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Effects of the COVID-19 Outbreak on the Use and Perceptions of Metropolitan Agricultural Parks—Evidence from Milan and Naples of Urban and Environmental Resilience

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Abstract: This article describes the multi-function of the metropolitan agricultural parks (MAPs) in Milan (Parco Agricolo Sud Milano) and Naples (Parco De Filippo) and their resilience within the last COVID-19 lockdown period. These parks play an important role in the urban regeneration and social inclusion processes in their relative metropolitan areas. Nevertheless, the restrictions imposed to limit COVID-19 contagions have imposed their closure or severely limited their activities, with evident consequences for the local population's well-being. This study's novelty is twofold: it is the first study examining the resilience and sustainability impact of MAPs during COVID-19; additionally, it is the first survey making use of Milan and Naples practices. The work uses primary and secondary data and mixed methods. Exploiting a document analysis and the elaboration of a semi-structured interview with the directors, the article lists the multiple functions of the parks and underlines their multidimensional governance vocations for fostering sustainable development—environmental, economic and social functions. The study also reveals that, during the lockdown, the parks' activities were strongly reduced or restructured. Recreational and educational activities were lifted in Parco Agricolo Sud in Milan whilst local farms restructured their food supply and fostered their network and linkages with the urban distribution channels. MAP in Naples had to stop its activities and reorganize into a smart-working system. Lastly, our study found that economic and farm network activities were resumed with greater urgency in Milan, whereas in Naples the recovery of the social practices has taken on greater importance.

Keywords: Milan; Naples; COVID-19; metropolitan agricultural parks; MAP; governance; urban regeneration; qualitative methods; primary data; secondary data

JEL Classification: O13; O18; Q01; Q23

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1. Introduction

Metropolitan parks (MPs) represent a crucial element in the urban fabric, as they are able to enhance the environmental quality of the spaces and the social conditions of local communities [1,2]. Recent observations have revealed their positive role in promoting the quality of life of urbanites and benefitting their health [3,4]. As essential parts of the local ecosystem, vegetation, water bodies and green spaces act as buffers against congestion, noise, and pollution [5,6]. They support the city's green infrastructure and provide multiple ecosystem services, above all providing and regulating services and cultural services [7–9]. Beyond these effects, the provision of cooling and shade accelerates recovery from heat and urban heat islands, further improving environmental conditions [10–12].

This work is grounded in resilience theory. Specifically, urban resilience theory has been used as a foundation to elicit lessons to be used for environmental economics, management and policy. Urban resilience can be defined as the feature of an urban system to overcome shocks and bounce forward. In this process, adaptation to change and mitigation of risk and vulnerability are crucial [13–15]. Urban resilience is intertwined with sustainable development and environmental preservation and is a primary objective of the UN sustainable development goals [16].

Other studies emphasize MPs' social functions. Metropolitan parks appear to facilitate physical activity and social interactions, which in turn promote the mental health of users [17]. As a green space, they provide a refuge from an increasingly stressful life [18], promote social cohesion [19] and enhance personal well-being [20]. They also serve as a valuable tool to ensure greater food and environmental security and combat environmental degradation and speculation [21–23]. In this sense, by acting on people's well-being and encouraging local sustainable development, urban areas and metropolitan parks can be determinants to effectively improve resilience [24,25].

As commons, urban green areas are crucial to facilitating environmental protection, social well-being and economic growth; these areas are instrumental to citizenship reactivation and to the resilience of cities [26–31].

However, the magnitude of these effects depends on some dimensions, like quality and accessibility [32], and the societal pressure for the conversion into urban areas [33].

Similar effects have not been tested for Metropolitan Agricultural Parks (MAPs). These parks represent areas in which agricultural activities are created, rediscovered or strengthened in order to safeguard and protect the territory and the metropolitan environment [34]. MAPs are, in fact, the result of rural areas' urbanization in the proximity of urban centers. They are often located near settlement forms where the edge between urban and rural spaces fades and the legacy of the rural society and the agricultural landscape is often eroded [35–37]. Their role appears fundamental in providing some commons—such as urban ecosystems and urban-rural landscapes as well as the quality and goods, facilities and amenities that these parks make available for urban people. In this sense, they may be considered providers of short food supply chains and recreational, tourist, social and cultural services. MAPs can be a powerful tool to motivate citizens to participate in community activities and inspire them to become engaged in a new pattern of local development where civic engagement becomes pivotal to ensuring sustainable and resilient ecological transitions [38–40]. However, most scholars focus on the study of urban-rural patterns and functions and support local administrations on the planning agenda drafting, less on the multifunctional and integrated characteristics analysis, as well as on the environmental, social and economic values of these parks (see [37,41]).

Nevertheless, planning MAPs also appears today to carry noteworthy criticalities. Problems can be generally traced back to two fundamental aspects: the study of management costs and the monetary quantification of the possible benefits of green areas within urban contexts [42]. With the COVID-19 emergency, a third aspect has been created—the one related to the usability of these areas considering the restrictions to protect the health of citizens. Research on how pandemics change the activities of MAPs and their adaptations to the restrictions is of great interest and not frequent at the moment.

To limit the COVID-19 diffusion, the national and regional authorities have imposed social distancing measures and stay-at-home orders, including a ban on free movement except for the case of urgent needs (viz. lockdown, March–May 2020). These restrictions have strongly limited the social, environmental and economic activities—including MAPs enjoyment [43,44]. Amongst the others, the cultivation of agricultural areas has been limited or suspended due to a lack of personnel whereas the access to farmhouses, urban gardens or other recreational activities has been interrupted [45]. However, during the outbreak, some Italian metropolises have adopted measures to preserve green and agricultural spaces, safeguard users' health as well as the continuity of economic activities located there. This

also happened in Parco Agricolo Sud Milano in the Milan Metropolitan area and De Filippo Park in Naples metropolitan area.

Parco Agricolo Sud Milano, amongst the first parks in Europe in terms of extension, has resisted the pressures to convert to a residential and productive space. On top of that, it has been suffering from management difficulties due to its extension throughout 61 municipalities in Lombardy. Multiple actors exist here, which make the local food chain dense and articulated (namely, community gardens, farms, vegetable growers, GAS, agri-tourism, recreational and education activities, etc.). During the lockdown, their activities stopped, except for some farms that have reorganized to sell their products online or to prepare the land for spring and summer crops. The urban gardens and farmhouses have been closed to the public. "Mercati della Terra" (Earth Market, @Slow Food) and the recreational and educational activities have been, thus, canceled.

