sustainability

MDPI

Review

Urban Greening and Local Planning in Italy: A Comparative Study Exploring the Possibility of Sustainable Integration Between Urban Plans

Rosalba D'Onofrio *, Antonio Bocca and Chiara Camaioni

School of Architecture and Design "E. Vittoria", University of Camerino, 63100 Ascoli Piceno, Italy; antonio.bocca@unicam.it (A.B.); chiara.camaioni@unicam.it (C.C.)

* Correspondence: rosalba.donofrio@unicam.it

Abstract: Urban green planning in Europe is of crucial importance for the sustainability of cities. Despite the existence of numerous best practices, in Italy the integration between green plans and urban planning tools still presents difficulties. This study focused on an analysis of Italian case studies that have engaged in innovative urban planning, assigning green areas a strategic role in the development of cities. The comparative analysis involved the green plans of Torino and Bolzano and the local urban plans of Prato and Bologna. The selection of cases was based on a multifaceted evaluation framework encompassing reference regulatory context, plan nature, environmental characterisation, vision and main objectives, priorities and implementation tools, communication and participation, and monitoring and management. Analysis of these case studies led to the identification of best practices for integrating human and environmental dimensions in local urban planning. However, the results indicate that integration of urban greening and local planning policies is frequently impeded by regulatory discrepancies and the varying impact capabilities of urban planning instruments. Despite the limited nature of the sample analysed, the study proposes a model of synergy between urban greening and local planning, suggesting an opportunity to create innovative interpretative and evaluative criteria for regulatory plans.

Keywords: urban green plan; green infrastructure; greening; sustainability; ecological networks; biodiversity

Academic Editors: Andreea-Loreta Cercleux, Elena Bogan, Marinela Istrate and Alexandru Bănică

Received: 27 January 2025
Revised: 15 March 2025
Accepted: 2 April 2025
Published: 4 April 2025

Citation: D'Onofrio, R.; Bocca, A.; Camaioni, C. Urban Greening and Local Planning in Italy: A Comparative Study Exploring the Possibility of Sustainable Integration Between Urban Plans. *Sustainability* **2025**, *17*, 3227. https://doi.org/10.3390/su17073227

1. Introduction

In Europe, the issue of 'green cities' has become a pivotal component of urban and spatial planning in recent years. Today, green spaces play an instrumental role in enhancing the quality of life in cities [1–3] and in fulfilling other significant functions, as evidenced by a continuous stream of research in the scientific literature. Green areas can assume pivotal roles adapting to and mitigating the effects of climate change [4,5]. These areas can also contribute to a range of aims, including: (i) the development of innovative urban regeneration policies [6,7]; (ii) the generation of additional environmental, economic, and social benefits [8,9]; (iii) the right to nature [10,11]; (iv) the enhancement of population safety and well-being [12–14]; and (v) the formulation of urban spatial development policies [15,16]. The EU Biodiversity Strategy 2030 [17], a key element of the European Green Deal, offers a comprehensive interpretation of the ongoing cultural change, advocating the need to 'bring nature back into our lives' and reaffirming the human need for green areas [12]. The EU Biodiversity Strategy 2030 suggests the Urban Greening Plan, now called the Urban Nature Plan (UNP) [18], as one of the tools to bring about this step change.

The aims of the UNP are: (i) to formalise cities' commitment to promoting biodiversity, (ii) to improve urban ecosystems, and (iii) to promote healthier and more resilient communities. Concurrently, a significant challenge lies in the harmonisation of green policies with those pertaining to mobility, housing, and climate change. This harmonisation is crucial for enhancing urban resilience and elevating quality of life [19]. Consequently, the function of UNP in advocating for the systematic integration of green spaces within spatial planning frameworks could assume a pivotal role in achieving climate neutrality through policy and intervention [20].

The notion of UNP is not a new concept in the European context, with many cities implementing analogous frameworks, as evidenced by the 'Life Urban Greening Plans' framework [21]. This framework aims to reintroduce nature into urban environments by connecting European cities and municipalities. However, literature and practical experience have identified numerous challenges in the implementation of such plans. These challenges can be attributed to: (i) uncertainties in implementation processes and lack of collaboration between different institutional sectors [8]; (ii) insufficiency of dedicated funds [22]; and (iii) lack of systematic and structural integration in planning practices [23]. Other criticisms concern the scarcity of knowledge and skills within public administration [24] and the lack of innovative and effective strategies to support community and green policies [25].

Analogous challenges are evident in the Italian context, where the experience of Urban Greening Plans (UGPs) precedes the European Guidelines, as evidenced by Law n. 10/2013, the 'Guidelines for the management of public green areas' [26], and the 'National Strategy for Public Green Areas' [27]. The Italian experience has been the subject of recent research by the Organization for Economic Co-operation and Development (OECD) and further national reflection by the Italian Institute for Environmental Protection and Research (ISPRA) [28].

The present paper aims to delve deeper into the limitations that have been identified by the OECD and ISPRA with regard to the development and implementation of UNPs in Italy. The focus will be on the challenges of integrating them into governance processes and their non-binding nature, which has been identified as a key issue [29]. Indeed, the non-binding nature of UGP in Italy has been shown to render this urban planning tool ineffective. Concurrently, this paper seeks to explore the potential for broader reflection that encompasses a paradigm shift in local urban planning. This contribution investigates the possibility of engaging in innovative local urban planning by transitioning from the traditional principle of land use [30] towards performance-based content and streamlined, effective implementation methods [31].

This paper is organised as follows: the first section presents the background of the Italian panorama on the aims of the UGP and their peculiarities and limitations in the direction of environmental sustainability; the materials and methodology are illustrated in Section 2, in which four UGPs and two examples of Local Urban Plans (LUPs) are compared; Section 3 presents the main research results; and Section 4 includes a discussion of open issues, limitations, critical aspects, and conclusions.

The Italian Experience

Italian urban planning has historically accorded a subordinate role to green spaces, with local administrations primarily concerned with complying with the stipulated minimum standards outlined in Law n. 1444/1968 [32]. This approach has overlooked the potential of green spaces as a conduit for fostering sustainable development [33]. Despite enabling substantial public land acquisition and ensuring minimum rights for community welfare achievement [34,35], this approach has disregarded the qualitative elements of green spaces and geographical particularities.

The prevailing emphasis on the quantitative dimensions of amenities within these plans has led to a neglect of qualitative aspects and the consideration of territorial specificities. Nevertheless, their contribution to enhancing urban living conditions and affirming the principle of every citizen's right to nature cannot be disregarded [10,11]. In recent years, this planning model has been contested due to the economic, social, ecological, and environmental changes that have taken place [36–38]. Building on the momentum of international and European policies on sustainable development and biodiversity conservation, Italy introduced a law on public green spaces in 2013 (Law n. 10/2013) [39].

The 2013 legislation represented a pivotal moment in the revitalisation of the pivotal role of urban green spaces from an environmental, social, and cultural standpoint. After this legislative act, the 'Guidelines for the Management of Public Green Spaces' (2017) and the 'National Strategy for Public Green Spaces' (2018) were promulgated. In addition to these documents, there are the most recent decrees on urban greening (the Minimum Environmental Criteria of 06/02/20 and the Ministerial Decree on Public Green of 11/03/20). All these documents, in accordance with other international instruments, provide municipalities and larger-scale entities with guidance on the planning and management of green spaces. According to the Guidelines, the UGP is a strategic tool that outlines a strategic vision for the (semi)natural, agro-silvicultural, urban, and peri-urban landscape of the city, as well as defining principles and setting guidelines for the creation of public green spaces in general urban planning (Article 6, paragraph 1, letter e of Law n. 10/2013). These aims are as follows: (i) the improvement of ecosystem services; (ii) the long-term development and enhancement of urban and peri-urban green spaces; (iii) the allocation of economic resources; (iv) the monitoring of aims achieved in accordance with the plan; and (v) the involvement of local communities.

The Guidelines delineate the minimum content and implementation modalities of the UGPs (see Table 1). It is imperative that the Guidelines encompass a knowledge framework derived from a green inventory, a guiding plan, and technical implementation standards. Moreover, the Guidelines must contain implementation mechanisms and monitoring of the aims set and subsequently achieved, as well as measures for integration with other sectoral urban plans (Services Plan, Traffic Plan, General Urban Plan for underground services, etc.).

Table 1. Minimum content, implementation, and monitoring of the UGP according national and European guidelines [26]. Authors' interpretation.

