

Article

Food System Resilience during COVID-19 Pandemic: The Case of Roman Solidarity Purchasing Groups

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Abstract: The restriction measures linked to the COVID-19 shock suddenly highlighted the vulnerability of most socioeconomic systems, including the food sector. In a context in which the limitation to the movement of people and goods has put the longer and more structured supply chains in serious difficulty, many experiences and initiatives have emerged as viable alternatives. The aim of the research was to understand if and how the Solidarity Purchasing Groups (SPG) of Rome have contributed to the resilience of the food system of the metropolitan city during the lockdown. The research was based on the results of a questionnaire administered to the SPGs of Rome during the first period of the pandemic (April–July 2020), enriched by some in-depth interviews carried out by the authors. What emerged was that, despite the limited extent in terms of products conveyed within the whole food system, the SPGs represented an important food supply channel during the lockdown period, for two main reasons: a greater flexibility and agility in moving and in handling goods and the possibility of remunerating local farms, contributing to the resilience of the local agri-food fabric. The analysis of the results confirms the strong vitality of such Food Movements in Rome and, at the same time, allows for the identification of a series of interventions that the institutions could adopt to favor the spread of a food environment more compatible with more sustainable and fairer forms of food production and distribution.

Keywords: food system; resilience; COVID-19; vulnerability; food security



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1. Introduction

The COVID-19 pandemic is an unprecedented disaster that has damaged normal lifestyle worldwide and has highlighted the fragility of international and national food systems and the limits of health systems, demonstrating how easily those can be disrupted [1]. The lockdown measures, such as the closure of borders, school and restaurant canteens, as well as the shutdown of tourism-related activities and food services, are provoking a strong socioeconomic crisis. The pandemic is expected to plunge most countries into recession in 2020, with per capita income globally contracting in the largest fraction of countries since 1870 [2]. More than 90% of COVID-19 cases have been reported in urban areas and have brought the worst consequences on vulnerable people. It has become clear that pandemic impacts have aggravated the vulnerability of a significant part of the urban population due to the job losses and the difficulty to access basic necessities [3]. The lockdown has highlighted the high complexity of food systems and the difficulty to manage food flows at a global level [4]. Food and Agriculture Organization (FAO) suggests that mobility and food importation restrictions have caused important effects on food production and supply mainly against small local farmers [5].

Furthermore, the number of people in vulnerable groups across society has increased because of fewer resources at their disposal and of the instability of food availability; in fact, restrictions to contain COVID-19 have left many people unemployed [6]. Because

of the COVID-19 pandemic, FAO estimates a possible strong increase of people become undernourished globally in 2020 (around 83–132 million people) [7]. In summary, COVID-19 has highlighted the weaknesses of food systems [8]: biodiversity reduction due to the industrial agriculture (that increases the chances for new viruses to appear); vulnerability of food supply chains, especially the longer ones. Finally, hunger and malnutrition are affecting millions of people and this situation will be exacerbated by the socioeconomic crisis triggered by COVID-19. The consequences of this crisis made even clearer the need for a change in the current food system [9]. According to the United Nations' Agenda 2030 of Sustainable Development, it is important to accelerate the shift towards a sustainable development and to spread the concepts of sustainability and resilience [10]. Urban food systems have proven themselves to be highly vulnerable to several threats; it has become crucial to make urban food systems more resilient [11]. Moreover, the majority of the 17 Goals of Agenda 2030 include themes that are directly or indirectly linked to food systems [12].

The purpose of this investigation was to understand if and how the Solidarity Purchasing Groups (SPG) of Rome have contributed to the resilience of the Roman food system during the lockdown. This research question is part of a wider planned analysis to explore the main impacts of COVID-19 shock on the food system, on food and nutrition security, and on the right to adequate food in the Roman area. The research was aimed at assessing what can be learned from the pandemic about the territorial food provisioning's ability to enhance the resilience and equity of food systems and under which conditions this is possible. Our hypothesis is that during the COVID-19 pandemic, the role of SPGs activities has increased in terms of number of new members and functions. Therefore, we decided to explain and examine in depth, with a dedicated research, the vision and philosophy of SPGs, particularly with regard to food system resilience to shocks. As Fonte [13] argues, SPGs are groups or organizations of households which have decided to avoid traditional trade systems and purchase necessities (mainly food, detergents and sometimes clothes) directly from local producers. The choice of every producer is based on shared principles such as origin and quality of productions, workers and environmental respect, social and ethical responsibility. In the first part of the paper, we analyse the concept of resilience in general and related to the food system. Then, we propose a short description of the Roman landscape and food system and the main impacts of the COVID-19 shock on them. Later, the essay describes the most significant results of a questionnaire administered to the SPGs of Rome during the first period of the pandemic (April–July 2020), enriched by some in-depth interviews. The last section discusses the main considerations about Roman SPGs resilience during the COVID-19 shock.

2. Background

2.1. Food Systems Resilience

As Hynes et al. [14] (pp. 175–179) argue, resilience must be the “core philosophy” to manage the system in case of disruptions, as COVID-19 has shown. The authors highlighted that not all the threats could be taken into account but relying on resilience philosophy means enhancing recovery and adaptations' capacity of the whole system. The authors suggest a set of recommendations to build resilience; among others: planning resilient infrastructures and supply chains or developing resilience assessing methods that could balance efficiency and resilience. Bené [15] (pp. 811–817) identifies some lessons in the context of COVID-19, which could be used to improve the comprehension about some shocks and increase our capacity to reinforce food systems' resilience through the planning of the right interventions. The first one regards the need to distinguish between resilience capacity and resilience per se. Resilience capacity represents inputs for the resilience process (e.g., knowledge), while resilience per se is the result of using those inputs in the middle term to improve long term results (improvement of well-being). This happens because of the difficulty to measure resilience per se. Indeed, resilience measuring is a key challenge for food systems studies. There are many developed frameworks to measure

a given aspect of resilience but, to date, none of those regards the overall food system resilience. The second lesson refers to the importance of choosing indicators, which could assess the main aftermath of food system resilience. The last recommendation is to better analyse and try to anticipate the main “ripple effects” that involve food systems after any shock.

The food system is intrinsically complex: it includes processes, value chains, a myriad of actors and interactions. Food systems are made of a large number of stakeholders and fields interconnected one another, so a single affected component could provoke a chain reaction. For these reasons, we refer to the food system on the basis of the literature of complex socio-ecological systems (SES): “SES visualizes the human environment interface as a coupled ‘system’ in which socioeconomic as well as biophysical driving forces interact to influence food system (and sub-system) activities and outcomes, both of which subsequently influence the driving forces” [16] (p. 90). This system is based on biophysical and social factors connected through feedback mechanisms and involves multiple sectors as well as different and sometimes conflicting actors. In this situation of uncertainty and complexity, the system is exposed to several challenges. Allen and Prosperi [17] suggest a SES approach for the analysis of the food system, which includes environmental determinants, complex social, political and economic considerations as factors of environmental, socio-economic and global change. The authors argue that the literature on resilience and vulnerability, which arises from the reference frameworks of SES, can provide some of the concepts to better frame the principles of sustainable food systems and identify the elements that should be monitored and evaluated [18]. Vulnerability is defined as the predisposition of a food system to be adversely affected and is generally considered as a function of exposure to a stress factor, effect (also called sensitivity or potential impact) and recovery potential (also called resilience or adaptation capacity). The distinction in three components, namely exposure, sensitivity and resilience, provides the elements of a model that specifies which characteristics have to be measured and how to structure the different indicators in a coherent framework to improve policy and decision-making.

