

Relationships, sustainability and agri-food purchasing behaviour in farmer markets in Italy

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Abstract

Purpose – The study aims to demonstrate that farmers' markets can represent a model of environmental, social and governance reference for modern agri-food systems facing the challenge of post COVID-19 pandemic reconstruction, responding to consumer expectations in terms of health, safety and wholesomeness of agri-food products.

Design/methodology/approach – A sample of consumers was surveyed in farmers' markets and social network analysis (SNA) was adopted as a methodological approach to reconstruct the links between the worlds of production and consumption and to derive the relative importance attributed to various factors that promote relational structures.

Findings – The work demonstrates the importance of sustainability – as a productive and behavioural model of firms – for the construction of efficient and durable relationship systems in two farmer markets in Sicily. In particular, four fundamental components emerge in the construction of networks represented by consumer sensitivity to sustainability processes, the individual behavioural model of purchasing and consumption, the expectation of political direction and the level and factors of knowledge of the firm. The clustering elements of the relationships were found to be the territory and local products, the environmentalist attitude and the protection of resources, as well as the adoption of a rational waste disposal policy, the fight against food waste, the encouragement of healthier and more sustainable consumption styles, clear and transparent communication and the activation of sustainable supply chain processes in line with the Sustainable Development Goals (SDGs).

Originality/value – The paper aims to demonstrate how alternative food systems can become a useful model for large enterprises, which are committed to rebuilding their business strategy to overcome the current crisis.

Keywords Alternative food networks, Social network analysis, Consumer, Health food, Green innovation in production and distribution

Paper type Research paper

1. Introduction

The recovery of the global economy in the post COVID-19 pandemic era will see the role of the green economy emphasised, requiring increasingly widespread innovations in production/processing/distribution but also in consumption to facilitate resilience, transition and reconstruction of economies (Di Marco *et al.*, 2020).

The societies of the future will thus be called upon to become increasingly inclusive and sustainable, thanks also to green innovations (Abu Hatab *et al.*, 2021). This process does not



exclude agriculture, a sector that at European level seems to be the recipient of the innovations envisaged by the “Green Deal EU” strategy and the related strategies “Biodiversity 2030”, “From farm to fork” and “Action plan for the circular economy”. These strategies will be more or less widely implemented within the CAP reform for the next programming period until 2027 (Cesaro *et al.*, 2020; Peeters *et al.*, 2020).

However, the political discussion on the future of the CAP is still in progress and although some preliminary documents hint at this green perspective, the final agreement will be the result of mediation between the EU Parliament and the EU Commission and, therefore, of the confrontation between the interests of governments, who want to regain lost positions in terms of the real economy, and citizens, who have rediscovered a great interest in environmental issues (ASviS, 2019; Pe’er *et al.*, 2020).

As a result of the above, it is clear that the green transition is now strongly conditioned by the consequences of the pandemic crisis and the effects produced by concerns about food security, rising supply chain and logistics costs, and radical changes in consumer behaviour (Rejeb *et al.*, 2020; Wang *et al.*, 2020; Savary *et al.*, 2020). As the world’s population fears for its vulnerability, awareness of the consequences of human behaviour on the environment, health and food consumption has increased (Farcas *et al.*, 2021); awareness of food waste and the importance of home-grown food has also increased (Gupta *et al.*, 2020; Rejeb *et al.*, 2020).

In this context, consumers, particularly in advanced countries, are increasingly interested in products (and packs) that are hygienically safe and able to guarantee hygiene and prevention, in healthy and health products to achieve higher levels of personal and environmental well-being (Caron *et al.*, 2018); finally, consumer interest in local products and localism is growing (Nomisma, 2020; Hobbs, 2020).

Therefore, in the face of this scenario, it is not excluded that consumers will increase their interest in the different alternatives to the industrial agri-food model, known in the literature as alternative food networks – AFNs or short chains or direct sales (Goodman *et al.*, 2012). Within these, in fact, some salient elements are recognised such as social cooperation and partnerships between producers and consumers, the ability to reconnect production and consumption using sustainable models, the ability to enhance local markets with regional identity and reaggregate value to the circulation of quality and differentiated products, such as organic products (Darolt *et al.*, 2016; Fraser *et al.*, 2016; Kessari *et al.*, 2020). The trust relationship was maintained during the COVID pandemic, partly due to social ICT technologies (Ahani and Nilashi, 2020).

AFNs in all their forms, therefore, represent the means through which it is possible to reconstruct the system of relationship and trust between production and consumption, which was interrupted in the traditional agri-food system as a consequence of lockdown, quarantine and pandemic distancing; in them, therefore, there is the natural concentration of a demand exercised by a consumer attentive to ethical aspects, sustainability and biodiversity (Butti Al Shamsi *et al.*, 2018).

Network actors develop formal and informal relationships, which are a powerful mechanism for the localisation of food systems and their survival (Feenstra, 1993; Brinkley, 2018).

In this context, the present research aims to understand to what extent through social relations – direct and indirect – within AFNs it is possible to

- (1) determine the increased sensitivity of the consumer towards the issue of sustainability;
- (2) express the capacity of the local system to recover sustainability performance;
- (3) manifest resilience to the pandemic economic crisis by supporting small producers, food security and adequate nutrition for families.

The research was carried out in Sicily, at farmer's markets in Catania and Palermo, where a representative sample of consumers was surveyed to study the relational dimension and to help policy makers improve intervention strategies.

2. Analysis of agri-food consumer relations in recent literature

Relationships – direct and indirect – constitute a relevant foundation in the construction of food systems and in the interpretation of their dynamics; therefore, they have been the subject of specific attention according to different perspectives of analysis and study (Tang *et al.*, 2018).

Some useful references can be traced back to “actor network theory” and “supply chain management theory” because they argue that relationships based on trust and cooperation are fundamental to the strength and vitality of networks. However, empirical investigations differ according to the upstream and downstream levels involved in production/processing, distribution and consumption for conventional and alternative food systems, such as AFNs, respectively (Lockie and Kitto, 2000).

In the upstream (push) perspective, i.e. starting from production and extending downstream along the distribution chain, a study of the relationships between suppliers, producers, workers, processors, brokers, wholesalers, retailers and consumers within the specific regional geographies of these networks has demonstrated the importance of promoting cooperation and trust (Jarosz, 2000).

In this process, a relevant role is played by seasonal markets, structures that eventually reconfigure social and material relationships and provide solutions for food security and a more sustainable food system (Audet *et al.*, 2017).

An examination of the emerging relationships between producers and consumers in response to broader processes of social and political transformation in Austria (Schermer, 2015) brought to light the potential role of AFNs as a modern form of community supported agriculture (CSA).

Relational environments represent the contexts within which new and different sources of power are mobilised and new practices and institutions are co-constructed and legitimised in the transition of agri-food systems. Transformations of food systems thus depend on the variety of interactions (Rossi *et al.*, 2019).

In the downstream (pull) perspective, i.e. in analyses that focus on consumption in order to obtain useful information to orient production/processing and distribution activities, there are several contributions related to the role that a certification system can play in the process of building relationships and the value recognised for products. An interesting paper analyses the role of certification in AFNs to explore the relationship and tensions between the horizontal and vertical dimensions of embedding processes and to understand the complexities of agri-environmental governance (Higgins *et al.*, 2008). In this case, certification favours the configuration of AAFNs even if it is not sufficient to win the trust of consumers, which is why producers have to spend a lot of resources on the creation of the relevant market (Brinkley, 2018).

