GAME CHANGER?
PLANNING FOR JUST AND SUSTAINABLE URBAN REGIONS

SciencesPo AESOP

Edited by
Marco Cremaschi

Cover
Camilla Ariani

Typesetting and formatting
Yuma Ando, Sebastien Wony

ISBN: 9789464981827
Published by AESOP
Paris, 2024

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Track 07: Environment And Climate **1042**

Urban Forestry Plan: an overview through different contexts, governance and policies

Maria Chiara Pastore, Claudia Parenti, Lucia Ludovici, Corinna Patetta
Polytechic of Milan,
mariachiara.pastore@polimi.it, claudiaida.parenti@polimi.it, lucia.ludovici@polimi.it, corinna.patetta@polimi.it.

Abstract

Urban forestry plans became an essential integrated tool in urban planning to promote adaptation and mitigation policies and strategies in contemporary cities.

This contribution presents a selection of plans developed in different countries, applying a structured critical interpretation to bring out and compare innovative elements and weaknesses to trigger a challenging comparison between American and European cities. This work frames the Forestami research project within the international urban forestry context to measure its impact and relevance and to address further activities.

The research reveals a heterogeneous approach and results by countries due to different political and cultural contexts to define which are the critical elements that each plan should use to contribute to the sustainable development of the territory.

1. Introduction

Urban forestry concept, developed in the 19th century in America, refers to an integrated, multidisciplinary and 'flexible' (Moeller, 1977) discipline which considers individual green space elements as part of an integral system (Miller, 1997; Konijnendijk & Randrup, 2004) by defining "the design, planning, establishment and management of trees, woodlands and associated flora and open space" (Ball et al., 1999, p. 325) to promote human well-being and urban biodiversity conservation. Urban forestry promotes the implementation of woodland, tree groups, individual trees, and associated open spaces, tending to emphasise the complete role of the forests rather than just their economic provision.

This discipline, widely developed in North America first and then in Europe, refers both to vegetation management within built-up areas both to the one located on the edge of the city (Randrup et al., 2005). Therefore, this different scale-based approach regards the implementation of trees in cities and urban contexts and the management of forests in large national parks and ecological corridors; defining a broad, aware and complete vision that recognises the important role that nature has in the urban territory.

Within the international scene, governance institutions addressed the urban greening topic through several planning and prescriptive levels, deliberating laws and regulations at different government degrees and defining new innovative approaches (Konijnendijk, 2003). The number of plans, laws, and research promoted recently underline a growing interest in sustainable planning and the emergence of urban forests as an integrated tool to contrast climatic transition, better citizens' well-being and health, and promote environmentally fair cities (Nilon et al., 2017, Pierce et al., 2020)

This contribution frames the Forestami research project - which started in 2018 to plant 3 million trees in the Metropolitan Area of Milan - within the international urban forestry context to measure its impact and relevance and to address further activities. It aims to explore urban forestry plans operating in different contexts and environments to define a common ground and develop a critical interpretation for grasping key concepts useful to enrich the possible goals and tools of the Forestami project. Within the broader context of the project research, analysing

effective case studies allows us to measure opportunities and limits of existing plans and provide an overview of actual urban forestry discipline assessment.

The paper analyses seven cases in Europe and the USA, selected among a wide range of international plans. These have been an interesting comparison for achieved results, goals and governance proposals. The inquired cases are Austin, Cleveland, Philadelphia and San Francisco in the US and Barcellona, Birmingham and Manchester in Europe (fig. 1). The comparison was also applied to the Forestami experience. The analysis shows preliminary results, highlighting interesting trends in the discipline.

Fig. 1 Description

2. Recognition of urban forestry tools: methodology and first results.

The research operated through analysing plans and projects developed over time by municipal and metropolitan authorities to study the strategies applied to implement urban forestry as an adaptive and mitigating tool. The first research phase identified 29 plans and projects distributed worldwide (tab.1), operating a screening on several cities, inquiring about the presence of urban forestry plans and projects, including diverse legislative and normative tools that complement urban forestry. The screening, operated in 2022, represents a partial framework of the topic assessment, considering the number of existing plans and language constraints since the research was conducted mainly in English.

