TOPIC 06

Forestry

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LE:NOTRE Institute
Linking Landscape Education, Research and Innovative Practice

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POLITECHNIKA GDAŃSKA

Hochschule für Wirtschaft und Umwelt Nürtingen-Geislingen

SAPIENZA UNIVERSITÀ DI ROMA

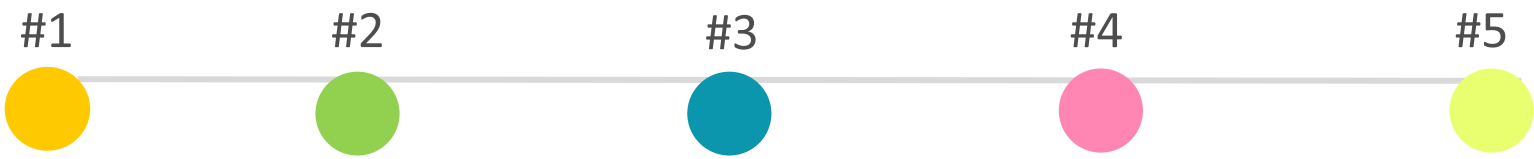
Co-funded by the Erasmus+ Programme of the European Union

Programme

PROGRAMME

17:30 - 17:45	Context, trends, initiatives
17:45 - 18:00	Interactive session
18:00 - 18:30	Key economic dimensions, stakeholders, funding, KPIs, case studies,
18:30 - 18:45	Feedback, Q & A

INDEX



Context/ Trends/ Initiatives

Key economic dimensions/ Benefits

Stakeholders/ Funding/ Economic valuation

KPIs/ Case studies

Key concepts/ Glossary

Introduction

Most Europeans live in urban areas. By 2050 it is expected that 90% of Europeans and the citizens of other developed countries will reside in urban areas.

In this context, a city that feels and functions like a forest is increasingly being proposed as a vision for future sustainable cities.

Green infrastructure is widely proposed (e.g. by the European Commission) as a strategy for delivering nature-based solutions that support climate adaptation capacity and sustainable development in Europe's urban areas.

Introduction

Research has shown that forested environs are increasingly a key ecosystem service provider in most European cities. Already during 19th century industrialization, many larger cities acquired so called “city forests".

Due to their quantity and quality, forest environs located in and around European urban areas are therefore foremost in providing the back-bone of urban green infrastructure.

https://Cities4Forests - Atlas of the Future — Atlas of the Future

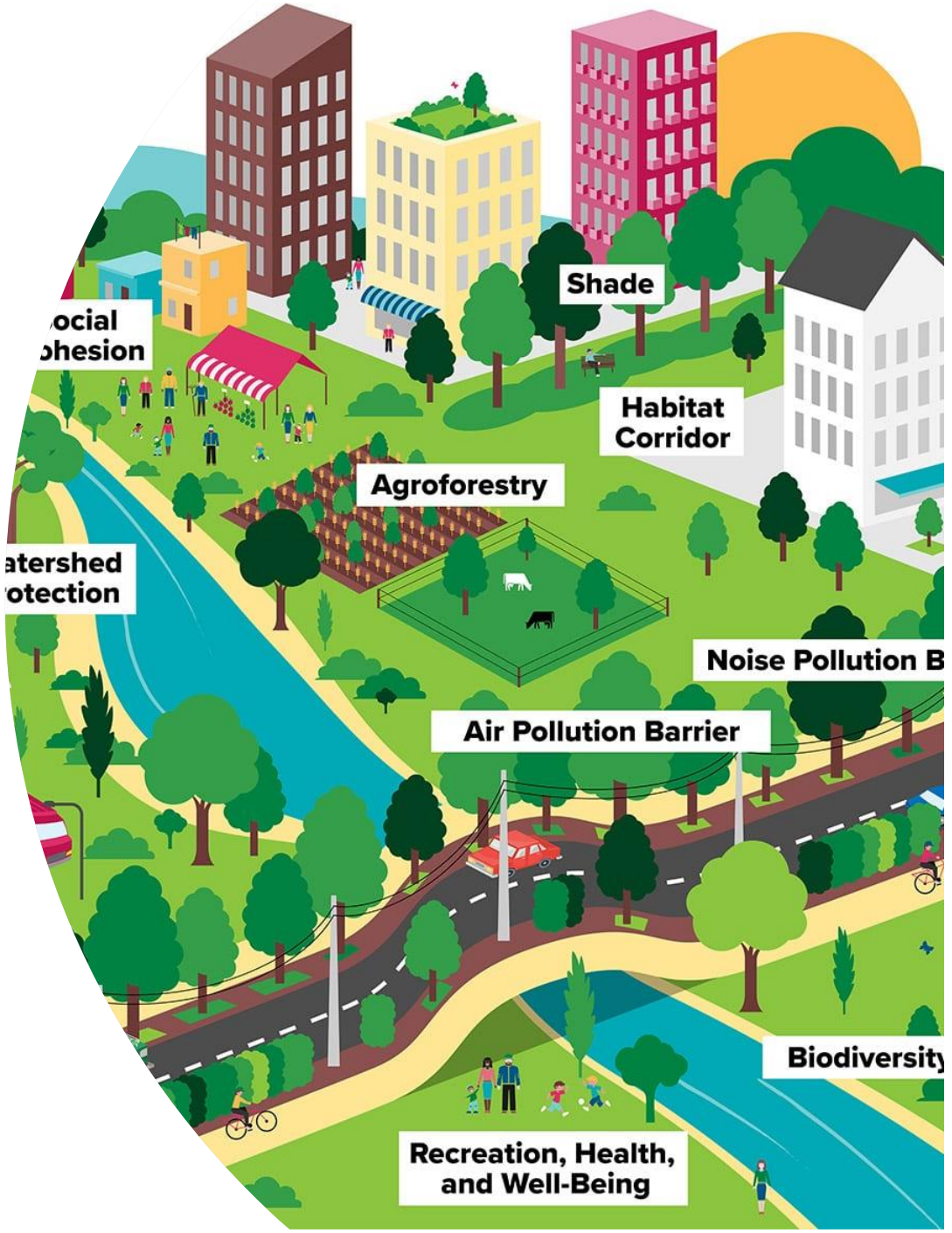
Contexts / Trend

Key terminology

Forest is the land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ (FAO, 2018).

Urban forests come in many different shapes and sizes. They include urban parks, street trees, landscaped boulevards, gardens, river and coastal promenades, greenways, river corridors, wetlands, nature preserves.

Urban forests, through planned connections of green spaces, form the green infrastructure on which communities depend.



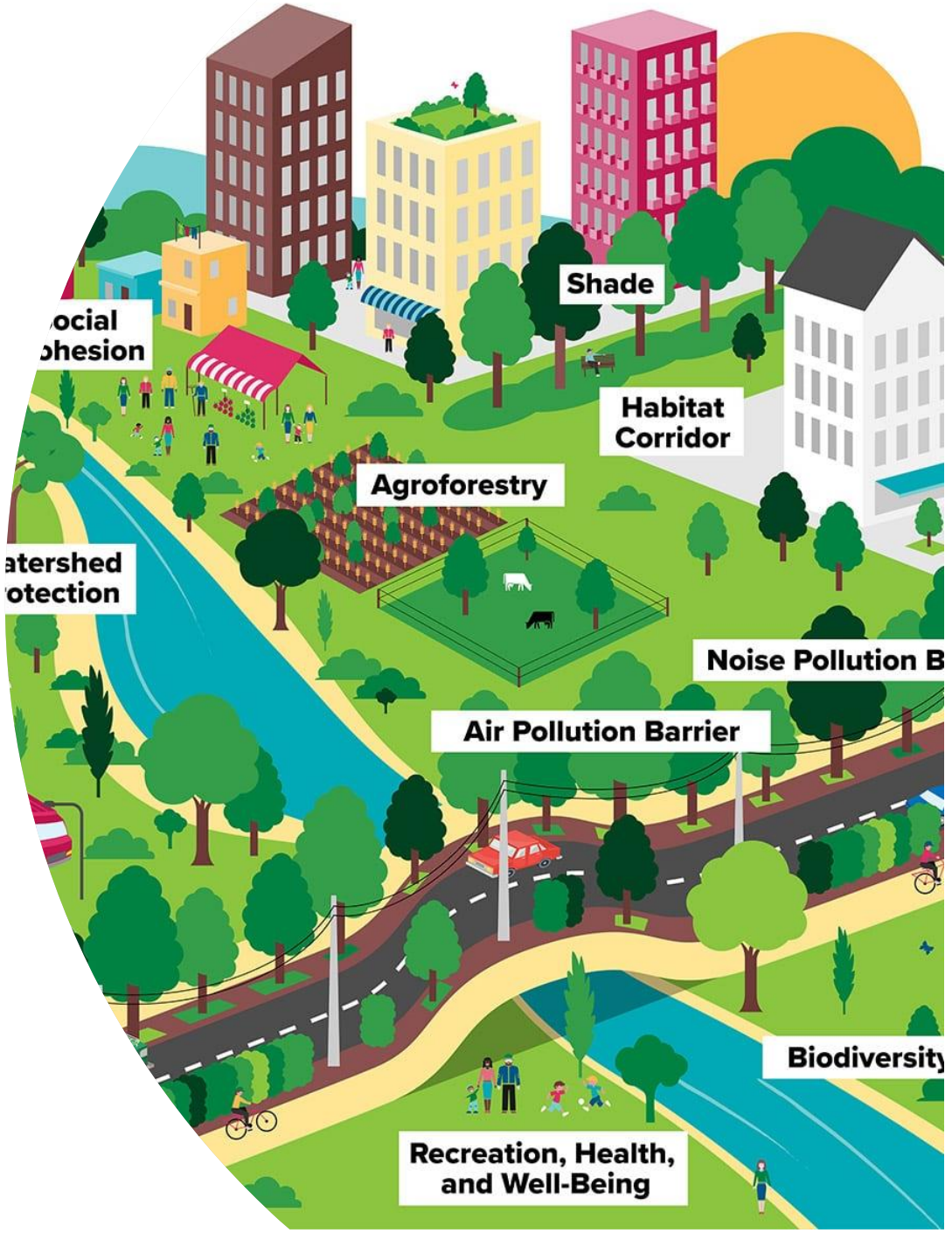
Context / Trend

Key terminology

Green infrastructure (GI) is a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services while also enhancing biodiversity (European Commission, 2023).

This network of green (land) and blue (water) spaces can improve environmental conditions and therefore citizens' health and quality of life.

It also supports a green economy, creates job opportunities and enhances biodiversity.