Social capital is recognised as a source of trust and collective commitment within a community for the regional qualification of food products through collective branding (Crespo *et al.*, 2014). The activation of social networks through some elements of social capital (friendship, kinship, acquaintance, collaboration and cooperation) move specific clusters, studied through social network analysis (SNA) which has shown that relationships can be established formally and informally to foster the development of local agri-food systems (Enriquez-Sanchez *et al.*, 2017).

Relationships also underpin inter-food chain relationships. To this end, an interesting study approach highlights how contrary to what we are used to observing conventional and alternative food chains do not represent separate paradigms in different European rural

contexts, but rather highly competitive contexts that are related to each other (Sonnino and Marsden, 2006).

Finally, formal networks have been used to study the sustainability performance of organic farms within local production systems and SNA is a useful tool in identifying the strengths and limitations of organic farms in terms of achieving holistic sustainability impacts. The role of institutions (local communities, research, certification stakeholders, consumer groups, etc.) in collaborative networks is also emphasised because they create space, experiment and legitimise new innovations towards sustainability (Butti Al Shamsi *et al.*, 2019).

3. Materials and methods

The survey was conducted in the farmers' markets of Catania and Palermo, two metropolitan areas located in eastern and western Sicily, which alone intercept the food demand of a potential pool of 2.1 million consumers. *Since in both metropolitan areas there are several farmers' markets operating on different days of the week, it was decided to choose only those markets operating on Saturdays and Sundays, which are the days with the highest number of customers. Therefore, on these two days the markets were preferred according to the number of producers (with selection of markets with a higher volume of products offered), turnover (turnover produced by the whole market) and the presence of typical regional products.* The survey was carried out in two stages: the first between the end of June and mid-July; the second between mid-September and the first week of October, periods identified in accordance with the limitations imposed by the pandemic lockdown imposed by the national authorities.

A total of 1,000 consumers were surveyed, including regular visitors to farmers' markets. A questionnaire was administered to the consumers in order to analyse, in a network and sharing perspective: (1) their degree of sensitivity towards sustainability behaviour; (2) their purchasing behaviour; (3) their degree of knowledge of the subjects on offer; (4) their perception of the sustainability actions adopted by companies able to win their trust. The answers, for privacy reasons, were coded with an ID code (S#); the subjects interviewed were informed of the purpose of the survey and anonymity was guaranteed.

The objective of the processing was – in addition to enhancing the information collected – also to characterise the network or network whose link between the nodes is represented by an affinity, choice, address or common characteristic in order to identify the strengths or weaknesses of the network itself.

The networks were analysed through SNA, using UCINET software.

SNA is a theoretical-methodological perspective that analyses social reality, starting from its reticular structure (graph theory), assuming that actors participate in social life by creating links with other actors and that these links influence reciprocal behaviour (Scott, 1988).

The process of analysis is purely analytical and starts from the construction of an affiliation matrix (case matrix $\times$ affiliations) creating a two-way correspondence between consumers and their preferences/needs, addresses and characteristics identified by the survey responses (affiliation network).

The affiliation matrix, the “place” where the survey data are collected, is a rectangular matrix also known as a two-mode network. It describes the participation of a defined group of actors (consumers) in a specific set of events (survey responses). It thus comprises two different types of nodes: actors and events. The relationships in the cells indicate, in the case of binary data, the participation (1) or absence (0) of actor *i* in event *j* (Borgatti *et al.*, 2009).

From this, it was possible to construct two valued type co-membership matrices composed only of survey responses where each matrix element quantifies their sharing between actors (consumer network) or composed only of consumers where each matrix

element quantifies survey response sharing (survey response network) (Knoke and Yang, 2019).

Networks have been described through a graphical representation based on the language and tools of graph theory. This is the so-called sociogram or graph and consists of a two-dimensional diagram formed by a population N of nodes (also called points or vertices) and a set of connecting lines between pairs of nodes indicating the presence of a relationship.

Then, the structure of the network was studied in its aspects of Cohesion and Centrality through the following measures (Wasserman and Faust, 1994):

Cohesion measures:

- (1) **Density:** this is one of the most important descriptive statistics and is used as an indicator of the general level of cohesion of the social network under consideration. It represents the proportion of ties actually established between the nodes of the social network out of all possible ties. It takes values between 0 and 1: values close to 0 indicate low density and thus low levels of cohesion, while values close to 1 indicate high levels of density and thus high levels of network cohesion. Density is equal to 1 in the case of complete networks, i.e. those where all nodes are connected to each other, while density equal to 0 highlights a social network with poorly aggregated nodes, in which participants have mostly non-reciprocal relationships. Often low density values identify isolated nodes (which have no relations with other nodes in the graph), or pending nodes (nodes connected to only one other node in the entire social network);
- (2) **Average degree:** number of average relationships between nodes in the social network;
- (3) **Average geodesic distance:** average distance between nodes in a social network. Geodesic distance means the shortest path existing between two adjacent nodes;
- (4) **Diameter:** maximum distance between two nodes (number of jumps from one node to another) within a social network.

Measures of centrality:

- (1) **Degree:** centrality based on the degree of popularity, given by how many outbound/inbound links a node has. It is equal to the absolute value of the sum of the “choices” received by a node, seen as incoming and outgoing links, by the other nodes inhabiting the social network;
- (2) **Betweenness:** centrality of a node, based on its being an intermediary between other nodes. It is based on the frequency with which each single node is in the shortest path connecting every other pair of nodes. If the value of the index is high, we are probably in the presence of a “junction”: an inhabitant of the network, important and of reference in communications, exchanges and connections between different areas of the network or even capable of connecting two different networks. It therefore indicates the hubs, i.e. the facilitators of relations;
- (3) **Closeness:** centrality of a node, based on its proximity to other nodes. It is fundamental in studies of social networks to understand the speed with which a node, within its network of belonging, can exchange information with other nodes. The value ranges from 0 to 1. If the value of this index is low, the node in question takes a few steps to reach any other node in the network, thus being able to exchange information quickly. We can say that this index is a measure of the nodes’ vitality in spreading information within the social network.

4. Results and discussion

4.1 Characteristics of the sample surveyed

The sample is predominantly male (56%) and aged between 35 and 60 years (61%), as shown in Table 1.

In line with other research on short production-consumption circuits (Wolf *et al.*, 2005), they have a medium-high level of schooling and training (13 years in 31% and 16 years in 20%; 18 and more years in 44%) and come from the peri-urban area of the chosen metropolitan city (Catania and Palermo, in 56%), travelling an average distance of between 1 and 5 km to reach the market (48%). This again expresses the interest in products, values and relationships conveyed through farmers markets (Brown, 2002).

The level of employment is self-employed (freelance, in 47% of cases) or employed (clerical, in 23%), while cohabitation is with other family members (83%), of whom there are children in only 55% of cases.

Finally, the family income is mainly placed in the range between 40 and 60 thousand Euros (41%) and in the immediately preceding range (between 20 and 40 thousand Euros), for 38%, thus suggesting a wide diversity of socio-economic situations involved in this distribution formula.

The sample also shows a specific knowledge of environmental issues and of the tools with which companies communicate ethical and environmental values to customers (Dodds *et al.*, 2014), such as specific brands (Table 2).