We identified three main categories of interest based on chosen key concepts considered relevant for current research trends on urban forestry: (i) green and health, (ii) governance, and (iii) ecosystem services. These key concepts have been used as lenses to read the plans and enhance the main innovative features for urban forestry (tab. 1).

(i) The **Green and Health** topic embraces the concept of nature as a fundamental element for people's health and well-being. Trees and forests can provide direct and indirect benefits (Mitchell et al, 2007) to the environment by reducing temperatures (Schwaab et al., 2021), reducing pollutant levels (Nowak & Greenfield, 2018), and on people's health by reducing stress and depression (Kondo et al., 2018),improving attention and restoration levels, enhancing social cohesion and promoting physical activities (Lachowycz et al., 2011).
Plans that work primarily with this theme are designed to consider citizens' and

socio-health needs, reflecting on the relationship between the urban environment and its effects on human well-being.

(ii) The **Governance Strategies** topic indicates existing governance approaches and planning mechanisms challenged by multifunctionality across temporal and spatial scales (Asadzadeh et al., 2023).
These strategies describe innovative tools to engage stakeholders at different levels and comprise active discussions and debates with citizens, enhancing critical aspects of forestation, innovative funding methods and engagement of stakeholders, as well as citizens' and companies' involvement in planting and monitoring activities. It also reflects upon the public or private initiative and the opportunity urban forestry could represent for social inclusion, offering job and building a local community network.

(iii) The **Ecosystem Services** (Pinto et al., 2022) theme identifies plans that focus on increasing public awareness by measuring the economic value of urban nature. By this, with accurate communication and an overall valuation, the strategy is to raise awareness of forestry socio-ecological values and identify the potential of afforestation intervention on the economic public budget.

Plan	Strengths	Period	Normative-Administrative tool
An Urban Forest Master Plan for Birmingham (UK)	Strategy and mapping data	2021-2051	Strategic Plan
London Urban Forest Plan (UK)	Ecosystem services and mapping	2020-2050	Integrated strategic Plan
Manchester City of Trees (UK)	Governance	Since 2015	Integrated strategic Plan
The Urban Green Infrastructure of Vittoria Gasteiz (Spain)	Green and health	Since 2014	Masterplan
Trees for Life, Barcelona (Spain)	Ecosystem services	2017-2037	Integrated strategic Plan
Bosque Metropolitano, Madrid (Spain)	Data mapping	2020-2040	Masterplan
Plan Arbre, Paris (France)	Green and health	2021-2026	Masterplan
Plan Canopee, Liege (Belgium)	Green and health	2020-2030	Participative Tool
City Trees Berlin (Germany)	Green and health	2012-2026	Participative Tool
FUN Porto – Native Urban Forests in Porto (Portugal)	Green and health	2013-2021	Participative Tool
City of Lubjana Urban Forest Strategic Plan	Governance	2020-2045	Strategic Plan
Cleveland Tree Plan (USA)	Green and health	2015-2040	Strategic Plan
Trees Atlanta (USA)	Green and health, mapping	2021-2025	Strategic Plan
Urban Forest Plan Denver (USA)	Governance	2018-2028	Strategic Plan
Halifax tree project (USA)	Green and health, mapping	since 2010	Strategic Plan
Vancouver Urban Forestry Plan (USA)	Green and health	2022-2050	Strategic Plan