The management of public green areas in the Naples metropolitan area focuses on the redevelopment of abandoned spaces policies. The creation of the gardens in the De Filippo urban park, the third-largest park lying within Naples, is part of this objective of the redevelopment of the public areas. It also includes the promotion of local products [46] and the knowledge of cultivation techniques with cultural exchanges and reintegration policies related to highly influential social and ecological factors [47] This objective is achieved with the collaboration of all stakeholders. Local governments and proactive citizens can encourage such practices with low social costs compared to the advantages in environmental, social and reputational terms. During the lockdown, this park had to stop its activities and reorganize them. Thanks to smart working, it has continued in supporting urban garden users with additional/substitutive therapy for diseases such as drug use and ludopathy; it has also held meetings to organize subsequent events with the many associations, schools and city committees making use of apps.

The purpose of this study is to explore, from a comparative perspective, the ways in which MAPs react and change their activities due to the restrictions imposed by the containment of the COVID-19.

The decision to focus on these metropolises is motivated by several reasons. Milan and Naples are among the few Italian metropolitan areas to have a MAP and consequently to have experienced the environmental, social and economic effects of their presence. The choice also depends on what happened during the lockdown (March–May 2020). During this period, Milan and Naples had been the two most affected metropolitan areas by this pandemic in terms of infection figures. Therefore, these metropolises applied strong restrictions on economic and social activities, including those that limited MAP activities and accessibility. Moreover, with only a few exceptions, the multidimensional functions of both parks, the implications of the restrictions in their functionality and their resilience against the lockdown effects have rarely been analyzed in prior studies.

This paper seeks to fill this gap in knowledge by listing the functions of these parks, as well as their probable changes and resilience due to the restrictions induced by COVID-19 diffusion. The novelty of this work is twofold. Albeit several publications examined the role of green areas during the COVID-19 outbreak in a sustainability framework [48,49], this is the first study that aims to analyze MAPs in relation to COVID-19, well-being, resilience and sustainability. Moreover, also the selected locations are original—this is the first case study analysis using Milan and Naples practices.

As such, the work at hand is structured as follows. Section 2 provides details on the undertaken research method. Section 3 highlights the case studies that profile the functions the Parco Agricolo Sud Milano and the De Filippo Park. Section 4 outlines the diffusion and impact of COVID-19 in the two metropolitan areas. Details of the possible implications of COVID-19 on the functionality of these parks and selected solutions adopted to mitigate the negative effects of the lockdown restrictions are depicted. This analysis was carried out during the lockdown period (March–May 2020), and the following period (June–October 2020). Section 5 discusses and concludes the study.

2. Methods

The findings of this paper concern the functions of the two considered metropolitan agricultural parks, as well as their resilience during and after lockdown.

The first point is described at the end of a document analysis that covered spatial regulations and plans (Table 1), as well as internet websites.

Table 1. List of laws, plans and websites considered.

Parks	Type of Document	Document
Parco Agricolo Sud Milano	Regional law n. 86/93	Piano generale delle aree regionali protette
	Regional plans adopted with DGR 7/818 del 2000	Piano Territoriale di Coordinamento del Parco Agricolo Sud Milano
	Regional plan adopted with Park delibera n. 33/2007	Piano di settore agricolo
	Website	www.cittametropolitana.mi.it/parco_agricolo_sud_milano (accessed on 20 October 2020)
De Filippo Park	Website	https://www.eracoop.it/index.php/servizi/dipendenze/item/39-lillipu-centro (accessed on 20 October 2020) https://www.comune.napoli.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/13115 (accessed on 20 October 2020) https://www.facebook.com/WWFNapoli/ (accessed on 20 October 2020)

Source: authors' elaboration.

The resilience of these parks was evaluated after the processing of semi-structured interviews submitted to the staff in charge of the Environmental Valorization department at Parco Agricolo Sud Milano, the coordinator of the Lilliput association for De Filippo Park of Naples, as well as to the members of WWF Naples in mid-October 2020.

The questions aim at collecting information related to the COVID-19 emergency and its management, the reactions of all actors operating in these parks and the adopted solutions to mitigate the negative effects of closure restrictions during the lockdown (March–May 2020). They also refer to the initiatives realized after the lockdown in the period June–October 2020. The answers were processed by text analysis and reported in this article.

The questionnaire was structured in four sections:

(1) the first relates to the degree of satisfaction with the use of the metropolitan agricultural park and how it is used;
(2) the second section is aimed at detecting the social function of metropolitan urban parks;
(3) the third part relates to the environmental function of metropolitan urban parks;
(4) and finally, the last section includes questions on the personal data, educational level, employment and economic situation of the respondents.

Considering that the objective of the analysis was to assess the positive effects of urban parks, it was decided that 50 questionnaires would be sent to all the stakeholders of the analyzed parks responsible for organizations, farmers municipal organizations and all people involved in urban park activities in general.

As regards structural data, the sample was unevenly distributed between men (74%) and women (28%). The average age of the respondents was between 30 and 50 and 65 years old, both with 36.7%. The educational level of the respondents was quite high: 45% had a secondary school diploma, 36% had achieved a university degree, 13% had a primary school level and 6% had obtained a master's degree.

Particularly, the interviews were carried out in the period between June and October 2020 to coincide with two post-lockdown events. The first was "Ritorno al Parco" for the south Milan agricultural park and the WWF event on 3 October 2020 for the re-opening of De Filippo Park. The main stakeholders who were interviewed included: park managers, gardeners and local citizens involved in the parks' activities.

Moving from material analysis to the case studies necessitated obtaining primary field data from scratch. The study at hand required obtaining primary data from the field. In addition, these data were integrated with secondary local data on COVID-19 trends and evolutions.

Specifically, during the interviews, both Milan and Naples stakeholders' replies were recorded verbatim, notated and transcribed using Microsoft Excel. Once data were collected, they were cleaned to elicit the most pertinent information. Therefore, data were assembled and organized to meet this inquiry's goals. Key outcomes from the selected stakeholders in both the MAPs were presented.

The process for elaborating this paper mainly included six methodological steps. First, a study on the MAPs, along with the COVID-19 situation in the two cities was elaborated. During that stage, preliminary contacts with the organizations' managers took place. After that, preliminary field visits were conducted in Milan and Naples where the MAPs were located. In a third step, stakeholders' analysis and targeting were realized. Thus, field interviews with MAPs stakeholders were performed. After that, data were collected, organized, assembled and analyzed. Lastly, the case studies for the selected MAPs were formulated.