To this end, 24 sustainability labels adopted by companies in different areas of activity were shown and the highest levels of knowledge were recorded for the carbon footprint (99% of the sample), the EU organic label (around 87%), the “slow food” and “recycled” product

Indications	Value. %	Indications	Value. %
<i>Gender</i>		<i>Family unit</i>	
Male	56.3	With children	55.4
Female	43.7	Without children	44.6
<i>Age</i>		<i>Family composition</i>	
Less than 18 years old	1.3	Single	16.7
Between 18 and 35 years	33.7	Family members and cohabitants	83.3
Between 35 and 60 years	61.4		
Over 60 years	3.6	<i>Residence</i>	
<i>Years of education</i>		Urban area	46.3
5 years (primary school)	1.2	Peri-urban area	53.7
8 years (junior high school)	3.6	<i>Distance to farmer's market</i>	
13 years (high school)	31.0	Less than 1 km	33.9
16 years (bachelor's degree)	20.2	Between 1 and 5 km	48.3
18 years or more (master's degree. PhD)	44.0	Between 5 and 10 km	14.3
		Over 10 km	3.5
<i>Employment in the society</i>		<i>Household income</i>	
Self-employed	47.0	Less than 20 thousand Euros	14.1
Employee	22.9	20 to 40 thousand Euros	38.5
Student	10.8	40 to 60 thousand Euros	41.0
Worker	6.0	From 60 to 80 thousand Euros	5.1
Manager	3.6	Over 80 thousand Euros	1.3
Unemployed	3.6		
Housewife	3.6		
Other	2.5		

Note(s): (*) Our elaboration. **Farmers' markets were selected according to the criteria indicated in the text under 3. Materials and methods**

Table 1.
Characteristics of the
consumer sample at
farmers' markets
(2020) (*)

labels, respectively with 76% of knowledge each and, finally, the “Agenda 2030” (47%), “ecolabel” (41%) and “ISO 14001” (32%).

This knowledge is important because several studies show the consumer’s interest in the environmental, social or economic challenges that humanity is facing and the value of the brand for differentiating the offer in a competitive market (Gupta *et al.*, 2013; Suki, 2016).

4.2 Network of individual consumer awareness of sustainability

The first step of the evaluation concerned the determination of the level of consumer awareness of the issue of sustainability, in order to demonstrate whether and to what extent such an attention can favour the construction of relationship systems preparatory to agro-food purchases.

To guarantee the anonymity of the interviewees, the questions contained in the questionnaire were extrapolated and coded (Table 3).

The sample showed particular sensitivity towards the rationalisation of electricity and water consumption, participation in the separate collection of paper, glass, plastic and spent batteries, and the use of reusable shopping bags and energy-efficient household appliances in daily life.

All this is confirmed within the graph of the affiliation matrix (Figure 1), while a partly contradictory view of the behaviour results from the marginality within the network of “use of ecological detergent products (S_U3)”, “use of returnable packaging/packaging (S_U4)”, “rationalise other (S_R3)” and “choose fair trade products (S_S4)”.

The essential elements around which trust relationships are built within the market are represented by the sharing of some essential principles in the food choices, represented by the attention paid to the label as a tool of information about the origin and the provenance of the product (S_S1), the interest towards proximity distribution formulae (S_S6) and local products (S_S3) and the availability towards local raw materials constituting ingredients for home-made food preparations (S_S2) and organic (S_S7).

The strength and frequency of the links obtained by cross-referencing the data through the matrix “sensitivity $\times$ sensitivity factors”, show the attention paid to the protection of resources (water, S_R2) and finds expression in purchasing behaviour that tends to favour the territory (Figure 2).

In order to locate the position of the sensitivity factor in relation to that of the others in the network the centrality index was calculated; in this way it becomes immediately visible if the factor has a position of strategic importance in the overall structure of the network and if it is

Table 2.
Different degrees of
knowledge of
sustainability labels
(2020) (*)

Label	Value. %	Label	Value. %
	86.7		75.9
	41.0	 Slow Food	75.9
	98.8		32.5
	46.8		

Note(s): (*) Our elaboration

Question	Extrapolated variable	Assigned code
What consumption do you rationalise?	Rationalise electricity	S_R1
	Rationalise water	S_R2
	Rationalise other	S_R3
What do you separate in the collection?	Recycle paper	S_D1
	Recycle glass	S_D2
	Recycle plastic	S_D3
	Recycle used batteries	S_D4
Do you use ... ?	Use of reusable shopping bags	S_U1
	Use of low energy appliances	S_U2
	Use of environmentally friendly cleaning products	S_U3
	Use of returnable packaging/ packaging	S_U4
1.2 And when making food choices? Do you look at the label to know where it was produced or grown?	Choice – look at the label	S_S1
1.2 And when do you make food choices? Does he/she make pizza. Bread or cakes at home?	Food choice	S_S2
1.2 And when making food choices? Does he/she choose local products?	Choose local products	S_S3
1.2 And when do you make food choices? Do you buy fair trade products?	Choose fair trade products	S_S4
1.2 And when do you make food choices? Do you buy drinks in glass?	Choice glass beverages	S_S5
1.2 And when do you make food choices? Do you shop in small local shops?	Choice of local shops	S_S6
1.2 And when do you make food choices? Do you buy organic fruits and vegetables?	Choice organic vegetables	S_S7

Note(s): (*) Our elaboration

Table 3.
Coding of questions
on sustainability
sensitivity asked to the
sample of consumers
surveyed at farmer
markets (2020) (*)

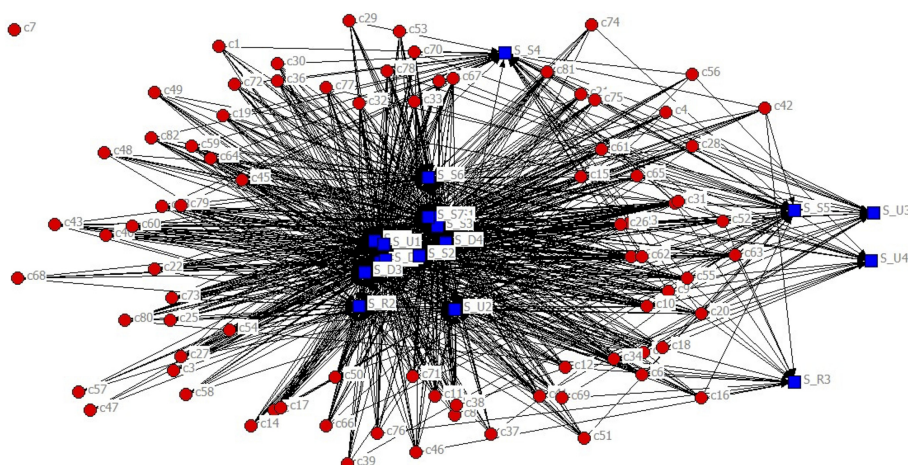


Figure 1.
Graph of the affiliation
matrix on
sustainability
sensitivity factors

Figure 2.
Graph of the
“sensitivity factors ×
sensitivity factors”
matrix

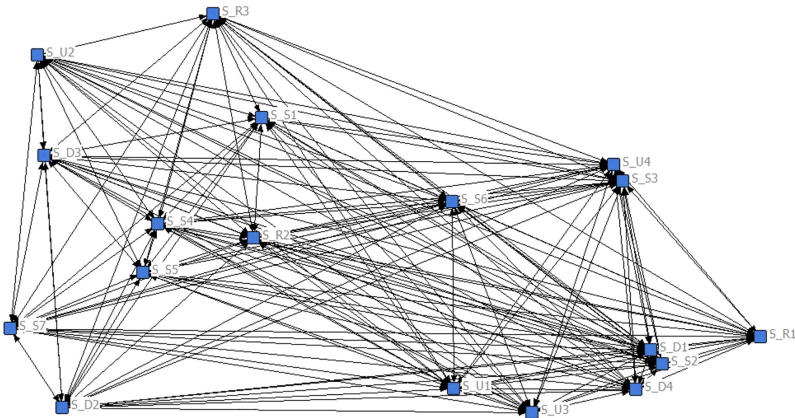


Table 4.
Network centrality
index on consumer
awareness factors of
consumers towards
sustainability (2020) (*)