Million trees NYC (USA)	Data mapping	Since 2016	Strategic Plan
City Plants, Los Angeles (USA)	Green and health	Since 2001	Strategic Plan
Green Plan Philadelphia (USA)	Green and health	2016-2028	Strategic Plan
Austin's Urban Forest Plan (USA)	Governance	2014-2034	Strategic Plan
Tree Pittsburg (USA)	Governance	since 2012	Strategic Plan
Urban Forest Plan San Francisco (USA)	Governance	2015-2035	Strategic Plan
Corridoras verdes, Medellin (Colombia)	Green and health	2016-2019	Masterplan
Proyecto Montes Verdes, Belo Horizonte (Brasil)	Green and health	Since 2019	Masterplan
Arboles para Lima (Peru)	Green and health		Masterplan
Make a Great City Greener, Melbourne (Australia)	Governance	2012-2032	Masterplan
Urban Forest Strategy, Bayside (Australia)	Governance	2022-2040	Masterplan
Sidney Urban Forestry Plan (Australia)	Governance	2022-2040	Masterplan
One Million Tree Movement (Singapore)	Data mapping	2020-2030	Participative Tool

Table 1. Recognition of plans and projects

The analysis reported the complexity and heterogeneity of implemented approaches from different cities worldwide.

The first consideration resulted in the diversity of normative and legislative tools. We identified different normative and administrative tool: (a) Strategic Plans provide spatial and strategic planning guidelines, (b) Integrated strategic Plans are an integration of an existing broader plans regarding a sustainable vision, (c) Masterplans are projects that provide spatial guidelines to design specific context, (d) Participative Tool concerns plans entailing citizen participation as a critical feature.

Because of this complexity, with the aim to investigate the plan tool as an important device to strengthen urban forestation, we mainly referred to the cases of the (a) Strategic Plan and (b) Integrated Plan, selecting interesting cases to reflect upon the following research themes.

The first research question inquired how cities face urgent and relevant issues related to climate change, investigating the effective interventions and their impacts.

The second reflection was carried out on the different governance processes (public and private) relevant to transferring the goals within public policies. In this field, it results interesting to investigate the differences between bottom-up and top-down approaches, as highlighted by Sanz et al. (2022).

The last investigation regarded the innovative engagement and communication implemented tools, referring to specific contexts and reflecting upon their replicability in other territories.

The research selected 7 main cases to deepen from the USA and Europe. These two contexts provide an interesting comparison due to various historical, environmental, and legislative factors, aiming to highlight common characteristics and strengths of each plan that can constitute the basis for structuring a comprehensive forestation plan. The comparison also

brings attention to the distribution of the Urban Forestry Master Plan planning tool within public planning. In Oceania, it is quite an adopted approach in cities, while in South America, Asia and Africa, there are mostly afforestation projects that, showing anyhow, a great growing interest for the topic.

3. The legislative context of the USA and Europe

Concerning the legislative framework, we found substantial differences between the USA and European approaches to the topic of urban forestry.

The plans selected within the North American context have been mainly conceived by state obligations, defined through established and unified legislation.

The establishment of the first United States Department of Agriculture (USDA) dates back to 1875, leading to the inception of the Forestry Department a year later, aimed at safeguarding the country's existing forests (Johnston, 1996). Simultaneously, the enaction of various acts, including the "Forest and Land Management Act", outlined a program to assess the benefits of urban forests. Another significant initiative was the creation of the 'Tree City USA Grant Program' to develop a comprehensive inventory of vegetation to enhance green spaces within cities. This program, developed by the Arbor Day Foundation, saw participation from 16 states and 42 voluntary communities. Furthermore, in 1990, the National Urban and Community Forestry Council was established to oversee and manage policies and projects related to urban forestation.

The obligation to draw up forestation plans emerged after the 2008 “Farm Bill”, an Act for which each Member State was responsible for evaluating the conditions of trees and forests in US territories and consequently developing "Strategic Plans for landscape conservation, forest protection and the increase of public benefits deriving from natural capital". These State Forestry Action Plans, initially developed and completed by all Member States in 2010 (Sambeek, 2017) and updated in 2015, were revised in 2020 by all 59 Member States (USDA, 2021). These plans establish effective worktables and are accompanied by strict economic planning for federal, statal, local and private resources to achieve national forest system conservation objectives. In addition to the action plans developed by individual states, the Department of Agriculture provides technical and economic assistance for forestation projects. It draws up monitoring reports on the state of US forests, evaluating and quantifying their ecosystem services.