Minimum Content	Implementation and Monitoring
Environmental and landscape characterisation of the various sectors within the municipal territory, delineated via ecological classification.	Relationship with other urban and sectoral plans (Services Plan, Traffic Plan, General Urban Plan for underground services, etc.).
Typological classification of vegetation structures (arboreal and shrub vegetation/herbaceous vegetation) and functional classification of municipal green spaces (accessible/non-accessible).	Programmatic indications for the three-year public works plan.
Estimation of the value of urban green spaces through the use of indicators.	Operational projects and design solutions to be implemented in the short to medium term with identified financial resources.
Analysis of the needs and 'demand' for ecosystem services.	Definition of indicators to monitor the plan's development and the achievement of its set aims.
Analysis of the existing flora and vegetation in terms of qualitative and quantitative evaluation.	Funding mechanisms and resource procurement for the implementation of the identified design solutions.
Planning of new green areas and new green infrastructures, as well as peripheral areas, with potential for urban green space expansion.	Information and communication plan for the engagement, participation and sensitisation of citizens.
Criteria for the construction of new green infrastructures.	

The UGPs function as an interconnecting link among public works programming, operational projects, and design solutions to be implemented in the short to medium term. The UGPs are associated with the 'Green Space Regulations' (GSRs), which establish principles and guidelines for the design, care, protection, and use of vegetation in public and private areas. The principles established by Law n. 10/2013 are substantially convergent with the recent European Guidelines (Table 2) [40].

Table 2. Comparison of UGP and UNP content according to Italian guidelines [26] and European guidelines [40]. Authors' interpretation.

	Guidelines Law n. 10/2013	**Urban Nature Plan Guidelines. Cycle Steps.**
Knowledge	- Environmental, landscape, and ecological characterisation. - Typological and functional classification of vegetation structures.	Step 5 Current state of nature and biodiversity.
Directions, Provisions, and Implementation	- Programming and planning of new green areas in implementation.	Step 6 Establishing goals/actions and related indicators.
Resource Procurement	- Funding mechanisms and resource procurement for the implementation of design solutions. - Operational projects and design solutions to be implemented in the short to medium term with identified financial resources.	Step 7 Agreeing on priorities, actions, responsibilities, timelines, and funding.
Training and Communication	- Information and communication plan for the engagement, participation, and awareness of citizens.	Step 8 Developing a strategy for public communication, education, and awareness.
Monitoring and Management	- Identification of indicators to monitor the plan's development and the achievement of its set aims.	Step 9 Establishing a system for monitoring, reporting, and evaluation. Step 10 Adopting and implementing the plan.

The stipulations outlined in Law n. 10/2013 did not oblige the drafting of the UGP or the adoption of the GSR, thereby conferring autonomy to individual municipalities in determining the utilisation of these planning instruments. The UGP has been identified as a consultation and information tool for all Italian municipalities, irrespective of size. While its utility is acknowledged, concerns have been raised regarding its operational effectiveness. These concerns have been further highlighted by ISTAT's recent survey of the urban environment in 2022. The analysis, which was conducted as of 31 December 2022, revealed that the UGP had only been approved in 11 municipalities among the 112 provincial capitals and metropolitan cities [41]. A recent study by ISPRA examined ten of these UGPs in depth. The study revealed how, in many cases, starting from natural capital and green and blue heritage, the UGPs are able to address key issues of urban sustainability, health, environmental justice, reduction of land consumption, and adaptation to climate change.

A significant number of plans also encompass the restoration of ecological connectivity, the promotion of health and active mobility, the regeneration of brownfield sites, the enhancement of agricultural multi-functionality, the monitoring of biodiversity, and the maintenance of green spaces through active citizenship. The motivation for these provisions is derived from a series of regional town planning laws that explicitly adopt a performance-based approach. This approach is intended not only to enhance but also to 'qualify' the presence of green spaces within the urban landscape. This objective is pursued to avoid a simplistic and fictitiously uniform vision of green spaces [42].

Despite the comprehensiveness of the content addressed by these plans, the ISPRA study documented that, in many cases, the UGPs are detached from the local regulatory context and disconnected from other mandatory planning instruments. Although not without difficulties, the UGPs demonstrate innovation in their content and approach to sustainability issues. The experience of the urban plans of a number of Italian municipalities, in which green areas take on the role of defining strategic choices for the sustainable development of cities, should also be assessed. This approach represents a paradigm shift in the realm of local urban planning, obviating the necessity for reliance on sector instruments, such as UGPs in the Italian context, which are characterised by their lack of direct effectiveness.

2. Materials and Methods

The ISTAT survey of Green Plans implemented in Italy since Law 10/2023 by the provincial capitals, conducted in 2022, included a sample of 11 co-municipalities with a Green Plan, eight of which were approved after 2010. These municipalities are Torino, Vercelli, Pavia, Bolzano, Padova, Parma, Bologna, and Matera. Two plans were adopted at the time, of which only one is currently approved: the Avellino UGP. Following consultation with ISPRA, three plans were excluded from the list: the Pavia and Vercelli UGPs (due to an absence of material on the respective municipal websites) and the Parma UGP (which, it was determined, did not meet the requisite standards for designation as a UGP, being instead a 'Green Space Regulation' (GSR)). This research carried out a comparative analysis of the green plans of Torino, Padova, Bolzano, and Avellino (based on official documents on the municipalities' websites and a bibliographic survey) and two urban plans, one of a regulatory nature and one of an operational nature. The General Urban Plan of Bologna, PUG (Piano Urbano Generale in Italian) was of a regulatory nature [43]. This Plan is included among the Green Plans in the ISTAT list, but in reality, it is more correctly an urban plan with the status of Green Plan. The second Plan is the Municipal Operational Plan of Prato-POC (Piano Operativo Comunale in Italian) [44]. The selection of the latter Plan was made on the basis of a bibliographic survey and its documented presence in the disciplinary debate as one of the first urban forestation experiments in Italy [45]. The bibliographic survey utilised the Google Scholar search engine in both instances, employing a query comprising the string 'UGP; Bologna PUC; Prato POC'.

The Bologna LUP is defined in Regional Law n. 24/2017 of Emilia-Romagna as the planning and governance tool of the municipal territory. The ULP is charged with the interpretation of objectives relating to the reduction of soil consumption, the protection of the public against hydro-geological risks, the regeneration of urban areas, and the protection and enhancement of the territory in its environmental and landscape characteristics, for the purpose of human well-being and the conservation of biodiversity and natural habitats.

The POC of Prato, as defined by Regional Law n. 65/2014 of Tuscany, is defined as the urban planning instrument of an operational nature, with forecasts that extend over a period of five years. It establishes the parameters for intervention in the transformation, enhancement, and protection of the municipal territory, defining the time-scales, modalities, and aims for such intervention. The plan aims to create a comprehensive record of the state of environmental, historical, and cultural resources, to direct their conservation, development, and transformation, and to measure their impact.

The query on Google Scholar was conducted from the date of adoption of the Plans. The search products for which PDFs were available were examined, and those deemed irrelevant on the basis of the title and later the abstract was removed. Concurrently, a survey of official documents was conducted on the websites of the municipalities (see: Trieste [46]; Bolzano [47]; Avellino [48]; and Padova [49]).

The selected UGPs and LUPs were investigated on the basis of some interpretative keys taken from the 'Guidelines for Green Management' and the 'Urban Greening Plans (now Urban Nature Plans) Guidance for Cities' (Figure 1), concerning:

- Programmatic context, tools, and reference projects: Identification of key regional legislation and the core themes within sustainable development strategies.
- Nature of the plans: Examining how the natural component is integrated within urban development strategies (e.g., greenbelts; green infrastructure as a basis for the urban structure; sponge cities, etc.).
- Environmental, landscape, and ecological characterisation: Assessment of the current state of nature and biodiversity; planning elements' quantitative evaluation of vegetation, the various functions of green space, the services provided, and associated risks; inventory of relevant policies and strategies).
- Vision and topics: Definition of goals, short- and long-term actions, and related indicators; integration with other instruments, such as the Services Plan, the Sustainable Mobility Plan, the Climate Adaptation Plan, etc.
- Training, communication, and participation: Details of the implementation of participatory design processes and communication and awareness-raising strategies.
- Implementation practices: Exploration of the proposed implementation mechanisms and the identification of necessary resource acquisition strategies.
- Monitoring and management: Selection of a monitoring and reporting system to evaluate the aims and results achieved.

This comparative analysis of the various plans, drawing upon documents available on official websites and within the extant literature, enabled the identification of common features, gaps, innovations, and critical issues. The primary aim was to assess the conditions and feasibility of incorporating the content of the UGP, as defined by European and national guidelines, into local-scale urban planning instruments. This approach fosters an integrated understanding of the functional systems and places within the city, as opposed to a sectoral analysis, thereby achieving an integration of strategic and operational content.