The methodology rationale is illustrated in a diagram in Figure 1.

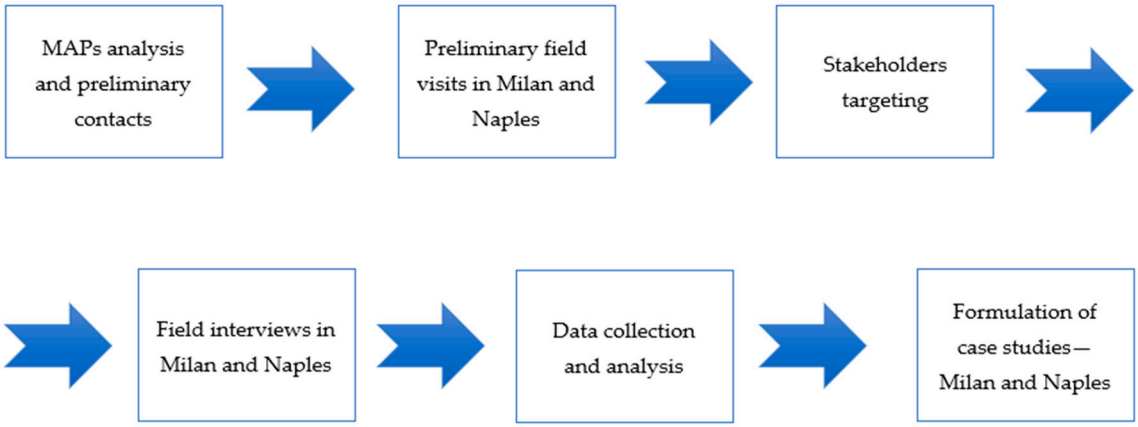


Figure 1. Methodology steps and rationale used for this work.

3. Case Studies

3.1. Parco Agricolo Sud Milano: A Park, Many Vocations

The Parco Agricolo Sud Milano is one of the oldest agricultural parks in Italy. It was formally established with the Lombardy Region law n. 24 of 1990. However, its presence and diffusion in the urban and peri-urban territory of the province of Milan began some decades before. Today, it includes the agricultural and forest areas of 61 municipalities and extends for 47 thousand hectares, as sketched in Figures 2a,b and 3.

The regional law classifies the park as an agricultural park and metropolitan belt. This classification depends on its geographical position, which is close to a large metropolis, Milan, in a densely urbanized context. The park presents all the typical features of peri-urban spaces (scattered human settlements, comprehensiveness of residential/productive functions, marginal and interstitial agriculture, etc.) and connects local natural areas to the agricultural system [8]. For its geographical location, it denotes a natural east-west ecological corridor, between the Ticino and Adda river catchments. Although interrupted by residential and productive settlements, scattered over the territory, this complex rural and natural landscape system supports the pressures for its conversion into residential places. In a network of groundwater and surface water, native and cultivated plant species coexist with farmsteads, castles and abbeys of great artistic and cultural value, as well as residential and productive settlements [8].

(**a**)

(**b**)

Figure 2. (**a**) Geographical coordinates of Parco Agricolo Sud Milano source google maps 2022. (**b**) Agricolo Sud Milano map, Source: website [50,51].

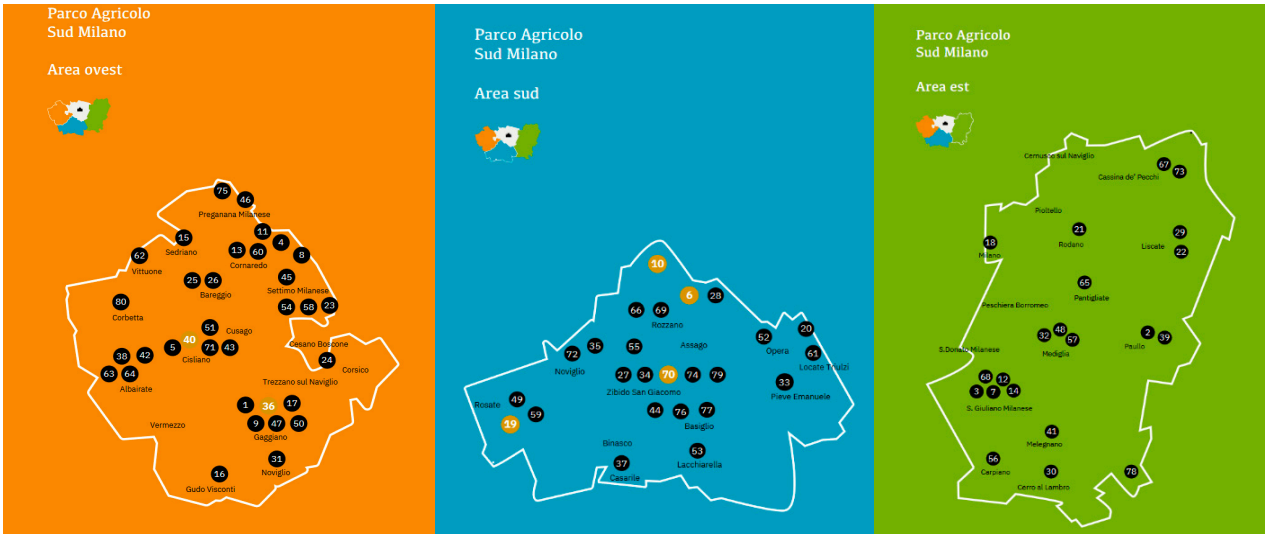


Figure 3. Map of 79 networked farms in the Parco Agricolo Sud Milano. Source: Adapted from Guida alle Aziende Agricole, Città Metropolitana Milano, 2019 [50,51].

The park has a strong agro-sylvo-cultural vocation and it aims at promoting "the protection and recovery of the landscape and the environment of the areas connecting the city and the countryside, as well as the connection of external areas with the urban green systems, the ecological balance of the metropolitan area, the protection, qualification and strengthening of agro-sylvo-cultural activities in line with the destination of the area, the use of cultivation and recreation of the environment by citizens" (as reported in the park's constitutive act).

