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Management Innovation Initiatives for Enhancing the Resilience of Community Green Spaces During Times of Crisis

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Abstract

Aim/Purpose: This study explored how Suzhou City has applied innovative management strategies to help its community green spaces remain resilient during times of crisis, such as labor shortages, environmental challenges, and disruptions from economic and public health emergencies. This research sought to understand how these strategies can maintain the functionality of green spaces, which are vital for public well-being, especially during difficult times.

Introduction/ Background: Community green spaces—such as parks and gardens—play a key role in improving public health and the quality of life in urban areas. They provide spaces for recreation, relaxation, and environmental benefits. During crises, such as the COVID-19 pandemic, these spaces may face significant challenges, including reduced maintenance, limited accessibility, and overall deterioration. This study focused on Suzhou City, which experienced a range of difficulties during the pandemic and other crises. It looked at how the city adapted its management practices to overcome these issues, and ensure that green spaces remained available and sustainable for its communities.

Methodology: The research followed a qualitative approach, combining document analysis, interviews with green space management experts, and field observations. Experts in urban planning and environmental management shared insights into how innovative techniques and strategies were implemented to address challenges in maintaining green spaces. Documents related to city planning, crisis management, and green space policies were reviewed to gather additional data. Observations of several green spaces throughout Suzhou City helped to assess the practical impacts of these management strategies. The data collected were analyzed to identify key themes and strategies that contributed to the resilience of green spaces during crises.

Findings: The study uncovered several significant challenges, including labor shortages, financial constraints, and disruptions from public health crises like COVID-19. Despite these obstacles, Suzhou City successfully implemented several innovative management strategies to ensure the resilience of its community green spaces. One key approach was flexible workforce management, which involved utilizing temporary staff and volunteers to sustain essential maintenance tasks. Additionally, cross-training existing staff to handle multiple roles helped to mitigate the impact of workforce shortages, ensuring that critical functions could continue uninterrupted. Another crucial strategy was the integration of technology into maintenance operations. The city adopted automated irrigation systems, digital monitoring tools, and online task coordination platforms to enhance efficiency and reduce reliance on manual labor. These technological solutions streamlined maintenance processes and optimized resource allocation, making green space management more sustainable.

Moreover, Suzhou City strengthened its emergency response systems to maintain public access to green spaces during and after disruptions. Implementing well-structured protocols allowed for rapid restoration efforts, ensuring that green spaces remained safe and functional for visitors even in times of crisis. Community involvement also played a significant role in maintaining urban green spaces. Encouraging local residents to participate in the upkeep of nearby parks fostered a sense of community ownership and responsibility. This participatory approach proved effective in supplementing municipal efforts, particularly when official staffing was limited. Overall, these

strategies were instrumental in preserving the resilience and accessibility of Suzhou's green spaces throughout various crises. The findings highlighted the importance of adaptable and sustainable management practices that can be swiftly deployed in response to unforeseen challenges, reinforcing the role of innovation in urban environmental management.

Contribution/Impact on Society: This research offers valuable insights into the field of urban planning and crisis management, demonstrating how innovative practices can strengthen the resilience of community green spaces. By focusing on a real-world example from Suzhou City, the study provides practical lessons that can be applied to other cities facing similar challenges. The findings underscore the need for flexibility, technological integration, and community engagement in managing green spaces, especially during times of crisis. These strategies not only help maintain green spaces, but also contribute to improving public health, social cohesion, and environmental sustainability.

Recommendations: The findings suggested key strategies for urban planners and policymakers to enhance green space resilience. Cities should adopt flexible maintenance systems that can quickly adjust to workforce shortages and disruptions. Technology integration, such as automated irrigation and digital monitoring, can streamline maintenance and reduce labor dependency. Developing proactive crisis management plans ensures that green spaces remain accessible and well-maintained during emergencies. Lastly, community participation should be encouraged to supplement municipal efforts and foster a sense of shared responsibility in maintaining urban green spaces.

Research Limitation: One limitation of this study was its focus on Suzhou City, which may not fully represent challenges faced by other cities with different socio-economic conditions or management practices. Additionally, while expert opinions were insightful, the research could have benefited from broader community input, including feedback from residents who use these spaces regularly.

Future Research: Future studies could explore the long-term impacts of the strategies implemented in Suzhou City, particularly how these innovations continue to affect green space resilience after the crises have passed. Additionally, research could examine the role of emerging technologies, such as remote sensing and geographic information systems, in enhancing the management of urban green spaces during both routine times and crises. Expanding the research to include other cities and regions would also help in understanding how these strategies can be adapted and applied in different urban contexts.

