UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE

Sustainable Urban and Peri-urban Forestry

An Integrative and Inclusive Nature-Based Solution for Green Recovery and Sustainable, Healthy and Resilient Cities

Policy Brief

Sustainable Urban and Peri-Urban Forestry:

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This policy brief was prepared as technical material to support the implementation of the project “Supporting UNECE member States to integrate the maintenance, protection and restoration of urban and peri-urban trees and forests in their post COVID-19 recovery plans.”

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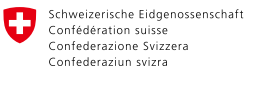

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Abbreviations and Acronyms

CAD	Canadian Dollars
COVID-19	Coronavirus Disease 2019
EU	European Union
EUR	Euros (Currency)
FAO	Food and Agriculture Organization of the United Nations
ha.	Hectares
PM2.5	Atmospheric particulate matter with a diameter of less than 2.5 micrometers
SDG	Sustainable Development Goal
SUPF	Sustainable urban and peri-urban forestry
UNECE	United Nations Economic Commission for Europe
UPF	Urban and peri-urban forest
USD	United States Dollars
WHO	World Health Organization

Key Messages

In an urbanizing world

- The contributions of forests, trees, and associated vegetation to climate change mitigation and adaptation, disaster risk reduction, public health and well-being, biodiversity conservation, and sustainable economic recovery and growth are increasingly important.
- Sustainable urban and peri-urban forestry (SUPF) is an integrative and strategic nature-based solution that can help develop green, sustainable, and resilient cities.
- SUPF goes well beyond the expansion of the urban tree cover via afforestation and tree planting; it requires long-term management of urban forest ecosystems to ensure that urban trees and forests are cared for and mature, and that the benefits they provide are optimized over time.
- Strong planning, through dedicated SUPF master plans or similar planning documents, can provide a critical foundation for sustainable long-term management and direction for implementation.
- Integrating SUPF programmes into city planning can significantly enhance their effective implementation.
- Strong assessment and monitoring of the progress and success of SUPF plans and programmes can play a critical role to help inform adaptive management.
- Strong collaboration, partnerships, and stewardship, including close collaboration with local communities can enhance SUPF outcomes.
- Peer learning and networking, public education, and awareness, benchmarking, and the exchange of good practices can all help to build partnerships for SUPF.
- National and sub-national authorities can support and enable local SUPF programmes through policy and legal frameworks; provision of data, information, and knowledge; and support for planning, implementation, and monitoring. This may be linked to international commitments, guidelines, knowledge, and funding.

1. Introduction: The Importance of Forests and Trees for Cities

Urban trees, forests, and green spaces have been increasingly recognized as important components of more liveable, healthy, and resilient cities. Functioning urban ecosystems help clean our air and water and to cool urban heat islands. They also help to support our well-being by shielding us from floods and landslides and providing opportunities for recreation. Indeed, the COVID-19 pandemic has been linked to increased appreciation of urban trees and forests.

This policy brief identifies opportunities for action to expand sustainable urban and peri-urban forestry (SUPF) in the UNECE region. SUPF is a cost-effective nature-based solution that provides many ecosystem services and benefits that contribute to sustainable development, climate action, biodiversity conservation, combating land degradation, and disaster risk reduction at the local, national, and global levels.

The brief highlights these services and benefits and outlines how urban and peri-urban forests can address the increased challenges faced by cities. This includes guidance for sustainable and inclusive planning, design, and management of urban trees and forests to optimize their benefits for all and over the long term.

The brief supports action as part of UNECE's Trees in Cities Challenge, launched at the United Nations Climate Action Summit in 2019. The Challenge is UNECE's voluntary global campaign engaging mayors and cities to localize action to combat climate change and foster urban sustainable and resilient development by implementing tree planting and adopting or strengthening urban and peri-urban forestry management practices [1]. It also offers guidance to cities on the implementation of the Geneva Declaration of Mayors, adopted by Mayors in 2020, and in particular on "making our cities greener." [2]

2. Sustainable Urban Forestry: Context

The urbanization challenge

In the past decades, the UNECE region has become increasingly urbanized. Cities and urban areas now host about 73% of the region's population, which is well above the global average[3]. While urban areas provide many opportunities for work, education, and community, they also face many challenges. This section presents an overview of challenges that can be addressed or mitigated to varying degrees by adopting sustainable urban forestry as a nature-based solution.

Many cities are highly exposed and vulnerable to the impact of climate change, which threatens their populations, infrastructure, and ecosystems. Temperature extremes are increasing and heat waves are becoming more frequent. This raises heat-related mortalities and compounds existing urban heat island effects. It also increases energy needed for cooling, which in turn elevates both greenhouse gas emissions and expenditure on energy. This is a significant challenge among the countries in the European Union (EU), which account for more than a third of registered heat-related mortalities among the elderly, with 104,000 out of the 296,000 deaths recorded globally in 2018[4]. Mortality from heat waves is expected to rise sharply over the coming years[5].

Similarly, climate change is increasing the frequency and magnitude of extreme precipitation events, which in turn increase the risk of landslides and flooding in urban and peri-urban areas. This threatens massive cumulative investments in public and private infrastructure and patrimony, accumulated over decades and centuries, which cannot be easily replaced in the face of the threat of climate change.

Urban areas also face major air pollution threats. In 2018, 34% of urban inhabitants of the 27 EU countries and the United Kingdom were exposed to ground-level ozone particles at concentrations above EU health target levels[6]. Furthermore, 84% of the population in Europe is exposed to fine particulate matter (PM2.5) levels above the maximum recommended by the World Health Organization (WHO); it is estimated that up to 125,000 lives could be saved per year if hazardous PM2.5 levels were reduced to safe levels[7].