Currently, the laws issued regarding urban forestation are about 105: in this context, the United States underlines how urban forestation, citizens' health, inclusion, and energy saving are strictly current and interconnected themes, moving towards an interdepartmental and multidisciplinary approach.

On the contrary, Europe has a different normative framework since the European Union does not include all the continent countries (as the UK), and its member states benefit from greater legislative autonomy than US. The Green Deal directive presented in 2019 is undoubtedly incisive, aiming to achieve climate neutrality by 2050 and planting 3 billion trees. Sinergically, with this directive, the promulgation of two plans -the European Strategy for Biodiversity 2030 and the Strategy for Forestry 2030- highlights the importance of forestation in urban environments for the well-being of citizens and the achievement of the objectives of the Green Deal. Moreover, the Nature Restoration Law is currently under approval, with the aim to restore degraded ecosystems in all member states, help achieve the EU's climate and biodiversity objectives and enhance food security. In this regulatory framework, many large European cities are therefore starting to equip themselves with plans to achieve climate neutrality objectives, adopting specific tools for urban forestation, as done by London, Barcelona, Paris and Milan. Despite the context being more uneven and linked to the national regulatory situation, there is

a progressive diffusion of the forestation, suggesting its adoption as a valuable tool for achieving community objectives.
Similarly, in the United Kingdom, the 2008 Climate Action Plan was updated in 2019 with the objective of zero net greenhouse gas emissions by 2050. This goal can be achieved by drafting the three-year action plans: the first plan refers to 2021-2024 and pursues the initial goal of creating 30,000 hectares of new forests annually by 2025. In particular, the role of the Forestry Commission Department is essential; it supports forestation policies and projects and the collection of available data, promoting for more than ten years the mapping of ecosystem services given by trees in cities. Moreover, in the United Kingdom, it is possible to observe a tradition linked to the active participation of citizens, who, since the 1990s and 2000s, have formed themselves into organised groups, meeting the interest and involvement of the administrations, as in the cases of Birmingham and Manchester. The first laws and urban forestry plans based on the US model were indeed promulgated in the United Kingdom.

In Italy, there is no defined national legislative panorama on forestation. At a national level, ISPRA (an Institute for Environmental Protection and Research) draws up reports on the State of Natural Capital in Italy. The regions in the Regional Territorial Plans identify the ecological corridors and the elements to be safeguarded, such as regional and national parks. They can determine some guidelines for protecting and safeguarding the existing natural heritage. Municipalities with more than 15,000 inhabitants have the legislative obligation (L. n. 10/2013 and guidelines of the Ministry of the Environment 2017) to draw up the Municipal Green Plans, tools that design the urban, peri-urban, agro-silvicultural structure of the city, providing guidelines for the creation of new green areas within the general urban planning. The green plan configuration differs from a real forestation plan, but it is currently the only defined legislative instrument that can have planning effects.

This tool has not yet become fully operational within urban management and planning activities at a local level. For example, only 11 provincial capitals in northern Italy adopted a green plan (Lazzarini et al., 2024), showing the necessity to improve the planning approach to urban greening.

4. An overview of selected Urban Forestry Plans

The selection of the 7 case studies identified plans presenting both particular elements of innovation in governance and strategy tools, in communication and the active involvement of stakeholders and citizens, and both when covering the role of 'pioneer plans' for specific themes that others have incorporated. For these reasons, the selected plans stand out for the approach used in addressing relevant environmental and social issues, constituting an accurate model that other cities can replicate in their forestation plans.

The proposed approach is a critical analysis conducted using this structure:

- City's state of the art: Why an afforestation plan?;
- Plan's goals and mission;
- Governance;
- Plan structure;
- First feedbacks;
- Additional communication activities and plan promotion tools if present.

The plans strengths are described below and divided based on the key concepts identified.

4.1 Green and health

The *Cleveland Tree Plan*, established in 2013 by the municipality's initiative and created in collaboration with the Cleveland Tree Coalition association, proposes a careful survey of the city's current state. Starting from assuming that trees are the only public infrastructure that increases in value over time (the more the trees grow, the more the benefits provided increase and the greater the impact on the health of the inhabitants), a precise mapping accompanies the Plan, assigning different environmental parameters that positively and negatively influence the health of citizens to each district and neighbourhood.