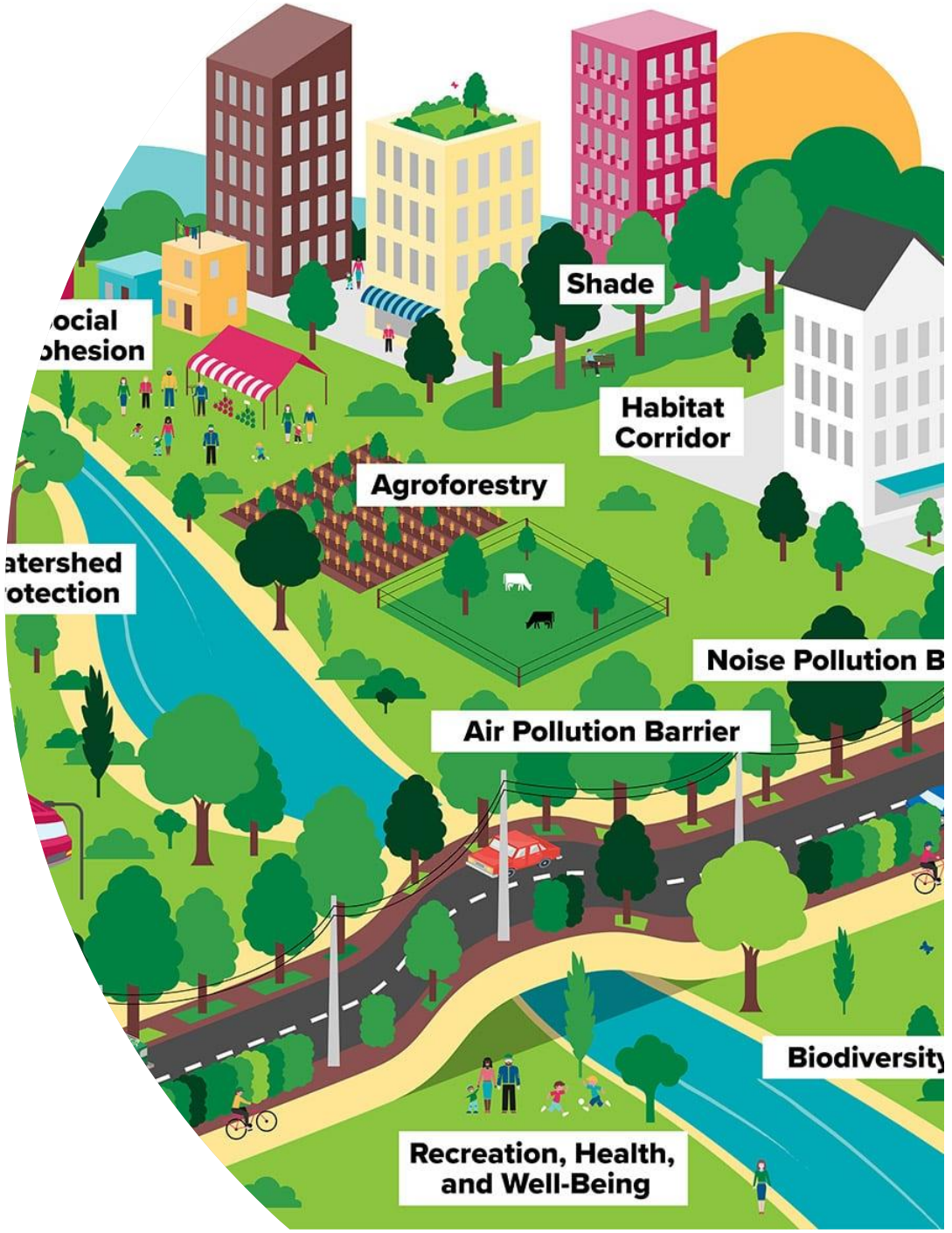


Context / Trend

Key terminology

Ecosystem services are the benefits that flow from nature to people. They can be provisioning (e.g. the supply of food, clean air and water), regulating (e.g. climate regulation, nutrient cycling, pollination), or cultural (e.g. recreation opportunities).

Nature-based solutions are actions to protect, sustainably manage, and restore natural and modified ecosystems that address societal challenges effectively and adaptively, simultaneously benefiting people and nature (IUCN, 2023).



Trends / initiatives

Recent trends show that more and more cities are turning to Nature-Based Solutions to help develop more sustainable, resilient and healthy urban spaces.

Urban and peri-urban forestry has been gaining attention in recent years as a valuable tool for addressing a number of urban challenges in the development of a more sustainable and resilient city model.

FAO has created the **Trees for the Cities** discussion group to meet the rising demand for a dialogue platform to facilitate regular exchanges and conversations worldwide among the urban forestry community.

Trends / initiatives

FAO called upon cities to invest in forest-based solutions towards a more sustainable and resilient model of urban development.

FAO invited communities to become part of the **Tree Cities of the World (TCW) Programme**, an international effort to recognize cities and towns committed to ensuring that urban forests and trees are properly maintained, sustainably managed, and duly celebrated.

In 2022, 170 cities in 21 countries earned the TCW recognition, including some cities from France, Spain, Italy, Slovenia, Sweden and United Kingdom from Europe.

https://treecitiesoftheworld.org

TREE CITIES OF THE WORLD™

A programme of:

Food and Agriculture Organization of the United Nations

Arbor Day Foundation

Trends / initiatives

The European Forum on Urban Forestry (EFUF) is a unique meeting place for practitioners, policy-makers, managers and scientists who are active in urban forestry, urban greening and green infrastructure.

The EFUF is facilitated by the International Union of Forest Research Organization's (IUFRO) Urban Forestry Research Group and has a strategic collaboration with the European Forest Institute (EFI).

Every year, the EFUF takes up an actual theme within urban forestry, such as financing, public involvement, partnerships, and management innovations.
https://efuf.org

Contexts/Trend

EU Green Deal

The European Green Deal includes several actions directly affecting forests and the forest-based sector. Most of statements on forests express problems like deforestation, threats to forests and biodiversity, and argue for forest and biodiversity restoration and protection.

EU Green Deal targets no loss of urban green spaces by 2030, a 5% increase by 2050, a minimum of 10% tree canopy caver in every European city, town and suburb, and net gain of green space that is integrated to buildings and infrastructure (Konijnendijk, 2023).

EU Forest Strategy 2030

The new EU Forest Strategy for 2030 is one of the European Green Deal flagship initiatives that builds on the EU Biodiversity Strategy for 2030 and addresses all the multiple functions of forests.

It contributes to achieving the EU's greenhouse gas emission reduction target of at least 55% in 2030 and climate-neutrality in 2050.

The strategy sets a vision and concrete actions for increasing the quantity and quality of forests in the EU and strengthening their protection, restoration and resilience.

EU Biodiversity Strategy

The new European Biodiversity Strategy for 2030 set new objectives for the protection of biodiversity in the European Union. Among these objectives are to increase the quantity, quality and resilience of the forests in order to retain their function for both biodiversity and climate.

The strategy aims for planting at least 3 billion additional trees in the EU by 2030, in full respect of ecological principles. The strategy mentions the particular benefits of tree planting in cities and the role of The New **European Urban Greening Platform** in facilitating urban tree planting.

https://ec.europa.eu/info/sites/default/files/communication-annex-eu-biodiversity-strategy-2030_en.pdf
https://platformurbangreening.eu/

European Landscape Convention (ELC)

Urban landscapes are an essential part of the daily lives of most of Europe's citizens. The European Landscape Convention (ELC) recognizes the value of everyday landscapes for the well-being of citizens, in urban areas as well (Loupa Ramos and Silva, 2015)

Almost all European countries are party to the ELC and by signing the Convention, states commit "to establish and implement landscape policies" and "to integrate landscape into all policies with possible direct or indirect impact on landscape" (COE, 2000, article 5). The integration of landscape into legislation and spatial planning documents presents itself as pivotal to the implementation of the convention.

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QUESTIONS FOR INTERACTIVE SESSION

Key economic dimensions

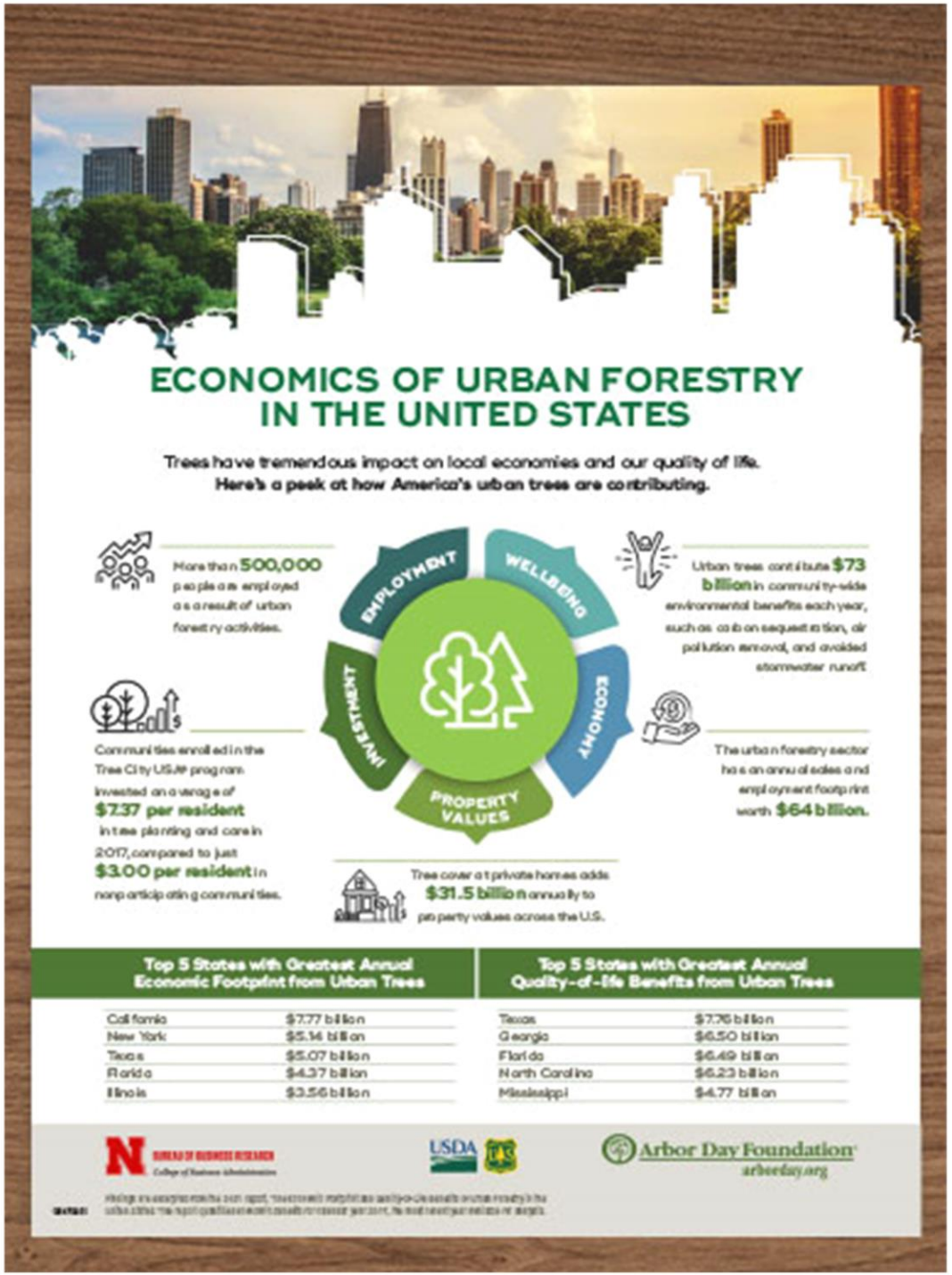
Key economic dimensions

Urban forests are dynamic ecosystems that provide critical benefits to people and wildlife.