Public health challenges faced by urban residents can also be linked to urban lifestyle diseases such as stress, cardiovascular diseases, and obesity. While urban forests and green spaces provide areas for recreation and exercise that is accessible to all, a recent pan-European study showed that more than 60% of people in European cities lives in sectors with insufficient green space (per WHO standards for good access to green space). There are exceptions, with Moscow providing good access to green space to 90% of its population[8].

The COVID-19 pandemic has posed an immediate and often devastating public health challenge of its own to cities, with urban areas recording an estimated 90% of all reported cases of the virus[9]. The pandemic has brought new challenges, with social distancing measures further restricting access to public spaces, particularly closed venues, exacerbating the access of city dwellers to already limited public green space.

Although the demand for urban woodland, parks, and other green space is growing, continuing urbanization, urban densification, and urban sprawl often result in the loss and fragmentation of urban natural areas[10]. In the United States, for example, an estimate four million urban trees are lost each year, or about 1.3% of the total urban tree stock[11]. Thus, there is an urgent need to effectively manage competing pressures of urban expansion while sustaining and enhancing urban ecosystems to preserve their multiple values. Urban trees and other vegetation are also under threat from impacts including climate change (including drought, extreme weather events, and increased wildfires), pests and diseases, and intensive recreational use[12].

International calls for urban green space, including urban trees and forests

The importance of urban green space is explicitly included in the United Nations Sustainable Development Goals (SDGs). Goal 11, target 11.7 calls for universal access to safe, inclusive, and accessible green and public space, in particular for women and children, older persons, and persons with disabilities[13]. However, significant progress is needed to meet this goal, as currently only about 47% of the world's population lives within walking distance to open public spaces.

The New Urban Agenda also emphasizes the multiple benefits of "safe, inclusive, accessible, green and quality public spaces … for social interaction and inclusion, human health and well-being, economic exchange and cultural expression and dialogue among a wide diversity of people and cultures"[14].

Urban ecosystems are also one of the focus areas of the United Nations Decade on Ecosystem Restoration[15]. In the period 2021-2030, the focus is on preventing, halting, and reversing the degradation of ecosystems worldwide, which in turn can help to end poverty, combat climate change, and prevent a mass extinction of species.

The United Nations Forum on Forests lists forests and trees in the urban context as a thematic priority under its Global Forest Goal number 2, which sets out to enhance forest-based benefits[16]. Furthermore, multiple United Nations organizations and platforms have increased their focus on urban forest and green space over time. An example of this is the WHO's Regional Office for Europe issuing 'Urban Green Spaces: A Brief for Action' in 2019[17]. FAO issued 'Guidelines on Urban and Peri-Urban Forestry' in 2016[18]. Furthermore, UNECE's Geneva Ministerial Declaration on Sustainable Housing and Urban Development calls for promoting green, compact, and resilient cities, highlighting the importance of green infrastructure (https://unece.org/housing-and-land-management/publications/geneva-ministerial-declaration-sustainable-housing-and)[19].The importance of inclusive access is highlighted in the 2013 Geneva UN Charter on Sustainable Housing, which calls for "universal access to safe, inclusive and accessible, green and public spaces, particularly for disadvantaged population groups" (https://unece.org/DAM/hlm/documents/Publications/EN_Geneva_UN_Charter_on_Sustainable_Housing.pdf) [20].

In Europe, policies such as the EU's Biodiversity Strategy for 2030 are seeking to strengthen the planning, management, and conservation of urban green spaces[21]. The EU's Forestry Strategy for 2030 calls for extending forest areas and the planting of an additional 3 billion trees by 2030, with urban forestry one of the areas of focus[22]. Urban green spaces are also an integral part of European climate ambitions and the push for carbon neutrality, as covered under the European Green Deal, and as supported by initiatives such as the European Covenant of Mayors, for example[23].

National governments have also become more active in including urban trees in their policies and programmes. The United States, for example, has emphasized the role of trees and other vegetation in mitigating extreme heat events[24]. The government of Canada has committed to planting an additional 2 billion trees over the next 10 years, with cities as priority areas, as part of a broader approach to nature-based climate solutions[25]. In the United Kingdom, endeavours such as the England Tree Strategy also show greater national-level attention for urban trees and urban green space[26]. Central Asian countries have initiated reforestation campaigns to halt land degradation and help with disaster control, including in urban fringes[27, 28].

It is cities, however, that often have a mandate for urban forests and green space. City governments also typically have an integrative mandate across sectors and are the direct beneficiaries of many of the multiple benefits of urban forests and green spaces for other sectors. Thus, the provision of urban forests and green spaces to all citizens can be an investment in a key public service that delivers these multiple benefits across sectors, fulfilling multiple mandates of the city government through one delivery mechanism. The recovery from the COVID-19 pandemic provides an opportunity to adopt and strengthen SUPF as part of efforts to "build back better" from the pandemic. This opportunity has been recognized by the Geneva Declaration of Mayors, in which mayors of the UNECE region committed to make cities greener, more equitable, resilient and inclusive, promote urban biodiversity, and take ambitious climate action (https://unece.org/housing-and-land-management/publications/geneva-ministerial-declaration-sustainable-housing-and)[29]. Fulfilling this declaration represents an important opportunity, yet given the challenges they face, cities need greater support from other levels of government and other partners to develop SUPF to its full potential.

3. Addressing Urban Challenges Through Urban and Peri-Urban Forestry

What is urban and peri-urban forestry?

