due to brand familiarity, an unbranded packaging design was employed. A claim indicating that the product was made of insect flour was added to the other front-of-pack elements, namely, type of pasta, cooking time and weight. After viewing the image for a self-determined amount of time, respondents were asked to answer the questionnaire by referring to the observed product.

The latent variables in the model were measured using scales that have been developed and validated in the literature and have been partially adapted to align with the objectives of the study. Food

neophobia was measured using the 10-item scale by Pliner and Hobden (1992). For detecting perceived healthiness and perceived quality the scales developed by Steptoe, Pollard, and Wardle (1995) and Kulikovski, Agolli and Grougiou (2011), respectively, were employed. Perceived risk was measured through the four items developed by Keh and Pang (2012), while the desire to eat through the 3-item scale of La Barbera, Verneau, Videbæk, Amato, and Grunert (2020). Finally, expected taste and purchase intention were investigated using the items proposed by Raghunathan, Naylor, and Hoyer (2006) and Van Rompay, Fransen, and Borgelink (2013), respectively. All statements were presented on a 7-point anchored scale (from 1 = "completely disagree", to 7 = "completely agree", except for *expected taste* scale which ranged from 1 = "not at all", to 7 = "very much").

To mitigate potential common method variance (CMV) associated with the use of self-reported measures, several procedural remedies were implemented during the questionnaire design phase. Firstly, an introductory message was used to assure respondents of the anonymity and confidentiality of the study (Chang, Van Witteloostuijn, & Eden, 2010). Secondly, questions were carefully designed to promote clarity and enhance respondents' understanding (Podsakoff, MacKenzie, Lee, Podsakoff, 2003). Thirdly, following the suggestion by Chang, Van Witteloostuijn, and Eden (2010), the order of some items was randomized to prevent interviewees from perceiving the detailed content of each construct.

The analysis was conducted in two stages. First, confirmatory factor analysis (CFA) was used to examine the validity and reliability of the constructs by estimating the measurement model. Second, the paths of relationships among the latent variables were explored. For the analysis of the measurement model and the conceptual model, structural equation modelling (SEM) was carried out using the LISREL software (release 8.80).

3 Results

3.1 Test of the measurement model

As the normality assumption was violated, according to the skew and kurtosis statistics, the measurement model was estimated using the Satorra-Bentler method (Satorra & Bentler, 1994). The analysis revealed that all items exhibited strong and significant factor loadings, except for two items of the food neophobia "ethnic food seems too strange to eat", "I'm very particular about what I eat") that negatively contributed to the validity of the scale. The Average Variance Extracted value (AVE = 0.394) did not exceed the acceptability thresholds for construct's validity and discriminant validity and the

model fit indices were not satisfactory. Consequently, the two items were removed, and the measurement model was re-estimated.

Table 1 – Items of the questionnaire and validity and reliability indexes

Construct	Items	Authors	AVE	CR
Food neophobia	I am always trying new and different foods (R) I don't trust new foods If I don't know what a food is, I won't try it I like food from other cultures (R) I will try new foods at dinner parties (R) I am afraid of eating things I have never eaten before I will eat almost anything (R) I like to try new ethnic restaurants (R)	*Pliner & Hobden (1992)*	0.589	0.853
Perceived quality	Insect-based food is high quality I think insect-based products are of higher quality than conventional foods Insect-based foods are less associated with health risks I think I get higher quality products with insect-based foods	*Kulikovski, Agolli, & Grougiou (2011)*	0.782	0.935
Perceived healthiness	*I think insect food...* has lots of vitamins and minerals keeps me healthy is nutritious is rich in protein is good for skin/teeth/hair/nails is rich in fibre	*Steptoe, Pollard, & Wardle (1995)*	0.779	0.955
Expected taste	How tasty do you think this type of pasta would be? How much do you think you would like to eat this type of pasta?	*Raghunathan, Naylor, & Hoyer (2006)*	0.862	0.926
Perceived risk	The thought of buying this product makes me feel uncomfortable The thought of buying this product gives me a feeling of unwanted anxiety The thought of buying this product makes me feel tense The thought of buying this product worries me a lot	*Keh & Pang (2012)*	0.801	0.941
Desire to eat	I would be curious to try a dish of pasta with insect flour, if cooked well In special circumstances, I could try a dish of pasta made with insect flour At a dinner with friends, I would try new foods made with insect flour	*La Barbera, Verneau, Videbæk, Amato, & Grunert (2020)*	0.901	0.965
Purchase intention	I would consider purchasing this product I would recommend this product to friends I would like to try this product	*Van Rompay, Fransen, & Borgelink (2013)*	0.862	0.949

Note. The table reports the validity and reliability indexes, as well as the items, the scales and their authors.