The recent application of these plans did not allow us to monitor their direct outcomes and any implementation difficulties, given the different territorial, legislative, and socio-economic contexts. Nevertheless, we were able to assess their effectiveness on the basis of the very nature of the instruments.

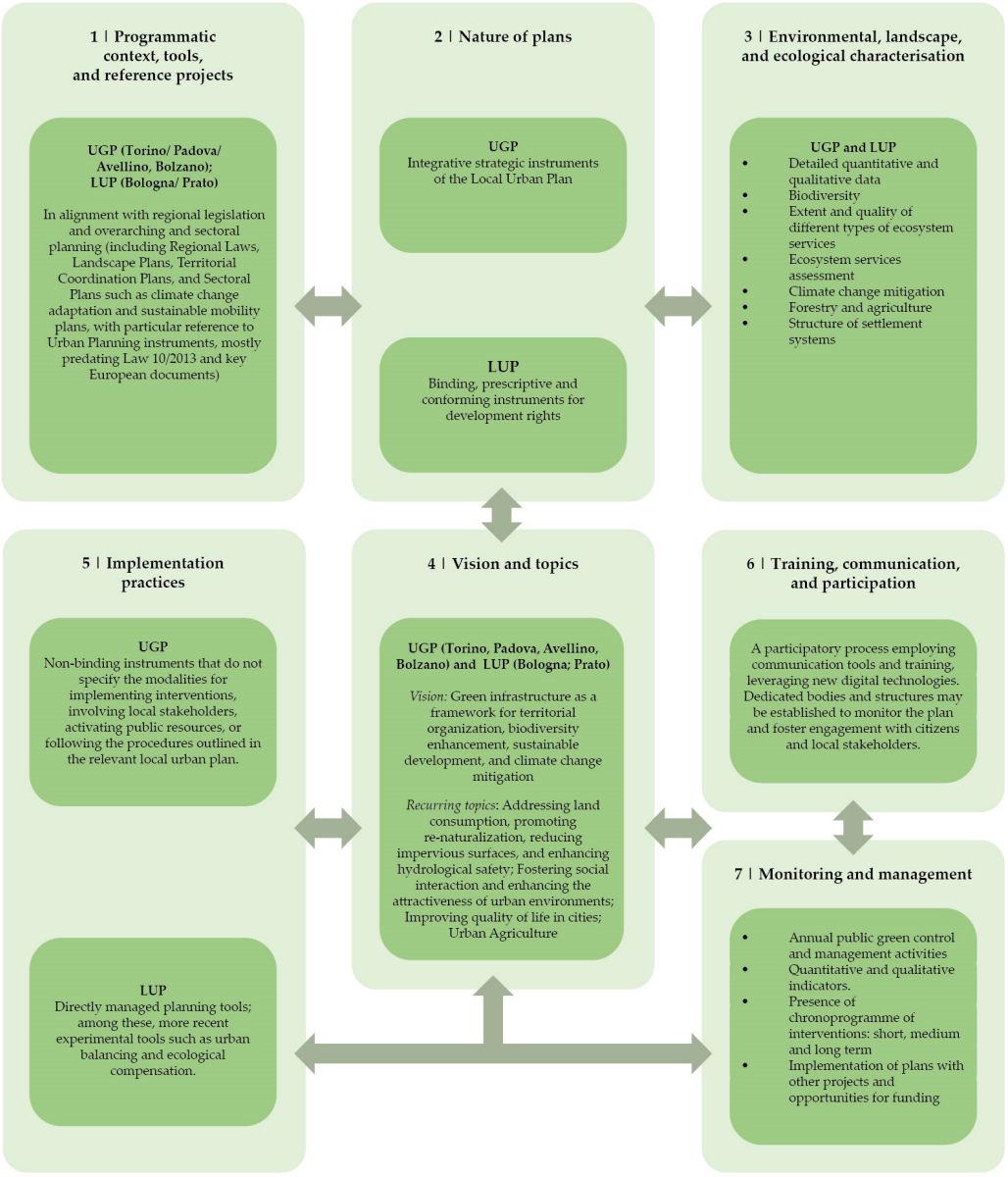

Figure 1. Methodological research framework for UGPs and LUPs. Authors' original work.

3. Results

A comparative analysis between UGPs and LUPs was conducted using interpretation sheets and a synthetic comparison scheme (see Figure 1). This analysis revealed both common elements and significant differences in relation to the selected keys of interpretation.

3.1. Programmatic Context, Tools, and Reference Projects

UGPs and LUPs are based on regional laws for government, the landscape, land use, and biodiversity. Climate adaptation is a constant (Table 3). This correlation is discernible in numerous urban centres, most notably in Padova and Bolzano. They encompass general principles for curtailing soil consumption (Dpp 31/2018 Bolzano), for the re-naturalisation of the territory (Veneto Regional Law (R.L.) 14/2019), and for ensuring biodiversity. The Torino UGP, in particular, references Piemonte R.L. 19/2009, which delineates methodologies for the protection and conservation of biodiversity and the regional ecological network. In the case of the Avellino UGP, the reference is Campania R.L. 13/2022, which aims to strengthen the infrastructural networks of green and open urban spaces to reduce soil

consumption. The synergy with strategic planning and plans on sustainable mobility and climate adaptation is also significant.

The Bologna LUP also demonstrates a robust reference to regional legislation. Emilia-Romagna L.R. 24/2017 introduces the general principles for government of the territory, inspired by protection of the environment, the ecosystem, and the cultural heritage. The LUP of Prato, in accordance with L.R. 65/2014, establishes its medium-term vision, underpinned by the principles of sustainable development and in synergy with the Sustainable Energy and Climate Action Plan (SECAP), the Sustainable Urban Mobility Plan (SUMP), other national plans and programmes for innovation in urban areas, urban regeneration, and security of peripheral zones, as outlined in the DPCM of 25 May 2016.

Table 3. A comparison between UGPs and ULPs and the relevant regulatory framework. Authors' original work.

UGP-LUP	Reference Law	Topics
Padova UGP	- Veneto Regional Law n. 14/2019 'Policies for Urban Regeneration and Re-naturalisation of the Territory'	- Restoration of natural environments
Bolzano UGP	- Provincial Law no. 9/2018 'Territory and Landscape' - Decree n. 17/2020 - Decree n. 31/2018	- Regional development and landscape management - Urban and territorial amenities - Limitation of land consumption
Avellino UGP	- Campania Regional Law n. 13/2022 (Measures concerning the streamlining of building consents, urban renewal, and the upgrading of existing built assets)	- Enhancement of networks of green spaces and the public realm - Limitation of land consumption
Torino UGP	- Piemonte Regional Law n. 19/2009 (Unified Text on the Protection of Natural Areas and Biodiversity)	- Preservation of biodiversity and the regional ecological network
Prato LUP	- Toscana Regional Law n. 65/2014 (Rules for Land Governance) - Ministerial Decree 25 May 2016	- Land governance - Preservation and quality of the land - Urban renewal - Urban security
Bologna LUP	- Emilia-Romagna Regional Law n. 24/2017 (Regional Regulation on the Protection and Use of the Territory)	- Net-zero land consumption - Urban regeneration - Land governance

3.2. Nature of the Plans

The UGPs of Torino, Avellino, and Padova manifest as strategic plans for urban green development, in accordance with national and European directives. However, it is important to note that these plans frequently precede recent legislation (Law 10/2023) and are non-binding (see Table 4).

The Avellino LUP, in particular, integrates strategic function with structural function, defining quantitative and qualitative aspects of green areas (aesthetic-landscape, environmental, ecological-climatic, functional, recreational, management, and maintenance aspects).

In contrast, the LUPs of Bologna and Prato regard the green system as a supporting element of urban planning, with objectives related to climate resilience and adaptation, as well as prescriptions for increasing urban resilience. Specifically, the LUP of Bologna incor-

porates the contents of the UGP, extending its purview to encompass the entire network of natural and semi-natural habitats. The municipality's LUP delineates and operationalises its programmatic choices concerning the city's green infrastructure, which is regarded as a pivotal factor in enhancing the territory's resilience, safety, and healthy environment.

The LUP in Prato challenges the conventional understanding of urbanism by adopting the principles of Landscape Urbanism [50]. Rather than prioritizing the built environment, the LUP conceptualizes the city as a network of interconnected green spaces, with built-up areas positioned within this network. This vision is articulated in the document 'Strategies for Urban Forestry' [51], which translates into a series of multiscalar actions, and in the 'Action Plan 2030', in which environmental resilience goals are expressed.

Table 4. The roles of the planning instruments and their principal goals. Authors' original work.