The plan showed a correlation between tree canopy distribution and citizens' health: in the districts where the loss of tree canopy was more significant it was found a reduction in the inhabitants' health, given the incidence of hospitalisations and the widespread presence of respiratory problems and cardiovascular disease in a variation between 3 and 4% depending on the distribution of the tree canopy. This approach aims to promote a fair distribution of the tree canopy to reduce health disparities.

The city of San Francisco has one of the lowest tree canopies among US cities (13.7%), being located in an arid and not naturally forested area.

The forestry plan, *Urban Forest Plan San Francisco*, adopted in 2015, allows for effective maintenance of trees and identifies new public and private areas to be forested to build a shared public vision for the city's development, involving various local actors and promoters. Three main actions divide the Plan, and their implementation follows different strategies and different time thresholds: rows of trees along the roads, parks and open spaces, and buildings and private properties.

The Plan addresses the relationship between citizens' health and the presence of green areas by implementing and managing trees along the streets. Ensuring shaded paths, safe streets, and a homogeneous distribution of trees throughout the city are the prerequisites for its implementation.

According to a previous analysis made by the municipality, it identifies the most popular routes, the safest ones and those suitable for different types of inhabitants (for example, elderly, disabled, people with strollers, and children), also proposing guidelines to make the street safer and healthier according with the type of traffic. In this sense, the forestation project becomes an urban regeneration tool that provides cultural, social and environmental benefits. The Plan addresses the relationship between citizens' health and the presence of green areas by implementing and managing trees along the streets. Ensuring shaded paths, safe streets, and a homogeneous distribution of trees throughout the city are the prerequisites for implementing the Plan. According to a previous analysis made by the municipality, it identifies the most popular routes, the safest ones and those suitable for different types of inhabitants (for example, elderly, disabled, people with strollers, and children), also proposing guidelines to make the street safer and healthier according with the type of traffic. In this sense, the forestation project becomes an urban regeneration tool that provides cultural, social and environmental benefits.

4.2 Governance

The *Green Plan Philadelphia,* reformulated by the administration in 2020 under the name *Philly Tree Plan*, is a strategic plan that pays attention to social aspects, guaranteeing equity and sustainability objectives that will improve the current state of the city, increasing the trees in the poorest neighbourhoods where most minorities live, also directing investments and development projects.

The Plan's base is the existing survey, which relates the tree canopy distribution to the income levels, the total population, the population affected by respiratory diseases, and exposure to high-temperature levels. For example, the survey records more deaths due to heat stroke in the hottest areas, where the temperature increases by around 6°. Those indicators are a part of the

priority map created in collaboration with the citizen organisation Community Voices Steering Committee. Three levels of priority have been identified: poverty, health problems (such as respiratory diseases and stress disorders) and temperatures. The overlapping of these three issues generated a priority map, allowing the identification of the areas most needing forestation interventions.

Concerning governance, it is significant the inclusion of the association 'Tree Philly' to develop the Action Sheet and strategic guidelines based on different problems identified from a continuous dialogue with citizens and stakeholders. For each problem, the Plan develops an action according to an intervention program and defines further proposals that citizens can remark on.

In Austin, *Austin's Urban Forest Plan* was implemented in 2012 to counteract a prolonged drought that had significantly reduced the presence of trees in the city.

Rather than defining a goal to be reached in a limited time, as other American Cities did, the municipality adopted a broad, long-term vision to establish guidelines for every City Department to manage the urban green infrastructure. The Plan proposes a critical approach, integrating the USDA tree canopy forecast, which requires cities to reach different tree canopy thresholds depending on climate.

The Plan's five goals include implementing a sustainable and resilient forest, improving tree management and care, growing a fund for each Department, protecting and preserving biodiversity and preserving ancient trees. With these defined goals, the municipality developed the 'Austin priority map', which assigns different environmental, social, economic and sanitary parameters for each city's district that, once crossed and overlapped, display the prioritisation of forestry projects according to the different sites.