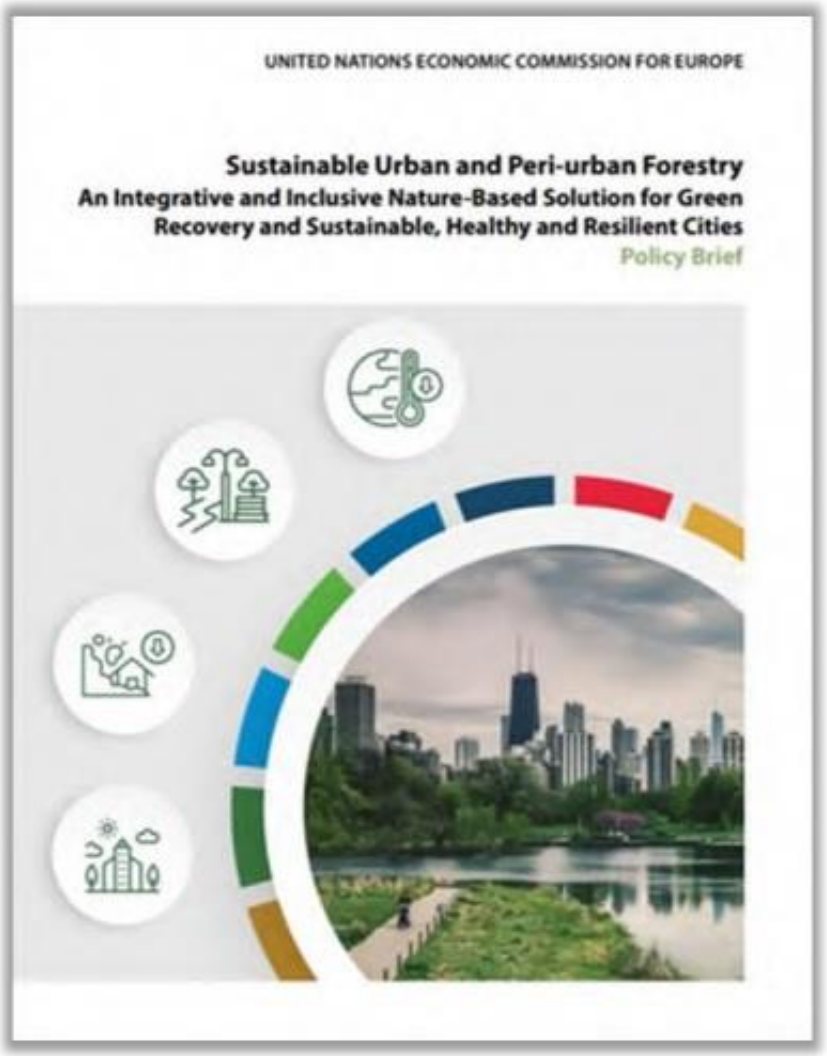
They help filter air and water, control storm water, conserve energy, and provide animal habitat and shade.

They add beauty, form, and structure to urban design.

By reducing noise and providing places to recreate, urban forests strengthen social cohesion and add economic value to our communities.



Benefits of urban forests



Key economic issues

Social benefits

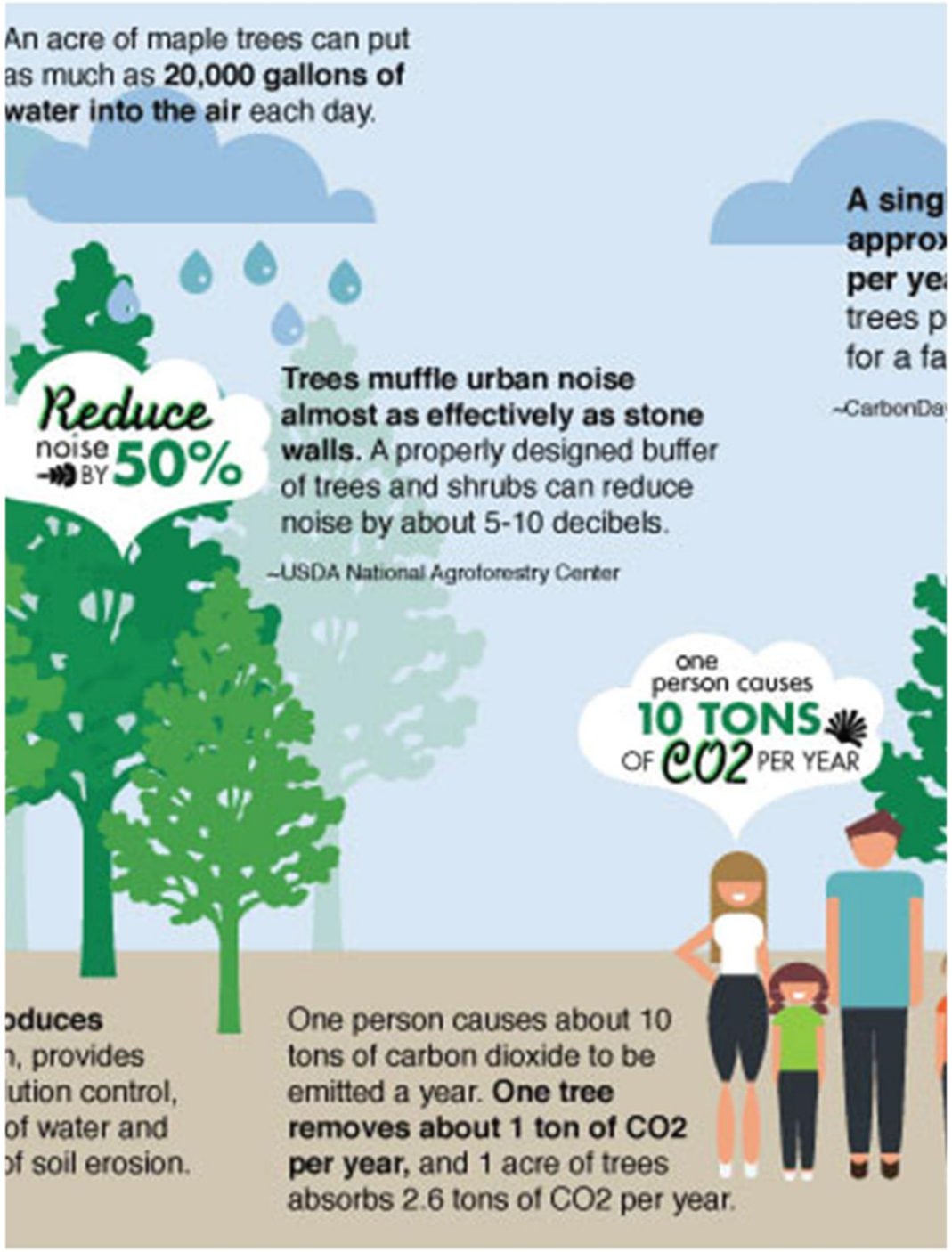
The social benefits of urban forests include:

- Urban forests promote physical activity
- Urban forests promote mental well-being and reduce stress
- Urban forests can promote healing
- Urban forests make cities more beautiful
- Urban forests increase road safety
- Urban forests provide food for people
- Urban forests promote social interaction and a sense of community

Environmental benefits

The environmental benefits of urban forests include:

- Urban forests reduce air pollution and provide oxygen
- Urban forests reduce the urban heat island effect and reduce the temperature of cities, helping cities adapt to climate change
- Urban forests reduce buildings' energy use, including heating costs
- Urban forests improve water filtration, store water, and reduce stormwater runoff
- Urban forests provide habitat for wildlife and promote biodiversity



Economic benefits

The economic benefits of urban forests include:

- Urban forests provide ecosystem services
- Urban forests add value for money spent on maintaining them
- Urban forests increase property values
- Urban forests help create attractive business districts and improve visitors' perceptions of them
- Urban forests have a positive influence on visitors' perceptions of a city
- Urban forests provide space for recreation

Key elements of economic

Ecosystem Services

In recent years, the concept of ecosystem services has been developed to describe the benefits of nature to people.

An ecosystem service is any positive benefit that wildlife or ecosystems provide to people.

The Millennium Ecosystem Assessment (MA), a major UN-sponsored effort to analyze the impact of human actions on ecosystems and human well-being, identified four major categories of ecosystem services:

- Provisioning
- Regulating
- Cultural
- Supporting

Key Economic Ideas

Provisioning Services

When people are asked to identify a service provided by nature, most think of food. Fruits, vegetables, trees, fish, and livestock are available to us as direct products of ecosystems.

A provisioning service is any type of benefit to people that can be extracted from nature.

Along with food, other types of provisioning services include drinking water, timber, wood fuel, plants that can be made into clothes and other materials, and medicinal benefits.

Key Element Economics

Regulating Services

Ecosystems provide many of the basic services that make life possible for people. Plants clean air and filter water, bacteria decompose wastes, bees pollinate flowers, and tree roots hold soil in place to prevent erosion. All these processes work together to make ecosystems clean, sustainable, functional, and resilient to change.

A regulating service is the benefit provided by ecosystem processes that moderate natural phenomena. Regulating services include pollination, decomposition, water purification, erosion and flood control, and carbon storage and climate regulation.