UGP-LUP	Purposes and Aims of the Plan
Padova UGP	Strategic function: - Establishing the 'green city' concept, based on its core natural ecosystems, with planned interventions to develop and enhance urban and peri-urban green spaces.
Bolzano UGP	Strategic function: - Increasing accessible public green space to meet the minimum standard required by legislation within the next few years; - Enhancing biodiversity in the urban environment; - Improving access to green spaces for citizens; - Developing a dense green network that extends into the city, originating from rivers.
Avellino UGP	Strategic and structural functions: - Establishing the (semi-)natural, agroforestry, urban, and peri-urban structure of the city; - Defining the guiding principles and criteria for the development of green spaces within future general urban planning frameworks.
Torino UGP	Strategic function: - Expanding green infrastructure to curb land consumption; - Promoting physical/social well-being and maximising ecosystem services to support climate change mitigation.
Prato LUP	Strategic function: - Establishing a green network comprising natural and semi-natural systems and habitats.
Bologna LUP	Strategic function: - Developing a continuous network of green areas throughout the city, integrated with purpose-built green islands.

3.3. Environmental, Landscape, and Ecological Characterisation

A comparison of the two different types of instruments reveals no substantial differences in the recognition and evaluation of green area systems (see Table 5). The UGPs furnish exhaustive quantitative and qualitative portrayals and assessments of a variety of green areas, biodiversity, ecosystem services, sustainable mobility, urban agriculture, and landscapes. This comprehensive approach emphasises the considerable heterogeneity of green and blue areas within urban environments and their diverse range of applications and functions. The analyses yielded information and economic estimates on the ecosystem services provided by green areas (Torino UGP) and biophysical estimates of ecosystem services (Padova UGP). The Avellino and Bolzano UGPs also address topics such as sustainable mobility, urban agriculture, and landscape.

However, the health and well-being aspects associated with the presence of green spaces in residential areas remain under-researched, despite the fact that these relationships have long been the subject of international debate [52]. The Avellino LUP, however, is a notable exception, as it aims to enhance the well-being of citizens by augmenting greenery to mitigate the impact of heat islands and enhance urban well-being. In the context of LUPs, the primary goals, as illustrated in the case of Bologna, include the creation of an 'urban eco-network', particularly in urbanised regions, through the expansion of green infrastructure to provide productive social and regulatory ecosystem services. Conversely, the Prato Action Plan places significant emphasis on the expansion of forested areas and the initiation of re-naturalization processes, with a particular focus on highly urbanized regions. The types of forestation include the following: peri-urban forests and woodlands; city parks (greater than 5000 sq. m.); small parks (less than 5000 sq. m.); and green buildings (green roofs and facades or use of low-emissivity materials).

Table 5. Environmental, landscape, and ecological characterisation of UGPs and LUPs. Authors' original work.

UGP-LUP	Environmental, Landscape, and Ecological Characterisation
Padova UGP	- Cognitive framework of green infrastructure and the city's tree heritage. - Investigations into the urban heat island effect, flood management, biodiversity, ecosystem services, proximity of green spaces, and urban agriculture. - Biophysical estimations of ecosystem services for the development of potential scenarios.
Bolzano UGP	- Planning frameworks. - Landscape assessment. - A survey and analysis of the current situation in urban and peri-urban areas. - Classification and analysis of different types of public and private green spaces. - An evaluation of urban green space quality based on a set of indicators.

Table 5. *Cont.*

UGP-LUP	Environmental, Landscape, and Ecological Characterisation
Avellino UGP	- A framework of the requirements for multi-functionality of green spaces (environmental mitigation, amenity, service provision, protection from hydrogeological instability, remediation of contaminated sites, landscape, etc.). Classification into two major categories: ○ built environments; ○ the area of natural and open space and the areas potentially destined for urban green infrastructure according to ULP forecasts. - Estimates related to ecosystem services, sustainable mobility, urban agriculture, and landscape.
Torino UGP	- A framework of knowledge inspired by the 'green printing' approach (utilizing demographic and socio-economic data, integrating climate and ecological analyses alongside higher-level regulations and urban planning requirements). - Economic estimations of ecosystem services.
Prato LUP	- A census of tree species and their benefits in six different zones of the city. - An evaluation of the monetary value of the benefits of trees related to climate change adaptation and energy conservation.
Bologna LUP	- A survey of the green space system for the construction of an eco-network (public green spaces, rural lowland areas; green inserts; green mitigation areas along the ring road—highway; private green spaces; the hillside); for the provision of recreational/social and regulatory ecosystem services.

3.4. Vision and Topics

A significant homogeneity of aims and visions was found in the UGPs studied, in line with the principles of L.10/2013 and the European guidelines (see Table 6). In the UGPs of Trento, Bolzano, and Padova, green areas emerge as strategic elements for urban sustainability, performing multiple functions. These functions include enhancing ecological resilience and biodiversity (as seen in Torino and Padova), promoting social cohesion (as seen in Bolzano), and mitigating the effects of climate change, as demonstrated by the adaptation strategies adopted by Padova (such as the sponge city approach) and Bolzano (response to heat waves and extreme events). A recurrent theme in the literature is the role attributed to the green area system in re-organizing the urban structure. The Bolzano UGP, for instance, features the "Green Ring" project, which strategically connects existing green spaces with those under development, creating a network that permeates the city. In the case of Avellino, the integration of green spaces with urban development is approached strategically and functionally, recognizing the potential of green areas to enhance the built environment. It is also crucial to emphasise the significance of contrasting land consumption, as evidenced by the examples of Bolzano and Torino, and the process of renaturation, as exemplified by Padova.

In the case of LUPs, green areas are recognised as a fundamental element in the organisation of the territory, with the aim of enhancing biodiversity and ensuring the sustainability of transformation interventions. In the city of Bologna, a proposal has been made to enhance the urban green infrastructure through the establishment of urban forestation rows and multipurpose tree belts, in addition to the implementation of small urban green interventions. The proposal further entails the incorporation of greenery

within the building envelopes of public buildings. Additionally, the proposal entails the establishment of an urban blue infrastructure, which is to be achieved through the management of water resources, the enhancement of river territories, and the protection of these areas from hydraulic risk. Mitigation of the urban heat island effect is prioritised through the implementation of measures aimed at climate adaptation of buildings and the enhancement of thermal comfort conditions during the summer months.

The 'Urban Forestry Action Plan' in Prato delineates six green strategies: (i) River and Gore Park, (ii) Infrastructure Mitigation Green, (iii) Capillary Green, (iv) Peri-urban Agricultural Gulfs and Large Parks, (v) Urban Demineralization, and (vi) Agricultural Belt Park. The specific abacuses and case studies that have been developed for the implementation of these strategies are linked to the aforementioned six strategies.

Table 6. Topics and vision of the UGPs and LUPs. Authors' original work.

UGP-LUP	Topics	Vision
Padova UGP	- Climate change resilience - Ecosystem service enhancement - Urban sustainability and quality of life - Re-naturalisation	Macro-strategies for: - Urban forest - Urban agriculture - Sponge city - Biodiversity - Park and accessibility - Recreational and cultural itineraries
Bolzano UGP	- Reduction of the impacts of climate change (heat islands and flash floods) - Increase in biodiversity and green spaces, also fostering of social interaction - Combatting soil consumption - Re-naturalisation - Sustainable mobility	Design guidelines: - Measures, guidelines. and criteria for the design and implementation of green spaces, green and blue infrastructure - Green Ring and Ring Promenade around the urban area - Greenway along future decommissioned railway tracks - Enhancement of tree-lined avenues - Naturalisation and enhancement of open urban and peri-urban ditches and canals
Avellino UGP	- Development of green infrastructure networks as ecological corridors - Reintegration of green spaces into urban fabrics - Mitigation of the urban heat island effect and enhancement of aesthetic and well-being perception - Ensuring the continuity of ecosystem services	- Creation of a multi-functional green network - Development of ecological and landscape corridors - Implementation of green spaces on compensatory land
Torino UGP	- Soil consumption reduction - Biodiversity conservation and ecological quality of existing green areas - Soft mobility - Ecosystem service assessment - Climate change mitigation	- Environmental compensation through the de-impermeabilisation and re-naturalisation of built-up surfaces - Repository of climate change mitigation solutions and demonstration projects - Inventory of urban gardens - Hillside woodland management plan - Strategies for recreational green spaces - Valuation of ecosystem services - Emergency response plan

Table 6. *Cont.*

UGP-LUP	Topics	Vision
Prato LUP	- Urban greening with socio-ecological aims and climate change adaptation goals	- Urban greening initiatives (including: river and backwater park, infrastructure mitigation green spaces, capillary green spaces, peri-urban agricultural gulfs and large parks, urban demineralization, agricultural belt park) - Inventory of building and open space interventions; inventory of key tree species; application of urban planning compensation for green space creation - Pilot schemes
Bologna LUP	- Enhancement of urban green infrastructure - Recognition of the environmental and landscape value of historical parks - Mitigation of urban heat island effects and improved flood protection - Sustainable mobility	- Urban forestry (comprising small-scale and large-scale greening projects, blue infrastructure for water management) - Strategic project 'Green Footprint', which envisions a new, large-scale ecological infrastructure for climate change mitigation, human health, and biodiversity - Strategies for urban and environmental quality - Ad hoc regulations and urban planning techniques (urban planning compensation) for the creation of green spaces

3.5. Training, Communication, and Participation

In all plans considered, the participation of stakeholders and citizens is fundamental, with the use of communication, training, and facilitation tools (see Table 7).