Agricultural activities that are practiced are conducted professionally and for social purposes, but also for tourist-recreational and environmental reasons by about 900 farms. Those are sparsely located all along with the park territory. They are specialized in the production of arable crops (more than 30,000 hectares, i.e., 87% of the agricultural area of the park). Woody crops (fruit trees and vines) have marginal importance. Similarly, permanent meadows have a reduced extension, while in the past they were the main source of food production for cattle. Today, more productive forage crops have been produced. These are better suited to sustain the high milk production of modern dairy cattle. Farms protect all these crops for their economic value; however, particular attention is paid to the *marcite*, which represents a typical crop of the lower Milanese area and is therefore also important from a historical point of view.

Farms also offer experiences of rural tourism (such as farm visits, typical product tasting, etc.). Seventy-nine of them are associated with an informal network which is mapped in Figure 3. This map is available on the park website. Evidencing distance among farms and verifying what kind of services farms offer helps in designing recreational routes and farm visits. It can also facilitate reorganizing the distribution of agricultural products in the nearby city markets in a more efficient, economic way, with a lower environmental impact.

In this park, 24 GASs (Gruppo di Acquisto Solidale, solidarity purchasing groups) and some farmers' markets operate. The first "Mercato della Terra", Slow Food Italy, is also there. Their presence is a signal of the strong focus on environmental protection, and the attention on supporting homegrown agricultural productions. They also represent a valid source of food for the Milan metropolitan area.

The park has the highest number of urban gardens in the whole Lombardy Region [7–9]. Almost all the municipalities operating here have started urban gardening projects for the integration of vulnerable categories (including, above all, the elderly and low-income people) through the cultivation of small plots of land. Through their concession for a limited period, the municipalities aim to preserve the surrounding environment, reduce the impact of human activities and beautify the whole park area.

This park also offers educational activities (visits, projects) in natural and agricultural areas and directly at farms. Some of these activities are directly addressed to the schools. Finally, it organizes leisure activities for the visitors which can be experienced both on foot and by bicycle.

By carrying out all these activities, the park assumes social, economic and environmental functions, endeavoring the promotion of sustainable development assets. This is confirmed by the interviewed park officer.

> *"The park is a sort of barrier to the conversion of agricultural land into residential and productive areas. The suspension of economic activities due to COVID-19 has partly slowed down the demand for conversion. The park serves to mitigate the pollution of this area which is among the most productive and populous in Italy".*
>
> Park's officer, authors' interviews, October 2020

In addition to the offsetting and mitigation effects on the climate and the use of natural resources, the director dwells on the effect that the attendance of the park has on the quality of life.

> *"The park is frequented by school children and families. The former learn to recognize plants through educational ecology paths. Families also participate in workshops on farms and spend time together. All these activities help to cement the social relationships between pupils and families. In addition, spending free time in nature has positive effects on health and mood".*
>
> Park's officer, authors' interviews, October 2020

Beyond environmental and social effects, the director includes food-related issues into the park's contributions:

> *"Thanks to the courses given on environmental and agri-food topics, provided to students and adults, the awareness of the importance of the environment increases. Participants learn the rhythms of nature and appreciate it. They also understand where food comes from and therefore become more aware consumers. This is also noticeable among those who cultivate the many urban gardens in our territory".*
>
> Park's officer, authors' interviews, October 2020.

The park's governance is structured as follows. Beyond the administrative structure, there is a political management organism that is made up of the president and 10 directors representing the entities that are somehow involved in the park management. Other organs are: the mayors' council, constituted by the mayors of the municipalities located in the Park; the assembly, which formulates opinions on the park's regulation and planning documents and reflects the interests, tensions and ideas of all 61 municipalities; the agricultural technical committee, which is specifically set up to examine and offer technical support to all interventions concerning the exercise of agricultural activity; the Commission for the Landscape, which operates on the procedures for the issuance of landscape authorizations and landscape compatibility assessments; and Associazione per il Parco Sud Milano Onlus, which operates in the park for the local agriculture, culture and values promotion.

GAS, farmers' markets and farms actively adhere to the initiatives provided by the Solidarity Economy District of Parco Agricolo Sud Milano (DESR). The latter has been active since 2008, thanks to the initiative of various actors of the Milanese Solidarity Economy, environmental associations and local institutions, which aim to preserve and requalify the park and its agriculture. The basic assumption that motivates DESR is that it is possible to safeguard the vocation of the park with initiatives to defend the farmsteads and their income while protecting the against the consumption of land: qualifying supply and demand, encouraging direct sales and 'internal' cycles of product processing, supporting multifunctionality (but without overwhelming agricultural activity), promoting agrobiodiversity capable of affecting the monocultures of the Park (rice and cereals) and intensive cattle breeding.

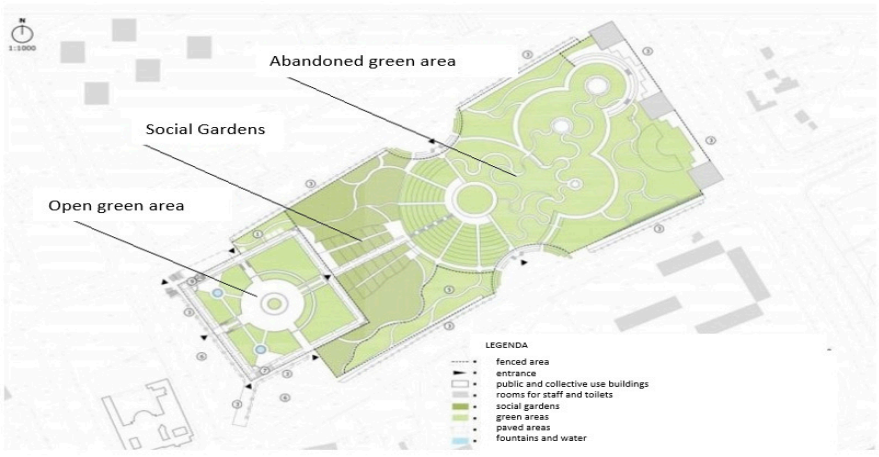
The park's officer was also asked about the park's governance.

"The presence of many actors is positive because in this way there are many points of view and interests. However, it makes it difficult to make decisions".

3.2. De Filippo Park, Naples—Between Territory Recovery and the Creation of Participatory Governance

Fifty-two parks compose the urban greenery of the Naples metropolitan area. Among these parks, De Filippo Park in Ponticelli emerges for its multifunctional vocation. This park is located in the eastern part of the Neapolitan metropolitan area and is part of the VI Municipality of Naples along with Barra and San Giovanni a Teduccio (Figure 4a,b).

(**a**)



(**b**)

Figure 4. (**a**) geographical coordinates of De Filippo Park source Google Maps 2022. (**b**) Adapted from De Filippo Park map. Source: WWF, 2020 [52].