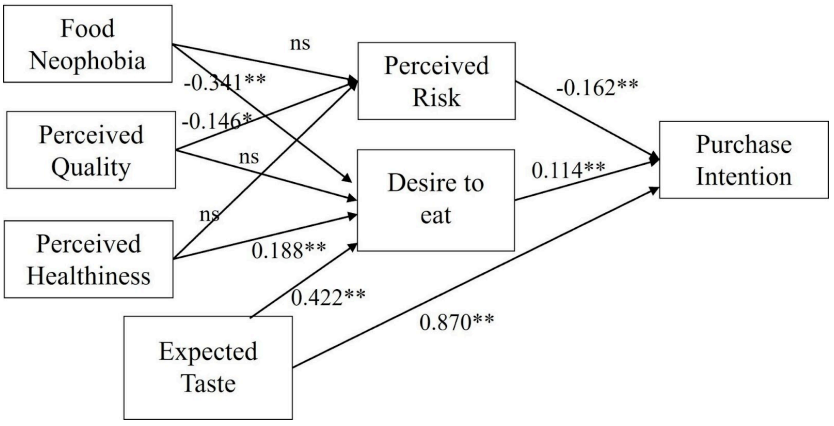
Source: Authors' elaboration

After the removal, the fit of the model was good: χ^2= 2878.749 (df=384); RMSEA=0.075; NFI=0.973; NNFI=0.975; CFI= 0.978; SRMR=0.090), all constructs exceeded the recommended cut-off points for the adequacy of 0.70 for the Composite Reliability (CR; Steenkamp & Van Trijp, 1996) and 0.50 for the Average Variance Extracted (AVE; Fornell and Larcker, 1981) (Table 1). Finally, accordingly to the Fornell and Larcker's (1981) criterion, the average variance explained by each latent variable was greater than any of the squared correlations involving the variable, thus suggesting that discriminant validity was achieved.

3.2 Test of the structural model

The analysis showed that overall, the structural model fits the data well (Satorra-Bentler χ^2= 2184.545, df=389; RMSEA=0.078, $p < 0.001$; NFI=0.971; NNFI=0.973; CFI= 0.976; SRMR= 0.103). Considering that fit indices can be affected by effects of violation of normality and independence (Schermelleh-Engel, Moosbrugger, & Müller, 2003), the overall pattern of indices suggests a valid approximation of the model to the data. Results from path coefficients (Figure 2) and t-values indicated that perceived healthiness ($\beta = 0.188$, $p < 0.01$), expected taste ($\beta = 0.422$, $p < 0.01$) and food neophobia ($\beta = -0.341$, $p < 0.01$) were significant drivers of desire to eat insect-based pasta, confirming H2, H7 and H8a. Specifically, while the first two variables had a positive effect on the desire to eat the product, as expected, neophobia acted as a deterrent. Conversely, only the perception of product quality can reduce the attribution of health risks associated with insect consumption ($\beta = -0.146$, $p < 0.05$), supporting H5, while the other antecedent variables had no significant influence on perceived risk. Finally, results confirmed H1, H8b and H9. Expected taste is the variable with the greatest impact on purchase intention ($\beta = 0.870$, $p < 0.01$), which is also mediated by desire to eat. Mediation analysis showed that the indirect effect of taste on purchase intention was significant (indirect effect: 0.048, CI [0.0249, 0.0740]). Desire to eat also exerted a positive impact on the intention to purchase pasta made with insect flour ($\beta = 0.114$, $p < 0.01$), while perceived risk negatively affects behavioral intention ($\beta = -0.162$, $p < 0.01$). Causal effects hypothesized in H3, H4 and H6 are not supported (see Table 2).

Figure 2 – Structural model with standardized coefficients



Source: Authors' elaboration

Table 2 – Summary of structural relationships with coefficients and status

	Hypothesized relationship	β coefficient (p value)	Status
H1	Perceived risk → Purchase intention	- 0.162 ($p < 0.01$)	Supported
H2	Food neophobia → Desire to eat	- 0.341 ($p < 0.01$)	Supported
H3	Food neophobia → Perceived risk	0.046 (n.s.)	Not supported
H4	Perceived quality → Desire to eat	0.066 (n.s.)	Not supported
H5	Perceived quality → Perceived risk	- 0.146 ($p < 0.05$)	Supported
H6	Perceived healthiness → Perceived risk	- 0.110 (n.s.)	Not supported
H7	Perceived healthiness → Desire to eat	0.188 ($p < 0.01$)	Supported
H8a	Expected taste → Desire to eat	0.422 ($p < 0.01$)	Supported
H8b	Expected taste → Purchase intention	0.870 ($p < 0.01$)	Supported
H9	Desire to eat → Purchase intention	0.114 ($p < 0.01$)	Supported