Key Elements Economics

Cultural Services

The importance of ecosystems to the human being can be traced back to the beginning of mankind with ancient civilizations drawing pictures of animals, plants, and weather patterns on cave walls.

A cultural service is a non-material benefit that contributes to the development and cultural advancement of people, including how ecosystems play a role in local, national, and global cultures; the building of knowledge and the spreading of ideas; creativity born from interactions with nature (music, art, architecture); and recreation.

Supporting Services

Ecosystems themselves couldn't be sustained without the consistency of underlying natural processes, such as photosynthesis, nutrient cycling, the creation of soils, and the water cycle.

These processes allow the Earth to sustain basic life forms, let alone whole ecosystems and people. Without supporting services, provisional, regulating, and cultural services wouldn't exist.

the underpinning (or supporting) services which enable other services to function, such as soil formation and nutrient recycling

Stakeholders / Funding

Stakeholders involvement

A wide range of local, national, and regional stakeholders are usually involved in urban forest decision-making, so a crucial consideration is how governance plays out among these actors.

Stakeholders could be anyone impacted by forests in an urban area: residents concerned about quality of life, elected officials, city staff, private and business landowners.

Stakeholders / Funding

Stakeholders involvement

Stakeholders may include concerned citizens, large private landholders, and green industry professionals, such as arborists, commercial growers, landscape contractors, and engineering professionals.

Regional groups may be important stakeholders for linking the efforts of neighboring communities for action on larger geographic and ecological issues.

Stakeholders involvement

Among the major stakeholders at European level is **FERN**, an organization based in Brussels, Belgium. Founded in 1995, FERN is an organization dedicated to protecting forests and the rights of people who depend on them.

https://www.fern.org

Another non-governmental organizations is the **World Wide Fund For Nature (WWF)**, based in Gland Switzerland, which welcomed the adoption of the New EU Forest Strategy.

https://www.worldwildlife.org

Funding opportunities

Interreg Project URBFORDAN: Urban Forests in the Danube Region

URBFORDAN stands for ‘Management and Utilization of Urban Forests as Natural Heritage in Danube Cities’.

Total investment for the project 'URBFORDAN' is EUR 2 788 566, with the EU’s European Regional Development Fund, European Neighbourhood Instrument and Instrument for Pre-Accession Assistance contributing EUR 2 370 281 through the Interreg “Danube Transnational” Operational Programme for the 2014-2020 programming period.

Funding opportunities

UFOREST - European Alliance on Interdisciplinary Learning and Business Innovation for Urban Forests

The UFOREST project aims at promoting Europe's innovation capacity among universities, cities and businesses to deliver a new approach to Urban Forestry.

UFOREST is a three-year (2020-2023) Knowledge Alliance project co-funded by the Erasmus+ Programme of the European Commission. The project promotes a cross-sectoral alliance that brings together universities, businesses and public administrations of often non-collaborative disciplines such as urban planning and architecture, with forestry and urban ecology.

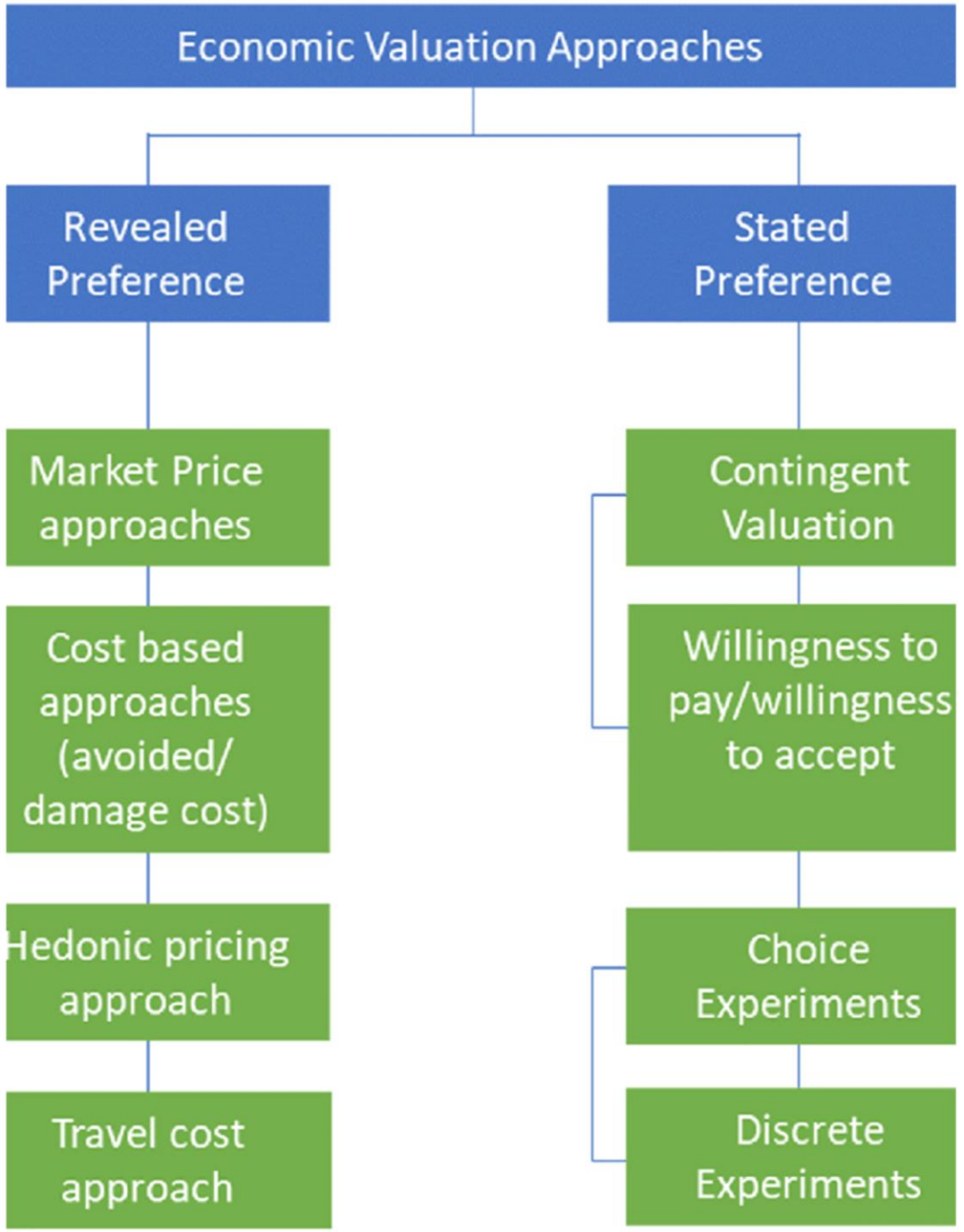
https://www.uforest.eu

Economic valuation of benefits

The term "**public value**" describes widely held public perceptions regarding the function and service contributions of any public entity (Moore 1995).

Urban forests will be adequately planned and stewarded only if urban citizens and decision makers recognize and understand the full range of services that forests and green spaces provide.

Economic valuation translates urban forest services and functions into terms that enhance public value.

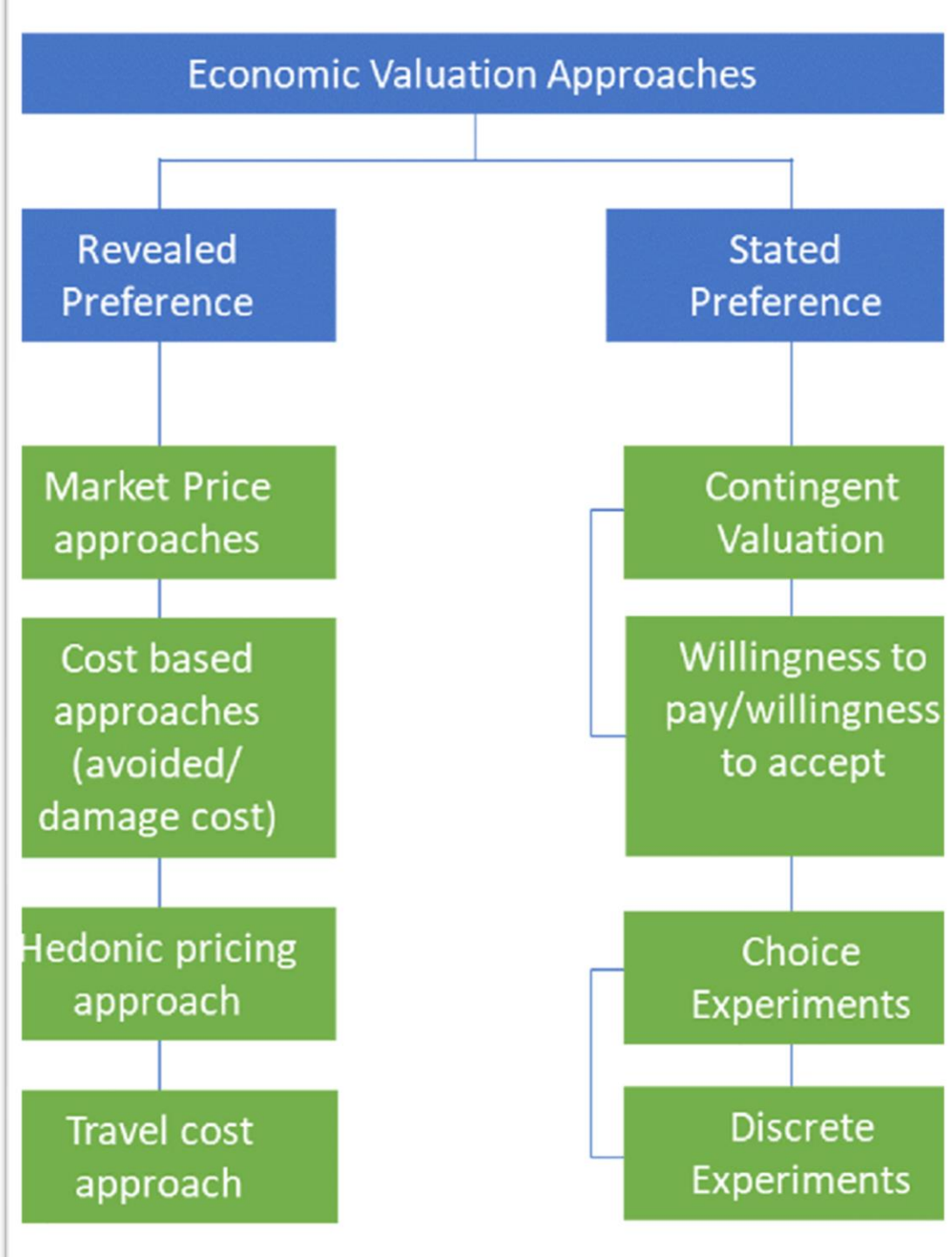


Economic valuation of benefits

Returns on investment in urban forests are less easily calculated compared to industrial forests which are managed for market goods. Dynamics of supply and demand for industrial forests establish prices and revenues for resource products, such as timber.