The concept of resilience has often been used to try to solve the challenges to which the system is subject. Resilience is a concept that originates in the field of mechanics at the half of 1800s and moved first to psychology, in 1950s and then to ecology in the 1970s but it has been widely adopted as a generic approach to socio-ecological systems [19,20]. It ended up playing a strategic role in risk adaptation and in the formulation of strategies to mitigate global climate changes. There are many definitions of resilience, most referring to the ability of a system to resist and/or adapt to disturbances over time [21,22] even those unpredictable and therefore not accounted for in the risk analysis, in order for the system to keep performing its functions and to provide its services or desirable results. According to The United Nations Office for Disaster Risk Reduction (UNDRR), resilience is “the ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner” [23].

The approach to the concept of resilience has great potential in reaching and assessing the degree of safety and sustainability of food systems. Many studies however refer to specific aspects of the food system and do not take into account the complex interrelations that compose it in a holistic way. Because of the abundance of literature about resilience and sustainability and the numerous models to assess resilience, some elements originated by various frameworks which could better explain the research results were considered. Tendall et al. [24] (pp. 18–19), for instance, define food system resilience as: the “capacity over time of a food system and its units at multiple levels, to provide sufficient, appropriate and accessible food to all, in the face of various and even unforeseen disturbances”. As the authors argue, the food system’s resilience can be divided into different components that influence food system behaviour as, for example, flexibility, robustness and adaptability, which establishes how much will be recovered after a shock. For the purpose of this study, one of the most important components of resilience, recognised by many scholars, is the concept of adaptability. As Fraser et al. [25], explain in “Panarchy Framework” of

the landscape ecology, we live in a world of instability and uncertainty that depends on unlimited dynamics and the food system is threatened by many factors. It is essential to find some tools to assess if the system is vulnerable to future shocks. According to this framework, the diversity is one of the main characteristics of vulnerability and is the second resilience's characteristic explored in this paper. The other principal characteristic that distinguishes SPGs's activities is the social aspect. In fact, Bernaschi [26] argues that solidarity among individuals could enhance the level of sustainability and resilience of the community. Table 1 resumes resilience domains, their description and references that have been taken into account as theoretical framework of the research.

Table 1. Description of the resilience's aspects.

Resilience's Aspects	Description	References
Adaptability	States how much of a specific aspect of the food system is recovered after a shock.	Tendall et al., 2015 [24]
Diversity	According to The Modern portfolio Theory: having multiple ways to access food decreases a kind of risk associated to food system, consequently reducing the vulnerability of the system.	Fraser et al., 2005 [25]
Solidarity	Solidarity among individuals in SPGs should be the basis for the social sustainability of a community.	Bernaschi D. et Crisci G., 2016 [26]

2.2. Roman Foodscape Description

The metropolitan area of Rome is located in the central-western area of the Italian peninsula and with a population of about 4.33 million inhabitants it is the most populous metropolis in Italy. Despite the widespread and historical presence of anthropic settlements, the area, which extends 5352 km² is characterized by a rich Natural Capital represented by 124,500 hectares of Protected Areas, and by a vast system of public green, gardens and historic villas that often wedge into the urban fabric [27]. An agricultural area equal to nearly 250,000 hectares, managed by over 2656 farms, complements this natural system. Within the Metropolitan City, the municipality of Rome includes 57,948 hectares of agricultural area, representing almost half (exactly 45.1%) of the 128,530 hectares of total area, the largest agricultural municipality in Europe.

The traditional agricultural landscape of Rome, called "Agro Romano", which represents a strongly identifying character of the city, is the result of the historical relationship between the city and the countryside, based on large estates whose owners—nobility and church—have always had little interest in investing in the primary sector. The Roman countryside is therefore designed above all by low-capital-intensive sectors: arable land (cereals and forage), permanent meadows, pastures, and, to a lesser extent, woody agricultural crops (olive trees) and vegetables. An important and historical productive vocation of the Agro Romano is the zoo technical breeding and particularly the sheep breeding, an essential component of the Roman foodscape. An important DOP product of great commercial weight is obtained from this production, namely the "Pecorino Romano". The bovine breeding is strongly oriented to supply the city with fresh milk which still represents more than 70% of the final milk consumption. Roman agriculture is rich in quality agri-food products: 13 PDO and PGI products (extra virgin olive oil, cheeses, cured meats, meats and sausages, fruit and cereals) out of a total of 27 in the Lazio region.

Although about 70% of food purchases take place in the large-scale retail trade, the Roman food system is characterized by a widespread presence of local markets (127, for a total of over 5000 merchants) [28], which represent a traditional source of food supply for the population.

The traditional Roman foodscape in recent years has been crossed by a series of innovative initiatives, which had their symbolic initial moment with the occupation of the land

by young farmers and cooperatives in the late 1970s. The particular vivacity of Alternative Food Movements [29] that distinguishes Rome from the post-war period onwards has led the Agro Romano to be the fertile ground for the development of pioneering experiences of urban agriculture and solidarity economy, in conjunction with the grass roots movements for the recovery of abandoned land. Urban agriculture today in Rome is rich in innovative experiences in the fields of organic agriculture and multifunctional agriculture, with particular reference to the social one.

In the metropolitan area of Rome there are numerous experiences of solidarity economy: the idea behind social and solidarity economy networks is the concept of reciprocity, or the exchange of practices and knowledge directly or indirectly, between different subjects of society, for "duties" of solidarity [26]. In Lazio and Rome, the Network of Social and Solidarity Economy (RESS) is active. It involves the various SPGs of the territory: consumers, producers and suppliers but also organizations and associations dealing with solidarity economy. The development of local food networks in Rome has been remarkable: all forms of short supply chains—from farmers' markets, to SPG, to the experiences of box schemes—have recorded significant success. The numbers of short supply chains in the Roman area present proportions of primary importance in the national framework: the municipality of Rome has 33 farmers' markets and 55 SPGs [30], while 744 of the 2656 farms in the area practice direct sales. Alongside urban farming, also urban gardening has experienced an extraordinary spread, with its positive impacts, especially in social and environmental terms: Zappata Romana [31] continues to map the experiences of shared gardens and gardens in Rome (today there are about 200 shared green spaces), while a study by CREA [32] found 3200 plots of residential gardens (85% of the total), shared gardens, institutional gardens and informal gardens in the city. In this dynamic, underdeveloped but also innovative at the same time, a food policy proposal was born for the city of Rome that stands out from other national and international initiatives for being born as a "bottom-up" initiative of civil society a Rome Food Council [33].