Degree sensitivity	Factor normalised to 1
S_S3	0.716
S_D3	0.699
S_D2	0.696
S_S1	0.694
S_D1	0.682
S_U1	0.675
S_R1	0.670
S_S7	0.597
S_S2	0.581
S_S6	0.576
S_R2	0.552
S_D4	0.545
S_U2	0.520
S_S4	0.404
S_S5	0.321
S_U3	0.216
S_U4	0.191
S_R3	0.165

Note(s): (*) Our elaboration

4.3 Network on habitual purchasing behaviour

The aspects of purchasing behaviour covered by the survey concerned the recurrent distribution channel for purchases, the determinants of choice, the importance of organic products in the food shopping list, the weight given to information and, finally, some aspects related to trust (Table 5).

The graph of the affiliation matrix (Figure 3) shows the marginality in the network of the factors related to the recurrent channels for purchasing, with the exception of the farmer market (purchase from the producer (A_A8); purchase from the distributor (A_A9); purchase in discount stores (A_A2); purchase in a small nearby supermarket (A_A3); purchase in a delicatessen or grocery store (A_A5); purchase in supermarkets/specialised shops (A_A6); purchase in GAS (A_A7); purchase of fruit and vegetables (A_P2)).

The graph highlights the close behavioural interrelationship that characterises those who prefer to buy organic or sustainability certified products (fruit and vegetables, fresh meat and fish, beverages, frozen food and ice cream) and the influence of factors that condition their choices such as the brand/company (A_I4) or the packaging (A_I6) and the level of information provided on control (A_G9), production standards (A_G8), production methods (A_G6) and counterfeiting (A_G5). Thus, the role of reputation (brand/company) and packaging is important in determining a sustainability impact that is appreciable in the eyes of the consumer. These results are also partly driven by the increasing use of social media channels by farmers active in the farmer market to promote their products and to schedule home delivery of groceries throughout the week.

Correlating the behavioural factors with the relative matrix (Figure 4) shows the marginality of the factors of purchase from GAS (A_A7) and preferences for frozen/frozen products (A_P3), demonstrating the existence of an antagonism between farmer market and GAS distribution formulae, to the advantage of the first modality and the lesser availability of products in the third range or with a high degree of transformation and conservation. The farmer market appears in the eyes of the consumer as the privileged distribution structure for supplies of fresh produce (Basile *et al.*, 2002; Timpanaro *et al.*, 2016).

Figure 4 shows, moreover, the centrality in the consumer's behavioural model of the choice factor "environmental impact of the product" (A_I3), as well as of the relevance of the information on sustainability present on the packaging and certifying the "delimited area of origin" (A_G3), the "production standard" (A_G8) and the greater "control" (A_G9).

The index of centrality on the strength of the links (Table 6) shows in the top positions the number of links related to the preference for quality products (A_I2, equal to 0.49), of the territory (A_F2, equal to 0.39), of the environmental impact (A_I3, equal to 0.35) and of organic products (A_F1, equal to 0.34), also as a contrast to counterfeits (A_G5).

These results attest, therefore, to the importance of relationships in the process of choosing and purchasing food products, the quality of which is linked to the recognition of the organic product and the territory; moreover, organic farming is the chosen tool for the construction of relationship systems and for quality assurance; the certification system has over time won the trust of the consumer in contrast to counterfeiting and, finally, the link lies in the environmental impact of the production and consumption process.

Thus, it is no coincidence that organic farming is emphasised because it represents a useful model for the creation of integrated, humane, ecological and economically sustainable agricultural systems, based in particular on local renewable resources and the management of ecological and organic processes, which are also recognised by consumers (Schader *et al.*, 2015; Butti Al Shamsi *et al.*, 2019).

Table 5.
Coding of questions on purchasing behaviour asked to the sample of consumers surveyed at farmer markets (2020) (*)

Question	Extrapolated variable	Assigned code
2.1. In which channel do you shop? [Hypermarket/Supermarket]	Buying in hypermarkets	A_A1
2.1. In which channel do you shop? [Discount]	Purchase in discount stores	A_A2
2.1. In which channel do you shop? [Small neighbourhood supermarket]	Purchase in a small neighbourhood supermarket	A_A3
2.1. In which channel do you shop? [City market]	Purchase at a city market	A_A4
2.1. In which channel do you shop? [Grocery shop (delicatessen or drugstore)]	Purchase in a delicatessen or grocery store	A_A5
2.1. In which channel do you shop? [Supermarkets/specialised shops]	Purchase in supermarkets/specialised shops	A_A6
2.1. In which channel do you buy? [Solidarity purchasing groups]	GAS purchase	A_A7
2.1. In which channel do you buy? [E-commerce: Buying from the producer]	Purchase from producer	A_A8
2.1. In which channel do you buy? [E-commerce: purchase from distributor]	Purchase from distributor	A_A9
2.2. To what extent are the following ASPECTS important when purchasing food products? (1 = low → 5 = high) [The price of the product]	Purchase influence – price	A_I1
2.2. To what extent are the following ASPECTS important when purchasing food products? (1 = low → 5 = high) [The quality of the product]	Purchase influence – quality	A_I2
2.2. To what extent are the following ASPECTS important when purchasing food products? (1 = low → 5 = high) [The environmental impact of the product]	Purchase influence – environmental impact	A_I3
2.2. To what extent are the following ASPECTS important when purchasing food products? (1 = low → 5 = high) [The brand/the company that produces it]	Purchase influence – brand/company producing it	A_I4
2.2. To what extent are the following ASPECTS important when buying food products? (1 = low → 5 = high) [Advertising]	Buying influence – advertising communication	A_I5
2.2. To what extent are the following ASPECTS important when purchasing food products? (1 = low → 5 = high) [Product packaging]	Purchase influence – product packaging	A_I6
2.2. To what extent are the following ASPECTS important when purchasing food products? (1 = low → 5 = high) [The advice/opinion of acquaintances, friends or relatives]	Purchase influence – recommendation from friends and/or relatives	A_I7
2.2. To what extent are the following ASPECTS important when buying food products? (1 = low → 5 = high) [The advice of experts (nutritionists, scientists, doctors ...)]	Purchase influence – expert advice	A_I8
2.2. To what extent are the following ASPECTS important when buying food products? (1 = low → 5 = high) [The information I find on the packaging]	Purchase influence – packaging information	A_I9
2.2. To what extent are the following ASPECTS important when buying food products? (1 = low → 5 = high) [Trust at the point of sale]	Purchase influence – confidence at the point of sale	A_I10
2.6. In what PERCENTAGE do you buy organic or sustainable food products in each of the following DEPARTMENTS? [Fruit and vegetables]	Buying fruit and vegetables	A_P1
2.6. In what PERCENTAGE do you purchase organic or sustainable food products in each of the following DEPARTMENTS? [Fixed weight fresh products]	Buying fruit and vegetables	A_P2
2.6. In what PERCENTAGE do you purchase organic or sustainable food products in each of the following DEPARTMENTS? [Frozen and ice-cream products]	Frozen food and ice cream	A_P3