Birmingham is the second largest English city by population, with over a million trees and large parks; since 2020, it has been among the Tree Cities of the World. However, due to the city's shape, urban greenery is mainly concentrated in peripheral areas, leading to unequal distribution and consequent non-uniform accessibility.

Due to the presence of such a large arboreal heritage and the need for its management, at the beginning of the 2000s, the administration promoted a strategy for the protection and maintenance of trees without allocating funds to implement biodiversity, causing a reaction among citizens. The protest over the lack of a vision for the city's green transformation led to establishing a working group in the City Council to promote the definition of the first "Birmingham Tree Policy" guideline report. The experience of the Council led to the creation of the "Birmingham Tree People" association, which became one of the leading promoters together with the municipality.

This first experience guided the development of the *Urban Forestry Master Plan* in 2021, created in collaboration with the municipality and the Birmingham Tree People association, which defines a vision for the forestry of the city in thirty years, providing a line of action for the first decade 2021-2031. The first part of the Plan defined a prioritised mapping based on the importance of the targets, which became the basis for defining subsequent lines of action. Moreover, the definition of a Tree Board allows coherent management of all the topics analysed. In this way, the administration provides a tool through which citizens can directly report problems relating to the state of trees to promote better heritage management.

In 2017, the tree canopy of Barcellona stood at around 25% and was characterised by an uneven distribution in the urban territory. In early 1995, the municipality promoted various plans for

managing and maintaining city trees, whose aims merged in 2013 into the '2030 Biodiversity Plan', created to increase urban greenery by 1 m2 for each inhabitant.

At the same time as the promulgation of constantly updated Biodiversity Plans to achieve the Carbon Neutral objectives for 2050, the municipality, in 2017, promoted the *Trees for Life* Forestry Plan for the thirty years 2017-37, which focuses its action on planning and managing the tree heritage of the city, to complete the 2030 Nature Plan.

The latter promotes a vision for implementing tree capital, divided into ten strategic lines, each including different actions defined in a temporal action program. The Plan also defines different areas of intervention according to the ratio of square meters of tree canopy per inhabitant for each city district. Plantations must be prioritised following equity, strengthening biodiversity, and integrating the metropolitan scale and connections.

An interesting strategy the municipality defines is the "Mans al Verd" program 2020-2023, a plan to promote citizen participation in maintenance and management projects of public green areas. The program presents different projects directly involving residents, inviting citizens to take care of the trees and shrubs by "adopting" them and providing the necessary resources for their care.

4.3 Ecosystem services

The *Manchester City of Trees* Plan was born from the experience that began in the 1990s of the "City of Trees" citizens' movement, which, during its work, found the support of institutions and administrations, promoting since 2019 a strategic plan drawn up following the ecosystem services mapping carried out with the I Tree software.

The Plan is part of a political context in which forestation is strongly encouraged and works on a metropolitan scale. Institutions have already promulgated plans for reducing emissions, the first of which is the Great Manchester Environmental Plan 2019-2024.

After evaluating the benefits reported by the existing assets, the Plan defines a priority mapping that identifies the areas to carry out strategic plantations, aiming to work on the different trees' benefits. Citizen participation in planting interventions is fundamental. City of Trees coordinates their engagement, offering tutorials to teach tree maintenance and organising collective planting events that also systematise the individual initiatives of citizens, who can implement tree capital even in private areas.

5. Critical comparison of plans

The proposed approach used to analyse the plans reveals the different approaches used by cities, allowing the understanding of the context of plan development and within which it operates and interacts with the territory.

This contribution highlights the common use of multidisciplinary tools, which are part of governance strategies and are shared by multiple sectors of the city, allowing the achievement of sustainable objectives by working on the political, economic and social front. All forestation plans work in parallel on several themes. However, the proposed classification (fig.2) highlights only the innovative approaches to compare the investigated plans in an interpretative approach.