The park was built between the late 80s and early 90s and opened in 1995. Now, it occupies an area of 12 hectares of which one hectare is currently under cultivation. Due to vandalism, the park was closed in 2008 and reopened only in 2015, when part of the park was assigned to the Lilliput association for the realization of an urban gardening project. The park has a morphologically flat structure in the southwest part, while in the northeast part there are artificial hills. There are numerous access routes and playgrounds for children, rest areas and a pedestrian path of about 1.5 km that surrounds the entire space. At the edge of the gardens, there is an artificial hillock of 4 hectares now in a state of abandonment and waiting to be assigned by protocol.

Inside De Filippo Park, there is a set of urban gardens. With a 2015 memorandum of understanding, the City of Naples has entrusted these spaces to the Department of Drug Addiction of A.S.L. (local health center) Napoli 1 with the daycare center Lilliput.

The creation of gardens in De Filippo Park is part of a 2011 project to redevelop the public area, "a color park", promoted by the Le Kassandre association and a master's degree in participatory planning and community mediation organized by Fondazione Mediterraneo. The purpose of the redevelopment was to render these spaces available to the community for commercial and cultural activities, obviously encouraging cultural exchanges and integration. Preventive analyses were carried out by the order of agricultural experts of Naples who certified the healthiness of the land suitable for the cultivation of vegetables and not only for ornamental plants.

The main idea is to create an area dedicated not only to users but also to other families, associations and citizens, to make them aware of the protection and care of their neighborhood. The mission of the park is to ensure a green space to create territorial culture. People have the opportunity to take custody of a small plot of land with members of schools, associations, city committees, churches and archaeological organizations that the Lilliput, among others, has formed within a social network. Through agriculture, they can learn a job, thus beginning a process of reintegration into work and society starting from the appropriation of important public spaces.

Lilliput has tried to create a network for the management of the various plots that make up the urban gardens. Some of the park's terraces have been assigned by Lilliput to other associations (Libera, Emergency, etc.), groups or institutions, as well as primary schools. This is a fine example of aggregation that involves not only the children belonging to the associations but also the people of the neighborhood.

Initially, the park's few terraces were entrusted only to people involved in rehabilitation pathways for the treatment of various addictions, such as alcohol and drugs. Later, the garden was opened to schools, associations and citizens of the metropolitan area; today there are 141 cultivable plots. Each area of the garden is assigned to different associations or institutes and identified with different colors (Table 2). Given the large number of gardeners operating there, meetings are managed by a city committee and are divided by area.

Table 2. Actors interacting with the De Filippo Park management in Ponticelli (source: our elaboration).

Institutional Representatives	Social Representatives	Citizen Representatives
The municipality of Naples	Santi Pietro e Paolo Church, Ponticelli	Citizen Committee
Naples Municipality Environment Department	S.mo Rosario Maria delle Grazie del Felaco Church, Ponticelli	
President of 6th Municipality of Naples	Emergency	
U.O.C. Director (belonging to ASL NA1)	Libera	
Lilliput Day Center ASL NA1 DSB 32	"Arteteca" cultural association	
College of Agricultural Experts and Graduated Agricultural Experts	"Pax Cultura" cultural association	
Archimedes Scholastic Institute	ReMida Social Promotion Association	
Calamandrei Scholastic Institute	Arcobaleno cultural association	
Sannino/Petriccione Scholastic Institute	Ardea cultural association	
Mother Claudia Russo Institute		

In the end, the project involved associations, individual citizens, including foreigners, committees and religious representatives.

4. Impact and Resilience of the MAPs over the COVID-19 Outbreak

4.1. The COVID-19 Diffusion and Impact in Milan and Naples

On 21 February 2020, the first positive cases of COVID-19 were recorded in Italy, triggering the whole of Europe and the world.

From 'day zero' on, a series of data relating to the spread of the epidemic, both nationally and locally, have been regularly monitored by the Civil Protection. Italy has been one of the most severely affected countries worldwide and has enforced some of the harshest restriction policies in the world. The spread of COVID-19 has immediately posed notable economic, social and environmental problems [43,53].

The first death due to the COVID-19 infection was observed on 21 February 2020, and in mid-March 2020, the number of deaths rapidly increased, resulting in almost 50% of excess deaths from any causes in March 2020. In April 2020, excess mortality was still 36%. In the first two weeks of May 2020, excess mortality decreased to 3%, and in the last two weeks of May 2020, the number of deaths was lower than that observed in the previous years (−7%) [54] (Figure 5).

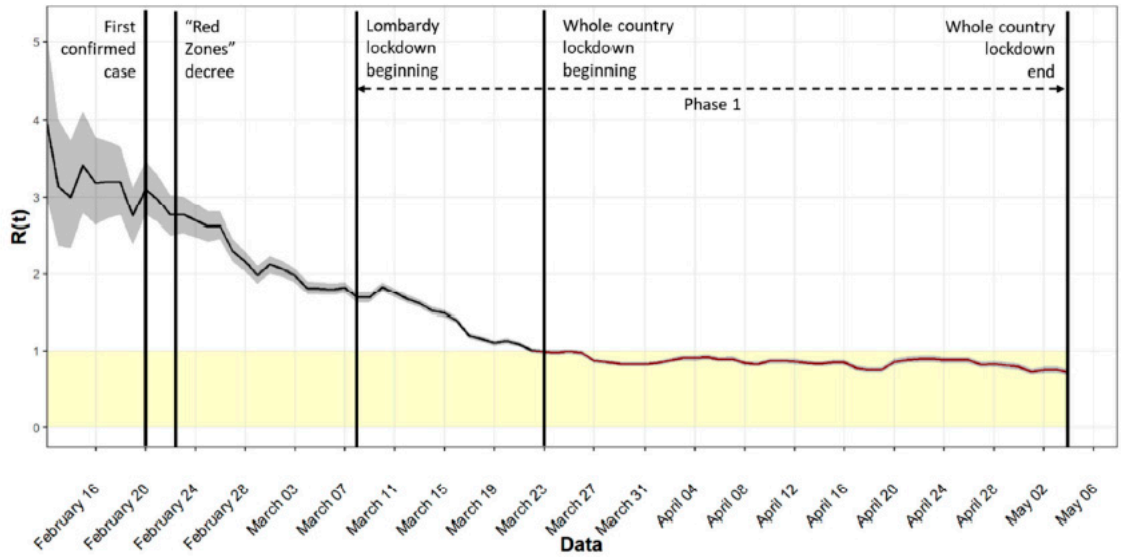


Figure 5. Institutional decrees and evolution of effective reproduction number (R_t). R_t values below I indicate that the epidemic is slowing down (each patient infects, on average, less than I person). R_t values above indicate that the epidemic is progressing (each patient infects, on average, more than I person). Source: Consolazio et al., 2021 [55].