In contrast many “products” of urban forests are public goods. Multiple “owners” invest in a city’s natural capital, generating “products” in the form of intangible functions and benefits for each resident, visitor and user.

The experience of these benefits by any single person does not exclude others from experiencing similar benefits, both immediately and indefinitely.

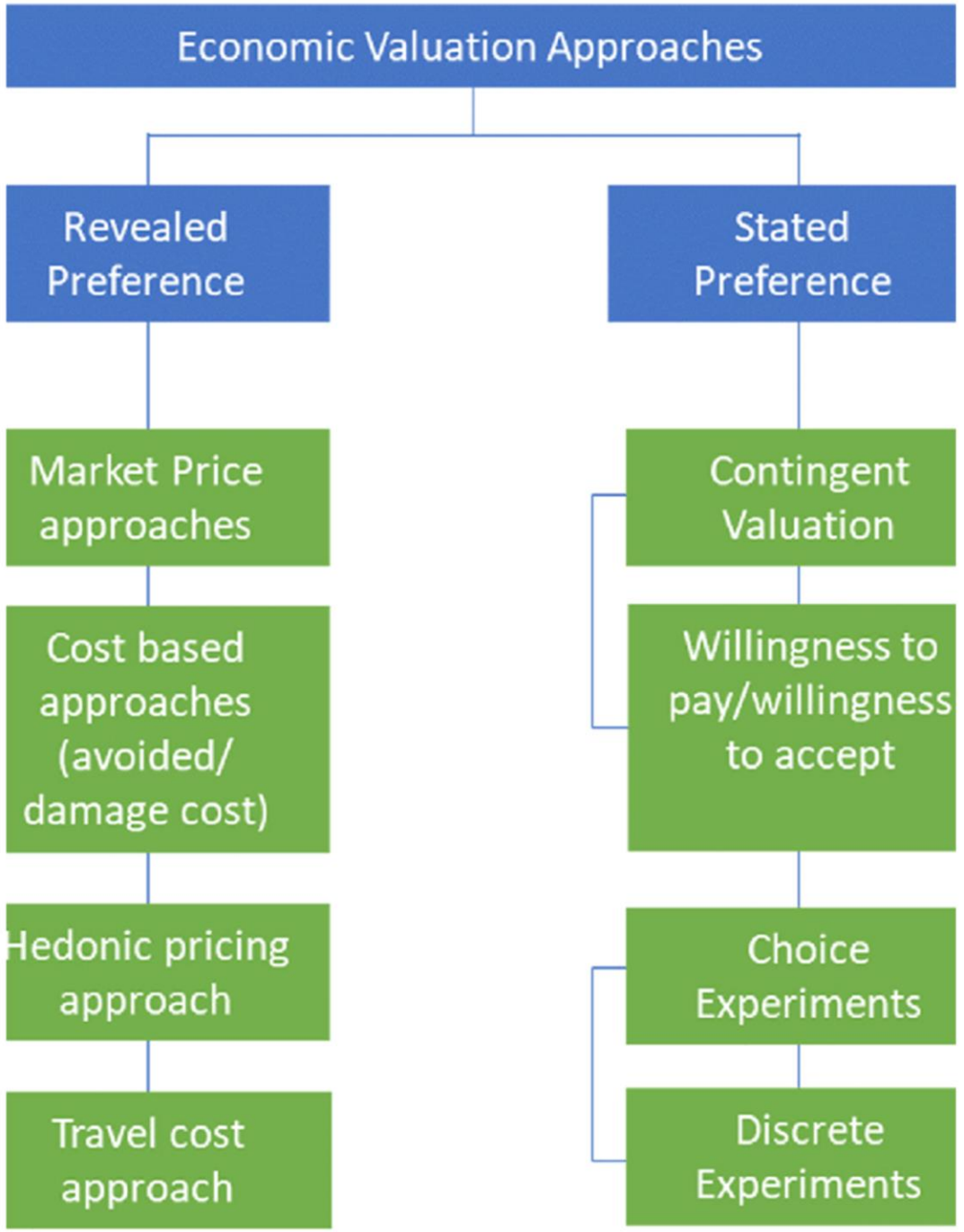


Key Elements Economic

Economic valuation of benefits

Economists have developed theory and methods for assessing public goods values. Many approaches were first developed to assess the economic value of non-market wildland resources which are transferable to urban settings.

Valuation studies have addressed many facets of urban forest benefits. Multiple models and methods have been applied to conditions in North American cities, and adaptation to other regions is possible.



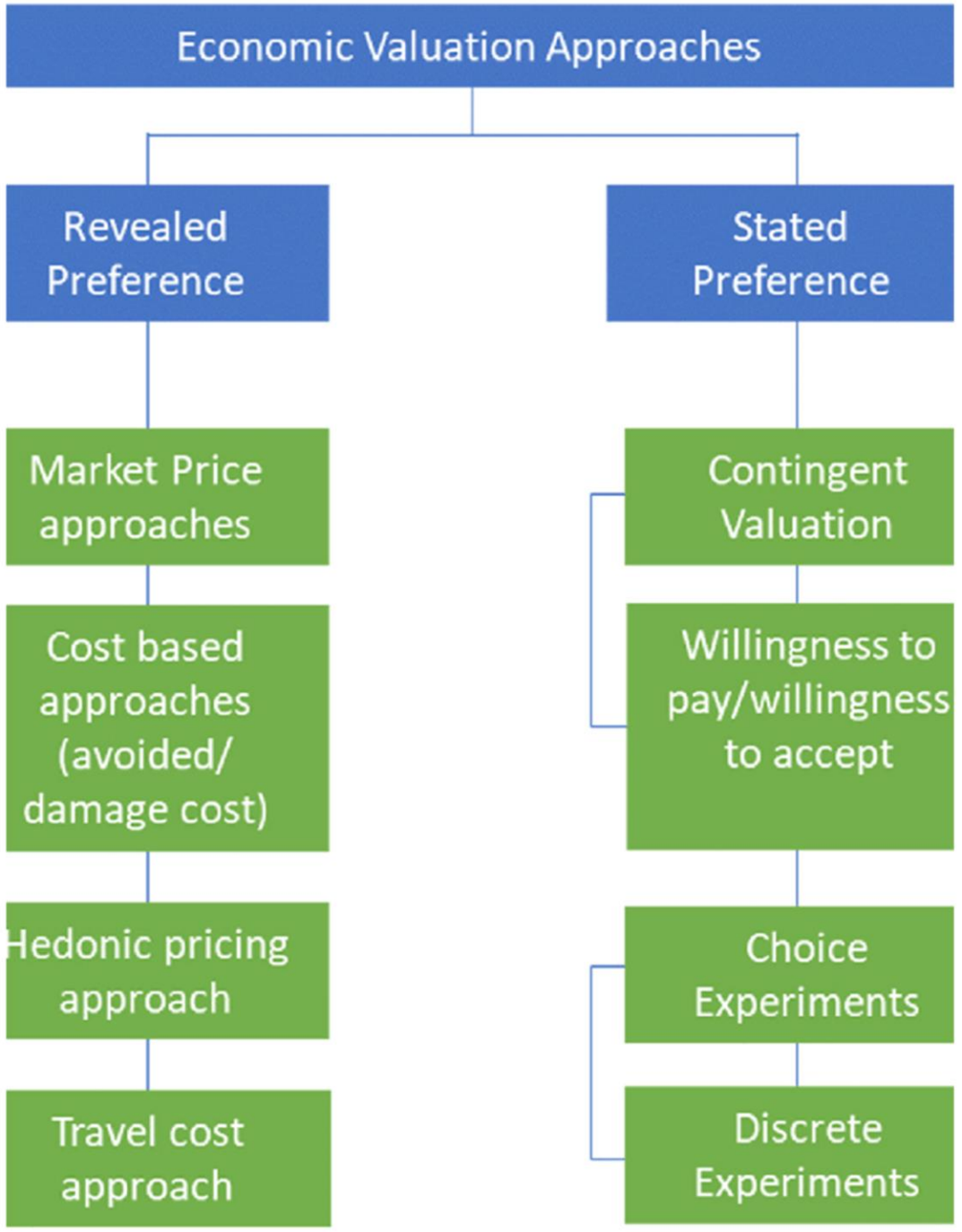
Economic valuation of benefits

Key elements of economic

Urban forests can be planned to directly affect the economic development of a municipality or region. The most direct valuation is to estimate marketable goods, or the value of purchase substitutes.

For example, urban agroforestry practices can produce human and animal foods and medicinal materials, thus contributing to urban food security. Diverse forest products can be inventoried across a city, and use values then compiled, based on prevailing market prices.

Regions with a tourism industry can use visitor surveys to find out expenses incurred by forest and green space users using the travel cost method.