Keywords: *Management innovation, community green spaces, crisis resilience*

Introduction

Crises—whether public health emergencies, economic downturns, or environmental disasters—can disrupt societies, impact well-being, and reshape the way people interact with their surroundings (Sutton et al., 2025). In recent years, urban communities have faced increasing challenges in maintaining public spaces, particularly green areas, during periods of instability. Restrictions on movement, workforce shortages, and shifts in public behavior have all influenced how cities manage and sustain these vital spaces (Allioui et al., 2024; Noaime et al., 2025).

The COVID-19 pandemic created a global crisis, affected public health and socioeconomic conditions, and altered the way people live, work, and interact. As of April 2023, the World Health Organization (WHO) reported more than 498 million confirmed cases and over 6.2 million deaths worldwide (WHO, 2023). The pandemic severely impacted various industries, including travel, education, and hospitality, leading governments to implement measures like lockdowns, social distancing, and mandatory face masks to curb the virus's spread.

Lockdowns and social distancing significantly disrupted daily life, leading to unintended adverse effects on physical and mental health (Lambert et al., 2020; Lin et al., 2021). The pandemic occurred at a time when human-nature interactions were already diminishing due to urban expansion and modern lifestyles. The reduced interaction with nature negatively impacted physical and mental well-

being by limiting social and recreational opportunities, exercise, and relaxation activities (Hartig et al., 2014; Lin et al., 2021; Truong & Clayton, 2020).

This crisis not only led to the loss of human life, but also affected the economy, public health, social infrastructure, and the environment, which continued to face global challenges (Kubatko et al., 2023). The pandemic's impact on urban greening efforts, especially in the context of prevention and control measures, has been profound. Greening maintenance units struggled to resume operations during this critical period. Urban green spaces play a crucial role in enhancing both physical and mental well-being, offering spaces for recreation, relaxation, and social interaction (Ojobo et al., 2024). However, disruptions to daily life— such as restrictions on public gatherings, resource constraints, and operational challenges—can limit access to these spaces, potentially affecting community health and quality of life (Robinson et al., 2024).

Suzhou, often referred to as the "City of Gardens," is renowned for its historical landscapes and ecological planning. With a green coverage rate of 41.5% and a total green space of 264 square kilometers (Xiao et al., 2018), the city has long prioritized environmental conservation and sustainable urban planning. However, like many cities worldwide, Suzhou faced challenges in ensuring the resilience of its green spaces during periods of disruption. Labor shortages, logistical constraints, and shifting public needs required new approaches to urban greening efforts.

The quality of urban gardens and green space management directly influences a city's image and residents' quality of life (Ding et al., 2022). Enhancing garden greening management and urban green space landscapes not only improves spiritual well-being, but also plays a crucial role in building an ecological civilization and a beautiful China (Tian, 2022). The way cities manage their green spaces during crises is directly linked to their overall sustainability and resilience. Effective green space management not only preserves environmental quality, but also strengthens social cohesion and urban livability. Therefore, this study aimed to understand how Suzhou City used innovative management strategies to keep its community green spaces resilient during times of crisis such as the COVID-19 pandemic. It also sought to identify practical approaches that can guide future urban planning and policy for green space management.

This study explored the challenges and best practices in managing urban green spaces during times of crisis, with a focus on Suzhou. By examining innovative management strategies, this research aimed to identify management innovation initiatives for maintaining urban greenery, ensuring that these spaces continue to serve their essential role in enhancing community well-being, even during uncertain times.

Literature Review

Management Innovation in Urban Green Space Maintenance During Crises

Management innovation involves the adoption of new or improved management practices, processes, and structures to enhance organizational efficiency and adaptability. It may include the development of innovative business models, the restructuring of organizations, the introduction of novel management techniques, or the integration of advanced technologies (Birkinshaw et al., 2008). Rather than being a sudden or radical shift, management innovation is often a continuous process, refining existing approaches to better address emerging challenges (Hamel, 2006). The COVID-19 pandemic underscored the importance of adaptable management strategies, particularly in maintaining public spaces that contribute to community well-being. Research by Yang et al. (2021) examined how the pandemic affected leisure time physical activity, and found that access to urban green spaces played a crucial role in mitigating declines in physical activity levels. Communities with well-maintained parks and green areas experienced smaller disruptions, as residents sought outdoor spaces for exercise and relaxation. This highlighted the broader role of green spaces in supporting public health and social resilience, especially during times of crisis.

Beyond its immediate health impact, the pandemic created significant operational challenges for urban green space management. Restrictions on movement, workforce shortages, and increased visitor numbers placed additional strain on maintenance efforts. Parks, public landscapes, and

gardens— essential for both ecological balance and community cohesion— required new approaches to ensure their upkeep amid shifting public health measures (Lin et al., 2021). The ability to sustain these spaces during crises was vital not only for environmental reasons, but also for maintaining social stability and mental well-being.

Best Practices in Maintaining Community Green Spaces During the COVID-19 Pandemic Period.