(continued)

Question	Extrapolated variable	Assigned code
26. In which PERCENT AGF do you purchase organic or sustainable food products in each of the following DEPARTMENTS? [Fresh meat and fish]	Fresh meat and fish	A_P4
26. In which PERCENT AGF do you purchase organic or sustainable food products in each of the following DEPARTMENTS? [Beverages]	Beverages	A_P5
28. What do you think, in general, about the INFORMATION on the packaging of food products that certifies their environmental friendliness and sustainability characteristics? (1 = low → 5 = high) [product quality]	Judgement information – product quality	A_G1
28. What do you think, in general, of the INFORMATION on the packaging of food products that certifies their environmental friendliness and sustainability characteristics? (1 = low → 5 = high) [product authenticity]	Information judgement – product authenticity	A_G2
28. What do you think, in general, of the INFORMATION on the packaging of food products, which certifies their environmental friendliness and sustainability characteristics? (1 = low → 5 = high) [defined area of origin]	Information judgement – delimited area of origin	A_G3
28. What do you think, in general, of the INFORMATION on food packages certifying their environmental friendliness and sustainability characteristics? (1 = low → 5 = high) [labelling work in the production area]	Information judgement – favouring work in the production area	A_G4
28. What do you think, in general, of the INFORMATION on the packaging of food products, which certifies their environmental friendliness and sustainability characteristics? (1 = low → 5 = high) [avoid buying counterfeit products]	Information judgement – avoid buying counterfeit products	A_G5
28. What do you think, in general, of the INFORMATION on food products' packaging certifying their environmental friendliness and sustainability characteristics? (1 = low → 5 = high) [regulated production methods]	Information judgement – regulatory production methods	A_G6
28. What do you think, in general, of the INFORMATION on the packaging of food products that certifies their environmental friendliness and sustainability characteristics? (1 = low → 5 = high) [because it is a traditional product]	Information judgement – traditional product	A_G7
28. What do you think, in general, of the INFORMATION on food products' packaging certifying their environmental friendliness and sustainability characteristics? (1 = low → 5 = high) [because it is a better product than the standard one]	Information judgement – above standard	A_G8
28. What do you think, in general, of the INFORMATION on the packaging of food products, which certifies their environmental friendliness and sustainability characteristics? (1 = low → 5 = high) [because it is a more controlled product]	Information judgement – more control	A_G9
3.1. If you want to be sure that you are buying a quality food product (good and safe) what do you trust most? (1 = low → 5 = high) [The organic label]	Trust – organic label	A_F1
3.1. If you want to be sure to buy a quality food product (good and safe) what do you trust most? (1 = low → 5 = high) [The territory of origin]	Confidence – territory of origin	A_F2
Note(s): (*) Our elaboration		

Table 5.

Figure 3.
Graph of the affiliation
matrix on
determinants of
purchasing behaviour

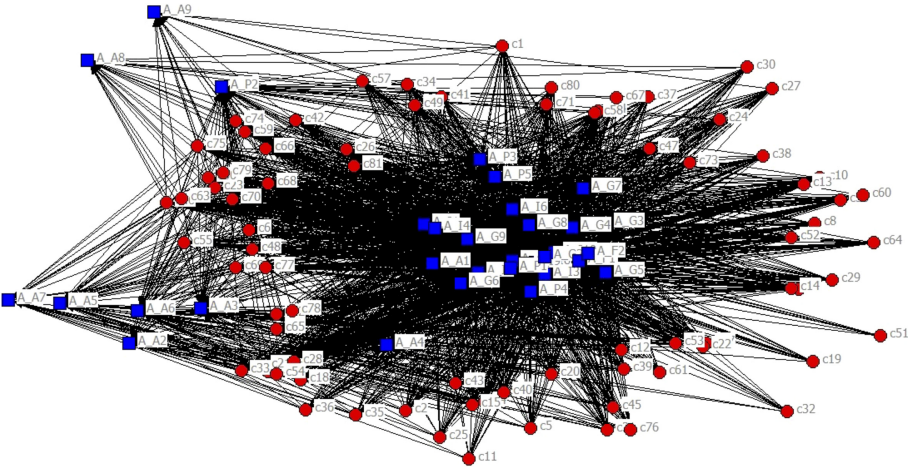
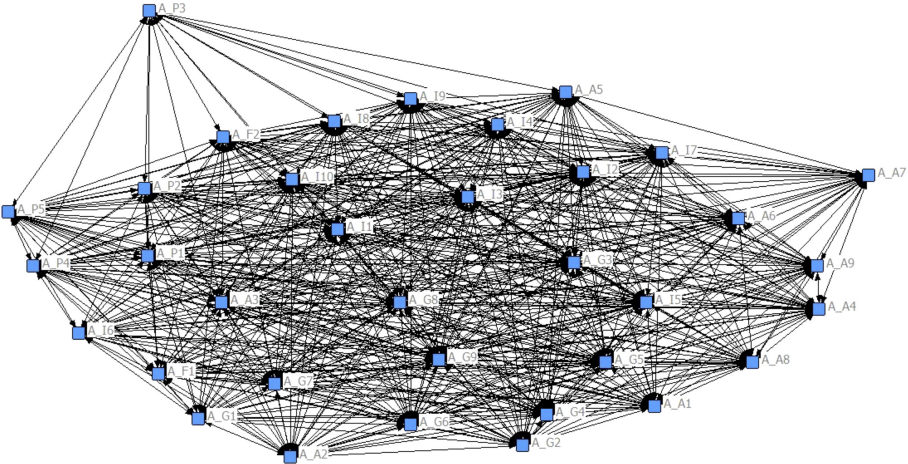


Figure 4.
Matrix graph
“behavioural factors ×
behavioural factors” –
Threshold >3



4.4 Network on consumer expectations of the agri-food system and policy

Another important aspect in the analysis of the relational system built within farmers’ markets is represented by that set of factors that direct the purchase because they are closely linked to the experience of individuals and to the expectations that the latter place in their unconscious on what can be achieved through sustainability in the post COVID reconstruction.

In this context, perceptions regarding quality logos and sustainability certification, the expectations placed in sustainability itself and the consequent actions to be carried out within the company are essential because they are considered useful for the promotion of sustainable innovations (Table 7).