In the Turin UGP, to support participation activities, a 'Participation and Active Citizenship Office' was established, and strong involvement of volunteers was promoted. In Bolzano, participation preceded the identification of aims to be achieved in the UGP through six workshops with key stakeholders. The activation of three tables was undertaken on three specific topics: (i) the water system; (ii) the consolidated city; and (iii) the belt open space system. In Padova, the involvement of technicians, institutions, cultural and sports associations, and neighbourhood councils was facilitated through the utilisation of new technologies and citizen science to raise awareness. Avellino has established an 'Environmental Council for Promotion and Communication' and a digital platform to update and educate the community on the implementation of projects, particularly among young people. In the context of urban planning, citizen involvement is equally extensive.

In the case of the Prato LUP, two levels of intervention were identified: a relational pathway among stakeholders and implementation through digitisation and communication. Specifically, the 'Prato forest city' network [51] was established to facilitate the coordinated involvement of stakeholders and citizens. This network includes a web platform that allows citizens to participate in reforestation through tree planting, financial contributions to projects, and direct participation in reforestation activities.

In the case of Bologna LUP, the participatory process initially involved the involvement of different sectors of the municipal administration. Consequently, an intersectoral working group was established, comprising various municipal departments and sectors, each of which was responsible for addressing specific issues. Notably, the activities of this working group were extended beyond the approval of the PUG, with the goal of ensuring the effective oversight of its implementation.

Table 7. Participation actions in the UGPs and LUPs. Authors' original work.

UGP-LUP	Participation Activities
Padova UGP	Actions targeting specific technical stakeholders (institutions, professional associations, etc.), various social, cultural, and sports groups, and neighbourhood councils. Promotion of citizen science.
Bolzano UGP	Implementation of six workshops and establishment of three thematic tables: (i) water system; (ii) built-up area; and (iii) peri-urban green spaces.
Avellino UGP	Establishment of an environmental consultation body, promotion and communication through the implementation of a municipal website; design workshops and idea competitions, environmental education activities, communication plan.
Torino UGP	Establishment of a Municipal Office for Participation and Citizenship; public awareness and communication actions.
Prato LUP	Creation of a relational path between actors through the use of new technologies: Prato Forest city project.
Bologna LUP	Involvement of stakeholders in the drafting of the Local Urban Plan.

3.6. Implementation Procedures

A significant distinction between UGPs and LUPs pertains to the methodologies employed in the implementation of interventions in both existing and prospective green areas. The UGPs, as non-binding instruments, identify possible ways of implementing interventions, through (i) the involvement of local actors; (ii) the activation of public resources; and (iii) the use of reference LUPs (Table 8).

The UGP of Turin has outlined its vision for the activation of strategic public–private partnerships, encompassing the following potential avenues: donations, sponsorships, collaborative agreements and pacts, shared management projects for common goods, municipal contributions for land protection, and the valorisation of protocols with third-party entities for the involvement of private individuals and businesses. In Bolzano, municipal funds are allocated, and additional funding is sought. In Padova, a timeline of strategies for the coming years has been drawn up, through the use of public financing or tools available from the LUP. Conversely, Avellino places significant reliance on the operational component of the LUP to facilitate the establishment of green spaces and the transfer of areas designated for urban transformation.

In the context of local urban plans, the establishment of green spaces is facilitated by the instruments that the plans directly manage, including those of recent experimentation, such as urban equalisation [53] and environmental compensation [54,55].

In the Bologna LUP, the aim of creating an urban eco-network is pursued through the provision of sustainability conditions and prescriptions at the urban and building scale. The enhancement of the environmental network and the provision of eco-services are facilitated by interventions through land designation and public–private operating agreements, encompassing the transfer of existing volumes with relocation outside the urbanised territory. In addition, it is prescribed that each project must demonstrate that it has analysed the different possible alternatives in order to reduce sealing and increase urban drainage.

In the case of the LUP of Prato, the Plan's objective of creating large green areas, located in densely populated areas and strategically positioned in the city, is pursued through synergy between public and private spheres. This is achieved by implementing measures of urban equalisation and environmental compensation. Furthermore, it is notable that the land areas ceded to the administration exceed 70%, in addition to the standards that must be realised concurrently with the implementation of private building. New constructions intended for public cessions must be designed to avoid fragmentation by situating them on the periphery of the existing settlement system. Furthermore, these constructions must facilitate fruitful and visual connections between parks and existing residential areas.

Table 8. Implementation procedures. Authors' original work.

UGP-LUP	Implementation Procedures
Padova UGP	The UGP is integrated with other existing planning and programming documents, including the ULP. It refers to these for implementation
Bolzano UGP	Allocation of dedicated economic resources to the UGP from the Municipal Budget. State funding
Avellino UGP	Planning and development of green areas through the LUP in urban transformation areas
Torino UGP	Activation of strategic public–private partnerships
Prato LUP	Public land transfers in urban transformation areas
Bologna LUP	Urban and building scale requirements

3.7. Monitoring and Management

Despite their varied manifestations, green monitoring and management activities are evident in both PMUs and LUPs (see Table 9). In addition to the ordinary annual monitoring and management of public green areas, PMUs are monitored in two phases. In the UGP of Padua, the first phase involves an evaluation of the implementation of the plan five years after its approval. The second phase involves evaluations at 10 and 20 years to ascertain consistency with the overall vision in relation to the proposed urban forestation, Nature-Based Solution (NBS), and green infrastructure interventions. The most frequently used indicators are quantitative in nature (Torino; Bolzano), but qualitative indicators are also employed (e.g., Bolzano). In the UGP of Avellino, interventions are categorised into short-, medium-, and long-term, with evaluations conducted over a five-year period in areas that have the potential to be transformed and allocated to public green spaces or urban forestation.

The Bologna LUP places significant emphasis on monitoring, employing a continuous and circular process that encompasses revision of the urban planning instrument. The construction of the LUP was informed by a comprehensive environmental analysis, the formulation of scenarios, the identification of objectives, strategies, and actions, and the establishment of monitoring mechanisms. Furthermore, the assessment process is accompanied by continuous discussions with citizens and their continuous information.

The LUP of Prato, in its Urban Forestation Strategy, envisaged continuous monitoring measures and promoted a series of initiatives for its implementation. These include the 'Charter for the Urban Regeneration of Green Cities' [56] and the 'Prato Urban Jungle' [57]. The former aims to curtail soil consumption through the recovery and reuse of existing buildings and the prioritisation of NBS interventions. The 'Prato Urban Jungle' initiative, on the other hand, is the result of financing obtained as part of the Urban Innovative Actions (UIA) programme. This project aims to experiment with a new urban paradigm,

in which nature is integrated into open spaces and buildings (roofs, facades, etc.). The project is founded on the principle of citizen involvement and user participation through a collaborative design process that encompasses the conception, design, and management of the intervention.

Table 9. Monitoring and management of UGPs and ULPs. Authors' original work.