1. "We Garden:" Community Experiment in Shenzhen, China. The "We Garden" community experiment in Shenzhen highlights effective green space maintenance through an innovative top-down governance approach to community gardens, facilitated by nonprofit organizations (Zhang et al., 2022). This model promotes sustainable governance, encourages public participation, and strengthens communication between the government and the community. The involvement of nonprofit organizations plays a pivotal role in developing these gardens and can serve as a valuable reference for similar community governance projects, including urban renewal initiatives. This model has proven to be adaptable and was essential during the COVID-19 pandemic, contributing to community well-being and resilience through green spaces.

2. Management Innovation for Greening Maintenance in Beijing: The Beijing Municipal People's Government has focused on strengthening prevention measures in key areas and among specific populations. The goal was to implement strategies that enhanced the management of landscaping work while effectively combating the epidemic (Beijing Municipal Bureau of Landscaping and Greening, 2020). Management innovations aimed at preserving green spaces during the COVID-19 pandemic strongly emphasized safeguarding public health and safety while ensuring the continued progress of critical landscaping projects. These regulations served as a model for managing epidemics at construction sites, offering valuable insights for managing urban community green spaces and projects. By adopting these innovative approaches, communities benefited from well-maintained green areas while simultaneously upholding public health during challenging times.

3. Management Innovation for Greening Maintenance in European Cities: The COVID-19 pandemic and climate change have highlighted the urgent need for better management of green spaces in European cities like Wrocław. The lack of pro-ecological solutions and a shortage of woody plants pose significant challenges. During the pandemic, the demand for green spaces that promote physical and mental health became even more pressing. Key contributions from research on this issue include recommendations for creating more resilient, post-pandemic city designs and improving the management of residential greenery. These recommendations involved an inclusive, multi-stakeholder approach with an emphasis on landscape architecture and sustainable urban planning (Dobrzańska et al., 2022), which includes the following strategies:

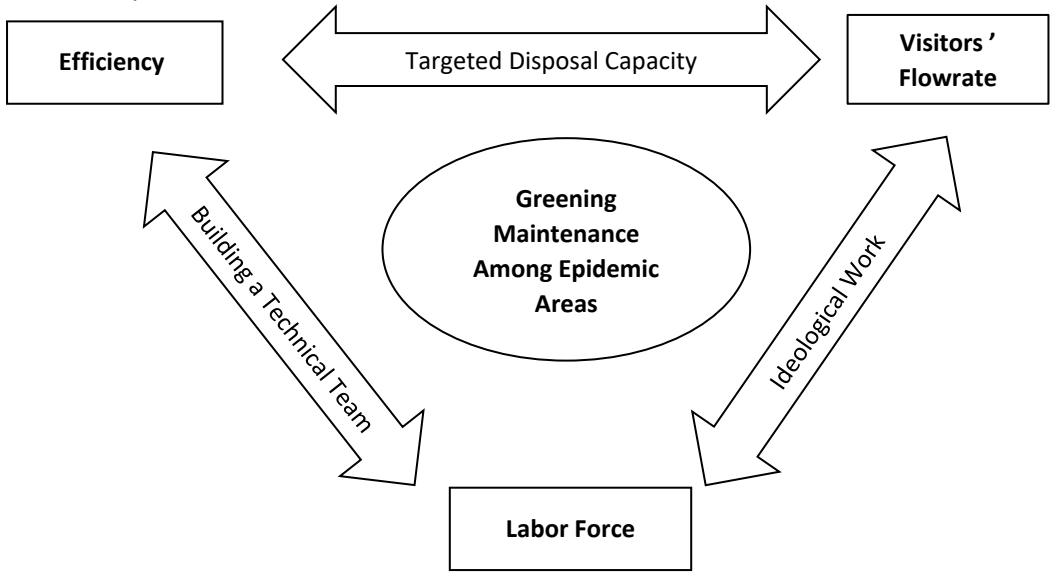
- expanding use of pro-ecological solutions by practitioners, supported by local authorities.
- protecting existing vegetation in legal records of Local Development Plans and balancing cleared versus planted greenery during construction.
- ensuring equal and easy access to high-quality greenery for all city residents.
- implementing continuous monitoring of green areas, using technologies like Normalized Difference Vegetation Index (NDVI), by local authorities.
- offering discounts and incentives for high-quality, appropriate greenery at housing estates

In conclusion, to enhance urban green space management, it is essential to promote pro-ecological practices, protect existing vegetation through legal frameworks, and ensure equitable access to quality greenery for all residents. Continuous monitoring using advanced technologies like NDVI and offering incentives for sustainable greenery in housing estates will also contribute to maintaining healthy and resilient urban environments.

Conceptual Framework

In response to these challenges, this study proposed a framework for management innovation in green space maintenance, focusing on operational efficiency, visitor management, and workforce sustainability. By analyzing how Suzhou City adapted its greening efforts during the pandemic, this research aimed to identify strategies that can enhance the resilience of urban green spaces—not only in health emergencies, but also in future crises that may disrupt urban life.