Overall, about 44,000 excess deaths were registered in the 3-month period considered, as compared with 33,386 officially registered by the Civil Protection Department as COVID-19-related. [54]. The difference is largely due to the under-certification of COVID-19 fatalities, mainly in March, but some of these excess deaths are likely to have occurred owing to inadequate management of other diseases during the COVID-19 pandemic and hence to excess mortality from elective procedures or other causes [56].

Several studies have tried to understand the fact that Italy was the first and most affected country in Europe by the outbreak [57]. According to [58], the high level of similarity in terms of economic, geographical, climatic and environmental conditions between the most affected area in China (Wuhan) with the most affected Italian one (Po Valley) is a possible explanation. Specifically, possible evidence relating to COVID-19 cases and Nitrogen-related pollutants and land take arise, particularly in the Po Valley area as well as in the Wuhan area. Other studies were conducted to understand a possible correlation between the number of infections and the different rural landscapes of the country. According to [59], areas with more highly diversified agriculture, valuable landscape, more forests and protected areas have on average fewer cases of contagion (mean 10%) than more energy-intensive landscapes.

Within urban ecosystems, a wealth of studies has provided evidence regarding the benefits of urban agriculture and urban gardens for public health. Researchers [60] have shown the benefit of Edible Green Infrastructure (EGI) in terms of urban regeneration

and well-being, suggesting a global rethinking of food security and food supply chains pursuant to the recent developments from the COVID-19 outbreak. As per [61] community urban gardens can help on supporting community resilience in terms of disasters and pandemics. Researchers [45] emphasize their role, as an example of social innovation, to support self-organized initiatives for food provisioning (and thus for food accessibility) at the time of personal and mobility restrictions due to COVID-19 to be considered amongst a wider innovation-oriented approach to COVID-19 solutions [62].

In October 2020, an increase in new cases was confirmed and reported in Italy for the ninth consecutive week with a cumulative incidence. In the period from 14 to 27 September 2020, 34.2 per 100,000 inhabitants were infected by COVID-19. A steep increase in the median age of the cases of 42 years vs. 41 the previous week was registered (Figure 6).

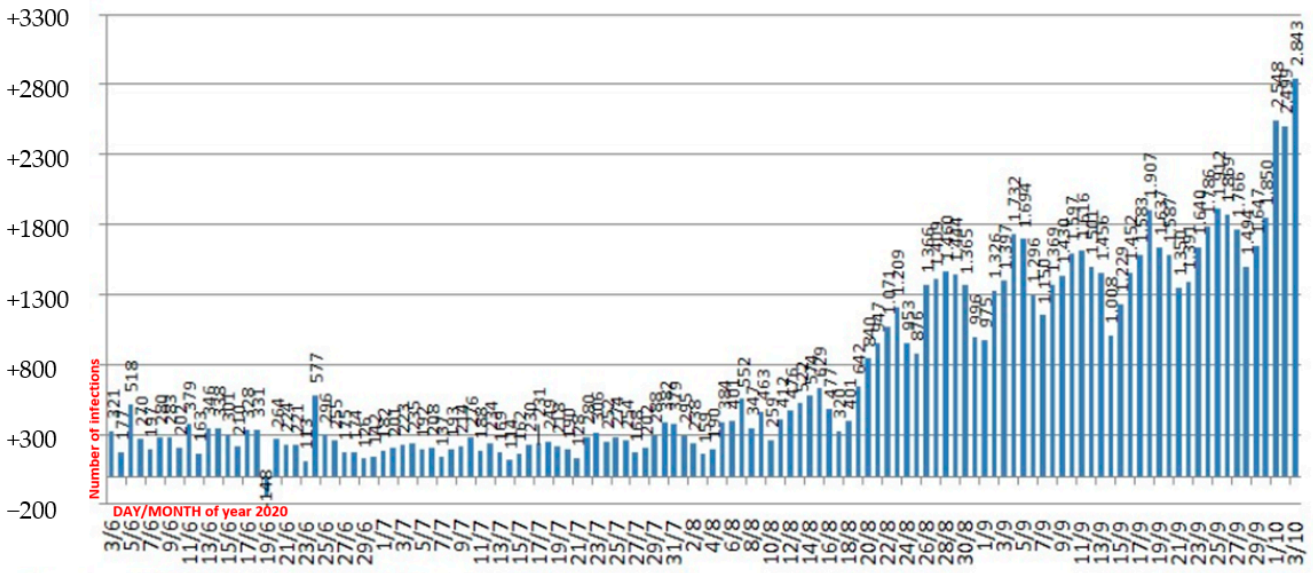


Figure 6. Italy—number of people infected by COVID-19 (SARS-CoV-2) per day. Italian Ministry of Health data based on GIMBE elaborations, 2020 [54].

Campania and Lombardy were among the most affected Italian regions during the second COVID-19 wave with more than 400 infected patients per day each (Figures 7 and 8).

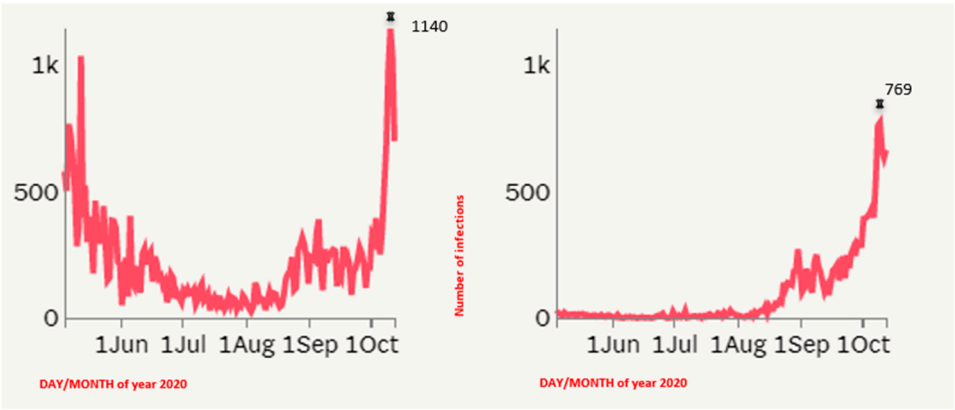


Figure 7. Trend of infections by COVID-19 (SARS-CoV-2) in Lombardy (**left**) and Campania (**right**). Adapted from Il Sole 24 ore, 2020.