UGP-LUP	Monitoring	Management
Padova UGP	The UGP stipulates the definition of several indicators and actions aimed at verifying its implementation. The Plan proposes methods to monitor the following planning objectives: environmental function; biodiversity; functions, accessibility, and functionality of green spaces.	Conducted in two phases: an evaluation of the plan's implementation five years after its approval, followed by assessments at the 10- and 20-year marks to verify the ongoing alignment with the plan's vision.
Bolzano UGP	The use of both quantitative and qualitative indicators is employed. The evaluation outcomes, ranging from 'very poor' to 'excellent', are presented on a dedicated map and also disaggregated by the main urban public parks.	The evaluation refers to the recent Minimum Environmental Criteria for sustainable urban green space management.
Avellino UGP	A multidimensional monitoring framework is in place, encompassing indicators such as: green balance, tree inventory, number of areas adopted by community groups, tree canopy renewal rate, play equipment provision, green jobs, and staff specialization index.	Interventions are divided into short-, medium-, and long-term phases. Over the five-year period, areas with potential for transformation into public green spaces or urban forests are to be assessed. The UGP encompasses a comprehensive maintenance plan and a general programming plan.
Torino UGP	For each strategic line, different lines of action are outlined, each accompanied by specific monitoring indicators.	Involvement of private entities is envisaged for both the development of new green areas, play areas, sports facilities, and urban gardens and maintenance activities. Urban forestry represents a particularly promising area for private sector engagement.
Prato LUP	For the three pilot project areas, benefits are estimated for the first 20 years following the plan's implementation.	Co-design activities will be carried out during the design and implementation phases, involving collaboration with various stakeholders in the creation and maintenance of green spaces.
Bologna LUP	Achievement and verification of the predefined objectives in the LUP (surface areas and number of trees) over a ten-year period from the approval year.	Development of climate change scenarios and community engagement sessions.

4. Discussion

The European Union has identified UGPs as pivotal instruments in achieving the objective of Nature in the City, in addition to providing a framework for the sustainable development of urban areas. The guidance is based on three main phases: (i) preparation, (ii) planning of actions, and (iii) implementation and monitoring. In the Italian context, UGPs demonstrate a high degree of alignment with the European Guidelines. Despite the fact that the UGPs examined place natural capital at the centre of development possibilities [8], there is a lack of effectiveness. European environmental policies aspire to harmonise nature protection with societal benefits, yet local governments must balance the preservation of green spaces with community needs. The challenge, therefore, is to find

a balance in which green areas add value to the sustainable development of the city [23]. The implementation of urban green plans is often hindered by the rigid nature of urban planning tools, the high costs associated with implementing and managing green spaces, and the non-binding nature of urban green plans [28].

The integration of green space within urban planning instruments at the local scale is frequently inadequate. This shortcoming can be attributed to the conventional methodology of urban planning instruments, which, in the past, did not prioritise environmental sustainability and urban greening to the same extent. The LUPs of Bologna and Prato emphasise that UGPs should not be regarded as novel planning tools, but rather as a fundamental framework [21] for the systemic integration of green infrastructures in urban regeneration processes. Furthermore, they have the capacity to enhance LUPs with new content [58].

This potential reconfiguration of contents and aims within the LUP could represent an element of disciplinary innovation. Conventional planning models have been predicated on land use (residential, industrial, or commercial). This conventional approach has hindered the comprehensive consideration of environmental protection issues [31,59,60]. Furthermore, a synergistic and coordinated approach has the potential to ensure sustainable development that is focused not only on urban well-being, but also on mitigating the risks of climate change. This approach would have a positive impact on increasing the urban resilience of future cities. Indeed, contemporary plans no longer have to rely on the provision of a minimum quantity of services and green spaces. Instead, the focus has shifted to ensuring quality of life and enhancing ecological and environmental performance. This paradigm shift enables the identification of potential mediations among urban development, land use, greening, and socio-economic goals [61]. Recent advancements in monitoring systems have enabled evaluation of the impacts of implemented policies. In a multitude of instances, members of the general public partake in monitoring activities through training and educational initiatives that are designed to fortify the resilience of both the urban environment and the local community in the face of persistent changes. The long-term implications of the adoption of participatory strategies have been demonstrated to engender more place-based and contextual solutions, as opposed to those of a more traditional nature [23].

The Bologna and Prato LUPs are indicative of this approach. These plans are characterised by regulatory mechanisms that direct urban transformations towards a more sustainable approach, including the promotion of desealing actions and urban forestation [30]. The efficacy of these plans in transforming urban practices has been demonstrated by the existence of consolidated mechanisms and techniques of equalisation, urban compensation, and public–private agreements. This has the potential to generate opportunities for green spaces, recreation, and cultural activities, thereby enhancing the ecological and environmental benefits of urban areas. The promotion of this paradigm shift has the potential to facilitate enhancement of the knowledge framework and evaluation, implementation, and monitoring of LUPs.

The emphasis on training and citizen participation indicates the validity and future adoption of a business model that is receptive to eco-innovation as a catalyst for sustainable development. In this regard, the city of Prato has made substantial investments through the European programme ‘Prato Urban Jungle’, engaging citizens, associations, and businesses in the initiative to enhance the city’s environmental sustainability through crowdfunding forestation campaigns. This innovative approach is not merely limited to the sharing of knowledge, but rather aims to shape concrete strategies. The implementation of these strategies is poised to yield economic value, in addition to environmental, ecological, and social benefits [62].

The analysis also reveals a focus on international co-operation, as evidenced by the case of Prato's UIA programme. Through this experience, Prato was able to develop a knowledge framework, enabling the replication of practices observed in more developed countries in the field of green and sustainable urban planning. The results demonstrate that inclusion of the environmental matrix in the drafting of LUPs is a priority, with the aim of reducing urban areas' vulnerability to floods and heat waves.

This shift in focus signifies a paradigm shift in urban planning, emphasising the development of strategies to mitigate climate and environmental risks. This paradigm shift, partially anticipated by the Prato and Bologna LUPs, has the potential to significantly impact urban planning and sustainability by

- Helping update the traditional urban planning model to adopt a qualitative and performance-oriented approach to planning [33,63]. This would produce high performance standards for the implementation of green infrastructure and the conservation of natural areas [64,65].
- Applying the operational requirements of LUPs for the proper management of the land regime to encourage public–private partnerships for the implementation of green spaces [33,66]. Careful planning of the resources required and identification of sustainable sources of funding are therefore crucial [67].

5. Conclusions

The research presented in this paper demonstrates that the process of urban greening is not only a technical challenge, but also encompasses cultural and social dimensions. This necessitates a synthesis of knowledge and innovation in the context of local planning processes. The integration of UGPs within LUPs has been identified as a potential strategy to enhance the transition towards sustainable urban development in the future.

This study emphasised that a LUP that aligns with the principles of Law 10/2013 and the National Guidelines should incorporate innovative analysis and evaluation methodologies, including:

- develop a framework of knowledge about nature and biodiversity and its valuation, using new methods of investigation (ecosystem services, climate scenarios, etc.);
- develop a planning vision of sustainability goals with related indicators;
- agree with the various sectors of the public administration on priorities, actions, responsibilities, and timeframes to be respected in the implementation of green works;
- use tools to make urban areas more equal and to compensate for the environment to encourage the creation of green areas by limiting the use of public resources;
- create a communication, education, and public awareness strategy; set up a system to monitor, report, and evaluate things through the use of methods whereby citizens can take part in research.

Despite the limited sample of UGPs and LUPs utilised in this study, the methodological framework and results provide a foundation for extending the analysis to a broader context. A comparison of this kind would facilitate updating the interpretative and evaluative guiding principles of LUPs. The replicability of the methodology is also noteworthy in the context of the local scale as a territorial unit that bears similarities to other European realities. A further possibility for the development of this research would be to explore market-based solutions at the European level for financing urban green infrastructure as an alternative to public funds, which are often insufficient to support sustainable urban regeneration.

Author Contributions: Conceptualization, R.D.; methodology, R.D. and A.B.; formal analysis, R.D., A.B. and C.C.; investigation, A.B. and C.C.; writing-original draft preparation, R.D., A.B. and C.C.; supervision, R.D.; project administration, R.D. and C.C. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by Life+ A_GreeNet (LIFE EU Programme, LIFE 20 CCA/IT/001752).

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Conflicts of Interest: The authors declare no conflicts of interest.