Figure 1 *Conceptual* F*ramework*



The conceptual framework for managing green spaces in Suzhou City during the COVID-19 pandemic highlights key factors essential for effective maintenance, including operational efficiency, visitor flow management, targeted waste disposal capacity, and workforce sustainability. These elements play a critical role in ensuring that urban green spaces remain accessible and well-maintained, even amid disruptions like those caused by public health crises.

This framework emphasizes the importance of management innovation in adapting to evolving challenges and advocating for the implementation of new strategies to enhance green space upkeep. By examining the dynamic interactions between these factors, the framework provides insights into how adjustments in one area—such as workforce allocation or visitor regulation—can impact overall maintenance effectiveness. Beyond addressing pandemic-related disruptions, the framework serves as a foundation for strengthening the long-term resilience of urban green spaces, ensuring they continue to provide ecological, social, and recreational benefits in future crises.

Research Methodology

A qualitative case study approach, which is well-suited for exploring complex, real-life situations, was used in this study. Suzhou City was chosen because of its strong track record in green space planning and its reputation as the "City of Gardens." This made it a meaningful and representative example for understanding how cities manage their green spaces during crises. Data were collected through three main methods: document reviews, semi-structured interviews, and on-site observations. These methods were guided by the qualitative research principles of Flick (2006) and Liamputtong (2009), which emphasize careful planning and systematic analysis.

Participants were selected through purposive sampling, focusing on individuals with direct experience in managing Suzhou City's green spaces during the pandemic. They included 12 community gardening experts and two specialists in innovation management, all of whom were actively involved in maintaining urban green areas. They were chosen based on their professional experience and familiarity with crisis-related challenges in the field. Interview guides were used to ensure that the conversations stayed focused and were consistent across participants.

The data were analyzed using thematic analysis, which followed five key steps: (a) organizing the information, (b) reviewing the content, (c) creating a coding structure, (d) assigning codes, and (e) identifying key themes (Mezmir, 2020; Kiger & Varpio, 2020). The process began with open coding to capture initial ideas, followed by grouping related concepts and narrowing down the most important themes. Content analysis was also applied to visual data—such as photos and videos from field visits—to spot patterns and better understand the physical condition of the green spaces (Hsieh & Shannon, 2005). This combination of methods helped to ensure that the findings were thorough and well-rounded.

Results

Challenges, Problems, and Obstacles of Managing Suzhou Green Spaces During the Pandemic

During the COVID-19 pandemic, both government policies and community efforts were introduced to support the maintenance of urban green spaces in Suzhou. These included tax breaks for green maintenance units, financial aid for service enterprises, and strict safety measures at construction sites. Local communities also stepped in, providing masks and protective gear to workers and helping secure tax exemptions for purchasing health supplies.

While these initiatives were well-intentioned and helped promote a safer and greener environment, major challenges remained. Labor shortages, supply delays, and a surge in visitors put extra pressure on already limited maintenance resources. As one participant shared, “Even with the support, we simply didn’t have enough hands or materials to keep up with the work—especially when more people started using the parks.” These experiences highlighted the gap between policy support and on-the-ground realities during a prolonged crisis. Table 1 provides a detailed overview of these challenges and their impacts.

Table 1 *Challenges and Impacts of COVID-19 on Green Space Maintenance*

Aspect	Findings
Contract Obligations	- COVID-19 disruptions caused delays in green maintenance projects, leading to delayed contract obligations and payment delays. - Enterprises' cash flow was significantly impacted, putting pressure on loan repayments and causing a decline in output value.
Labor Force	- Work delays for migrant workers and difficulties in resuming production resulted in increased enterprise expenses. - Scattered personnel returning after the epidemic further burdened construction sites economically. Shortage of seedling maintenance personnel made managing projects difficult, especially in different areas with plant loss. - Administrative work lagged, and online communication reduced work efficiency.
Construction Timing	- COVID-19 pushed construction into the off-season, causing postponement of planned plantings before high temperatures. - Low survival rates for summer plantings led to significant losses and increased expenses.
Cost Increase	- Epidemic-related costs increased, including on-site investigations, disinfection measures, and procurement of protective equipment. - Difficulties acquiring epidemic prevention items like masks, thermometers, and disinfectants.

The COVID-19 pandemic created a complex set of challenges for green space maintenance in Suzhou City, impacting both operations and outcomes. Delays in project execution, supply chain disruptions, and deferred payments also placed pressure on contractors’ financial stability, making it difficult to meet annual targets. Labor shortages—especially among migrant workers—exacerbated these issues, while the lack of skilled personnel for seedling maintenance led to increased plant losses and higher replanting costs. One participant noted, “We couldn’t find enough skilled workers after the lockdowns, and even routine tasks like irrigation became difficult to manage.”