2.3. Roman Food System Resilience during the COVID-19 Pandemic

From an initial analysis of the impacts that COVID-19 has had on the Roman agri-food sector as a whole, it emerges that catering and collective canteens suffered the most critical issues. Considering the weight of these activities in terms of household spending, and therefore their contribution to GDP, but also their social function, the sudden closure of these activities is an element of greater impact on the socioeconomic system. Strong criticalities are also found for production and for some typical aspects of urban agriculture, such as agricultural multifunctional farming and Farmers' Market. A positive impact area—also in relative terms—is the consumption styles one. This concerns both the composition of purchases, the consumption habits and the supply channels, which, even in the face of the strong growth of large-scale distribution, have recorded, also from a cultural point of view, a willingness to innovate on the part of families [34]. Finally, a more nuanced area concerns trade exchanges, understood both as a possible difficulty for the procurement of raw materials and, above all, the difficulty for those supply chains—first of all the wine one—strongly oriented to exports. The distribution system seems to be one the most affected by the COVID-19 pandemic shock. The impacts concerned both home deliveries—a structural element of distribution as large-scale retail trade and neighbourhood agriculture—and the perception of supply channels, with a trend towards diversification that reverses pre-COVID-19 trends to a certain extent. It will be interesting to monitor whether these changes can become structural, but certainly the flexibility of Italian families is an excellent indicator of both resilience and the potential for diffusion of different lifestyles and consumption styles. A second area is more strictly economic, with negative impacts on both long (export) and short agricultural supply chains (especially for the area of multifunctional farming). An area of great impact is the social sustainability of food systems. In this case, the greatest impact is on food poverty and consequently on access to food. This data refers also to the dynamics of the products' prices, especially the fresh ones.

Although Rome was not one of the epicenters in the first phase of the pandemic, it has undergone the restrictions provided by the government which, in order to contain the infections, has extended the lockdown to the entire country. In addition to the problems strictly related to the health crisis, the Roman food system has encountered numerous problems related to the extension of the limitations. First of all, the closure of all catering and accommodation activities, markets and canteens as well as ports and airports, had a negative economic impact on the city's Hotel, Restaurants & Catering (Ho.Re.Ca) sectors. From a socioeconomic point of view, due to the initial difficulties in the circulation of goods and products, there has been a rush to purchase, with very long lines at the retail outlets and empty shelves for some types of products, as well as increases in prices for many types of goods. Even traditional agriculture has encountered various obstacles related to the difficulty in finding manpower and the cutting of the market share dedicated to exports, especially for the wine sector. From a social point of view, the closure of many businesses and the consequent loss of work for a considerable portion of the population has accentuated the problems relating to poverty and social inequalities, especially for the most vulnerable sections of the population. There have been numerous responses to the urgent problems linked above all to the increase in the level of food poverty, worsened by the closure of school canteens, on which many families rely for the provision of at least one daily meal to their children.

Some of these measures were adopted by the administrations; others were the result of civil society initiatives, involving citizens' organizations, networks and the third sector. Among the initiatives implemented by the Capitoline Administration, the supply of basic food packages to families in need has been adopted. In May about 45,000 packages of food have been purchased and distributed in different areas of the city, thanks to the networks of various subjects and with the collaboration of the Civil Protection [35]. The administration was also the protagonist of important initiatives such as the provision of "shopping vouchers" for the purchase of food or basic necessities for poor people. In May, there were approximately 66,000 individuals and families for whom the "Shopping Vouchers" had already been paid, for a total of over 200,000 people and a value of over 21 million euros [35]. Other initiatives, promoted by many Municipalities of Rome, concerned the establishment of "Solidarity Markets", i.e., the possibility for elderly and fragile people, unable to go out to avoid contagion, to receive the shopping at their homes. Moreover, many well-known charities in the Roman territory such as Caritas, the Italian Red Cross and the Community of S. Egidio, have increased their workload by providing food and help to the neediest. The regional food bank (Banco Alimentare) [36], for instance, found a significant increase in the volume of food collected and distributed in Rome. In fact, in the months of March and April 2020, the food bank distributed 1800 tons of food to the 450 associated entities. Furthermore, the beneficiaries increased by 37% bringing the total number to around 120,000 people; at least 10% of these are considered new beneficiaries, i.e., people who had never had to go to charities for food before the pandemic. It is above all thanks to the networks and the involvement of citizens' organizations that the most effective response to the crisis has been guaranteed. Many small associations, SPGs, citizens' organizations, parishes, have guaranteed the delivery of shopping bags and other basic necessities to many families in difficulty. Furthermore, many entities and associations have faced the difficulties encountered very well and have developed innovative tools and ideas to face the contingency. The SPGs, for example, have created Condominium Purchase Groups [37], involving the largest number of families in their condominium to organize a shared shopping, avoiding (by choice or necessity) the long lines at the supermarket and buying from local producers. Local farmers were also affected by the lockdown. Many of the activities related to multifunctional farming have been banned; many had to reorganize their businesses to include home deliveries. Initially, some producers unfamiliar with a delivery system had problems organizing home deliveries due to increasing orders. On the other hand, local producers have strongly and with great effort collaborated to the supply of local, healthy and sustainable food, contributing to the resilience of the city.

3. Materials and Methods

A dedicated survey has been used to collect information about Roman SPGs. The questionnaire has been created through the Google Form platform, starting from a review of the white literature on the most reliable SPGs online surveys, performed until April 2020. To the first part, based on general information about the SPGs (composition of the group, type of products mostly bought, logistic methods etc.), was added a dedicated section about COVID-19 pandemic effects on SPGs' functioning. The investigation took place during the so called "first wave" of the COVID-19 pandemic crisis. The questionnaires have been sent in the middle of May and the answers have been collected until the end of June. The questionnaire had been sent to different types of SPGs: some of them are non-profit constituted associations, while others are informal and constantly evolving realities. Because of the constantly changing shape of SPGs, recent official data were not available, so a list of recipient SPGs has been created on the basis of some information accessible on unofficial dedicated websites. The creation of a sample started from the list present on the Network of Social and Solidarity Economy (RESS) [38] and the SPGs Lazio and Rome Network [39] websites. According to these sources, in 2015, in the metropolitan area of Rome, there were 55 SPGs [30] while in November 2020 they amounted to 57 [40]. Due to the informal and variable nature of these groups, each SPG present on the above-mentioned lists has been directly contacted. Finally, all the 57 SPGs' active in the Metropolitan area of Rome have been collected and have composed our reference sample.