The concept of the urban and peri-urban forest is defined as the sum of all woody and associated vegetation in and around urban areas. This part of the urban ecosystem is the focus of the interdisciplinary field of urban forestry, which is still relatively young as a well-defined field of its own (the concept was officially coined in North America in the mid-1960s). It has seen rapid growth over the years, in terms of policy, practice, research, and education, and is now a globally used approach.

Many North American and European countries and cities in the UNECE region recognize "urban forestry" as term, although its translation into national languages can sometimes be difficult. The Russian Federation and many countries of the Caucasus and Central Asia have distinct categories in their forest legislation for peri-urban (greenbelt/protection) forests and forest parks[30].

Including peri-urban areas where the forest cover is often higher than in urban centres is at the core of urban and peri-urban forestry. It builds on a legacy that dates back centuries. For example, many European cities have owned and managed city forests for years, leading to a strong tradition of 'city forests'[31]. Urban tree planting and the establishment of urban parks also have a long history. Many cities in the Russian Federation, Caucasus, and Central Asia have developed dense urban green structures and greenbelts. However, taking a long-term and integrative view of all forests, trees, and associated vegetation in cities, and applying an urban ecosystem perspective are innovations. The city or metropolitan area is seen from the perspective of integrated ecological, social, economic, and political systems, with forests and trees playing a central role in the functioning of the urban socio-ecological system. The integrated approach connects across the urban green infrastructure, from single trees to large-scale forested areas, enabling a more coordinated and sustainable management approach.

Urban and peri-urban forestry is one of the multiple concepts and approaches for greening cities that has received increased attention in recent years. It differs from the other urban green space concepts by its focus on forests and trees as key components. Box 1 provides an overview of some of the most important concepts. **Urban and peri-urban forestry** can be a nature-based solution, and is integrative, linking tree dominated components of urban and peri-urban green structures and spaces. It is also closely linked with the green infrastructure planning approach, which reflects the need to look at the entire network of **green and blue spaces** (such as lakes, rivers, and wetlands) in a city or metropolitan region. This requires a move away from a focus on individual spaces to a focus on this entire network. This is because it is through a well-connected and well-functioning network of green and blue spaces that many ecosystem services can be generated. Urban areas function as ecosystems, or rather socio-ecological systems, and through the presence of trees and other vegetation they can become more resilient to the impacts of climate change.

Box 1
Key urban greening concepts

Nature-based solutions: the protection, sustainable management and restoration of ecosystems as solutions to societal and environmental challenges[29]. These solutions "are inspired and supported by nature, [and] are cost-effective, simultaneously provide environmental, social, and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes, and seascapes, through locally adapted, resource-efficient and systemic interventions"[30].

Urban greening: "a social practice characterized by organized or semi-organized efforts to introduce, conserve, or maintain outdoor vegetation in urban areas"[31].

Green infrastructure planning: planning of a network of physical features that provides ecological, economic, and social benefits to society through nature-based solutions, underpinning human well-being and quality of life. In urban areas, green infrastructure is made up of green and blue spaces, such as parks, street trees, and green roofs as well as lakes, rivers, and wetlands[32].

Urban green structure planning: The planning of green structure as a multi-functional urban system, "where 'the green' in the city is attributed to different values and functions inspired by the landscape ecological thinking"[33].

Urban and peri-urban forestry: "An integrated, interdisciplinary, participatory, and strategic approach to planning and managing [forest and] tree resources in urban and peri-urban areas for their economic, environmental, and sociocultural benefits"[34].

Urban and peri-urban forests not only include forest ecosystems and woodlands but embody an integrative perspective on all trees and associated vegetation, including street tree plantations, urban parks, cemeteries, trees in private gardens, and other urban tree sites. The woodland part of the urban and peri-urban forest is a very important component, as it provides a series of key ecosystem services, such as protection of drinking water, carbon sequestration, prevention of land degradation, and provision of outdoor recreation settings.

For urban and peri-urban forestry to be truly successful, in light of the many challenges and pressures outlined in section 2, it also should focus on the sustainable management of forest resources and a continuous provision of ecosystem services for current and future generations. It should also seek to optimize the benefits provided to local communities, while minimizing potential negative aspects that may limit the recreational use of urban and peri-urban forests, such as exposure to allergens and perceived risk of crime.

Reflecting the importance of long-term planning to ensure the sustainability of the ecosystems services and benefits of urban and peri-urban forestry, this policy brief defines the concept of Sustainable Urban and Peri-urban Forestry (SUPF) in Box 2, in terms of its key dimensions[38].

Box 2
Defining sustainable urban and peri-urban forestry

Sustainable urban and peri-urban forestry (SUPF) is the art, science, and practice of planning, designing, establishing, and managing urban and peri-urban forests to meet the current needs and desires of society for the benefits these provide, while ensuring such benefits for future generations.

For SUPF to deliver on its promise, it needs to be:

- **Integrative**, linking the different tree-dominated components of urban and peri-urban green structures.
- **Strategic**, taking a long-term perspective and implementing a natural resource management perspective.
- **Multifunctiona**l, providing many different ecosystem services at the same time to meet diverse needs and provide multiple benefits to society.
- **Interdisciplinary**, uniting the contributions of a wide range of disciplines and professions.
- **Inclusive**, focusing on working with local urban communities and good stewardship to optimize the provision of ecosystem services and benefits.
- **Urban and peri-urban**, recognizing the need to operate in high-pressure, dynamic urban contexts, often with challenging conditions for growing urban trees.