Moreover, the shift to remote administrative processes slowed communication and decision-making, which further hindered timely responses. Off-season planting, a consequence of earlier delays, resulted in low survival rates for summer vegetation, and contributed to both financial and ecological setbacks. These combined issues highlighted the systemic strain faced by urban greening operations during crises, and underscored the importance of flexible and well-resourced management systems. Essential maintenance tasks, such as timely irrigation and pest control, were particularly affected. In some cases, inadequate irrigation during the germination stage compromised plant health, while delays in pest control during spring resulted in failure to meet maintenance standards (see photos shown in Figure 2).

Figure 2 *The Problem of Community Greening in Suzhou During the Epidemic*

Source: *Photographed by the Researcher*

Furthermore, rising expenses related to on-site inspections and the procurement of epidemic prevention equipment intensified the challenges faced by green space management teams. These additional costs placed a financial burden on maintenance units, further complicating their ability to sustain routine operations. The key challenges and obstacles encountered in managing green spaces during the COVID-19 pandemic in Suzhou City are summarized in Table 2.

Table 2 *Problems and Obstacles in Managing Green Spaces During the Pandemic in Suzhou City*

Finding	Description
Labor Force	During the outbreak, a serious shortage of labor for spring green space maintenance work arose in the community due to controlled personnel flow. This affected timely irrigation and pest control, impacting plant health and overall greening efforts.
Efficiency	The outbreak and effective control of the epidemic affected greening and maintenance operations. Some employees' lack of COVID-19 awareness led to reduced work efficiency and potential impacts on work quality, even resulting in resignations and unexplained absences.
Visitors' Flowrate	Despite implementing closed management measures, communities experienced increased flows of people, posing challenges in controlling visitor numbers in small parks. The labor-intensive nature of greening and maintenance required personnel distribution throughout the community.

During the pandemic, restrictions on personnel movement led to significant labor shortages, particularly during the critical spring maintenance period for community green spaces. Essential tasks such as timely irrigation and pest control were not completed effectively, negatively impacting plant growth and the overall quality of greening efforts. One participant explained, “By the time we could return to work, many of the plants were already damaged—we were always playing catch-up.”

Additionally, the pandemic reduced work efficiency and quality due to some employees' lack of awareness about COVID-19, leading to heightened fear, resignations, and absenteeism. Managing visitor flows in smaller parks also became increasingly challenging. Overcoming these obstacles is crucial in ensuring the continued maintenance and enhancement of green spaces in the community during such crises.

Management Innovation Initiatives to Maintain Community Green Spaces During the Pandemic

Initiatives for management innovation aimed at maintaining green spaces in the community during the COVID-19 pandemic period are shown in Table 3. Explanations follow.

Table 3 *Initiatives for Management Innovation to Maintain Community Green Spaces During the Pandemic*

Key Initiative	Description
Epidemic Prevention and Emergency Management	Develop prevention plans, ensure availability of disinfectants and emergency supplies, regular disinfection, and enhance emergency response capabilities through training and feedback.
Effective Control of Labor Force	Implement a real-name system, track worker movements, maintain detailed records for effective oversight, and ensure transparency and safety through point-to-point management.
Addressing Psychological Well-Being of Workers	Provide mental health support, offer training in technical skills and psychological education, and conduct regular check-ins to reduce stress and anxiety, ensuring focus and productivity.
Leveraging Management Innovation	Establish specialized teams, improve critical thinking, adapt green space management for the "New Normal," set clear goals, and provide continuous training for technicians to improve efficiency.
Managing Visitor Flow in Green Spaces	Implement an online reservation system, stagger visitor arrivals, enforce maximum capacity limits, and install signage to guide visitors, ensuring social distancing and safety protocols.

1. **Epidemic Prevention and Emergency Management**. To address the challenges posed by crises like the COVID-19 pandemic, robust prevention and emergency management plans are critical in green space maintenance. This involves developing and refining preventative measures, ensuring the availability of disinfectants and emergency supplies, maintaining well-stocked medicine boxes, managing emergency funds, and enforcing strict protocols for workers' housing areas. Routine disinfection and sterilization processes should be implemented regularly. Furthermore, enhancing the emergency response capabilities of project teams is essential, which includes training workers regarding safety practices, and encouraging active feedback and oversight to ensure rapid and effective responses. One participant remarked, "The key wasn't just having a plan—it was making sure everyone knew their role and felt supported when things changed fast." These efforts build confidence and help green spaces stay open and safe, even during uncertain times.

2. **Effective Control of Labor Forces**. Managing labor forces efficiently during times of crisis requires integrating health and safety measures into daily operations. This includes implementing a real-name system, tracking workers' movements, and maintaining detailed records on each laborer. Each worker's file should include personal details, health status, work history, and performance metrics. This system allows for precise management and tracking, ensuring effective oversight and control of labor activities. To ensure transparency and safety, point-to-point management is necessary, from the construction unit to the worksite.