The questionnaires had been sent by email to the previously identified sample of SPGs and finally 22 replies have been collected. Since SPGs were overwhelmed by the impacts of the lockdown, submitting the answers had been difficult for some of them. The authors have repeatedly reminded them to participate to the study. In order to take into account some important aspects related to the research design such as the social, humanitarian and community aspects, the quantitative data of the analysis (results of the questionnaire) have been combined with a subsequent qualitative part. This part concerned semi structured in-depth interviews, directed to the leaders of the SPGs. Three SPGs were chosen for the interviews in relation to their presence on the territory, number of members and backgrounds. The interviews occurred through semi structured questions posed through CATI methods between May and June. The questions were mainly focused on the difficulties faced during the lockdown and the different SPGs' reactions to the crisis in terms of suspension of activities or adoption of new tools to manage the contingency. The results of the questionnaires had been extracted from Google Form and analysed using Microsoft Excel, the basic functions of descriptive statistics. The interviews were recorded and transcribed. Subsequently they were examined to identify the main arguments. Following a classification of the main topics analysed, they were integrated into the analysis resulting from the questionnaire.

4. Results

4.1. Definition of Clusters

The total number of questionnaires returned to the research group is equal to 22. This entails a satisfying result in terms of data collected, as the SPGs surveyed represent the 38% of the sample. The descriptive characteristics of the sample are described below, on the basis of which it was possible to analyse the results for the identification of descriptive clusters. The 64% of the SPGs in the survey supply between 10 and 30 participants, while the remaining share of SPGs caters to more than 40 participants. Almost half (48%) of the SPGs obtain supplies from agricultural or processing companies located in municipalities other than Rome, while a third of them obtain supplies both in other municipalities and in the municipality of Rome. The 4% intentionally purchase only from the Municipality of Rome, while just one SPG supplies, as well as in the municipality of Rome and nearby municipalities, also in the neighbourhood where it makes deliveries. Of the total 22 answers received, 13 of them supply weekly from producers, regardless of the type of products they sell, while the remaining nine supply from producers at different intervals of time

depending on the product sold: fresh pasta every two weeks, meat, dry pasta and flour every four weeks, parmesan every two months. On the demand side, the average monthly expenditure of the participants in the GAS survey is almost perfectly evenly distributed between an amount exceeding € 100 (in 36% of cases), an amount between € 76 and € 100 (in 27% of cases) and an amount of less than € 75 (in the remaining 36% SPGs). Among the latter, four SPGs report an average expenditure between € 51 and 75, three an average expenditure between € 30 and 50 and only one declares an average expenditure between € 10 and 20.

The process of aggregating the questions related to the composition of the SPG in terms of size (number of participants), type of products sold, geographical origin of products, frequency of purchase from suppliers and average amount of expenditure by consumers made possible the identification of three clusters that explain the sample of SPG interviewed. Following a qualitative analysis performed by the authors comparing the variables affecting the possible SPG groups, the type of product sold by the SPG was found to be the variable that best explained the differences in the sample, since this variable creates sufficient differentiation between the SPG groups, while maintaining a similar frequency of cases. Therefore, the identified clusters meet the criterion of the type of products sold in the SPG. These clusters have been described in the Table 2.

Table 2. Description of the clusters derived from the survey sample.

Name of Cluster	Frequency	Description
Flexitarian	9	SPG who sell food, mainly fruit, vegetables, meat and cheese
Flexitarian Premium	6	SPGs that sell food, including high value-added products such as honey, pasta, oil, wine, pastry and preserves. In addition, they sell other household products (ecological detergents, soaps)
Vegetarian/Vegan	7	SPG who only sell fruit, vegetables, flours and, in a few cases, cheeses

4.2. Survey Results

Following the identification of the clusters, it has been possible to analyse how the crisis resulting from COVID-19 has impacted the forms of solidarity distribution of food.

The analysis shows that, during the first months of the pandemic, the number of participants in the survey's SPGs increased, especially for the Vegetarian/Vegan (VEG) cluster and for the Omnivore (OMN) cluster. The Flexitarian Premium cluster, on the other hand, shows alternating trends: in a third of cases the participants decreased, while they remained stable in 17% of cases and increased in 50% of cases (see Figure 1).

Interestingly, the SPGs that saw membership increase saw also a total increase of 74 participants. However, the Flexitarian Premium cluster sees a decrease of 10 participants, all attributable to a single SPG that initially had to extend delivery times and then completely stop the service. In fact, due to the informal nature of SPGs, some of them were unable to continue their sorting and distribution activities in the lockdown period. In fact, due to the mobility restrictions, it was impossible for members to justify their movements toward the headquarter and difficult to find a different explanation to the authorities. This increasing trend of SPGs participants was confirmed also by the interviews carried out. Many of the SPGs' interviewed members, in fact, declared an increase in the number of people who joined the SPG and many of these have confirmed their subscription even after the first phase of lockdown.

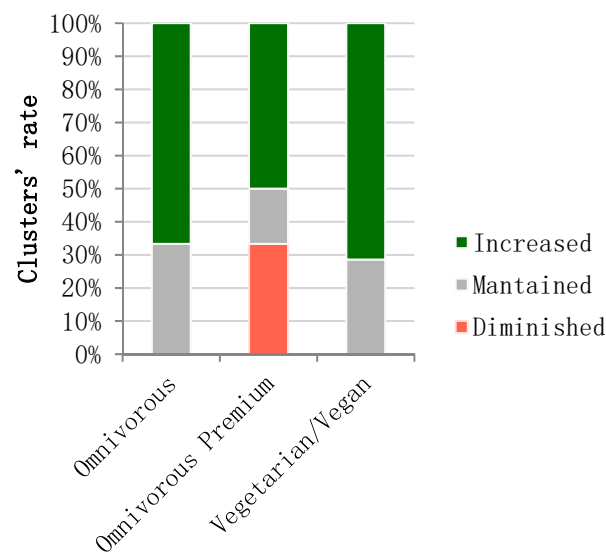


Figure 1. Percentage of Solidarity Purchasing Groups (SPG) that have witnessed participants increase, remain stable and decrease, by cluster. Source: authors' elaborations.

Consistent with the fact that the Vegetarian/Vegan cluster has seen an increase in the number of participants, the analysis of the questionnaires shows that the very cluster has increased the purchase of products from suppliers in 46% of cases, while in 54% of the cases the demand for supplies remained stable. The two Flexitarian clusters show a smaller increase in purchases (34% of the SPGs belonging to the Flexitarian Premium cluster and only 17% of those belonging to the Flexitarian cluster) and the 38% of the SPGs belonging to the Flexitarian cluster had to reduce purchases from suppliers (see Figure 2). During the investigation period, the investigated SPGs bought more fruit and vegetables from suppliers (both increased for 71% of SPGs), eggs (increased in 60% of cases), flour (increased in 53% of cases), milk and yogurt (increased in 45% of cases). On the other hand, purchases especially of cured meat (decreased in 25% of cases), pasta (decreased in 24% of cases), bakery and pastry products (decreased in 23% of cases and not increased by any SPG) and preserves have reduced (decreased in 22% of cases) (see Figure 3).