Abbreviations

The following abbreviations are used in this manuscript:

UNP	Urban nature plan
UGP	Urban greening plan
GSR	Green space regulation
LUP	Local urban plan
SUMP	Sustainable urban mobility plan
SECAP	Sustainable energy and climate action plan
NBS	Nature-Based Solutions
ISPRA	Italian Institute for Environmental Protection and Research
OECD	Organization for Economic Co-operation and Development

References

1. Mensah, C.A.; Andres, L.; Perera, U.; Roji, A. Enhancing quality of life through the lens of green spaces: A systematic review approach. *Int. J. Wellbeing* **2016**, *6*, 142–163. [CrossRef]
2. Ruckelshauß, T. The effect of green areas on life satisfaction: A comparison of subjective and objective measures. In *Handbook on Wellbeing, Happiness and the Environment*; Maddison, D., Rehdanz, K., Welsch, H., Eds.; Edward Elgar Publishing: Cheltenham, UK, 2020; pp. 245–265. [CrossRef]
3. Bocca, A. Sustainable development and proximity city. The environmental role of new public spaces. *TeMA J. Land Use Mobil. Environ.* **2024**, *17*, 71–87. [CrossRef]
4. Graça, M.; Cruz, S.; Monteiro, A.; Neset, T.S. Designing urban green spaces for climate adaptation: A critical review of research outputs. *Urban Clim.* **2022**, *42*, 101126. [CrossRef]
5. Lai, D.; Liu, W.; Gan, T.; Liu, K.; Chen, Q. A review of mitigating strategies to improve the thermal environment and thermal comfort in urban outdoor spaces. *Sci. Total Environ.* **2019**, *661*, 337–353. [CrossRef] [PubMed]
6. Mell, I. Examining the Role of Green Infrastructure as an Advocate for Regeneration. *Front. Sustain. Cities* **2022**, *4*, 731975. [CrossRef]
7. Eigenheer, D. Urban Regeneration and Green Space Sistem: São Paulo Metropolitan Area. In *Design for Health. UIA 2023. Sustainable Development Goals Series*; Hasan, A., Benimana, C., Ramsgaard Thomsen, M., Tamke, M., Eds.; Springer: Cham, Switzerland, 2023; pp. 3–16. [CrossRef]
8. Kabisch, N.; Frantzeskaki, N.; Pauleit, S.; Naumann, S.; Davis, M.; Artmann, M.; Haase, D.; Knapp, S.; Korn, H.; Stadler, J.; et al. Nature-based solutions to climate change mitigation and adaptation in urban areas: Perspectives on indicators, knowledge gaps, barriers, and opportunities for action. *Ecol. Soc.* **2016**, *21*, 39. [CrossRef]
9. Villanueva Cortés, P. *The External Impact of the Green Economy: An Analysis of the Environmental Implications of the Green Economy*; IPE Working Papers 56/2015; Berlin School of Economics and Law, Institute for International Political Economy (IPE): Berlin, Germany, 2015. Available online: https://www.ipe-berlin.org/fileadmin/institut-ipe/Dokumente/Working_Papers/ipe_working_paper_56.pdf (accessed on 10 November 2024).
10. Alves, F.; Costa, P.M.; Novelli, L.; Vidal, D.G. The rights of nature and the human right to nature: An overview of the European legal system and challenges for the ecological transition. *Front. Environ. Sci.* **2023**, *11*, 1175143. [CrossRef]
11. Huq, C. Green Unionism and Human Rights: Imaginings beyond the Green New Deal. *Pace Environ. Law Rev.* **2023**, *40*, 158. [CrossRef]
12. Reyes-Riveros, R.; Altamirano, A.; De La Barrera, F.; Rozas-Vásquez, D.; Vieli, L.; Meli, P. Linking public urban green spaces and human well-being: A systematic review. *Urban For. Urban Green.* **2021**, *61*, 127105. [CrossRef]

13. Mears, M.; Brindley, P.; Jorgensen, A.; Maheswaran, R. Population-level linkages between urban greenspace and health inequality: The case for using multiple indicators of neighbourhood greenspace. *Health Place* **2020**, *62*, 102284. [CrossRef]
14. Lafortezza, R.; Carrus, G.; Sanesi, G.; Davies, C. Benefits and well-being perceived by people visiting green spaces in periods of heat stress. *Urban For. Urban Green.* **2009**, *8*, 97–108. [CrossRef]
15. Feltynowski, M. Urban green spaces in land-use policy-types of data, sources of data and staff-the case of Poland. *Land Use Policy* **2023**, *127*, 106570. [CrossRef]
16. Breuste, J. The Green City: General Concept. In *Making Green Cities: Concepts, Challenges and Practice*; Breuste, J., Artmann, M., Ioja, C., Qureshi, S., Eds.; Springer International Publishing: Cham, Germany, 2023; pp. 3–18. [CrossRef]
17. European Commission. Directorate-General for Environment. In *EU Biodiversity Strategy for 2030-Bringing Nature Back into Our Lives*; Publications Office of the European Union: Luxembourg, 2021. Available online: https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en#documents] (accessed on 10 November 2024).
18. European Commission. Urban Nature Platform. Supporting Towns and Cities in Restoring Nature and Biodiversity. Available online: https://environment.ec.europa.eu/topics/urban-environment/urban-nature-platform_en#urban-nature-plan-guidance-and-toolkit (accessed on 15 December 2024).
19. Giannico, V.; Spano, G.; Elia, M.; D'Este, M.; Sanesi, G.; Lafortezza, R. Green spaces, quality of life, and citizen perception in European cities. *Environ. Res.* **2021**, *196*, 110922. [CrossRef]
20. ICLEI. *Tackling the Climate and Biodiversity Crises in Europe Through Urban Greening Plans*; Scientific Opinion Paper/October 2021; Umwelt Bundesamt: Dessau-Roßlau, Germany, 2021. Available online: https://iclei-europe.org/publications-tools/?c=search&uid=iLn4nemY (accessed on 10 November 2024).
21. EUROPARC Federetion. About Urban Greening Plans. Available online: https://www.europarc.org/about-urban-greening-plans/ (accessed on 26 November 2024).
22. Aubert, G. *How Much Will the Implementation of the Nature Restoration Law Cost and How Much Funding Is Available?* Ecologic Institute: Berlin, Germany, 2021. Available online: https://ieep.eu/wp-content/uploads/2023/01/4_-Nature-Restoration-Law-and-Funding.pdf (accessed on 2 January 2025).
23. Bellè, B.M.; Deserti, A. Urban Greening Plans: A Potential Device towards a Sustainable and Co-Produced Future. *Sustainability* **2024**, *16*, 5033. [CrossRef]
24. Feltynowski, M.; Kronenberg, J.; Bergier, T.; Kabisch, N.; Łaszkiewicz, E.; Strohbach, M.W. Challenges of urban green space management in the face of using inadequate data. *Urban For. Urban Green.* **2018**, *31*, 56–66. [CrossRef]
25. Schneider, A.E.; Neuhuber, T.; Zawadzki, W. Understanding citizens' willingness to contribute to urban greening programs. *Urban For. Urban Green.* **2024**, *95*, 128293. [CrossRef]
26. MATTM, Ministero dell'Ambiente e Della Tutela del Territorio e del Mare-Comitato per lo Sviluppo del Verde Pubblico. Linee Guida per il Governo Sostenibile del Verde Urbano. Del. No. 19-03/07/2017. Available online: https://www.mase.gov.it/pagina/comitato-lo-sviluppo-del-verde-pubblico (accessed on 2 January 2025).
27. MATTM, Ministero dell'Ambiente e Della Tutela del Territorio e del Mare-Comitato per lo Sviluppo del Verde Pubblico. Strategia Nazionale del Verde Pubblico. 2018. Available online: https://www.mase.gov.it/sites/default/files/archivio/allegati/comitato%20verde%20pubblico/strategia_verde_urbano.pdf (accessed on 2 January 2025). (In Italian)
28. Chiesura, A.; D'Ambrogi, S.; Pileri, P.; Bultrini, M.; De Maio, E.; Faticanti, M.; Giardi, G.; Lepore, A.; Bataloni, S.; Baldini, B.; et al. *I Piani Comunali del Verde: Strumenti per Riportare la Natura Nella Nostra Vita?* Quaderno ISPRA 33/2024; ISPRA: Roma, Italy, 2024. Available online: https://www.isprambiente.gov.it/it/pubblicazioni/quaderni/ambiente-e-societa/i-piani-comunali-del-verde-strumenti-per-riportare-la-natura-nella-nostra-vita (accessed on 10 December 2024). (In Italian)
29. OECD. *Developing an Integrated Approach to Green Infrastructure in Italy*; OECD Publishing: Paris, France, 2023. [CrossRef]
30. Pogliani, L.; Ronchi, S.; Arcidiaco, A.; Di Martino, V.; Mazza, F. Regeneration in an ecological perspective. Urban and territorial equalisation for the provision of ecosystem services in the Metropolitan City of Milan. *Land Use Policy* **2023**, *129*, 106606. [CrossRef]
31. Ronchi, S.; Arcidiacono, A.; Pogliani, L. Integrating green infrastructure into spatial planning regulations to improve the performance of urban ecosystems. Insights from an Italian case study. *Sustain. Cities Soc.* **2020**, *53*, 1–12. [CrossRef]
32. Decreto Interministeriale 2 April 1968, No. 1444. Available online: https://www.bosettiegatti.eu/info/norme/statali/1968_1444.htm (accessed on 2 January 2025).
33. Pelorosso, R.; Gobattoni, F.; Leone, A. Increasing Hydrological Resilience Employing Nature-Based Solutions: A Modelling Approach to Support Spatial Planning. In *Smart Planning: Sustainability and Mobility in the Age of Change. Green Energy and Technology*; Papa, R., Fistola, R., Gargiulo, C., Eds.; Springer: Cham, Switzerland, 2018; pp. 71–82. [CrossRef]
34. Giaimo, C. Tra Spazio Pubblico e Rigenerazione Urbana. Il Verde Come Infrastruttura per la Città Contemporanea. Urbanistica Dossier Online 2020; Volume 17. Available online: http://www.urbanisticainformazioni.it/IMG/pdf/ud017.pdf (accessed on 10 February 2025).
35. Lanzani, A. L'Italia degli standard urbanistici. Che fare, oggi? *Territorio* **2019**, *90*, 77–83. [CrossRef]