3. **Addressing the Psychological Well-being of Green Space Maintenance Workers**. In times of crisis, the psychological well-being of green space maintenance workers is as important as physical health measures. Raising awareness about epidemic prevention and providing mental health support is crucial. Offering training that includes not just technical skills, but also psychological education, can help eliminate fear and build emotional resilience. One participant shared, "Some

workers were afraid to come in, not just because of the virus, but because they felt overwhelmed. Just listening to them made a difference."

Managers should conduct regular check-ins with employees, especially those dealing with anxiety or emotional distress, and provide support and interventions as needed. By addressing employees' concerns and reducing stress, workers will be more focused, which contributes to a peaceful and productive work environment.

4. **Leveraging Management Innovation to Overcome Low Work Efficiency**. Research shows that management innovation is key to overcoming low work efficiency during crises. Establishing specialized teams, improving critical thinking, and enhancing emergency preparedness are all essential. Developing a flexible and effective green space management system tailored to the New Normal is necessary. This includes setting clear goals, defining standards, adapting strategies as new challenges arise, and refining management systems continuously. Strengthening the organizational and execution abilities of green space teams will improve both day-to-day operations and crisis response. One participant explained, "We had to reorganize quickly—assigning people to new roles and streamlining tasks so we wouldn't fall behind." Further, another added, "What helped most was ongoing training. We needed to understand new tools and methods as situations kept changing."

Creating a skilled technical team can also elevate the community's green spaces professionally and aesthetically. Providing ongoing training for technicians ensures they stay updated on emerging technologies and trends. Strengthening team structure and upskilling technical staff not only improved the efficiency of routine tasks, but also helped the green spaces look better and function more smoothly, even during tough times.

5. **Managing Visitor Flows in Green Spaces During High-Traffic Periods**. Implementing an online reservation system is recommended to ensure social distancing and manage visitor flow, especially during peak times. This system allows visitors to reserve time slots in advance, limiting the number of people in the green space at any given time. A participant shared, "By setting up time-based entry, we could spread visitors out more evenly throughout the day—it really reduced pressure on our staff."

Staggering visitor arrivals and setting clear entry times further prevents overcrowding. A maximum capacity limit based on social distancing guidelines should be enforced, along with one-way pathways to control movement and minimize close encounters. Installing clear signage and floor markings helps visitors adhere to safety and hygiene protocols. Additionally, employing staff or volunteers to monitor the flow and ensure compliance with these measures enhances the safety and enjoyment of visitors.

Discussion

This study emphasized the critical need for well-structured prevention and emergency management strategies to ensure the ongoing upkeep of community green spaces, particularly during crises such as the COVID-19 pandemic. During such challenging periods, it is essential to have clearly defined protocols to prevent disease transmission. This includes making sure that disinfectants, emergency supplies, and financial resources are readily available to address unforeseen situations. Regular cleaning and disinfecting, along with enhanced emergency response mechanisms, play a vital role in keeping these green spaces safe for the public while ensuring they remain functional. A proactive approach that combines these elements not only safeguards the health and well-being of workers, but also helps to maintain the accessibility, beauty, and value of these spaces for the community at large (Hong et al., 2019).

Moreover, integrating epidemic prevention measures into labor management is key to reducing the spread of diseases, such as COVID-19, among workers responsible for maintaining these spaces. Measures like implementation of a real-name system, meticulous labor recordkeeping, and stringent control over worker movements are critical in preventing outbreaks. These actions help ensure a safer environment for those maintaining the spaces and broader communities who depend on these areas for recreation and leisure (Labrague, 2021).

Throughout the pandemic, it became clear that supporting workers' psychological health and well-being through targeted training and emotional support was essential. Such support systems directly impacted workers' productivity and overall health, showing that a combination of physical and psychological safeguards is necessary for maintaining a resilient workforce (Lovejoy et al., 2021). The health and safety of those involved in green space maintenance are paramount, as they directly impact the long-term viability of these spaces, especially during times of crisis.

This research study also sheds light on how management innovation can significantly enhance the efficiency of green space maintenance, especially under the strain of a crisis. Introducing flexible and adaptable systems, establishing specialized teams, and improving emergency preparedness are all critical to ensuring that green spaces are managed effectively during times of crisis. These strategies not only optimize existing resources, but also ensure that a rapid, coordinated response to any challenges that arise (Obrenovic et al., 2020; Pring et al., 2021; Zhang et al., 2024). The study's findings offer valuable insights for policymakers, landscape managers, and urban planners who wish to improve the resilience and management of green spaces in future crises. By adopting innovative management practices, cities can ensure that their green spaces will continue to thrive, even under the pressure of unforeseen events or challenges, like the "New Normal" or future pandemics.