Table 6.
Network centrality
index on determinants
of purchasing
behaviour (2020) (*)

Factors determining purchasing behaviour	Degree normalised to 1
A_I2	0.486
A_F2	0.385
A_I3	0.349
A_F1	0.344
A_G5	0.343
A_G9	0.334
A_G6	0.324
A_G4	0.317
A_I9	0.316
A_G8	0.308
A_G2	0.292
A_I8	0.281
A_I1	0.275
A_G3	0.265
A_I4	0.261
A_G1	0.258
A_G7	0.240
A_I10	0.238
A_P1	0.232
A_I7	0.225
A_A1	0.177
A_P2	0.136
A_A3	0.111
A_I5	0.105
A_I6	0.104
A_P4	0.100
A_A5	0.082
A_A6	0.070
A_A2	0.058
A_A8	0.048
A_A4	0.046
A_A9	0.044
A_P5	0.035
A_A7	0.024
A_P3	0.014

Note(s): (*) Our elaboration

The graph of the affiliation matrix does not highlight any element in a marginal position, confirming the value attitude characteristic of buyers in farmers' markets (Figure 5). Thus it is evident that the corresponding affiliation pairs are linked through common actors in the case of quality logos and the function they play in purchasing choices, outcomes on food security, natural resource management, climate change mitigation and economic growth, as well as actions that need to be developed at the societal level to strengthen sustainable purchasing, reduce food waste and stimulate purchasing.

With reference to the individual evaluations (Table 8) it is possible to observe that on average there tends to prevail a vision of the brand as a tool to accompany the choice (I_L4), as well as a dimension of consumption sensitive to the management of natural resources (I_R2) and to the fight against climate change (I_R3). However, the consumer considers it important that there is a greater institutional commitment to encourage consumption (I_A2 and I_A5, for more incentives) and the world of research to increase levels of sustainability in the world of production (I_A3).

Table 7.
Coding of questions on
purchase orientation
asked to the sample of
consumers at farmers’
markets (2020) (*)

Question	Extrapolated variable	Assigned code
1.3 What do you think about the SUSTAINABILITY/ENVIRONMENTAL quality and certification logos on food packaging? (1 = low → 5 = high) [they are recognisable]	Recognisable quality logos/certifications	L_L1
1.3 What do you think about the SUSTAINABILITY/ENVIRONMENTAL quality and certification LOGOS on food packaging? (1 = low → 5 = high) [they are clear]	Clear quality logos/certificates	L_L2
1.3 What do you think about the SUSTAINABILITY/ENVIRONMENTAL quality and certification LOGOS on food packaging? (1 = low → 5 = high) [Are they reliable]	Reliable quality logos/certificates	L_L3
1.3 What do you think about the SUSTAINABILITY/ENVIRONMENTAL quality and certification LOGOS on food packaging? (1 = low → 5 = high) [they help me to choose the most environmentally friendly products]	Quality logos/certificates help you choose	L_L4
1.3 What do you think about the SUSTAINABILITY/ENVIRONMENTAL quality and certification LOGOS on food packaging? (1 = low → 5 = high) [I do not have enough information to be able to evaluate them]	Quality logos/certificates help to choose	L_L5
1.4 What do you think are the results that sustainability can help to achieve? (1 = low → 5 = high) [Ensuring food and social security]	Expected outcomes – Ensure food and social security	L_R1
1.4 Which outcomes do you think sustainability can help to achieve? (1 = low → 5 = high) [managing natural resources wisely]	Expected results – managing natural resources wisely	L_R2
1.4 What results do you think sustainability can help to achieve? (1 = low → 5 = high) [mitigating climate change]	Expected results – mitigating climate change	L_R3
1.4 Which outcomes do you think sustainability can help to achieve? (1 = low → 5 = high) [promoting economic growth]	Expected results – promoting economic growth	L_R4
1.5 What actions are needed to better involve society and promote social innovation in the field of sustainability? (1 = low → 5 = high) [improve the quality of information on organic products]	Actions needed – better information on organic products	L_A1
1.5 Which actions are needed to better engage society and promote social innovation in the field of sustainability? (1 = low → 5 = high) [provide incentives for buying sustainable organic products]	Actions needed – more incentives to buy	L_A2
1.5 Which actions are needed to better engage society and promote social innovation in the field of sustainability? (1 = low → 5 = high) [funding research on consumer behaviour]	Actions needed – funding research on consumer behaviour	L_A3
1.5 Which actions are necessary to better engage society and promote social innovation in the field of sustainability? (1 = low → 5 = high) [promoting social innovation in the food chain]	Actions needed – promote social innovation in the agri-food chain	L_A4
1.5 Which actions are necessary to better involve society and promote social innovation in the field of sustainability? (1 = low → 5 = high) [strengthen actions to encourage healthier and more sustainable consumption]	Actions needed – strengthen actions to encourage healthier and more sustainable consumption	L_A5
1.5 Which actions are needed to better involve society and promote social innovation in the field of sustainability? (1 = low → 5 = high) [strengthen actions to reduce food waste in households and food service industries]	Actions needed – strengthen actions to reduce food waste in households and catering industries	L_A6

Note(s): (*) Our elaboration

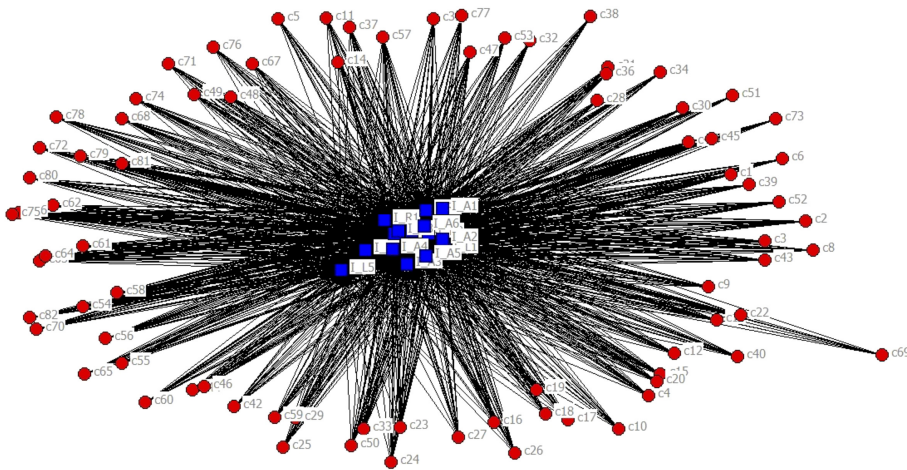


Figure 5.
Graph of the affiliation
matrix on factors
directing purchasing
behaviour

Among other things, the greatest concordance in the answers (less variability of views) was recorded for the reduction of waste in the home and in industrial and/or commercial environments (I_A6) and for sales promotion through incentives (I_A2), which according to the graph of the matrix of driving factors are placed on top positions and with a high number of links with them (Figure 6).

The centrality of the network demonstrates the role of agro-food in the construction of an alliance between citizens-consumers and all the subjects of the institutional world and production for the sharing of the common goods of the environment, solidarity and social inclusion (Table 9). Resource management, attention to waste reduction, the importance of innovation and information on organic products are central, with ratings of “over 0.6”; values between 0.5 and 0.6 are recorded for the importance of sustainability in supporting economic growth as a new challenge in the post-COVID era.

4.5 Network on knowledge of producers operating on the farmer’s market

A final element of analysis is represented by the importance for consumers of the knowledge of the companies, and their level, which operate on the farmer’s market. Several studies show, in fact, that the main advantages of buying agricultural products directly from producers lie not only in the freshness of the food, the certainty of its origin and the opportunity to consume seasonal products, but also in the opportunity to create a relationship of trust and knowledge, even in those who have no experience in this type of purchase (Svenfelt and Carlsson-Kanyama, 2010).