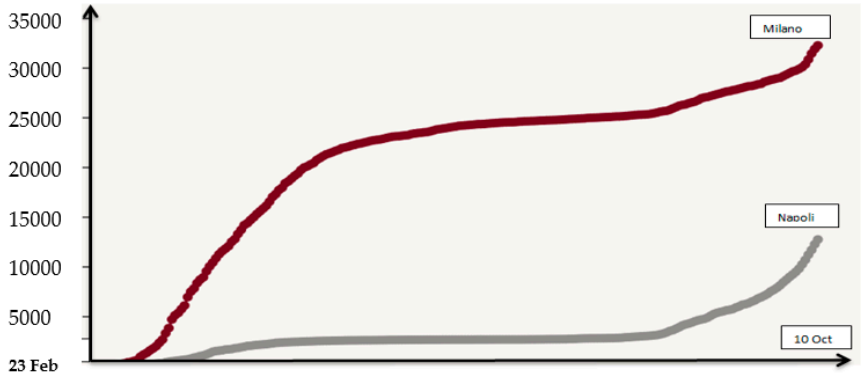


Figure 8. Trend of COVID-19 (SARS-CoV-2) infections in Milan and Naples. Adapted from Il Sole 24 ore, 2020 [63].

Furthermore, unlike during the first wave, in the second wave, even the metropolitan cities of Milan and Naples were strongly affected.

4.2. Resilience of the Two MAPs during and after the Lockdown

Parco Agricolo Sud Milano closed on 8 March 2020, as an enforcement of the Prime Minister's Decree of the same day, which ordered the lockdown and termination of all non-essential businesses and institutions, including recreational and educational ones.

During the lockdown, all park activities were stopped according to this national legislation. Recreational and educational activities in the program were canceled, while the farmhouses stopped receiving guests. The farms continued to prepare the land and cultivate it, albeit with difficulty. Those included in the network mentioned before reorganized their commercial structure, in order to continue selling their products. They improved their online sales systems and restructured their logistic channels to reduce movements for the goods delivery. According to the interviewee, this reorganization was quite successful, so much so that losses resulting from the inability to continue with the hospitality and educational activities were mitigated. Even the gardens were closed and no longer cultivated though this decision was taken by the municipalities of the park as the body responsible for their management. The Earth Market and farmers' markets were no longer organized. During that period, many actors were no longer active in the management of the park. In fact, 61 municipalities were involved in the emergency management, while the administrative bodies of the park worked to assist all the other actors operating there, monitoring the situation and evaluating possible solutions to mitigate the negative effects on the activities.

In the southern area of the Milan municipality included in the park, the QuBi project has been strengthened. Initially intended only to provide assistance in the daily shopping of some families in difficulty, during the lockdown the project has seen its beneficiaries grow exponentially due to the increase in the number of households without work or with difficulty in paying bills. Part of the food collected from farms in the park and from local supermarkets and shopkeepers was stored at the premises of some voluntary associations, parishes and listening centers.

The activities of the park were resumed in May 2020, in compliance with the directives for the containment of contagion. At first, the park organized virtual tours and the Food Film Festival, totally online. On the park website, people could visit park areas virtually and attend the screening of films realized by independent and food-themed filmmakers and uploaded to this platform.

Afterward, three of its areas were reopened to visitors. Those spaces were visited by a fair amount of people. The turnout was considered a sign of confidence in the park and a desire to return to it after the closing. The Earth Market was again organized, but the reorganization of the stands strictly followed the requirements for social distancing. Only 25 farms were able to participate (compared to the 40–50 that normally took

part before). At the same time, online sales continued. Urban gardens also reopened. Recreational and educational activities in support of schools were not immediately resumed, due to the difficulties of some schools resuming lessons in compliance with the anti-contagion provisions.

The lockdown period led to the closure of the parks in the city of Naples from March to May 2020. That period required different management of the activities related to De Filippo Park by its users. Given the impossibility of using the fields due to the mobility restrictions, urban gardeners continued to interact with each other only through WhatsApp meetings. ASL Napoli 1 patients, who were used to cultivating the plots before the COVID-19 outbreak continued these activities via smart working. Thanks to a resolution, they were able to return to the gardening activities from April 28. According to Lilliput's director, the situation presented various complications from a management perspective.

From a social point of view, many users suffered a regression in their behavior due to the impossibility of pursuing outdoor activities such as gardening. With the forced obligation to stay at home during lockdown, there was an increased risk of individuals falling into illegal activities such as gambling and drugs. From an environmental point of view, the cultivated fields suffered the loss of the entire harvest and considerable efforts were needed to restore them. Initially, access to the fields was managed using shifts and in small groups. Moreover, the common areas were closed to avoid the risk of people gathering. From the point of view of security, the gardeners complained about the difficulty of controlling the park through cameras and surveillance, a challenge that was even more important during this pandemic period.

Since the beginning of May, all the other users of the garden of the De Filippo Park have also reused their spaces. The schools have returned to take guided tours of the park and others have applied to have a space to cultivate their own.

The park eventually resumed organizing events. On 4 October 2020, there was the first major meeting in De Filippo Park organized with WWF Naples. The event had as background the social garden realized in De Filippo Municipal Park by the Lilliput daycare center of the Asl Napoli 1 center—coordinated by Anna Ascione—and by the community of gardeners, gathered in a civic committee.

Figure 9 witnesses a topical moment from the event.

Figure 9. Multi-stakeholder event in De Filippo Park, 3 October 2020—attended by urban green council member of Naples municipality, WWF Naples representatives and Lilliput managers (source: authors' elaboration).

WWF Naples wanted to reward Ponticelli for realizing a community revalorization of greenery and social and urban spaces. Symbolically, a tree planted in the garden area where several specimens have been stolen and damaged during the outbreak was donated. Citizens and associations of eastern Naples have also offered their contributions to the

purchase of other trees that will be planted later, creating an orchard in an area of the urban park still to be recovered. According to Ornella Capezzuto, president of WWF Napoli, this park is characterized by its social value, and it is also recognized as having a high naturalistic value due to the number of bird species. A small specimen of a hawk was found inside the park, and it has been taken care of by the Legambiente Association.