The current extent of urban and peri-urban forests

Although urban and peri-urban forests (UPFs) are recognized for the essential ecosystem services they provide, surprisingly little is known about their extent. To date, only a handful of countries have made attempts to comprehensively assess their UPF resource. One example is the United States, where urban forests have been gradually integrated into the national forest inventory, making use of much-enhanced geospatial analysis tools to assess canopy cover. The most recent national assessment by the Forest Service notes that urban areas accounted for 3% of total land area and estimates (2019) that forest cover is 39% in these urban areas, which are home to over 80% of the national population[39]. This assessment projects that urban areas will cover 8.6% of the total land area by 2060. The United States Forest Service also conducts resource assessments at the sub-national and city level3 The United Kingdom made a first assessment of what it calls 'tree cover outside woodlands' in 2017, as part of its national forest inventory[40]. This assessment looked at both rural and urban trees and found that there are 196,000 hectares (ha.) of tree cover outside woodlands in urban areas, for an average urban tree cover of 16.5%.

At the local level, many cities do not have a full overview of their UPF resource, and if inventories exist, they often only focus on the publicly owned and managed trees. This is slowly changing, as an increasing number of cities and metropolitan areas are attempting to make a more comprehensive assessment of their urban forests. This reflects their appreciation of the importance of having an up-to-date overview of their UPF resource as a foundation for planning and sustainable management. This is challenging owing to the diverse nature of UPF structures and ownership. It is important to note, however, that the involvement of national governments varies; for example, national authorities in the Russian Federation, Caucasus, and Central Asia have traditionally had higher levels of involvement in the management of UPF.

While assessments of UPF resources are limited, the available examples from cities that have conducted assessments provide a good overview of some of the complexities involved in managing UPFs, such as engaging with private owners and managing competing demands for space. For example, the City of Barcelona, Spain, estimated that it hosts 1.4 million trees, i.e., about 1 tree per resident[41]. Only about 20% of these trees are managed by the city council. The total 'tree mass' covers about 25% of municipal land, but one large regional park hosts about 70% of all trees in the city, resulting in a de facto canopy cover in the built-up areas of only 10%. Toronto, Canada, has an estimated urban forest cover of 28.4 to 31%, representing 11.5 million trees. Less than 1 million of these are city street trees, while about one third of all trees are situated in city parks and natural areas. The remaining trees are located on private property[42]. Urban forest inventories are used as a baseline for setting future tree canopy targets. Based on a recent assessment of its urban and rural tree canopy cover, the Canton of Geneva, Switzerland, is now striving for increasing canopy cover to 23-30%[43].

Although the 'forest ecosystem' part of urban forest is often included in national forest inventories, it can still be difficult to have a full overview of this important UPF component. For example, it can even be a challenge to define how the boundaries of urban and peri-urban areas are drawn. From the available data, the picture that emerges is one of a relatively small but very important resource that poses its own specific challenges due to varied ownership, intensive use, and fragmentation. Considering areas in a buffer around urban cores, one study estimated that urban woodland in the Nordic countries made up about 825,000 ha, or about 1.4% of all productive forest area in those countries[44]. In Sweden, although UPFs makes up only about 2% of the total forest area, these areas account for more than half of all forest recreational visits in the country.

Urban woodland areas are often fragmented and small, which can undermine their ecological viability; their management can be complicated by a diverse patchwork of public and private owners (including municipal governments). Research in Denmark showed, for example, that the most common size class of woodland areas was between 2 and 4.9 ha. This study also found that 83% of areas formally defined as forest were located at the fringe of urban settlements[45].

The potential of sustainable urban and peri-urban forestry

Urban and peri-urban forests (UPFs) are essential for urban areas and urban communities. They provide a wide range of ecosystem services and benefits that are increasingly recognized and proven by research (Figure 1).