The trust and guarantee that characterise direct sales purchases generate a pleasant sensation of a return to the past, of being closer to nature, of contrasting the weakening of the relational system to the point that consumers who buy frequently and live closer to a farmer market tend to have more trust in local food systems than in conventional ones, characterised by a convenience-oriented lifestyle (Chen *et al.*, 2019).

The resulting network on relational trust is constructed through a series of questions coded in Table 10.

The affiliation matrix returns a position of marginality in the knowledge network for a number of firms operating in the markets considered (C_A1, C_A2, C_A3, C_A4, C_A5, C_A6 and C_A10), but at the same time a centrality for others (C_A7, C_A8, C_A9, C_A11, C_A12,

Table 8.
Consumers' ratings of
factors influencing
purchases at farmers'
markets (2020) (*)

	I_L1	I_L2	I_L3	I_L4	I_L5	I_R1	I_R2	I_R3	I_R4	I_A1	I_A2	I_A3	I_A4	I_A5	I_A6
Average value expressed (1 = low to 5 = high)	2.9	2.6	2.6	3.2	2.4	1.8	4.1	4.1	3.7	3.9	4.2	3.9	3.6	4.0	4.2
Minimum value expressed (1 = low to 5 = high)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	1.0	2.0
Highest value expressed (1 = low to 5 = high)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Highest value expressed (1 = low to 5 = high)	3.0	2.0	2.0	3.0	1.0	1.0	5.0	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0
Coefficient of variation (standard deviation), %	39.3	45.5	42.0	34.6	51.3	63.3	25.5	27.8	31.8	26.6	24.1	29.6	32.3	28.7	21.7
Note(s): (*) Our elaboration															

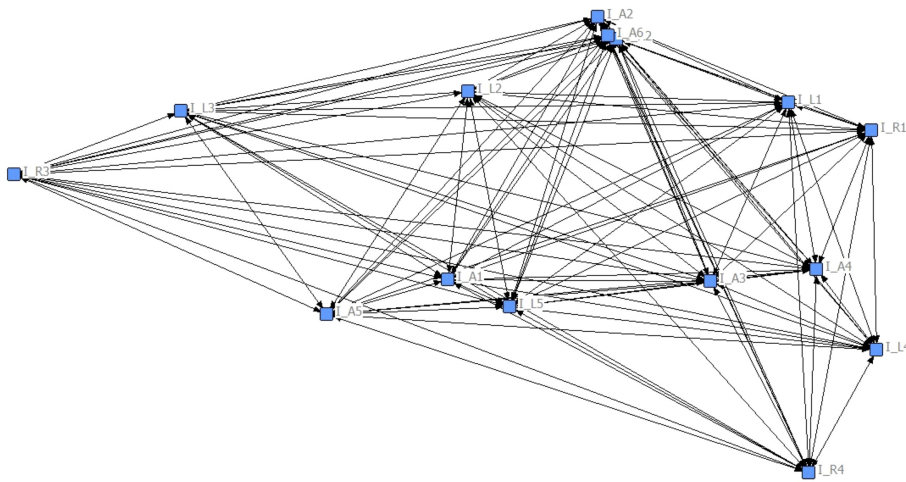


Figure 6.
Matrix graph “address
factors × address
factors” – Threshold >3

Addressing factors	Degree normalised to 1
I_A6	0.670
I_A5	0.659
I_R2	0.654
I_A4	0.653
I_A1	0.649
I_R1	0.634
I_R4	0.594
I_A2	0.582
I_R3	0.527
I_A3	0.450
I_L4	0.361
I_L1	0.316
I_L3	0.246
I_L2	0.218
I_L5	0.151

Note(s): (*) Our elaboration

Table 9.
Network centrality
index on factors
guiding purchasing
behaviour (2020) (*)

C_A13 and C_A14), demonstrating how important knowledge is for the construction of the trust relationship (Figure 7).

In the central area of the graph the factors expressing the level of knowledge tend to aggregate in progressively homogeneous groups, linked to the company’s sensitivity to sustainability issues (clarity of objectives and targets for improvement, C_C4; waste differentiation, C_C5; and marketing communication on the sustainability values of products, C_C7), social welfare (management and monitoring of impacts, C_C3; involvement of the upstream and downstream supply chain, C_C8; and active labour policies, C_C9) and connection with the territory (communication and dissemination, C_C1; and voluntary actions and support of local initiatives, C_C2).

Crossing the knowledge factors reveals the depth of the relationships and the capacity of individual companies to coagulate the interest and relationship of consumers on specific aspects of sustainability (Figure 8).

Question	Extrapolated variable	Assigned code
4.1. Do you know one of the following companies [1]?	Knows 1	C_A1
4.1. Knows one of the following companies [2]	Knows 2	C_A2
4.1		
4.1. Is familiar with one of the following enterprises [3] 4.1	Knows 3	C_A3
4.1. One of the following enterprises is known [4]	Knows 4	C_A4
4.1. One of the following enterprises is known [5]	Knows 5	C_A5
4.1. One of the following enterprises is known [6]	Knows 6	C_A6
4.1. One of the following enterprises is known [7]	Know 7	C_A7
4.1. One of the following enterprises is known [8]	Know 8	C_A8
4.1. One of the following enterprises is known [9]	Know 9	C_A9
4.1. One of the following enterprises is known [10]	Know 10	C_A10
4.1. One of the following enterprises is known [11]	Know 11	C_A11
4.1. One of the following enterprises is known [12]	Know 12	C_A12
4.1. One of the following enterprises is known [13]	Know 13	C_A13
4.1. One of the following enterprises is known [14]	Knows 14	C_A14
4.3. What do you know about the company(ies) with which you have most dealings? [Interacts and communicates in a clear, transparent and continuous way the commitment to sustainability]	Clear, transparent and continuous communication of sustainability commitment	C_C1
4.3. What do you know about the company or companies with which you have most dealings? Does/does it carry out voluntary actions or is it involved in financing initiatives/projects linked to local realities?	It carries out/has carried out voluntary actions or has committed itself to financing initiatives/projects linked to local realities	C_C2
4.3. What do you know about the enterprise(s) with which you have most dealings? Has it set up a system to manage and monitor its impact on the environment?	Has set up a system to manage and monitor its impact on the environment	C_C3
4.3. What do you know about the company or companies with which you have most dealings? Has it defined objectives and targets for the improvement of its environmental impact?	Has defined objectives and targets to improve its environmental impact	C_C4
4.3. What do you know about the company or companies with which you have most dealings? [It applies waste sorting policies]	It applies waste sorting policies	C_C5

Table 10.
Coding of questions on the degree of knowledge of producers asked to the sample of consumers surveyed at farmer markets (2020) (*)

(continued)

Question	Extrapolated variable	Assigned code
4.3. What do you know about the company or companies with which you have the most relationships? [Carries out analysis. Studies. Research on customers' perception of the sustainability of the company or brand or product]	Carries out analyses, studies and research on customer perceptions regarding sustainability	C_C6
4.3. What do you know about the company or companies with which you have most dealings? [Does he/she adopt communication and marketing policies (e.g. product launches, events) in which the sustainable values of the product are highlighted?]	Adopts communication and marketing policies (e.g. product launches, events) in which the sustainable values of the product are highlighted	C_C7
4.3. What do you know about the company or companies with which you have most dealings? Has it activated a process of involvement/awareness-raising on sustainability issues in its downstream and upstream supply chain?	Has activated a process of involvement/awareness-raising on sustainability issues in its downstream and upstream supply chain	C_C8
4.3. What do you know about the company or companies with which you have most dealings? [It adopts a labour policy which respects workers' rights]	Adopts a labour policy that respects workers' rights	C_C9

Note(s): (*) Our elaboration

Table 10.