Conclusions and Implications

In conclusion, this study offers meaningful insights by reimagining community green spaces, not just as city features, but as vital infrastructure for handling crises. It presents a fresh perspective on how green space management must adapt to unexpected challenges like the COVID-19 pandemic. Using Suzhou City as a case study, the research findings show how innovative practices—such as flexible staffing, digital tools, and community involvement—can help keep these spaces functional during difficult times. This shifts the conversation around urban resilience, connecting it directly to the adaptability of our green infrastructure.

The study’s contributions are both academic and practical. On the academic side, it adds to current literature by framing green spaces as dynamic systems that need responsive and adaptive management. Practically, it recommends real-world strategies, including using technologies like GIS for better monitoring and encouraging collaboration across sectors to manage resources more effectively.

By adopting approaches like these, cities can protect public health and the environment while also building long-term resilience and public trust. Moving forward, urban policies should formalize these innovations to ensure that green spaces remain accessible, sustainable, and ready to meet both environmental and community needs—especially in times of uncertainty.

For future research studies, it is essential to explore the long-term impact of management innovations introduced during the COVID-19 pandemic, particularly regarding labor planning, cross-training, and technology integration. Understanding how these innovations evolve and whether or not they will become integral to routine practices is crucial for the future sustainability of green space management. Additionally, research studies should assess the challenges and opportunities of incorporating advanced technologies into green space management to ensure its effectiveness in both current and future crises. These findings provide valuable guidance for future urban planning and management strategies.

References

Allioui, H., Allioui, A., & Mourdi, Y. (2024). Maintaining effective logistics management during and after COVID 19 pandemic: Survey on the importance of artificial intelligence to enhance recovery strategies. *Opsearch, 61*(2), 918–962. https://doi.org/10.1007/s12597-023-00728-y

Beijing Municipal Bureau of Landscaping and Greening. (2020). *Notice of Beijing Municipal Bureau of Landscaping and Greening on printing and distributing the administrative provisions on the prevention and control of pneumonia caused by novel coronavirus at landscaping construction sites (JLB [2020] No. 23)*. Beijing Municipal Forestry and Greening Bureau. http://www.bjlydd.com/news/26.html

Birkinshaw, J., Hamel, G., & Mol, M. J. (2008). Management innovation. *Academy of Management Review, 33*(4), 825–845. https://doi.org/10.5465/amr.2008.34421969

Ding, A., Cenci, J., & Zhang, J. (2022). Links between the pandemic and urban green spaces, a perspective on spatial indices of landscape garden cities in China. *Sustainable Cities and Society, 85*, 104046. https://doi.org/10.1016/j.scs.2022.104046

Dobrzańska, J., Nadolny, A., Kalbarczyk, R., & Ziemiańska, M. (2022). Urban resilience and residential greenery—The evidence from Poland. *Sustainability, 14*(18), 11317. https://doi.org/10.3390/su141811317

Flick, U. (2006). *An introduction to qualitative research* (3rd ed.). Sage.

Hamel, G. (2006). The why, what, and how of management innovation. *Harvard Business Review, 84*(2), 72–84. https://hbr.org/2006/02/the-why-what-and-how-of-management-innovation

Hartig, T., Mitchell, R., De Vries, S., & Frumkin, H. (2014). Nature and health. *Annual Review of Public Health, 35*, 207–228. https://doi.org/10.1146/annurev-publhealth-032013-182443

Hong, S. K., Lee, S. W., Jo, H. K., & Yoo, M. (2019). Impact of frequency of visits and time spent in urban green space on subjective well-being. *Sustainability, 11*(15), 4189. https://doi.org/10.3390/su11154189

Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research, 15*(9), 1277–1288. https://doi.org/10.1177/1049732305276687

Kubatko, O., Merritt, R., Duane, S., & Piven, V. (2023). The impact of the COVID-19 pandemic on global food system resilience. *Mechanism of an Economic Regulation, 1*(99), 144–148. https://doi.org/10.32782/mer.2023.99.22

Labrague, L. J. (2021). Psychological resilience, coping behaviours and social support among health care workers during the COVID-19 pandemic: A systematic review of quantitative studies. *Journal of Nursing Management, 29*(7), 1893–1905. https://doi.org/10.1111/jonm.13336

Lambert, H., Gupte, J., Fletcher, H., Hammond, L., Lowe, N., Pelling, M., Raina, N., Shahid, T., & Shanks, K. (2020). COVID-19 as a global challenge: Towards an inclusive and sustainable future. *Lancet Planetary Health, 4*(8), e312–314. https://doi.org/10.1016/S2542-5196(20)30168-6

Liamputtong, P. (2009). Qualitative data analysis: Conceptual and practical considerations. *Health Promotion Journal of Australia, 20*(2), 133–139. https://doi.org/10.1071/HE09133