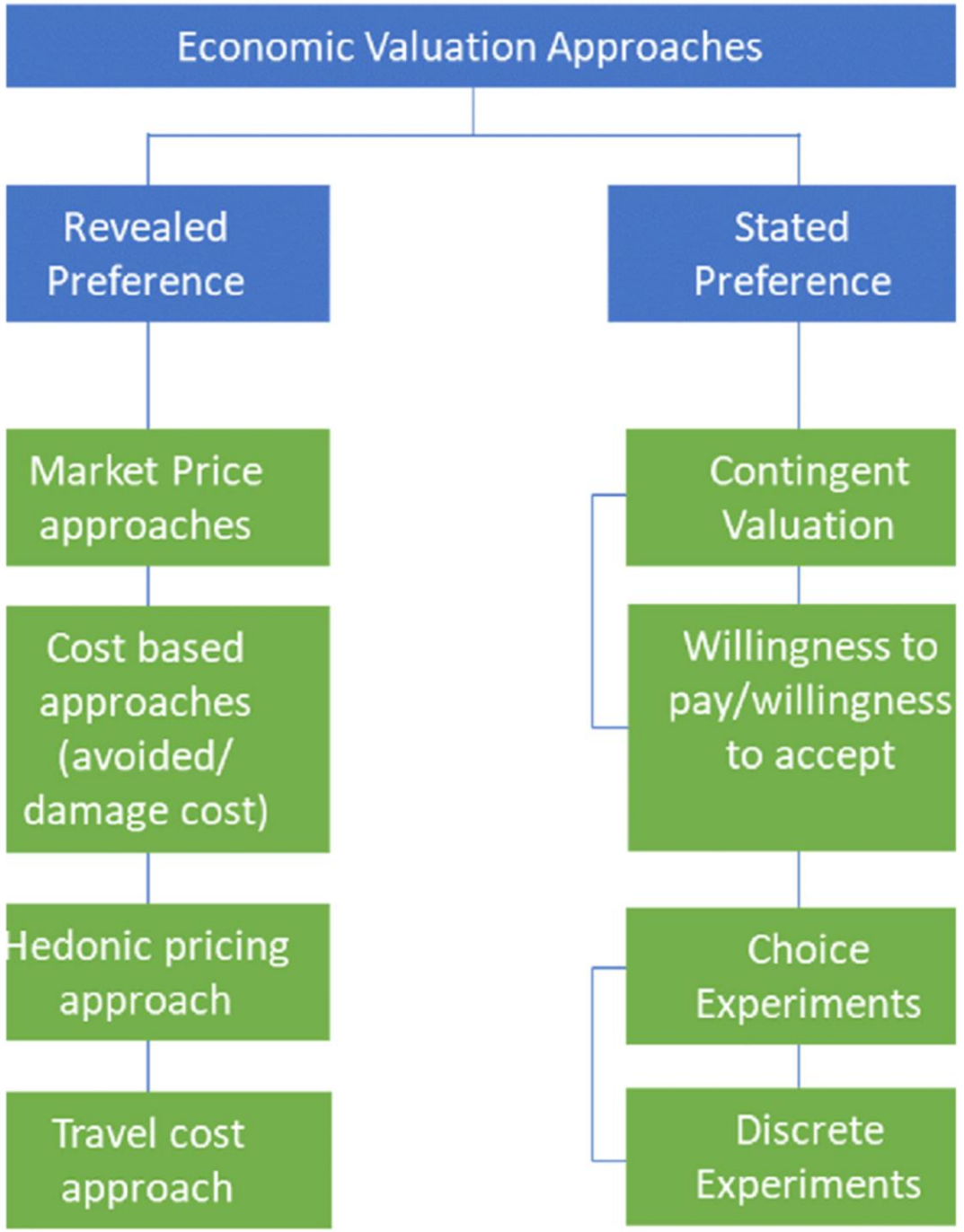
Key elements economic

Economic valuation of benefits

Hedonic or amenity pricing is the measurement of a price increment that correlates to a desirable condition or situation.

Numerous studies have concluded that a quality forest or green space has a positive economic ripple effect on nearby properties.

Appraised property values of homes that are adjacent to parks and open spaces are typically about 8 to 20 percent higher than those of comparable properties elsewhere.



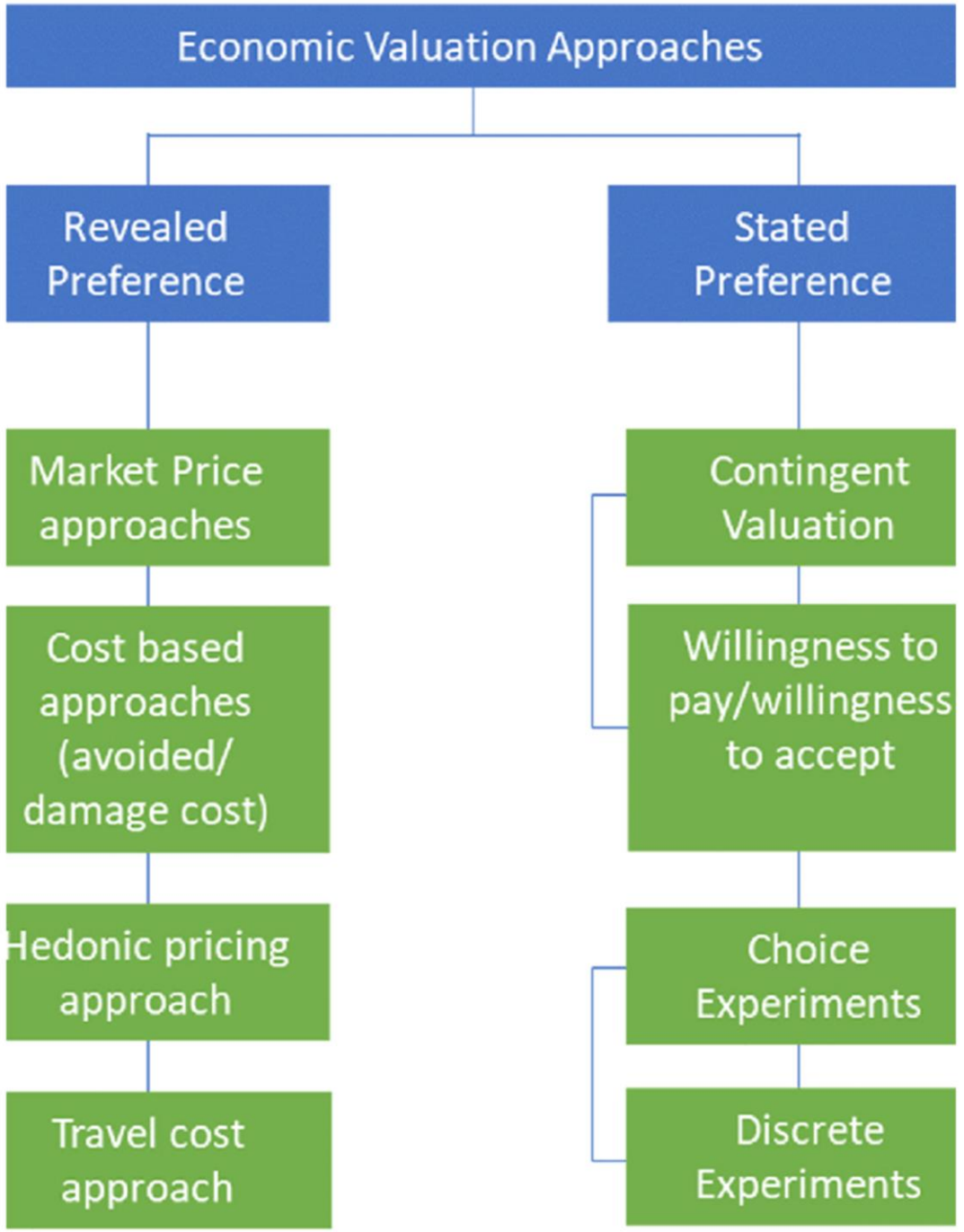
Key elements economics

Economic valuation of benefits

One study found that rental rates of commercial office properties were about 7 percent higher on sites having a quality landscape, including trees.

Studies on how trees affect shoppers' behaviour in retail business districts employ the contingent valuation method.

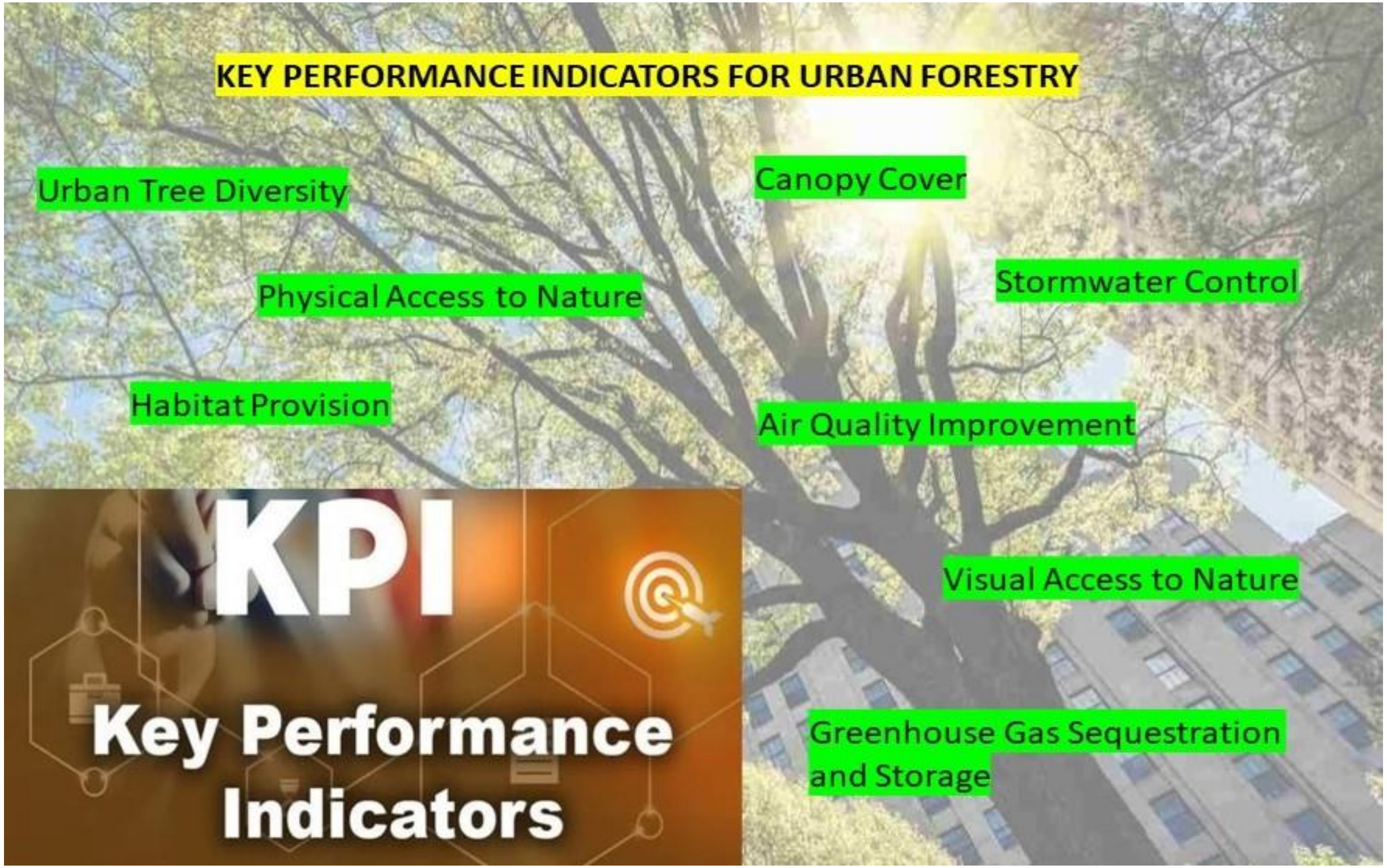
Consumers claim they are willing to pay about 9 to 12 percent more for products in downtown shopping areas with trees, versus in comparable districts without trees.