The various activities of this park have led to an effective regeneration of the territory. This is only possible through the park's ability to meet the needs of different actors: the municipal administration, the horticulturists and intermediaries [64].

5. Discussion and Conclusions

This article described the multiple functions of the metropolitan agricultural parks (MAPs) in Milan and Naples. The paper also investigated the resilience of MAPs focusing on the end of the second lockdown, designed to limit COVID-19 diffusion in Italy.

Both parks contribute to improving the environmental quality of the spaces and the social conditions of local communities, as perceived by their officers. Pressure on natural resources and for land conversion in residential settlements results in a shrinking of park territory. Social interactions among users appear to stimulate the users to appreciate the parks. This happened thanks to the offer of numerous cultural, educational, and social activities involving civil society—inter alia, students, companies and voluntary associations. Beyond their role in fighting social isolation and environmental degradation, both parks also prevent food insecurity in the local population. In their territories, many farms operate and sell their products to visitors, local markets and distribution centers. Thanks to the courses provided on environmental and agri-food topics to students and adults, awareness of the importance of the environment has increased. Participants learn the rhythms of nature and appreciate it. They also understand where food comes from and therefore become more aware consumers. This is also noticeable among those who cultivate the many urban gardens in both territories. As such, the parks' role in providing public goods, such as urban ecosystem and urban-rural landscape quality, and short foods supply chain, as well as recreational, social and cultural services is evident.

With the COVID-19 emergency, both parks had to reconsider their entire organization and the extent of all activities previously offered due to the restrictions imposed to protect the population's health.

These restrictions have strongly limited the MAPs activities: the cultivation of agricultural areas has been limited or suspended due to a lack of personnel, and the access to farmhouses or other recreational activities was interrupted. The educational and recreational activities were stopped, and the urban gardens were closed to the public. The functionality of the parks was, therefore, reset to zero. This was justified by the high number of infections that were recorded in both metropolitan areas.

However, during the lockdown, new activities were experienced. In Milan, the farms that had joined a network within the park reorganized their production and distribution. They tried, through the network, to reorganize the logistics of shipments and source their products from the nearby urban municipalities. The reorganization of the other activities has not been possible because of additional events that occurred. The didactic activities were not realized because of the closure of the schools; the company visits were not even held for the prohibition to move for non-essential reasons. The reorganization was also difficult because of the high number of actors present in the Milanese park (in addition to the 61 municipalities, also voluntary organizations and associations).

The management of MAPs is a concerted matter. Their extension over vast territories that go beyond traditional administrative boundaries impose systems of multistakeholder governance targeting a multitude of actors. In their design and formation, particular attention is paid to the allocation of responsibilities and competencies among these actors. This is done through regulatory acts or concerted projects and, above all, through the participation of a plurality of public and private stakeholders who, in concert, are called

upon to work to promote the proper management of parks. This applies to both Milan and Naples.

Milan MAP has, with special regulations, determined the relationships between the participating municipalities as well as the promotion of relationships between the various actors through the implementation of projects such as the networking of small producers or municipalities for the realization of social gardening experiences. This activity is also favored by the "aggregating" action of the GAS and the Rural District. In any case, all these efforts for the convergence of the various interests lead to a diversity of intentions that reflects the multifunctional (tourist, agricultural, social and environmental) vocation of the park itself. This happens regularly under normal conditions. During the lockdown, however, there have been problems due to the commitment of many actors, the municipalities first and foremost, in the management of the emergency.

At the end of the lockdown, activities resumed very slowly. The agricultural activities continued, while the visits and lessons were mainly offered in online mode. Difficulties in the reopening of schools and restrictions on excursions discouraged the scheduling of recreational and educational activities in the short term.

Practical governance recommendations may be given to local administrators, authorities, planners and park managers. MAPs can be a tangible asset for fostering socio-economic and environmental resilience and sustainable local development for these communities. They will also help local people to interact and actively participate in local activities by means of civic engagement and decision-making; these changes may ride a wave of polycentric governance inspired by the commons and democratic participation [35,65]. Governance may, hence, absorb the lesson of producing bottom-up solutions for the management of the parks. The levels of participation may eventually be extended to neighboring areas and districts. Such an integrated, polycentric, bottom-up governance may illuminate new urban resilience models in Italy and Europe.

According to the studies by Ugolini et al. 2021 [66], in Italy in recent years, the perceived importance of urban green space has grown among both public and private actors and is linked above all to factors of environmental sustainability and health. Moreover, the case studies reflect characteristics of MAPs related to 'ecosystem services' to the community [67,68]: in order to reduce the heat island effect [69], the support of plant and animal biodiversity [70], the provision of food (e.g., through community gardens) [71], and social sustainability activities [72].

The analysis of the case study relating to the Ponticelli urban park reveals that management focused on the redevelopment of the territory, understood as the recovery of abandoned spaces, social inclusion and enhancement of the territory.

The urban gardening project is well organized and tries to overcome the difficulties of meeting the needs of the various local actors characterized by different targets and socioeconomic conditions. The relationship with the public administration, even if positive, is often fragmented and is mediated by the lead partner (Lilliput daycare). Unfortunately, repeated acts of vandalism within the structure undermined the project's effectiveness.

These activities feed what is defined as social innovation in the urban sphere [73] creating the possibility of determining urban change from below by participating in the birth and expansion of these activities that envision the urban park as a multifunctional public space.

Much remains to be done in the municipal De Filippo Park in Ponticelli. A good part of the public structure, in fact, has been closed for several years due to lack of maintenance and has also been excluded from the redevelopment works that the city administration has planned for the next few years. In addition, both the area used for dog walking and the area equipped with carousels for children remain closed to date. WWF activists are monitoring the 52 urban parks in the municipality of Naples to update the survey previously carried out in 2008. The monitoring of the first fourteen parks, including De Filippo Park, shows a worsening of the general park conditions. The most critical points concern the care and quality of the greenery and the inaccessibility of some parks closed even before the

lockdown of March 2020 due to the lack of staff. Moreover, the approval of a municipal regulation for urban green areas is of fundamental importance.

This paper reported two case studies. Our findings can be instructive for the limited case evidence we provide, though this study does not have the goal of drawing generally applicable rules of practice. Future studies could extend the number of respondents to other park operators or include an analysis of the resumption of activity at a greater distance from the end of the lockdown. Among the interviewees, gardeners, farms and tour operators could also be included, as well as the public administrators that operate there.

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