36. Giaimo, C. Dagli standard urbanistici a verde alle performance urbane. In Proceedings of the Il Verde Urbano Come Motore di Rigenerazione Cittadina, Urbanpromogreen, Venezia, Italy, 17–18 September 2019. Available online: https://urbanpromo.it/2019/eventi/il-verde-urbano-come-motore-di-rigenerazione-cittadina/ (accessed on 2 January 2025).
37. Giaimo, C. La trama. Dopo 50 anni ripartire dagli standard. In *Dopo 50 Anni di Standard Urbanistici in Italia*; Giaimo, C., Ed.; INU Edizioni: Roma, Italy, 2019; pp. 30–40.
38. Giaimo, C.; Tosi, M.C.; Voghera, A. Tecniche urbanistiche per una fase di decrescita. In Proceedings of the Downscaling, Rightsizing. Contrazione Demografica e Riorganizzazione Spaziale, Torino, Italy, 17–18 June 2021; Planum Publisher-SIU: Roma-Milano, Italy, 2021. [CrossRef]
39. Legge 14 January 2019, No. 10. Norme per lo Sviluppo Degli Spazi Verdi. Available online: https://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:legge:2013;10 (accessed on 2 December 2024).
40. European Commission. *Urban Nature Plans. Guidance for Cities to Help Prepare an Urban Nature Plan*; EU Publications: Luxembourg, 2024. [CrossRef]
41. Istat. Istituto Nazionale di Statistica. Ambiente Urbano-Anno 2022. Available online: https://www.istat.it/comunicato-stampa/ambiente-urbano-anno-2022-2/ (accessed on 2 December 2024).
42. Calabrò, M.; De Biase, C. Il governo del territorio nel confronto tra saperi: Note su una prospettiva funzionale della pianificazione del verde urbano. *Riv. Quadrimestrale Dirit. Dell'ambiente* **2024**, *1*, 185–212. Available online: https://www.rqda.eu/en/marco-calabro-claudia-de-biase-il-governo-del-territorio-nel-confronto-tra-saperi-note-su-una-prospettiva-funzionale-della-pianificazione-del-verde-urbano/ (accessed on 10 February 2025).
43. Comune di Bologna. PUG. Piano Urbanistico Generale di Bologna. Available online: https://cantierebologna.com/2023/08/18/il-caldo-come-la-pandemia-le-strategie-di-adattamento-del-comune-di-bologna/e (accessed on 2 December 2024).
44. Comune di Prato. POC. Piano Operativo Comunale. Available online: https://www.greencitynetwork.it/portfolio_page/prato-dal-piano-operativo-tra-riuso-e-natura-allurban-jungle/ (accessed on 2 December 2024).
45. Barberis, V. Towards the Harmonic City. In *Harmonic Innovation*; Lecture Notes in Networks and Systems; Cicione, F., Filice, L., Marino, D., Eds.; Springer: Cham, Switzerland, 2022; Volume 282. [CrossRef]
46. Comune di Torino. Piano Strategico del Verde di Torino. Available online: http://www.comune.torino.it/verdepubblico/il-verde-a-torino/piano-infrastruttura-verde/ (accessed on 2 December 2024).
47. Comune di Bolzano. Piano del Verde di Bolzano. Available online: https://opencity.comune.bolzano.it/Documenti-e-dati/Documenti-tecnici-di-supporto/Piano-del-verde-di-Bolzano (accessed on 2 December 2024).
48. Comune di Avellino. Piano del Verde di Avellino. Available online: https://www.comune.avellino.it/piano_del_verde/ (accessed on 2 December 2024).
49. Comune di Padova. Piano del Verde di Padova. Available online: https://www.comune.padova.it/piano-verde-comunale (accessed on 2 December 2024).
50. Mostafavi, M.; Najle, C. *Landscape Urbanism: A Manual for the Machinic Landscape*; Architectural Association: London, UK, 2003.
51. Prato Forest City. Available online: https://www.pratoforestcity.it (accessed on 10 January 2025).
52. WHO. *Urban Green Spaces and Health. A Review of the Evidence*; World Health Organisation Regional Office for Europe: Copenhagen, Denmark, 2016. Available online: https://iris.who.int/handle/10665/345751 (accessed on 20 November 2024).
53. Miceli, E. *La Gestione dei Piani Urbanistici. Perequazione, Accordi, Incentivi*; Marsilio: Venezia, Italy, 2011.
54. Bonavero, F.; Cassatella, C. Per un progetto delle compensazioni ambientali. Il contributo di una visione sovralocale nelle procedure di valutazione della Città metropolitana di Torino. In Proceedings of the Planning-Evaluation. Le Valutazioni nel Processo di Pianificazione e Progettazione. XXIV Conferenza Nazionale SIU Dare Valore ai Valori in Urbanistica, Torino, Italy, 23–24 June 2022; Planum Publisher-SIU: Roma-Milano, Italy, 2023; pp. 137–144.
55. Cerreta, M.; Russo, M. La valutazione come parte del processo pianificatorio e progettuale. In Proceedings of the Planning-Evaluation. Le Valutazioni nel Processo di Pianificazione e Progettazione. XXIV Conferenza Nazionale SIU Dare Valore ai Valori in Urbanistica, Torino, Italy, 23–24 June 2022; Planum Publisher-SIU: Roma, Italy, 2023; pp. 7–14.
56. Green City Network. Carta per la Rigenerazione Urbana delle Green City. Available online: https://www.greencitynetwork.it/wp-content/uploads/Carta-per-la-rigenerazione-urbana-delle-gren-city-1.pdf (accessed on 10 January 2025).
57. Comune di Prato. Prato Urban Jungle. Available online: https://www.pratourbanjungle.it/it/pagina1943.html (accessed on 10 January 2025).
58. Coppola, E. E se il piano del verde divenisse parte integrante del piano urbanistico comunale? *BDC Boll. Cent. Calza Bini* **2021**, *21*, 141–160. [CrossRef]
59. Dorst, H.; van der Jagt, A.; Raven, R.; Runhaar, H. Urban greening through nature-based solutions—Key characteristics of an emerging concept. *Sustain. Cities Soc.* **2019**, *49*, 101620. [CrossRef]
60. La Rosa, D.; Pappalardo, V. Planning for spatial equity. A performance-based approach for sustainable urban drainage systems. *Sustain. Cities Soc.* **2020**, *53*, 101885. [CrossRef]

61. Costadone, L.; Vierikko, K. Are traditional urban greening actions compliant with the European Greening Plans guidance? *Urban For. Urban Green.* **2023**, *90*, 128131. [CrossRef]
62. Galuzzi, P.; Vitillo, P. *Rigenerare le Città. La Perequazione Urbanistica Come Progetto*; Maggioli Editore: Milan, Italy, 2008.
63. Cortinovis, C.; Geneletti, D. A performance-based planning approach integrating supply and demand of urban ecosystem services. *Landsc. Urban Plan.* **2020**, *201*, 103842. [CrossRef]
64. Corgo, J.; Cruz, S.S.; Conceição, P. Nature-based solutions in spatial planning and policies for climate change adaptation: A literature review. *Ambio* **2024**, *53*, 1599–1617. [CrossRef]
65. Brunetta, G. The Green and Blue Infrastructure Projects in Spatial Planning as a Key Component for Adaptation to Climate Change. In *Green Infrastructure Planning Strategies and Environmental Design*; Giudice, B., Novarina, G., Voghera, A., Eds.; Springer: Cham, Switzerland, 2023; pp. vii–ix. [CrossRef]
66. Muñoz Gielen, D.; van der Krabben, E. *Public Infrastructure, Private Finance: Developer Obligations and Responsibilities*, 1st ed.; Routledge: London, UK, 2019. [CrossRef]
67. Stanghellini, S. Un approccio integrato alla rigenerazione urbana. *Urbanistica* **2017**, *160*, 8–15.