Key Performance Indicators

Key economic dimensions

The KPIs reflect the priorities to expand, protect, improve, and connect urban forests. They display some of the contributions relevant administrations make to people, nature, and the economy through the urban forests. The use of KPIs also reflects their commitment to evidence-based working and to ensuring that there is robust data available to the urban forestry sector to underpin policies and operational decisions.

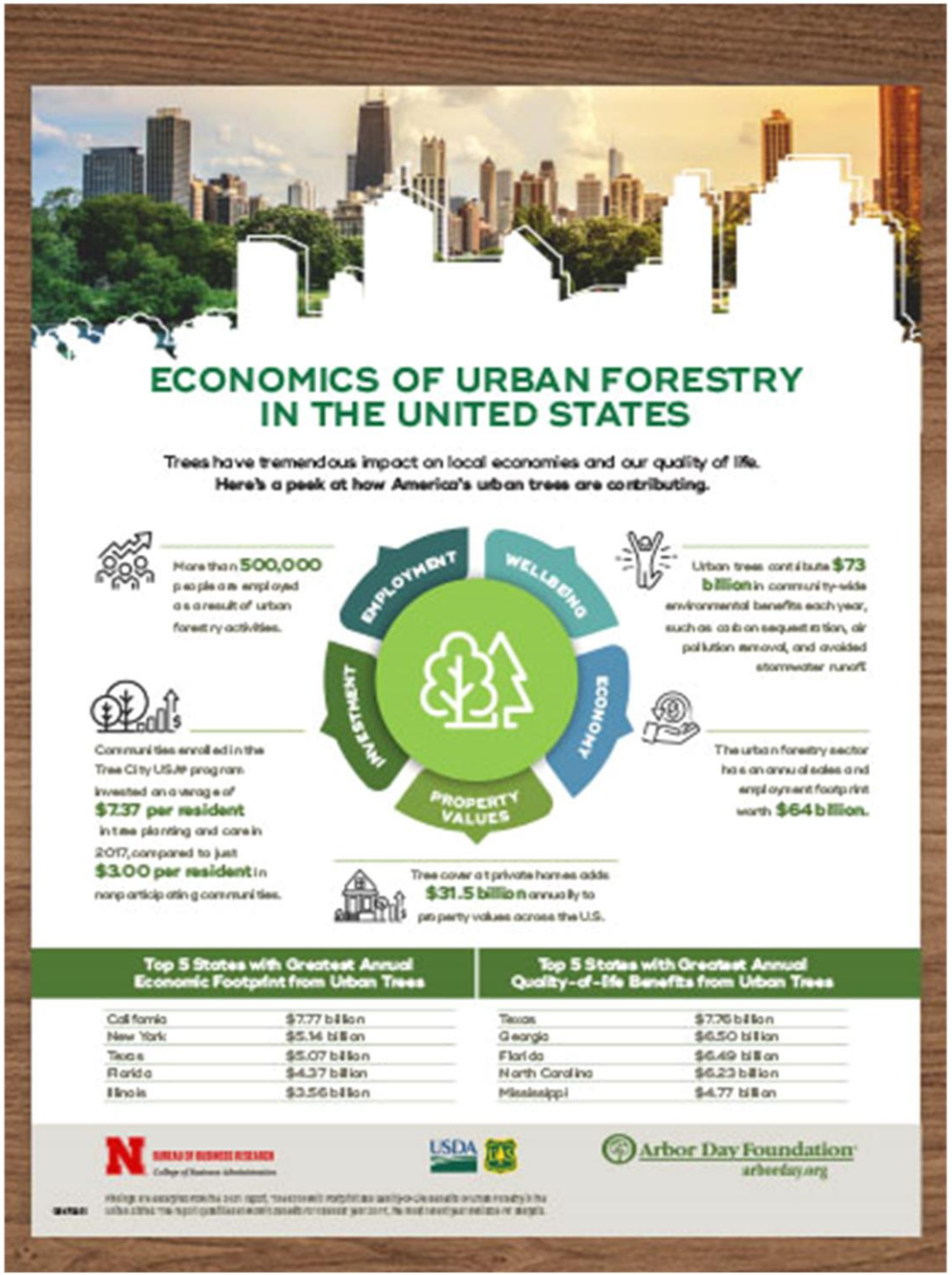


Case studies

Forests and green spaces in urban areas provide more than aesthetic benefits.

Where there are trees, there are reduced energy costs, decreased stormwater treatment costs, increased property values, increased spending at stores, increased employee satisfaction, and lower health care costs through cleaner air and increased recreational opportunities.

Researchers at the USDA's Forest Service found that U.S. urban forests save $7.8 billion annually in avoided residential heating and cooling costs and an additional $3.9 billion in avoided emissions



Case studies

Case studies

Seattle’s Urban Forest Stewardship Plan (Washington, USA)

The City of Seattle introduced the Urban Forest Management Plan in 2007 as a guiding document to help address the needs of the local urban forest. The plan set a goal to increase the city’s canopy cover to 30 percent by 2037. Resulting achievements include:

– Creating the Urban Forestry Commission
– Creating a new, permanent position to grow and manage reLeaf
– Completing an online map of street trees
– Adopting a “Green Factor” policy for new developments
– Using i-Tree Eco to analize the structure, function, and economic benefits of Seattle’s urban forest
- Being named by American Forests as one of the top ten best cities in the US for urban forestry

Case studies

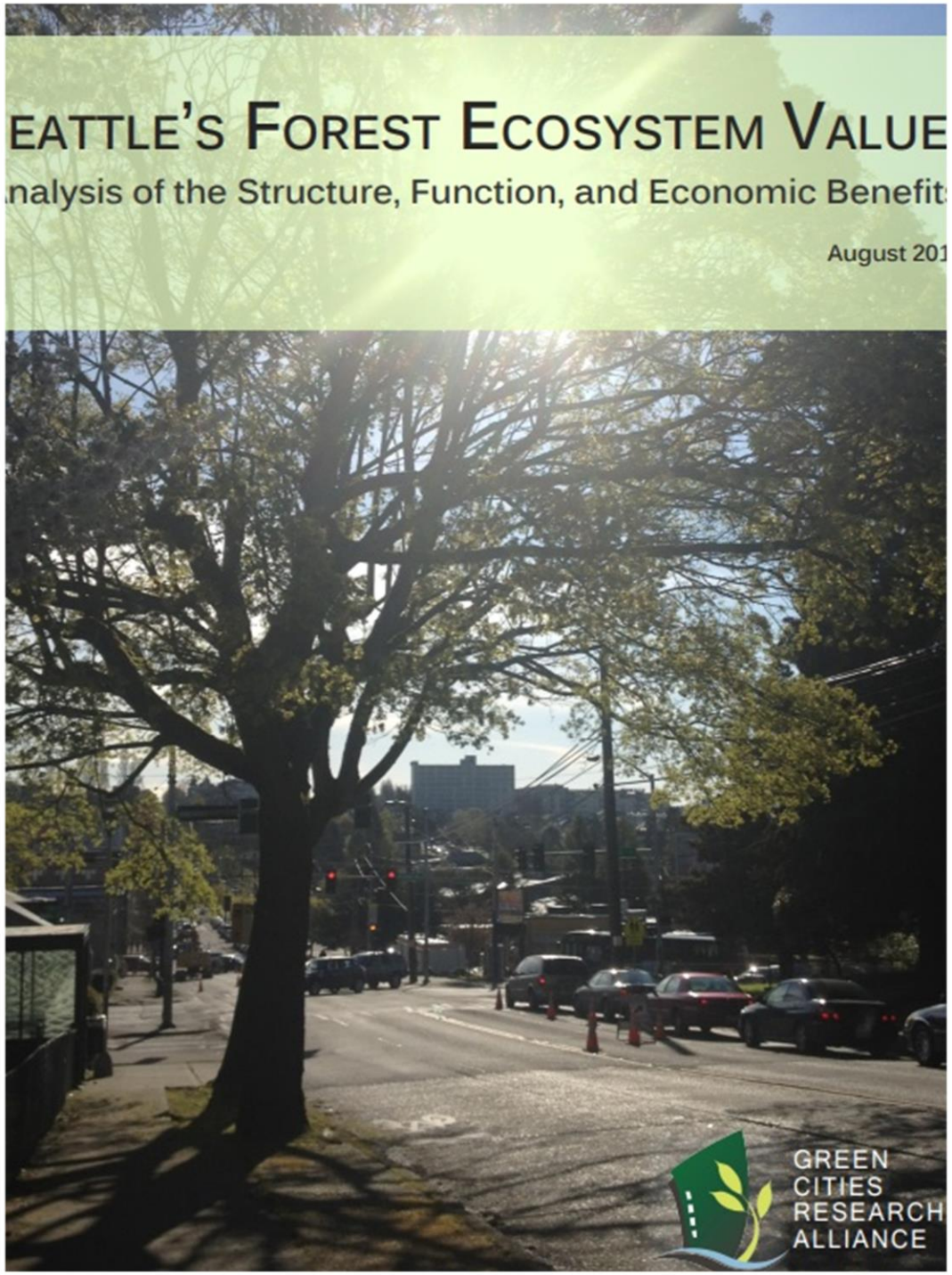
Case studies

Seattle's Urban Forest Stewardship Plan (Washington, USA)

An estimated 2 million metric tons of carbon dioxide equivalent is stored in Seattle's urban forests with an additional 140,000 metric tons of carbon dioxide equivalent sequestered annually. These carbon benefits are estimated to equal $10.9 million in savings from carbon storage and $768,000 annually from carbon sequestration.

The forest in Seattle removes 725 metric tons of pollution from the environment every year, providing a pollution removal value of $5.6 million annually.

Seattle's urban forest reduces energy use in residential buildings by 166,000 million British thermal units of natural gas and 43,000 megawatt hours of electricity, for an annual savings of



Case studies

Case studies

Municipal Forest Resource Analysis (Boise City, Idaho, USA)

Electricity saved annually in Boise from both shading and climate effects of the trees totals $184,117 and annual natural gas saved totals $147,639 for a total energy cost savings of $331,756 or $14 per tree.

Citywide, Net CO2 reduction valued at $6,060 or $0.26 per tree. Net annual air pollutants removed, released, and avoided are valued at $6,292 or $0.27 per tree. Boise's trees intercept rain, reducing stormwater runoff with an estimated value of $96,238, at $4 per tree.