Source: Authors' elaboration

4 Discussion and conclusion

The present study was motivated by the following research questions: What psychological barriers hinder the consumption of insect-based foods? What are the factors that encourage it? The increased interest in this issue has been driven by the evidence demonstrating that current agricultural techniques are not sustainable and the consequent urgency to find alternatives that can reliably meet the demand for food while reducing environmental impact.

Although insects consumption is a common practice for millions of people around the world, other consumers are reluctant to include insects as a component of their diet due to cultural and psychological barriers. This study fits into this framework and aims to contribute to the existing body of research on consumer acceptance and interest in insect-based foods.

The results showed that the expected taste is the main driver of both the increased desire to eat insect-based pasta and the intention to purchase it. This demonstrates that predisposition toward the product is largely determined by the positive expectations that are automatically created in individuals before they even taste a food. Concurrently, other variables also play a role in influencing the judgment and interest in insect-based foods. Perceived healthiness increases the desire to taste them, while quality expectations reduce the perception of risk. Finally, food neophobia is confirmed as a deterrent to individual willingness to consume these products. Therefore, aversion to new foods, decreasing one's desire toward them, limits dietary diversity and nutrition. The results provide valuable theoretical and managerial insights by highlighting the positive and negative factors that can influence consumers' food choices and indicating potential avenues for further research.

The first aspect that deserves attention is that taste expectations play a crucial role in consumers' purchasing decisions, as demonstrated by previous research (e.g., Chen & Antonelli, 2020; Clark, 1998; Drewnowski, 1997; Goncikowska, Modlinska, Adamczyk, Altuntaş, Maison, and Pisula 2023; Li, Wang, Ruan, Pan, & Huang, 2024; Piqueras-Fiszman & Spence, 2015). Sensory expectation towards the product act as an important driver of purchase intention and desire to eat, with reference to a staple of Italian food tradition that is pasta. Therefore, it could have a fundamental role in making consumers more familiar with insect-based products and consequently reduce cultural resistance. This means that communication and launch strategies for insect flour-based products must focus on highlighting the similarity with traditional dishes, reducing the idea of a strong change in tastiness. It is important to emphasize the flavor and present both the product sensory features as well as organoleptic characteristics in a context that makes the product itself more appealing. For example, suggesting combinations with dishes or ingredients already known and appreciated in the local culture and emphasize the non-alteration of taste can facilitate acceptance and reduce initial resistance. In addition,

marketing communication must go beyond simple product promotion and serve as an educational tool. Providing clear and detailed information about the nutritional benefits of insect flour, such as their high protein content and sustainable attributes, can help allay any health concerns and overcome prejudice against non-traditional foods (Meng, Li, & Fan, 2024). It is also important to address consumer concerns about food safety by highlighting studies and certifications that demonstrate the absence of risks. Finally, an approach that encourages consumer engagement, such as tasting events or communication campaigns that encourage the sharing of positive experiences, can further strengthen trust and interest in these new products. This not only encourages a change in eating habits but also builds a community of informed and passionate consumers.

Another important aspect to consider is the role of consumer perception of quality and healthiness. These factors have a significant impact on the evaluation of and interest in insect food products: these findings confirm previous studies indicating that perceived quality influences perceived risk (Beneke, Flynn, Greig, & Mukaiwa, 2013) and perceived healthiness influences the desire to eat (Hartmann & Siegrist, 2016). Healthiness evaluation seems to be associated with individual benefits, such as vitamin/protein intake. This could explain its significant impact on the intention to consume the product rather than on risk, intended as a feeling of anxiety or worry towards the product. On the contrary, perceived quality refers to product excellence, such as, production processes and origin of ingredients, enhancing the product's perceived reliability, which significantly reduces the perceived risk towards insect-based food. To facilitate acceptance and encourage trial of such products, it is therefore crucial to actively work on improving the perception of their quality and wholesomeness. This may not only increase the desire to consume them but also help to reduce the perception of risk associated with their use. Several strategies can be implemented such as developing advertising campaigns and institutional initiatives that highlight not only the nutrition benefits of insect-based products, but also their positive impact on the environment. Clearly the communication of these benefits can help build a positive narrative around these foods, making them more attractive to consumers. In addition, communication strategies at the point of sale are of fundamental importance. Packaging, for example, can be a powerful communication tool that can convey implicit meanings and influence purchasing decisions. Investing in packaging design that clearly communicates the nutritional and environmental values of insect-based products is crucial to attract consumers and facilitate their choice when they are actually deciding at the point of sale (Silayoi & Speece, 2007).