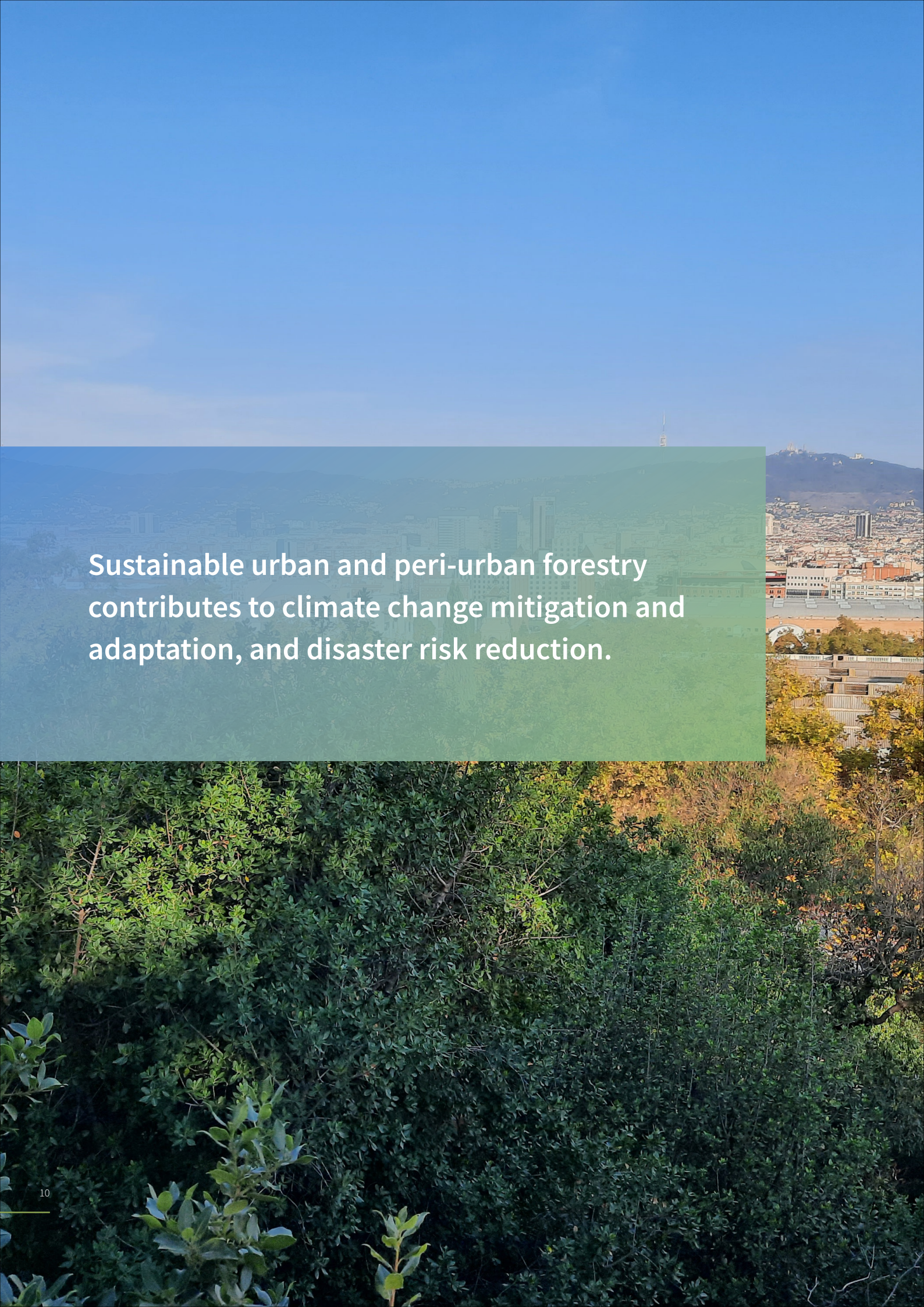
Sustainable urban and peri-urban forestry contributes to climate change mitigation and adaptation and disaster risk reduction

UPFs provide substantial regulatory ecosystem services for climate change mitigation and adaptation. In fact, UPFs can be considered as critical infrastructure, that is, assets essential for the functioning of societies and economies; for example, urban trees reduce local ambient temperature up to 8 degrees Celsius46. This helps urban communities reduce the health impacts of heat extremes and adapt to projections for these extremes to worsen under climate change. The trees placed near buildings also sequester carbon, while simultaneously reducing greenhouse gas emissions by reducing energy needs (and expenses) for air conditioning.

UPFs can also reduce land degradation and provide critical infrastructure for dealing with natural disasters. For example, UPFs support disaster risk reduction by helping stabilize slopes to prevent landslides. Another very important role of UPFs relates to their providing considerable stormwater volume and pollution control through rainfall interception and intensity reduction, as well as stormwater infiltration and uptake and nutrient load reduction47. Tree canopy can, for example, substantially delay stormwater runoff, thus relieving pressure on urban drainage systems.

The economic impact of these functions of UPFs is substantial. A recent national study in the United States commissioned by the Arbor Day Foundation found that urban trees contribute 73 million USD in community-wide environmental benefits each year, out of which 65 billion USD represent carbon sequestration by urban trees and 3 billion USD represent contributions to stormwater regulation48. While countries like the United States have made progress, locally and nationally, in making the business case for investing in UPFs, research on their costs and benefits is limited throughout much of the UNECE region.

Figure 1 The potential of urban and peri-urban forestry



Sustainable urban and peri-urban forestry contributes to climate change mitigation and adaptation, and disaster risk reduction.

Sustainable urban and peri-urban forestry improves our health and well-being

Urban and Peri-urban Forestry (UPF) makes essential contributions to our health and well-being. Research has identified specific contributions to physical, mental, and social health, as well as to cognitive development. People who live in greener urban areas and/or have easy access to public green space are in better mental and physical health and are more likely to engage in social interactions in their neighbourhoods.

During the COVID-19 pandemic, urban green spaces that remained accessible provided highly needed 'refuges' for urban residents. Research from across the globe showed major increases in the appreciation for - and recreational use of - urban green spaces, including local forests[49, 50]. In the light of the global pandemic, scholars and policymakers have called for rethinking and transforming cities to respond to the reality of COVID-19 and potential future pandemics, by building more resilient, inclusive, and sustainable cities. Local street trees and pocket parks showed their value during the COVID-19 pandemic, offering much needed green space on people's doorstep.

In fact, studies have also shown that specific components (e.g., street trees vs. park trees) of UPFs have their own specific health impacts. For example, trees on schoolyards can stimulate the health and cognitive development of children, community gardens can support social cohesion, and peri-urban forests provide a wide range of benefits including for mental health. Trees often feature strongly in studies that show the health benefits of urban nature. A study in Toronto found, for example, that having 10 more trees in a city block, on average, improves health perception in ways comparable to an increase in annual personal income of CAD 10,000 and results in higher life expectancy[51].

Increasing urban forest and green space can also improve health and reduce mortality through air pollution. Estimates suggest it could prevent up to almost 43,000 deaths in European cities every year[52]. This would also have a major economic impact by reducing health-care costs.

Health benefits can also result from the role of UPF in food production and even contributing to local food security, more sustainable local food systems and improved nutrition, for example through food forests[53].