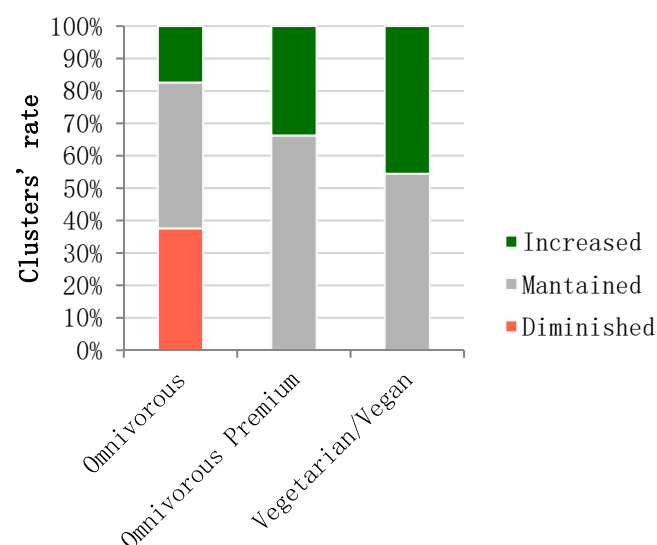


Figure 2. Percentage of SPG whose purchases from suppliers during the first months have increased, remain stable and decrease, by cluster. Source: authors' elaborations.

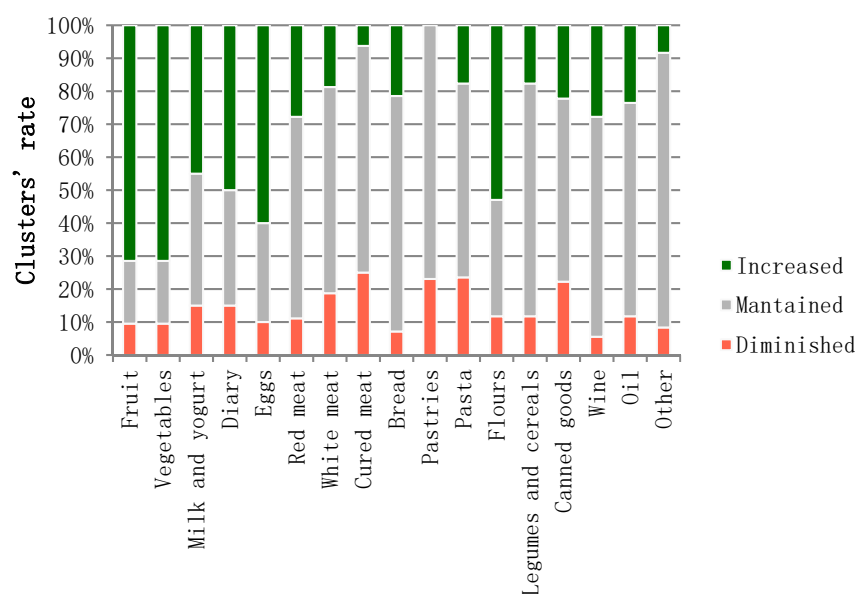


Figure 3. Percentage of SPG that have increased, unchanged and diminished the purchases from suppliers, by type of product. Source: authors' elaborations.

In terms of product availability from suppliers, the Flexitarian cluster suffered a decrease in 35% of cases, while Flexitarian Premium witnessed a decrease in availability in a quarter of cases and stability in three quarters of cases (Figure 4). Consistent with what emerged from the analysis regarding the increase in participants in the Vegetarian/Vegan cluster and the purchase of products by the same group, the availability of products increased in 17% of cases and remained stable in 69% of SPGs. Consistently with the increased demand for flours (increasing in 53% of cases), the latter recorded a reduced availability in 35% of SPGs (see Figure 5). White meat, probably due to the interruptions, restriction measures and consequent lack of manpower, which occurred in such complex supply chains as those of livestock, especially in the little ones, shows a reduction in availability in 38% of SPGs. This data has also been confirmed by interviewees. Eggs, dairy products and pasta were the products that were more available. Bottled products such as oil and storable products such as legumes and cereals, however, remained stable during the first months of the pandemic crisis. Fruits and vegetables have remained almost stable, in the face of increased demand.

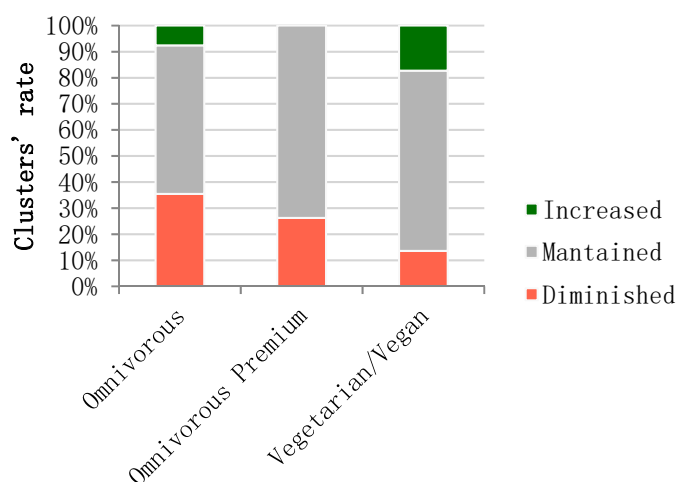


Figure 4. Percentage of SPG that have witnessed increase, stability and decrease of the products availability from suppliers, by clusters. Source: authors' elaborations.

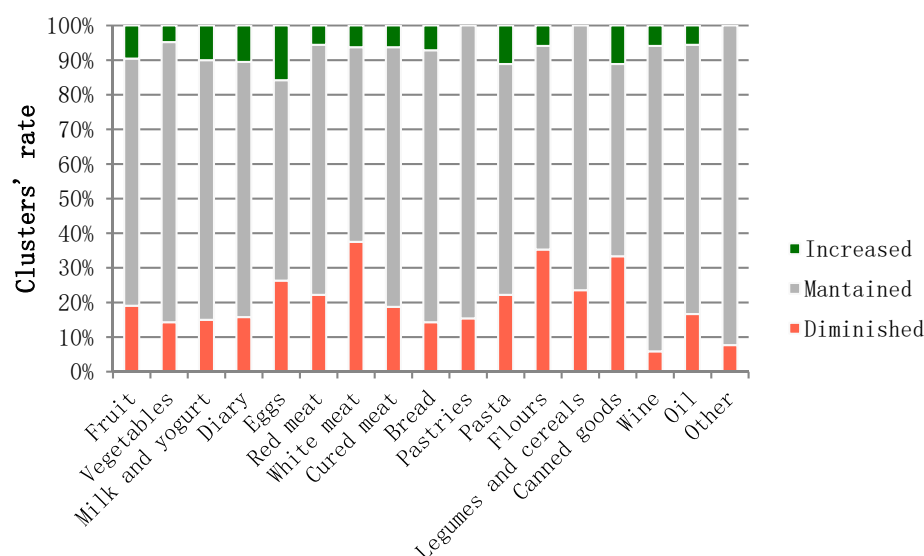


Figure 5. Percentage of SPG that have witnessed increase, stability and decrease of the products from suppliers, by type of product. Source: authors' elaborations.