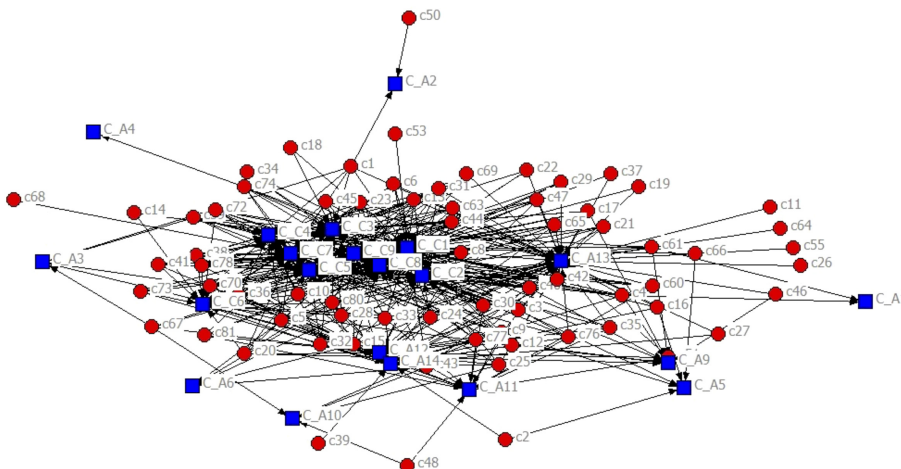


Figure 7.
Graph of the affiliation
matrix on knowledge
factors and their
influence on
purchasing behaviour

Thus it appears that the greatest number of connections are established for some companies (C_A13, C_A14; C_A12) that are particularly committed to sustainability issues and the related marketing communication, implementation, monitoring and control policies of the supply chain, as also shown in Table 11.

Figure 8.
Matrix “knowledge
factors × knowledge
factors” – Graph

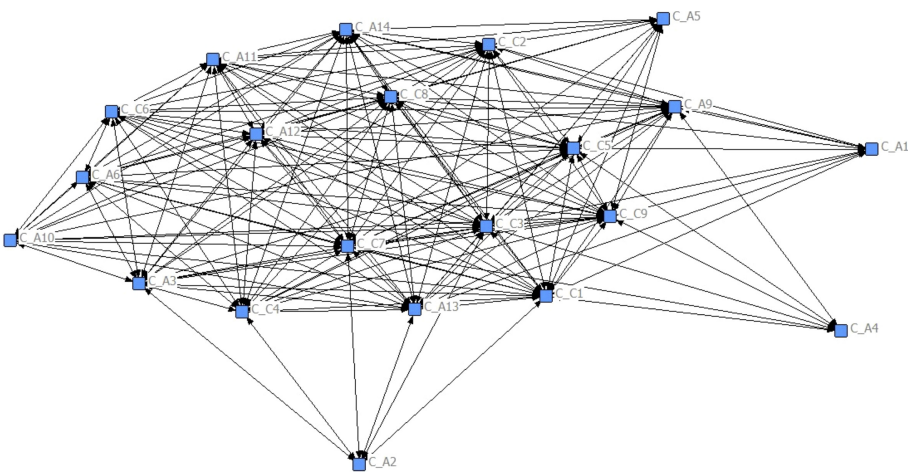


Table 11.
Network centrality
index on knowledge
factors factors
influencing purchasing
behaviour (2020) (*)

Addressing factors	Degree normalised to 1
C_C1	0.379
C_A13	0.314
C_C8	0.312
C_C9	0.272
C_C7	0.264
C_C3	0.240
C_A14	0.232
C_C2	0.230
C_C4	0.223
C_C5	0.222
C_C6	0.212
C_A12	0.161
C_A11	0.117
C_A9	0.063
C_A6	0.057
C_A3	0.045
C_A10	0.029
C_A5	0.028
C_A1	0.014
C_A2	0.007
C_A4	0.007
C_A7	–
C_A8	–

Note(s): (*) Our elaboration

5. Conclusions

The topicality of the work is to be found in the transformations taking place across the planet in the post-pandemic era of COVID and in the ever-increasing role that green aspects will play in the behaviour of the various economic players.

In support of this political approach, reference should also be made to the constraints assumed by the various countries in achieving the Millennium Goals with Agenda 2030 and

the use of resources (e.g. within the Next Generation EU) earmarked for achieving a green revolution.

However, the COVID pandemic has also brought about changes in individual and collective behaviour and in the systems of relations between different individuals, with repercussions on food consumption (Ipsos, 2020). Thus, the importance of local food, memory, the basic ingredients of food preparations and the health aspects and green innovation in production and packaging have been rediscovered. Thus, knowledge, trust and assurance of quality and health become central elements in reassuring consumers about behavioural values within food systems.

These values represent elements of sharing and cementing a system of direct and indirect relationships within alternative food systems, such as farmers' markets, which thus become a reference model for their potential favourable impact in achieving business value.

In particular, the research has demonstrated the existence of four catalysing elements for the construction of relational networks, represented by individual sensitivity towards sustainability, habitual purchasing behaviour, expectations about the agri-food system and agri-food policy and, finally, knowledge of the system of enterprises operating in farmers' markets.

As found in the literature, consumers who turn to these markets show greater sensitivity to the various aspects of sustainability and its declinations and tend to build relationships around the trust placed in the territory and its products because they are considered to be of quality, on the environmental impact and the safeguarding of important natural resources, such as water, and the adoption of strategies for the separate collection of waste (above all, plastic and glass).

Other relevant aspects are the opportunity to promote healthier and more sustainable eating and consumption styles, to combat food waste and promote a sustainable use of resources, as well as the implementation of sustainability models extended upstream and downstream of the agri-food chain, which are considered indispensable in the transition towards a food system more in line with the expectations of the modern consumer.

Finally, some of the networks are based on relationships linked in common by the need to encourage clear and transparent communication systems on the comparative impacts generated by sustainable and conventional production models, not least because the fragility shown in the face of the rapid spread of the pandemic has made it clearly evident how interconnected the two hemispheres of the planet are and how devastating the effects of intensive use of resources can be.

This work completes the literature on the relational aspects of alternative food networks and, as such, can offer useful food for thought to various stakeholders and public and private decision-makers. This is also because in the post-COVID reconstruction, investment space can be dedicated to strengthening logistics and organisational services in order to guarantee stability to the various realities present in the area, or it can coagulate the interest of new producers interested in communicating their commitment to sustainability and/or the adoption of production strategies based on good practices or agroecology.

Not only that, but on the basis of the results of the research and the importance of the value elements collected, the farmers' market can be a reference model from an environmental, social, ethical point of view, because it produces shared value, for large companies committed to seeking new business strategies to recover from the current crisis through natural, social and relational forms of value creation, as well as financial and manufacturing ones (Saarijärvi, 2012; Kuckertz *et al.*, 2019).

Future research will focus on understanding how digital transformation can combine with sustainability to find new answers to consumer expectations.

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