Sustainable urban and peri-urban forestry can help conserve biodiversity and contribute to ecosystem restoration

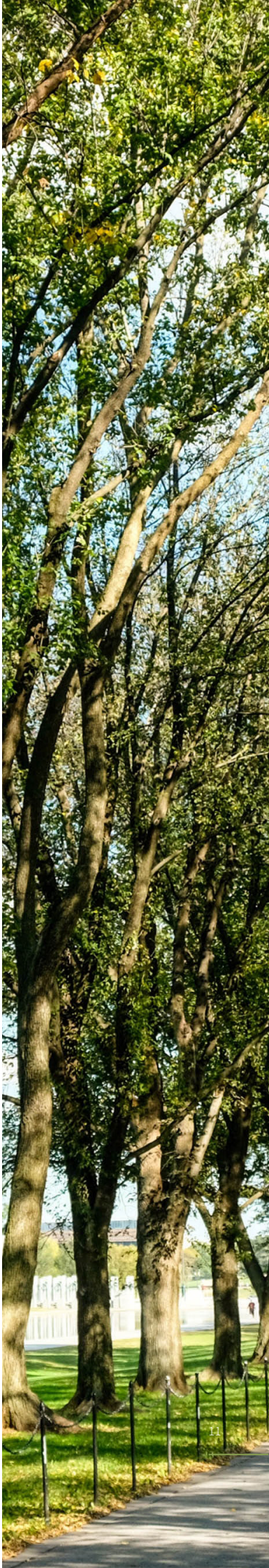
Cities can host surprisingly high levels of biodiversity, partly because of the presence of non-native species in gardens and parks, but also as cities are often situated in ecological hotspots and represent a wide variety of habitats. Among green spaces, urban parks often have the highest biodiversity[54]. A study of urban and suburban parks in the region of Flanders, Belgium, showed that they host close to 50% of all bird species found in the region, as well as more than 60% of all amphibian species[55]. Links have been found between biodiversity and health benefits, and UPFs are also important for urban dwellers to maintain connections with plants, animals, and natural processes. This may help to improve awareness and appreciation of the value of forests and forest policy among the urban and peri-urban population, including policies traditionally more focused on rural areas.

Sustainable urban and peri-urban forestry contributes to green economies and recovery

As nature-based solutions that help address key societal challenges, UPFs can be part of climate change strategies that are cost-efficient. Moreover, UPFs typically provide more than one specific benefit at a time, making them an attractive instrument for addressing many urban challenges.

This includes important economic benefits. For example, the urban forestry sector in the United States has an annual sales and employment footprint worth 64 billion USD, providing an estimated half a million jobs as a result of activities by governments and private sector organizations[56]. Recent studies have calculated another impact of UPFs is that they add an estimated 31.5 billion USD to property values across the United States[57]. Furthermore, UPFs often provide critical protection to drinking water resources of cities that are highly valued in both monetary and non-monetary terms.

The current focus on greener cities and tree planting will also generate more economic activity and entrepreneurship, creating new green job opportunities across the globe. For example, a study in Sweden, a country of just over 10 million people, assessed that about 1.8 billion EUR are used annually to manage urban green spaces[58]. This presents an important opportunity for green investment and job creation during times of economic recovery, including recovery from the COVID19 pandemic.



4. Enhancing the Impact of Sustainable Urban and Peri-Urban Forestry

For SUPF to live up to its full potential, the following aspects need to be addressed:

Urban and peri-urban forests to the doorsteps of all urban residents

The many benefits of sustainable urban and peri-urban forestry (SUPF) need to be delivered to all urban residents, irrespective of age, gender, income, education, and cultural background. Environmental equity in terms of the fair and equal distribution of the benefits should be part of any SUPF programme, as called for in SDG 11.7. Research has clearly demonstrated that people benefit optimally when they have easy and immediate access to UPF, such as seeing trees from their window, having a decent canopy cover in their neighbourhood, and being no more than a five minute walk to the nearest public green space[59]..

More diverse and resilient urban and peri-urban forests

Urban and peri-urban forests (UPFs) that are diverse in species composition have been found to be more resilient to the effects of climate change and to outbreaks of pests and diseases[60]. Diversity also means including a wide range of urban and peri urban forestry components, from quiet city forests to green schoolyards and community gardens, and from bustling city parks to serene cemeteries. Each of these can provide for many different uses, experiences, and benefits.

Planting is good, sustainable management is better and requires long-term planning

Amid calls for climate action, tree planting is receiving a lot of attention from the public and politicians, including in urban areas, and often on a massive scale. This is good, as expanding tree cover can help address climate change and support efforts to stay within planetary boundaries while promoting sustainable development. However, urban and peri-urban tree planting should be linked with long-term, adaptive SUPF management and is only likely to make sense if tree survival rates are improved drastically. Sufficient resources (including funding) and capacities should be reserved for this. The benefits of urban trees will increase as they are nursed to full maturity.

Predictable, long-term finance and resources are a critical need

Sustainable management of urban and peri urban forests depends on long-term planning. Without predictable long-term finance and resources, it is more difficult for city authorities to plan, commit to, and efficiently implement SUPF management plans over longer planning horizons. SUPF plans that are not based on realistic budgets may fail to meet their objectives if sufficient funds are not ultimately available. Unrealistic budgets may also lead to inefficiencies if available resources ultimately exceed the ambition of plans and targets. Municipal budgets themselves, can be among the most predictable sources of finance for urban forests. Fully valuing benefits of SUPF may justify budget increases, while improved SUPF planning may increase the efficiency with which available resources are used. National and sub-national funds and programmes may also be predictable sources and can help to catalyse finance from other sources, including increased urban forestry allocations in municipal budgets.