Among the main changes encountered by SPGs in supplies to producers, an increase in the number of collection points is highlighted above all. In addition, the lengthening of delivery times and, to a much lesser extent, the decrease in weekly deliveries and the interruption of the sales service to the SPG are noted. In some cases, delivery times have been changed or deliveries have been made directly to the homes of the SPG participants. In general, many SPGs see a great deal of commitment on the part of manufacturers to ensure the supply of products, even those of the most modest size.

Through in-depth interviews it was possible to underline the abovementioned drivers of variations. These are partially attributable to the difficulty of some producers to supply food because of increased orders and logistic issues in the first weeks of the lockdown. In fact, due to the number of orders received and the lack of manpower, some local farmers have been forced to sell just by "box scheme" initiatives. In other cases, SPGs encountered some problems in managing big orders (for example farinaceous and olive oil) because, due to the closure of some of their production units, producers asked for an extra charge to sort the orders in different points. As emerged from the interviews, because of the extra charge, they decided not to buy and every SPG member found other retailers. As Tendall et al. [24] have highlighted in the food system resilience action cycle, resilience does not consist only in the capacity to absorb and adapt after a shock but, above all, in the capacity to prevent it developing stability. In this sense, both SPGs, as representative of Alternative Food Networks (AFNs) world, and the other distribution channels were unsuccessful. However, it can be asserted that many SPGs have shown a great ability to absorb the shock and adapt to the new situation in a few weeks if not days. Even in the interviews, it emerged that the increase in the demand required a new type of logistics involving both suppliers and consumers. For some SPGs, the logistics issue was correlated to the closure of their production units; this problem has been immediately solved thanks to the availability of SPG members and linked producers to manage groups' deliveries. Further to this point have been created some little delivery hubs to allow food unloading and distribution.

The prices of products sold through SPGs were negatively affected by the pandemic crisis only to a very limited extent. In fact, only 9% of the SPGs in the Flexitarian cluster recorded a price increase, a percentage that drops to 8% in the case of the Vegetarian/Vegan cluster and to 5% in the case of the Flexitarian Premium cluster. Fruit and vegetables, probably due to a lack of manpower and the consequent increase in business costs, recorded a price increase for 19% and 29% of the SPGs surveyed, respectively (see Figure 6). In addition, the SPGs belonging to the Vegetarian/Vegan cluster also purchased products

from new producers, while this happened in 22% of the SPGs belonging to the Flexitarian cluster. The SPGs of the Flexitarian Premium cluster continued to source from the same companies.

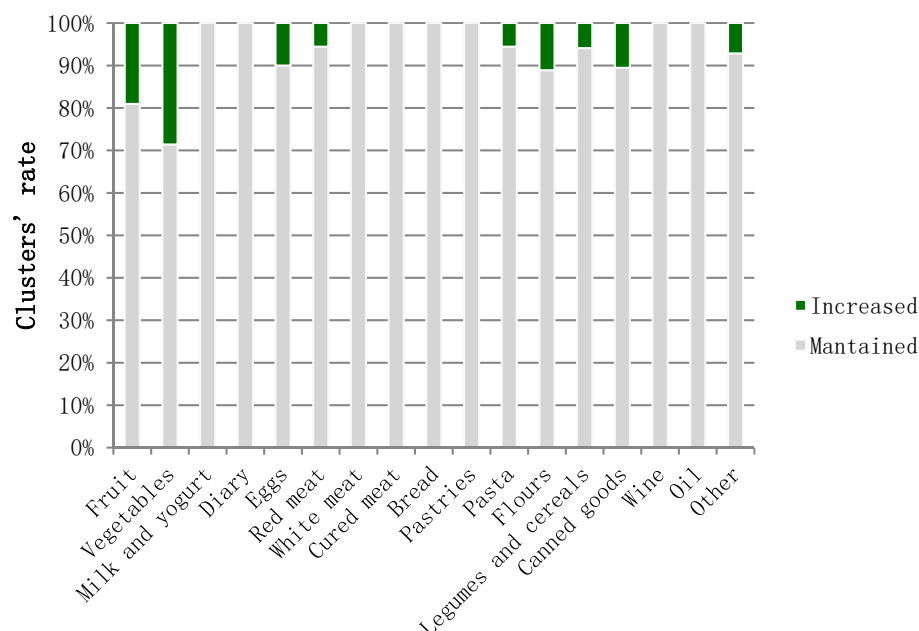


Figure 6. Percentage of SPG that have witnessed increase and decrease of the products' prices, by type of product. Source: authors' elaborations.

5. Discussion

The analysis of the results shows that the SPGs have been able to deal with the shock and the related restrictions on movements and economy in a flexible way, adapting to the turbulent environment created since early March 2020. In our research design, many of the involved SPGs have shown in very different ways the ability to adapt. For instance, although many of the SPGs headquarters had been closed due to the lockdown measures, just one suspended the activities and the others were able to arrange food supplies. According to Tendall et.al. [24], the capacity to absorb and adapt to a shock could be considered as a resilience characteristic. Nevertheless, the results have highlighted some weaknesses affecting SPGs. In fact, the supply of some products has suffered partial interruptions or there have been difficulties in supplying product categories with more complex supply chains (e.g., white meat), while other products have seen prices increase due to the increase in demand, partially undermining the contribution to resilience of the solidarity purchasing system organized on the Roman territory. The triple fiduciary relationship that binds producers to SPGs and the latter to consumers, has ensured that solidarity and civil reasons have compensated for the objective difficulties concerning, first and foremost, the physical movements of producers and consumers, contributing to local resilience.

5.1. Cost-Benefits of SPGs

The data on the increase in SPG participants during the first months of the pandemic, shows that forms of food distribution with fewer passages along the supply chains have been considered attracting for an increasing share of population. Even though, in absolute terms, the trend has involved a limited number of new participants, the purchase of agri-food products through an SPG cannot be compared to sales in other outlets and retailers, since the first usually involves at least the registration, the payment of a membership fee and the adhesion to the association and its statutory principles. Therefore, the increase in SPGs participants is likely to become a stable phenomenon, triggered by the COVID-19

shock, but it is not comparable to the eventual increase that occurred in other sales channels of agri-food products. In the Roman area, many associations and awareness networks have done their utmost to try to make people understand the importance of supporting local farmers and producers. In fact, the latter, relying on marketing methods based on the daily or weekly relationship with the customer, risked being left with unsold production, with evident repercussions on profitability and company liquidity. Those information campaigns, often informal and based on word of mouth, have led some of the population to question the effects of food purchases on local producers and, therefore, on the regional economy. Despite in the same period of crisis the purchases of food at large stores and discount stores has increased, these data show us that there has been a diversification of the forms of purchase that also involved the SPGs which, as explained above [25], has increased the level of resilience in many neighbourhoods of Rome. The latter, while representing a marginal share of the city's food purchases, are evidently considered as marketing channels capable of conveying fresh, high quality products, often absent from supermarket shelves and above all of supporting small local producers. As well as confirmed by the interviewees, this is evidenced by the fact that the type of SPG that shows the most significant increase is the Vegetarian/Vegan one.