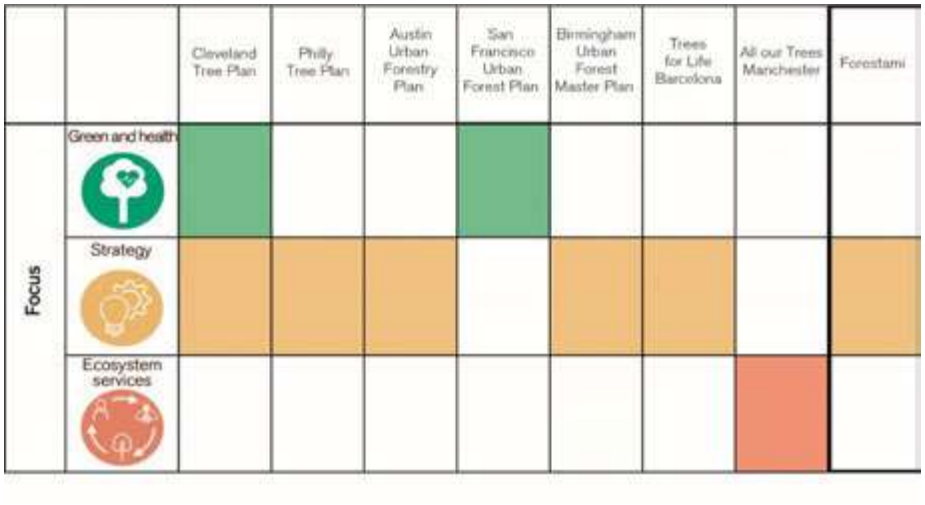

Figure 1. Strenghts of each examined Plan

In particular, the health topic emerges primarily in the USA, widely treated in different forms, e.g., in Cleveland with a focus on the increase in diseases and the loss of tree canopy, in San Francisco, paying particular attention to the quality of the busiest streets. In Europe, however, since the forestation discipline gained importance in urban planning only in recent years, the plans are more focused on formulating strategies useful for involving various local and institutional actors and evaluating ecosystem services linked to forestry interventions.

In America, therefore, the topic of forestation and well-being has been discussed for almost a decade; the monitoring information for the plans, unlike in Europe, is complete and exhaustive, and the plans themselves, now revised and updated, integrate principles that guarantee social equity, in order to use forestation as a tool of urban, environmental and social regeneration.

The legislative point of view also constitutes one of the main differences. While in the USA, the legislation requires individual states to formulate a forestation plan with the support of the Forestry Department, in Europe, the autonomy of individual states results in legislative fragmentation.

The directives formulated by the main governmental body, the European Union, are perceived as guidelines by individual member states but do not always become part of the legislation, even though many European cities have recently promoted the definition of plans for greenery and biodiversity. Promoting urban biodiversity is then not related only to the urban forestry plan tool, but it is conceived in other planning approaches, such as the Barcelona Nature Plan demonstrates. The United Kingdom, on the other hand, stands out as one of the leaders of forestation in the European context. Therefore, this partial examination returns only to the context of the forestry plan, remembering that, at the same time, other cities are equipping themselves with other tools, such as the Biodiversity Plans.

In the USA plan, the municipality is always involved in the plan formulation, with initiatives that sometimes involve and activate local organisations but are mainly promoted by public bodies. Even in Europe, public bodies support many plans, but looking at some citizens' initiatives necessary to start these processes, as in Birmingham and Manchester, is interesting.

Figure 2. Engagement and governance levels

From the plans comparison (fig.3), it is, in fact, clear that most of these have a public nature, characterised both by the initiative, often carried out by individual municipalities, and by the participation of financiers and partners. Instead, the Birmingham and Manchester plan stands out for the approach that involves more citizens and private entities, combining the requests of a plan with a bottom-up approach that meets the needs of associations and communities in parallel.

While the governance and financiers are primarily public, the presence of public partners and the involvement of citizens in the plan's activities are a constant for all plans.

This comparison shows that the level of governance employed does not influence the level of engagement: even public plans work in close contact with citizens and local realities (less with the third sector), and even bottom-up plans manage to obtain financiers and partners public.