Finally, food neophobia appears to be a significant barrier to considering insect-based products as a purchase alternative since it increases the perception of risk. This phenomenon is evident among consumers who show a certain reluctance to try new or unconventional foods, such as insect-based pasta, especially in cultural contexts where such foods are not traditionally accepted. These results

confirm the role of food-neophobia in modulating consumer liking as reported in previous findings examining consumers perception of non-insect based protein-rich products (Fantechi, Contini, & Casini, 2023; Grahl, Strack, Mensching, & Mörlein, 2020). A group of consumers, referred to as “laggards”, tends to remain anchored to their eating habits and can approach these new products only when they become widely available and accepted in the market. On the other hand, early adopters, who are more likely to experiment and embrace innovation, represent a crucial segment for marketing strategies. Not only can these consumers be the first to try insect-based products, but they can also act as ambassadors, becoming an important word-of-mouth channel. Their positive experiences can influence other consumers, reducing the negative perception associated with food neophobia and facilitating greater acceptance.

It is worthwhile for managers and marketers to develop strategies that not only target early adopters but also address the concerns of late adopters. This could include educational campaigns that highlight the nutritional and environmental benefits of these products, as well as ensuring that they are presented in familiar and appealing ways. This is the only way to overcome the barriers of food neophobia and encourage greater market penetration.

In summary, successfully encouraging the consumption of insect flour-based products requires an integrated approach that combines effective communication, strategic marketing and product design in order to build a positive and reassuring perception that can lead to greater consumer acceptance and consumption.

5 Limitation and future research agenda

In addition to literature and managerial contributions, the paper opens the discussion to future research perspectives. Several avenues for future research appear promising that could help improve the acceptance of insect meal products.

First, this study specifically focused on Italian consumers and a specific product rooted in the nation culinary culture, limiting the generalizability of the findings to other cultural settings and food categories. Therefore, these results should be interpreted with specific reference to the country under investigation and cautiously compared to other cultural contexts as well as other insect-based products As food products are deeply embedded in cultural traditions, these play a crucial role in shaping consumer choice and consumption behaviors. Future research should broaden its scope to include cross-national and cross-category comparisons in order to identify potential cultural differences in the acceptance and perception of insect-based foods.

Second, since expected taste is a key factor in food choice, future research could focus on how taste expectations are shaped by prior experiences, whether through direct consumption or exposure to marketing communications. In this regard, studies could examine the impact of branding, packaging, labelling and product claims on shaping taste expectations and, consequently, consumer willingness to try insect-based foods. In addition, an experimental design including a tasting test would allow the measurement of actual taste perception beyond expected taste, providing a more comprehensive understanding of how sensory experiences influence consumer attitudes and purchase intentions.

Thirdly, food neophobia is a significant barrier to the acceptance of insect-based foods. Future research could focus on this aspect and investigate potential strategies to reduce aversion to novel foods, particularly those made from insect meal. This could include exploring the psychological mechanisms behind disgust, fear and food neophobia, as well as identifying effective interventions to overcome these barriers.

Another important aspect to explore is the effectiveness of communication campaigns to identify the most persuasive messages to encourage consumers and reassure them about the safety and quality of insect-based products. Future research could test different communication approaches to determine which ones generate greater interest and acceptance. Specifically, studies could compare the impact of messages that: (a) emphasize the nutritional benefits of the product, particularly its high protein content and essential nutrients, (b) focus on taste attributes, reassuring consumers about flavor expectations and positive eating experiences, (c) emphasize sustainability benefits, underlining the environmental advantages, such as reduced resource consumption and lower carbon emissions. By comparing these approaches, future research could provide valuable insights for designing more effective marketing communication strategies that enhance consumer acceptance of insect-based products.

Finally, the proposed model in this study could be tested in different market segments to gain a deeper understanding of consumer adoption dynamics. In particular, distinguishing between early and late adopters is crucial, as these groups may have different motivations and barriers that influence their willingness to accept insect-based products. In addition, a consumer segmentation approach could help identify other key target audiences, such as health-conscious consumers, environmentalists or protein-seekers, who may be more inclined to adopt these products.

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