Stewardship is key

UPFs serve local communities, and it is crucial to involve them in the stewardship of these areas. This can assist with meaningful placemaking and place-keeping, helping to preserve these spaces while building stronger relations between people, trees, communities, and forests. Stewardship also embodies the important longer-term perspective, fostering a culture of intergenerational understanding, engagement, and partnership. It can help build long-term support among residents for SUPF policies and programmes as well as for rural forest policy and afforestation efforts in general. Stewardship needs to be sensitive to the range of cultural and other characteristics of local communities, including those of indigenous peoples.

Dedicated strategies, planning, and plans

SUPF is a complex matter. Cities are highly dynamic and constantly changing, and it usually takes a long time for trees and forests to reach maturity; even when using fast-growing tree species for rapid results, the next tree generation needs to be considered. To unlock their ecosystem benefits, green spaces such as forests, trees, and associated vegetation in and around urban areas need to be placed at the heart of urban planning. In particular, SUPF programmes need a longer-term vision, developed together with the local community, to provide ambition and direction. Overall visions need to be translated into clear objectives, targets, and performance measures in a planning process. Developing a SUPF master plan for a city can help make these measures explicit and ensure that sufficient resources are allocated. These plans need to be well aligned with other municipal policies and programmes.

Well-informed sustainable urban and peri-urban forestry reflecting good practice

The planning, establishment, and management of UPFs need to be based on sound evidence and reliable, up-to-date information. It should include insights into the UPF resource, and the local community in which it is situated. State-of-the-art practices can strengthen sustainable management efforts. Here, the exchange of knowledge and peer learning will be important, but also the provision of clear guidelines and standards that provide directions and benchmarks for management practices and the provision of good and fair access to green space. Research, education, training, and knowledge transfer in SUPF need to be supported and expanded for these efforts.

Tracking and demonstrating success

Rigorous monitoring of SUPF programmes and activities is often lacking today. Ideally, cities, urban and peri-urban forest owners, communities, and other stakeholders should establish a sound baseline and then track the impact of their SUPF programme. This includes the development of the UPF resource, but also the changing provision of different ecosystem services and their benefits as well as local community perceptions and involvement. This type of monitoring for success can also offer a good foundation for benchmarking between cities as well as for communicating the benefits of UPF to citizens. Recent years have seen the rapid increase in geospatial and other types of tools that can be used for measuring performance, as well as the emergence of specialized companies and other organizations that can support these efforts.

Using sustainable urban and peri-urban forestry to strengthen the urban-rural interface

Cities often have major footprints on their surrounding area. Given that a large part of UPFs include the urban periphery, this offers opportunities for better planning and management for integration across the urban-rural interface. This can create new opportunities for more sustainable land use and agricultural activities, carbon sequestration, the protection of drinking water, and better management of the risk of forest fires in urban and peri urban areas. Enhancing the connectivity of green spaces (the green structure) and land-use across the urban-rural interface will result in a more holistic view on our food systems including the sustainable production at local and regional levels, benefit food security and biodiversity, and help change systems that currently do not perform to their potential.

Strengthening partnerships and collaboration

SUPF governance and management requires 'horizontal' integration, for example between different municipal departments and other stakeholders. But it is not only a matter of cities, nor of only one specific department in the municipal administration. It also requires 'vertical' integration through coordination of local, regional, and national policies, legislation, and programmes. It involves a wide range of authorities, landowners, interest groups, businesses, communities, and demographic groups. This highlights the need for collaborative approaches that account for, engage with, and mobilize the specific needs, skills, mandates, and resources of these different partners.

Making the business case for sustainable urban and peri-urban forestry

The essential contributions of SUPF to urban societies have become clear, supported by a growing body of research. The benefits of investments in trees can be worth as much as five or six times the cost of investment[61]. However, not everyone is aware of this. As urban and peri-urban decision-making involves many competing and urgent interests, it is important that a strong case for SUPF is made, for example in terms of addressing key challenges such as climate change and public health threats. To support this effort, a stronger business case needs to be made for SUPF. The benefit-to-cost ratio of SUPF, as well as stronger evidence of the non-monetary and political benefits, can provide persuasive evidence of it being a worthy area of political priority and investment. The contributions of SUPF to the green economy and the potential for job creation should also be stressed[62].

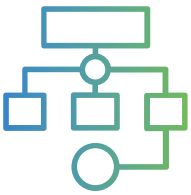
These aspects of enhancing the impact of SUPF all need attention. Addressing these will require new partnerships that involve a wide range of stakeholders, with emphasis on local and regional players. However, international organizations can play an important role in enhancing the implementation and impact of SUPF, working with governments and various stakeholders at different levels, and fostering a culture of collaboration, coordination, and integration. This is also in the spirt of the integrative nature of SUPF. This can include efforts to support sustainable management of all types of forests by strengthening national capacities and monitoring systems..

5. Opportunities for Action

Addressing the above priorities will advance efforts to develop and implement SUPF, in the near and long term, thus benefiting and strengthening urban and peri-urban communities. Some specific opportunities for action to do this are defined below.

Implement global and national policies and goals locally through SUPF

The importance and contributions of urban und peri-urban forests are clearly reflected in the global goals. These includes the UN's Sustainable Development Goals and, particularly, SDG 11; the call of the United Nations Forum on Forestry to focus on forests and trees in the urban context; international processes for sustainable forest management; and multiple afforestation, restoration, and tree planting campaigns to address climate change, biodiversity loss, and landscape degradation. National goals and policies often reflect global goals in addition to a focus on national circumstances. SUPF provides an important framework to deliver national and global goals through localized action, and there is scope to significantly expand SUPF strategically to advance progress.