From the point of view of the potential, the increase in the number of participants during the pandemic crisis is an indicator of how much the consumers-members consider the SPGs to be more flexible and adaptable in the movement of goods than conventional supply chains. While research on the impacts of COVID-19 on local food systems in Italy has found greater diversification of food procurement methods [41], a factor of preference for SPGs has been represented by places of purchase, which usually take place outdoors and away from the risk of gatherings.

As emerged in many interviews, the COVID-19 crisis has shed a light on food systems' critical issues. The increased availability of time for individual organization of food purchasing forms has allowed many new members to join existing SPGs and, in some cases, participate in management activities. In particular, the active form of participation in an SPG is precisely the principle that distinguishes them from a passive approach to food purchase [13]. In fact, one of the reasons why many people have expressed the desire to join an SPG is to make a different and more sustainable food choice. Probably this choice should derive from a personal predisposition or a curiosity to take a risk and a responsibility becoming part of an organized group, building a different relationship of trust with neighbourhood's small retailers or local producers. As emerged, a new awareness about food choices and the importance of having high quality food at the right price, especially for the most fragile people, has increased. From this point of view, as Fraser et al. argue, an increase of diversity in terms of supply channels reduces the vulnerability of the food system. Due to the brief time of the investigation, it is not possible to understand all the reasons of the supply channels' change. From the interviews carried out, we know that the main reasons that prompted many people to join the SPGs were: the necessity or the desire to avoid long queues at the supermarket or the demand for more local and healthy food, but we do not have enough elements to evaluate if this is a trend that will continue over time after the COVID-19 shock. Furthermore, during interviews it was evident that, in recent decades, an essential social fabric has been weakened; the same has proved to be really important in the first phase of the COVID-19 crisis for the resilience of the city and for the social sustainability. Therefore, it became clear that the relationship between potential new consumers and local farmers should be reformed and that a new role should be conferred to local and Farmers' Markets. Many SPGs argue that local markets should become the social cornerstone, especially in the neighbourhoods and slum of the city and the leading solution for local products which do not receive the proper attention from the municipality and cannot compete with the large-scale distribution.

5.2. Food Products' Demand

Consistently, given the increased number of members, SPGs have demanded a greater volume of products from suppliers. This is particularly true for vegetarian SPGs, while the omnivore data shows that meat and dairy producers have had greater problems responding to increased demand. This may be due to the fact that animal-based productions, above all white meat production, need a more complex organization for processing, which often requires the outsourcing of some phases. Indeed, during the lockdown, due to restrictions on physical movements and a lack of manpower, these supply chains may have slowed down and therefore were unable to supply as much product as required. As evidence of the fact that SPGs have helped to cover plant-based needs, Figure 3 shows that 71% of them have demanded larger volumes of fruit and vegetables, followed by eggs and flours. The latter, in particular, showed an increase in sales also in conventional distribution, due to the increased propensity to cook traditional flour-based dishes at home (bakeries, pasta, bread, etc.). Further demonstrating the "substitution" factor, purchases from bakery and pastries suppliers declined, probably because people spent more time cooking at home.

From the interviews carried out, it has emerged that the increase in demand is mainly related to the need to avoid big supermarkets' queues and crowded places. In fact, according to Coluccia et al. [42], a big part of the population chose small supermarkets. Secondly, they paid attention to food quality and origins. In general, there was an increase in healthy food choices, and this suggests that in the future an increasing number of people will change their habits of food. The attention to socio-ethical aspects has also been mentioned, namely supporting local economy and local farmers. The time spent to prepare dishes is a significant aspect: becoming part of an SPG requires a group responsibility and much time to dedicate, if compared to the usual time needed to buy and cook food. In fact, the lockdown has highlighted the possibility to avoid the common "fast food" habits and dedicate more time to the family preparing a recipe, rediscovering food traditions. The increased demand has underlined the need for a better organization and professionalism for an SPG: many of these have introduced some technical tools such as software or bank accounts typical of the traditional trade.

5.3. Food Products' Availability

Alongside the increased demand for products from producers, the results of the analysis show that supply has not always been able to meet demand. In fact, although 17% of the SPGs in the vegetarian cluster showed an increase in product availability (but 14% showed a decrease), the other two Omnivore and Omnivore Premium clusters witnessed a decrease in availability of, respectively, 35% and 26%. These data confirm again that the products that have been in short supply are the most complex ones (mainly meats), which require the integration of different steps along the supply chain. As confirmed by the interviews, the meat supply chain has suffered most from the restrictions due to the pandemic shock as it relies on a large number of operators who intervene in various stages of the supply chain, often in distant places. This evidence indicates that a possible solution for future similar shocks is the one that has long been supported by some groups of breeders, namely the provision in the city of publicly managed collective places for the processing of animal products. Instead, plant-based products have mostly remained available and, in some cases, have even been more available, despite price spikes occurred in some cases. In fact, as shown in Figure 5, the products that have shown the most a decrease in availability are white meats, flours (which, as observed above, have seen a large increase in demand), canned products and eggs. Regarding prices, it is interesting to note that only 7% of total SPGs experienced an increase, which affected the omnivore cluster to a slightly greater extent (9% of SPGs). Foods that show an increase in prices are vegetables (increased for 29% of SPG), fruit (increased for 19% of SPG), canned good and flour (both increased for 11% of SPG). This means that, in the face of greater demand and a less than proportional increase in availability, the demand for fresh products has led to an increase in prices. However, for 92% of the overall SPG prices remained stable, highlighting the

fact that the trust relationships that are woven between producers and consumers in short supply chains mean that free-riding phenomena are less frequent. Furthermore, although in large-scale distribution there have been price increases in many product ranges, in the SPG the income motivations, which should have led to an increase in prices, have been balanced by solidarity motivations of mutual aid, which have helped to keep prices stable.

5.4. Cultural and Charity Activities

Interviews underlined that, due to the rise in the number of indigents, there was an increase of charities specifically with regard to basic necessities such as food. It should be noted that the SPGs have played a significant role in supporting civil society initiatives on the front of aid to the poor. In fact, in many cases food boxes have been organized to be distributed to the indigents thanks to the recovery of food not commercially usable from the producers supplying the SPGs, spontaneously contributing to alleviate the problem of access to food for part of the population [43] and so, to the social resilience of the Roman area.