Lin, B. B., Egerer, M. H., Kingsley, J., Marsh, P., Diekmann, L., & Ossola, A. (2021). COVID-19 gardening could herald a greener, healthier future. *Frontiers in Ecology and the Environment, 19*(9), 491–493. https://doi.org/10.1002/fee.2416

Lovejoy, M., Kelly, E. L., Kubzansky, L. D., & Berkman, L. F. (2021). Work redesign for the 21st century: Promising strategies for enhancing worker well-being. *American Journal of Public Health, 111*(10), 1787–1795. https://doi.org/10.2105/AJPH.2021.306283

Mezmir, E. A. (2020). Qualitative data analysis: An overview of data reduction, data display and interpretation. *Research on Humanities and Social Science, 10*(21), 15–27. https://doi.org/10.7176/RHSS/10-21-02

Kiger, M. E., & Varpio, L. (2020). Thematic analysis of qualitative data: AMEE Guide No. 131. *Medical Teacher, 42*(8), 846–854. https://doi.org/10.1080/0142159X.2020.1755030

Noaime, E., Alalouch, C., Mesloub, A., Hamdoun, H., Gnaba, H., & Alnaim, M. M. (2025). Sustainable cities and urban dynamics: The role of the café culture in transforming the public realm. *Ain Shams Engineering Journal, 16*(3), 103320. https://doi.org/10.1016/j.asej.2025.103320

Obrenovic, B., Du, J., Godinic, D., Tsoy, D., Khan, M. A. S., & Jakhongirov, I. (2020). Sustaining enterprise operations and productivity during the COVID-19 pandemic: Enterprise Effectiveness and Sustainability Model. *Sustainability, 12*(15), 5981. https://doi.org/10.3390/su12155981

Ojobo, H., Oluwagbemiga, P. A., & Shamang, K. J. (2024). Unveiling the impact of urban green landscape on quality of life in Kaduna, Nigeria: Residents' perceptions and sustainable strategies. *Journal of Contemporary Urban Affairs, 8*(1), 16–36. https://doi.org/10.25034/ijcua.2024.v8n1-2

Pring, E. T., Malietzis, G., Kendall, S. W., Jenkins, J. T., & Athanasiou, T. (2021). Crisis management for surgical teams and their leaders, lessons from the COVID-19 pandemic; A structured approach to developing resilience or natural organisational responses. *International Journal of Surgery, 91*, 105987. https://doi.org/10.1016/j.ijsu.2021.105987

Robinson, H., Molenaar, J., & Van Praag, L. (2024). Navigating spatial inequalities: The micro-politics of migrant dwelling practices during COVID-19 in Antwerp. *Urban Studies, 61*(9), 1756–1772. https://doi.org/10.1177/00420980231217738

Tian, L. (2022). Analysis of the artistic effect of garden plant landscaping in urban greening. *Computational Intelligence and Neuroscience, 2022*, 430067. https://doi.org/10.1155/2022/2430067

Truong, M-XA., & Clayton, S. (2020). Technologically transformed experiences of nature: A challenge for environmental conservation? *Biological Conservation, 244*, 108532. https://doi.org/10.1016/j.biocon.2020.108532

Sutton, J., Cleave, E., Casey Sadler, R., Hutchenreuther, J., Oosterbaan, C., & Arku, G. (2025). Working in the Crisis: Practitioners' perceptions of and responses to the COVID-19 Pandemic. *Urban Affairs Review, 61*(1), 125–160. https://doi.org/10.1177/10780874241241232

World Health Organization (WHO). (2023). *WHO coronavirus (COVID-19) dashboard*. https://covid19.who.int/

Xiao, X. D., Dong, L., Yan, H., Yang, N., & Xiong, Y. (2018). The influence of the spatial characteristics of urban green space on the urban heat island effect in Suzhou Industrial Park. *Sustainable Cities and Society, 40*, 428–439. https://doi.org/10.1016/j.scs.2018.04.002

Yang, Y., Lu, Y., Yang, L., Gou, Z., & Liu, Y. (2021). Urban greenery cushions the decrease in leisure-time physical activity during the COVID-19 pandemic: A natural experimental study. *Urban for Urban Green, 62*, 127136. https://doi.org/10.1016/j.ufug.2021.127136

Zhang, F., Lv, Y., & Sarker, M. N. I. (2024). Resilience and recovery: A systematic review of tourism governance strategies in disaster-affected regions. *International Journal of Disaster Risk Reduction, 103,* 104350. https://doi.org/10.1016/j.ijdrr.2024.104350

Zhang, X., Pan, D., Wong, K., & Zhang, Y. (2022). A new Top-Down governance approach to community gardens: A case study of the “we garden” community experiment in Shenzhen, China. *Urban Science, 6*(2), 41. https://doi.org/10.3390/urbansci6020041