5.1 Comparison with Forestami project

In Italy, one of the most relevant forestation projects is Forestami, born in 2018 by a research of Polytechnic of Milan, to plant 3 million trees and improve air quality in the metropolitan city of Milan, through constant dialogue between public administrations, universities and bodies operating in the territory, citizens and companies, and the construction of memoranda of understanding that mark the shared commitment to sustainable change in the territory.

In this context, the project is not defined by a legislative obligations, but it is raised by the cooperation of different entities that operate together in the territory to achieve a common objective.

Collective planting activities and cultural dissemination carried out by various training events are a part of the project that also involves schools and citizens and establishes the commitment to participate in the collective change of the territory.

The Forestami project, although not born with a superordinate planning nature, is comparable with the plans described above for these three main reasons: a) the scale, 2) the cultural value, and 3) the governance.

In fact, Forestami includes a broad territorial dimension, not dealing only with a limited area; its spatialisation has characteristics that interact with planning tools. Then it has a collective nature that communicates with the public and private sectors.

And finally, if governance is one of the main strengths, the project has also started reflections on green issues and health and ecosystem services in recent years.

It constitutes an important reference in the Italian context as it holds a public partnership with various bodies, including cultural ones, which operate in the area at all government levels.

6. New perspectives for Urban Forestry plans

As previously mentioned, the elements highlighted in this research can be used in different ways and on different levels to investigate effective tools to improve urban forestry plans in Italy. Public and private governance, citizen engagement, and site-specific objectives adaptable to local, environmental, political and economic contexts are the essential elements that emerged from an analytical synthesis.

Starting from the analysis of the selected plan, the first consideration regards the governance point of view; the public interest in shaping the vision and providing an economic base is crucial for the structure and composition of multidisciplinary teams (Ordóñez et al., 2019).

From an engagement point of view, we underline the interest in the active involvement of citizens through training and participatory events, the sharing of the plan goals with stakeholders and associations, the engagement of local entities that deal with sustainability already present in the territory with the consequent creation of new job opportunities, and the involvement of minorities such as social groups of different cultures and religions. These elements are relevant points involving the constant construction of a dialogue between the administrations and the inhabitants of the cities, which also guarantees the reduction of disparities. However, it is necessary to provide effective tools to measure the impacts of these interventions on the social realm.

Another fundamental aspect resulting from the analysis is the plan's flexibility and its goals, which are closely related to the context's environmental, social, and political conditions, by analysing and reading the state of the art of the city. In this way, considering the challenge of climate change (Gill et al., 2007), it is possible to guarantee a gradual transition in the territory. Then, the constant temperature increasing and the severe droughts that have affected almost all urban contexts led to a significant loss of tree canopy and the reformulation of various plans. In this sense, the proposed objectives cannot only be quantitative but also aim to improve our cities' urban, environmental, and social quality.

Plans can then treat open green spaces and health themes by using the mapping tool, which precisely identifies the spaces that contribute to the psychophysical well-being of people, determining their distribution and accessibility. Verifying the fair distribution of trees in cities is fundamental to guarantee environmental justice, whereby all citizens benefit equally from open spaces by reducing disparities (Wolch et al., 2014,Sharifi et al., 2021). Plans also often use mapping as an interactive and participatory tool in which citizens can acquire an awareness of the environmental quality of the neighbourhood in which they live, which forestation interventions will be carried out and the degree of priority of the interventions.

The lack of defined and complete European and Italian legislation has consequences on planning balances, whereby the most capable territories and cities, with more economic resources and knowledge, spontaneously initiate virtuous forestation plans and projects.

Therefore, it clearly emerges the importance of a public coherent legislation that directs the definition and programming of forestation plans sharing common objectives and concretely contributing to the sustainable development of the territory.

Pending comprehensive and unified legislation on urban forestry, the recommended best practices and highlighted features should aim for urban forestry plans to be recognised and conceived not merely as sectoral plans but as integrated development tools within territorial governance frameworks.

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