SPGs have played, in very different ways, a key role connected to the possibility to offer food to fragile people in the Roman area demonstrating, as Bernaschi [26] argues, how solidarity represents an essential resilience variable. In some cases, the food given, still edible but no longer saleable, came from SPGs' food suppliers. In other cases, the positive effect of the charity was double. One of the SPGs, for instance, organized fundraisings to buy food from local farmers and cooperatives already linked to SPGs, providing vulnerable families with food and basic necessities. In this way, they managed to help both local small farmers and families in need. Some other SPGs initiatives have been integrated with the civil society ones, enhancing social resilience; for example, an organization of parents linked to a neighbourhood elementary school, created a virtuous circle to support fragile people. Specifically, helped by the SPG, they collected basic necessities and clothes for single women with children and large families which, because of the closure of school canteens, could no longer count on at least one guaranteed daily meal for their children. In this way, many people who participated to charity initiatives, had also the opportunity to know and approach SPGs methods and appreciate their "ethic and sustainable" vision.

During that period of isolation and distance, the plan and design of deliveries and the information exchange have been lived as a social time for SPGs. The contingency was an opportunity for many people (neighbours or co-owners) to discover SPGs activities. Moreover, many SPGs have been organized to provide also other type of products (not just food items), for instance, detergents and clothes. Furthermore, during the first months of the pandemic crisis, the SPGs tried to keep their cultural role active, taking on the dissemination and training initiatives on agro-ecology and the rights of workers in agriculture. One of the best initiatives concerned a books delivery for members and not only. Indeed, SPGs organized online presentations of books and webinars about agricultural workers' situation, trying to promote a vision of sustainable agriculture from farm to fork. This means that, in some cases, the SPGs have been able to replace the traditional places of cultural meetings, circulating information and giving opportunities for exchange in a moment of lockdown characterized by the lack of such opportunities. In terms of resilience, this is also an important aspect; indeed, taking a counterfactual approach, it is questionable whether other associations would have been able to play this important cultural role. Overall, interviewees stated that politics has not made an effort to sustain SPGs during the lockdown, especially with regard to members and producers in collecting and supplying products. Nevertheless, the opposite situation has arisen in many cases: the districts have been supported by many organizations, some in the form of SPGs, to identify fragile people to be helped.

6. Conclusions

The research conducted contributes to the studies related to the vulnerability of food systems, with particular reference to the shocks provoked by the COVID-19 lockdown. In

fact, in consideration of the quantity and quality of Food Movements in the metropolitan city of Rome, the purpose of the study was to analyse whether, to what extent and in which way the Solidarity Purchasing Groups have represented a resilience factor of the system food compared to the current shock. The results provided important indications on the role of alternative distribution channels and on the policies that could guide their greater capillarity in the Roman food environment. In fact, if on the one hand the research has highlighted the growing weight of SPGs as purchasing methods, on the other it has emerged that the lack of a clear regulatory framework and political direction is a barrier towards the structuring and better organization of these initiatives. In fact, in most cases, SPGs are informal and not-recognised groups of people and this has caused the closure of their headquarters during the lockdown. In other cases, because of the volunteer nature and the lack of acknowledgement of their activities, many SPGs cannot afford the rent of an office and have to rely on other associations' offices, community centres or spaces made available by parishes.

Given the period in which the survey was carried out (April–May 2020), the authors are not yet able to assess the transformative and adaptable capacity of SPGs to respond to such increases in demand. What is questionable is the extent of the flexibility of these marketing channels, which often base their functioning on voluntary work and cannot ensure efficiency and responsiveness to absorb a greater demand for products. Therefore, considering the alternative role that SPGs play more or less explicitly to large retailers, it is important to underline that in terms of resilience to external shocks, SPGs still have ample room for manoeuvring and that if they want to constitute a valid alternative to large-scale distribution, it must be supported by more structured and efficient organizational forms.

From the point of view of critical issues, the pandemic crisis has triggered some latent and structural criticalities affecting the Roman food system. Although this institutional gap has been partially compensated by civil society initiatives and by the SPGs themselves, the research has shown that the absence of a food policy at the metropolitan level is an absolutely crucial issue for the sustainable development agenda of the city of Rome. In fact, the possibility of diffusion and scaling-up of short supply chains depends on a logistic organization that cannot ignore the support of the administration. This support must concern both the supply, through the provision of adequate material and intangible platforms for aggregating and organizing products, and the demand, providing spaces, information, structures and resources to facilitate access to food. This need is the most urgent at this time, as individual manufacturers are suffering from labour shortages and logistical restrictions that create significant bottlenecks. Another area that the administration could support is the one relating to the coordination between the work of the SPGs, their suppliers and the local markets, which most of all suffered from closures during the first months of the pandemic crisis. In fact, given that marketing channels such as local and farmers' markets have been closed, many producers have struggled to redirect their products towards the SPGs. However, the match between supply and demand has not always been effective, producing distortions highlighted by the fact that many SPGs asked for products but did not know which suppliers to turn to. Finally, the increase in demand has stimulated a better organization by the SPGs, which in some cases have been able to respond by introducing tools typical of traditional trade such as management software, digitalization of some processes, implementation of databases etc. In this context, only the most structured SPGs were able to invest part of their human resources—very often on a voluntary basis—and financial resources to improve the management of customers and foster better food flows, while those of smaller size suffered more and, in some cases, failed to go along with the increased demand for local products.

This evidence on the gaps between access to food, local initiatives and the role of institutions raises a big question about the interpretation of the nature of the right to food: can we still continue to allow large swathes of the population not to have access to healthy, fresh, fairly produced food, while this remains unsold in the producers' warehouses? In a context of increasing household poverty, reduced purchasing power and increased

economic and social inequalities, can we still rely on the strict rules of economic exchange for the ability to eat healthy food in sufficient quantities? What role do SPGs play in mitigating the process of “commodification of food” or reduction of multiple (and not monetizable) dimensions of food to its tradable features, that can be valued and exchanged in monetary terms? According to Vivero-Pol [44] a food system in which food passes from being a commodity to a common good involves some steps: firstly, food should be recognized as a fundamental human right and the food system organized to enforce this right for all: if we change the way we see food, then we start unlocking unpermitted ideas and we discover that there could be other ways to allocate such an essential resource. This entails proper governance with collective actions. Secondly, access to food should not rely exclusively on purchasing power: everybody should have an entitlement to a minimal access to food, which entails that the market should not be the only way to access it. In these phases, cities today have the most appropriate levers to accelerate the transformation of food systems on the basis of place-based choices [45], motivated by the individual economic, social, production and geographical conditions of the places in which they produce their effects. For instance, cities could support other means of food allocation that rely on collective arrangements (based on mobile apps or proximity relationships within neighbourhoods), allowing eaters to have a say in how the process is organized (i.e., urban food councils already found in hundreds of cities). This could be a way to deepen food democracy, by encompassing alternative movements that share the opposition to the commodification of food, such as food justice, food sovereignty, degrowth or agroecology.

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