Coordinate SUPF with other sectors and policies

SUPF contributes to a wide range of other sectors and policies. Important synergies can be achieved if policies and programmes are integrated. This includes, among others, urban planning, public health, public education, climate action, land use, forestry at large (including in rural areas), agricultural policies, and economic development. Often, important synergies are missed because of the lack of policy coordination and alignment. Strong baseline data and monitoring thereof, clear plans and targets, effective coordination mechanisms, and strong political support are among the elements that can strengthen coordination and impact.

Involve national and regional authorities and policy makers more in the strengthening of SUPF governance and collaboration

In many countries, the responsibility for UPF has been left to local governments, but there is a need for broadening the governance framework. This includes regional and national-level guidance, policy frameworks and supporting mechanisms, and providing better links with international policies and agreements. National governments can advance efforts to make SUPF a priority. For example, by creating dedicated national policies, programmes, and funding streams for SUPF, governments can foster a culture of cross-level collaboration. Innovative ways should be identified for promoting SUPF in collaboration with local stakeholders, for example by exploring opportunities for co-governance.

Develop and diversify funding for SUPF

SUPF is a nature-based solution that offers essential goods and services to local communities. However, it requires predictable and reliable funding to allow for long-term planning and implementation. The contributions of SUPF to climate change mitigation, air pollution reduction, public health promotion, and even food security and sustainable food systems all hold promise for tapping into existing and new public and private sector funds. Developing the business case for SUPF can assist with developing and enhancing access to these funding sources. Strong planning, good monitoring, and reliable public financing can also help to catalyse other sources of funding. Successful examples of innovative funding can also be shared and replicated among cities, sub-national, and national authorities..

Learn from, document, and disseminate good examples and good practice

Good examples of successful SUPF exist across the UNECE region and the world. It is important to share and discuss these examples, existing models and experiences to foster a culture of peer learning. Approaches cannot always be directly copied because of different local conditions, but there are often key elements in programmes that can inspire and inform action. There is a strong emerging demand for guidance and tools to support practitioners, and such knowledge products could be developed building on peer exchange and good practice.

Foster a culture of regional and cross-boundary collaboration

The UNECE region includes countries with widely differing conditions, challenges, and opportunities. However, countries in the region also face common challenges such as urbanization, climate change, public health, biodiversity loss and unsustainable food systems. They all have the same urgent task at hand to develop urban areas that are resilient, healthy, and economically competitive. Regional and cross-boundary collaboration can take many forms. This includes collaboration across administrative, ecological, and other geographic boundaries at the international, national, and subnational levels. This sort of collaboration can often be supported actively through joint research and planning; dedicated governance mechanisms, and; political, technical, and financial support at different administrative levels (city, national, regional, international). It may also include cooperation on thematic issues, including beyond immediate borders. Collaboration may often be formal, but informal collaboration, including through peer networks can also play an important role. Examples include the UNECE Informal Network of Experts on Sustainable Urban Forestry (launched in 2021) and the European Forum on Urban Forestry, a well-established network and annual meeting of urban forestry experts[63, 64].

Assess, monitor and benchmark across the region

In their efforts to implement UPF, cities and countries will benefit from regional assessments, monitoring, and benchmarking. This well help evaluate the status of SUPF in the region (e.g., in terms of the UPF resource and its benefits) and track progress over time. National and international organizations can help coordinate these efforts, linking them to existing data collection and monitoring programmes.

Promote the use of international standards and guidelines

Different guidelines and norms relevant to SUPF have emerged recently, such as the WHO Europe's guideline for easy access to public green space and the canopy level targets set by cities. A recent example of a more comprehensive guideline, the '3-30-300 rule' for SUPF, is provided in Box 3. Efforts to develop, disseminate, and adopt such guidelines can support the expansion of SUPF as a nature-based solution, as can the development and implementation of standards for sustainable urban forest management.

Promote greater awareness of the importance of SUPF

There is an opportunity to communicate the benefits of SUPF among the wider public to mobilize children, schools, neighbourhoods, companies for education reasons but also for a deeper engagement and a sense of ownership of this nature-based solution. Questions such as: "What benefits do urban trees provide for us?" and "How can I get involved in the stewardship of my local UPF?" can raise awareness of the importance of urban trees and forests. More importantly they can help raise funds from the public and private sector to manage this nature-based sustainable solution for generations to come.

Box 3
The 3-30-300 rule for greener, healthier, and more resilient cities

The '3-30-300 rule' is a guideline proposed by the Nature Based Solutions Institute[62] that stipulates that:

3 Everyone should be able to see at least 3 mature trees from their home and place of work or study;

30 There should be a 30% tree canopy cover in each neighbourhood; and

300 The maximum distance to the nearest high-quality public green space should be 300 metres.

In this way, the public health and climate benefits of urban trees are brought into all neighbourhoods and to all individual residents.

These targets are based on evidence linking distances from homes and places of work, as well as the density of canopy cover, to many of the benefits of SUPF highlighted in this policy brief. However, given the great diversity of cities in the UNECE region, the most appropriate targets for a given city should consider the local context.

The '3-30-300 rule' also makes it clear that trees are not always the solution, and sometimes other, more locally appropriate types of vegetation should be used.

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Sustainable Urban and Peri-Urban Forestry - An Integrative and Inclusive Nature-Based Solution for Green Recovery and Sustainable, Healthy and Resilient Cities

Policy Brief

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