The estimated total annual benefits associated with aesthetics, property value increases, and other less tangible improvements are approximately $561,917 or $24 per tree on average. The grand total for all annual benefits — environmental and aesthetic

Case studies

Case studies

Benefits and Costs of Street Trees in Lisbon, Portugal

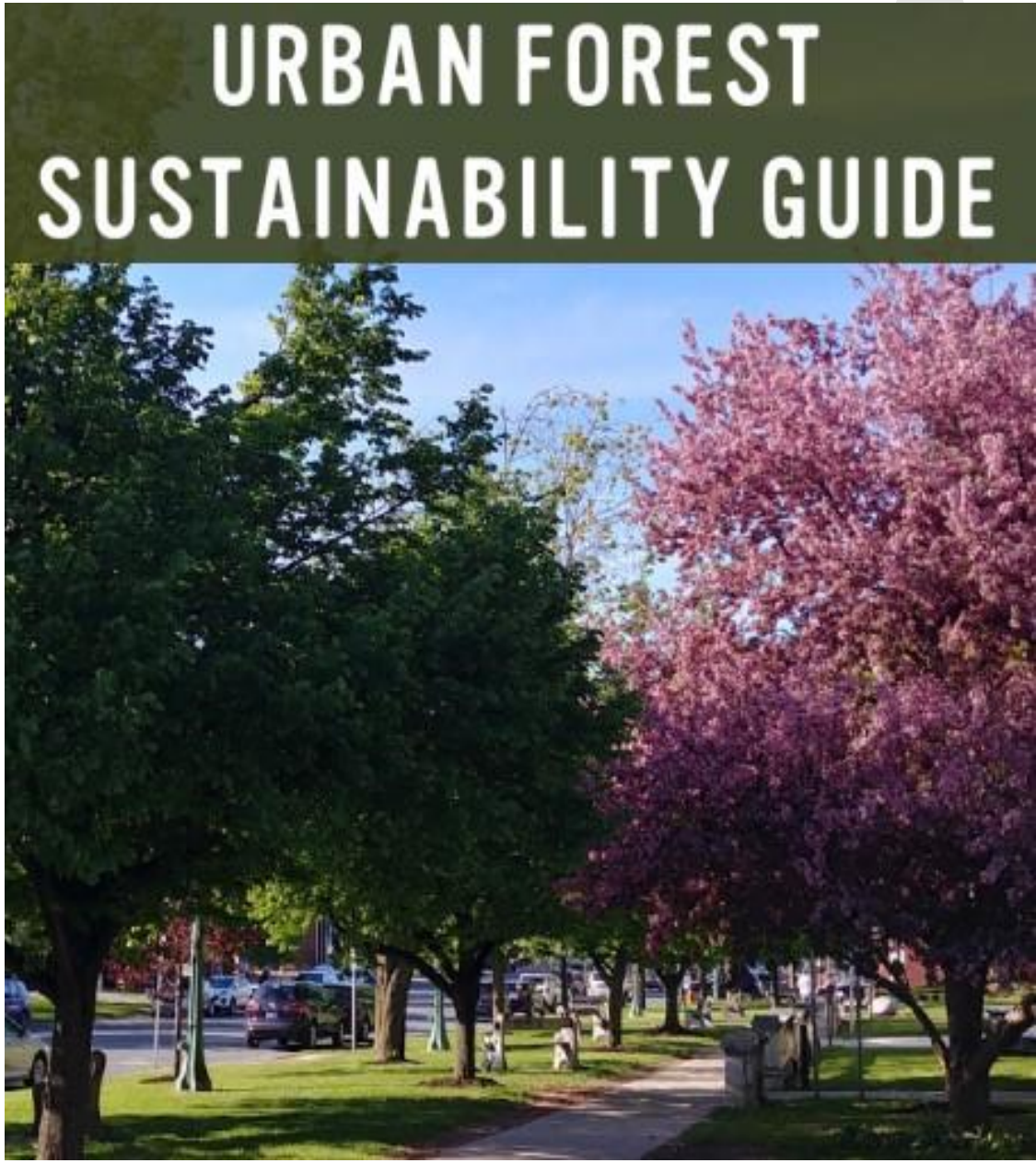
The computer tool i-Tree STRATUM was used to calculate the benefits of urban trees in Lisbon, Portugal. Lisbon's street trees are dominated by *Celtis australis*, *Tilia spp*., and *Jacaranda mimosifolia*, which together account for 40% of the urban trees.

- For every $1 invested in tree management, residents receive $4.48 in benefits.
- The value of energy savings ($6.20/tree), CO2 reduction ($0.33/tree) and air pollutant deposition ($5.40/tree) were found.
- The large values associated with stormwater runoff reduction ($47.80/tree) and increased real estate value ($144.70/tree) were substantially greater than values obtained in U.S. cities.

Pathway to a Sustainable Urban Forests

Transition from the current urban forestry policy and practices to a sustainble ones could be done with a plan which will identify opportunities to lead initiatives that will contribute to the effective management, protection, enhancement, and growth of urban forest.

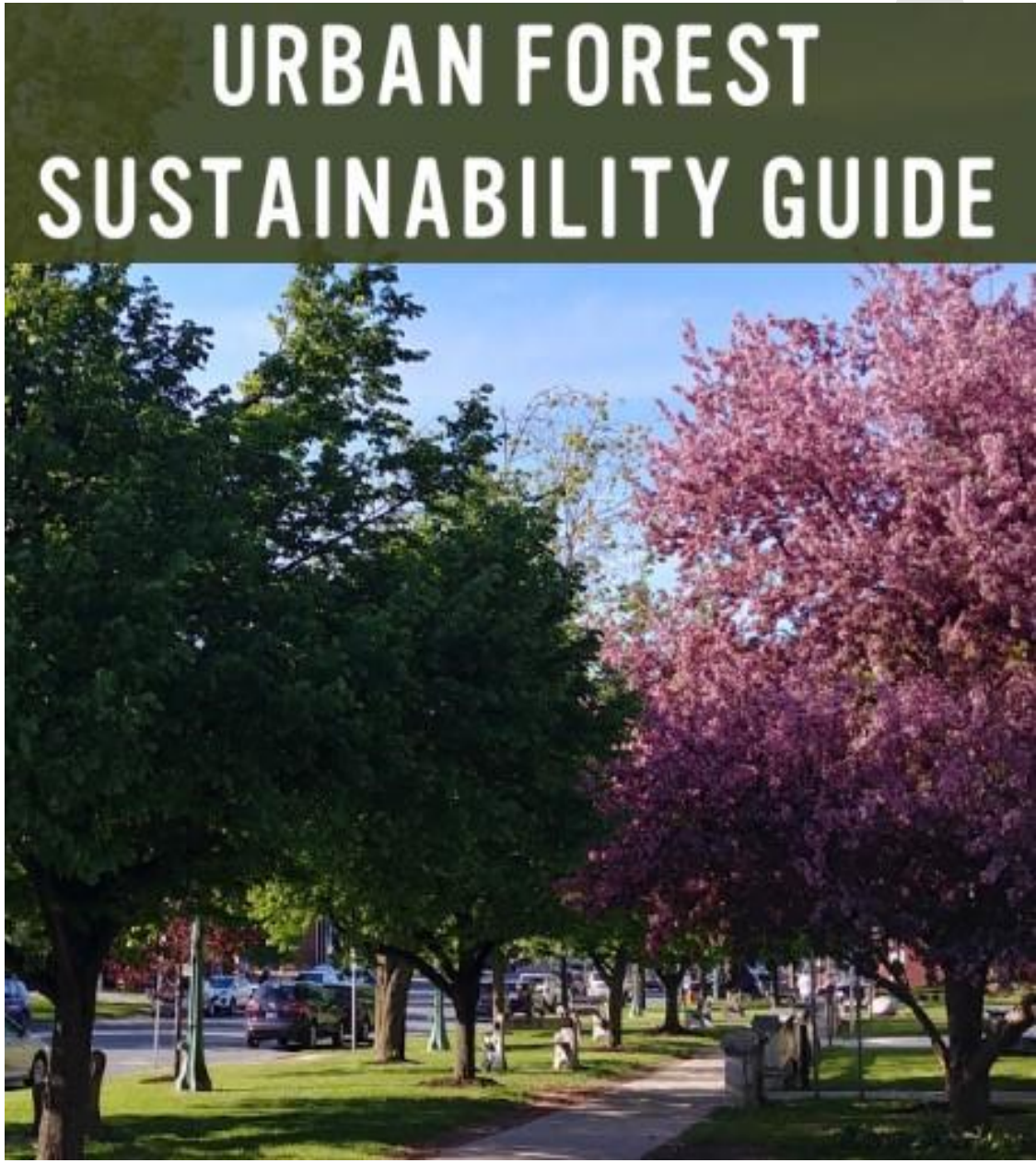
The plan should align with multiple strategic priorities. The Plan should also identify multiple internal and external stakeholders to support the work.



Pathway to a Sustainable Urban Forests

The following actions and more are needed:

- Incorporation of additional urban forestry considerations in planning and development processes
- Enhancement of tree planting opportunities in consultation with internal and external partners
- Securing funding for urban forestry initiatives through internal and external sources
- Designing and implementing an integrated tree inventory and work order management system
- Developing a formalized asset valuation approach for trees
- Delivering education and outreach initiatives for staff and the public.




An Urban Forest
Master Plan for
Birmingham
2021-2051
Executive Report
Birmingham
City Council
NATURE BASED
SOLUTIONS
Treeconomics

This rule in urban forestry and urban greening argues that everyone should be able to see **at least 3 trees** from home; with a **30 % vegetation cover** in each neighbourhood and the nearest park being a **maximum of 300 meters away**! (Konijnendijk, 2023).

Final remarks

Cities, which are already responsible for around 75% of global CO2 emissions, are also at the forefront of fighting climate change and simultaneously are particularly vulnerable to its impacts.

Urban trees and forests have been highlighted as a solution that can help to achieve the SDGs and make the cities resilient to the future impact of larger populations, higher temperatures, pandemics, weather extremes and natural disasters.

https://unece.org/media/news/366653
https://treesincities.unece.org/

Final remarks

Final remarks

Sometimes called a nature-based solution, sustainable urban forestry was identified by experts from national governments, city governments and civil society as a cost-effective option to future-proof.

Highlighting the contribution of urban forests to sustainable development and climate action, the European Union, is discussing moving towards legally mandated targets to increase green spaces and canopy cover in European cities up until 2050.

https://unece.org/media/news/366653
https://treesincities.unece.org/

Final remarks

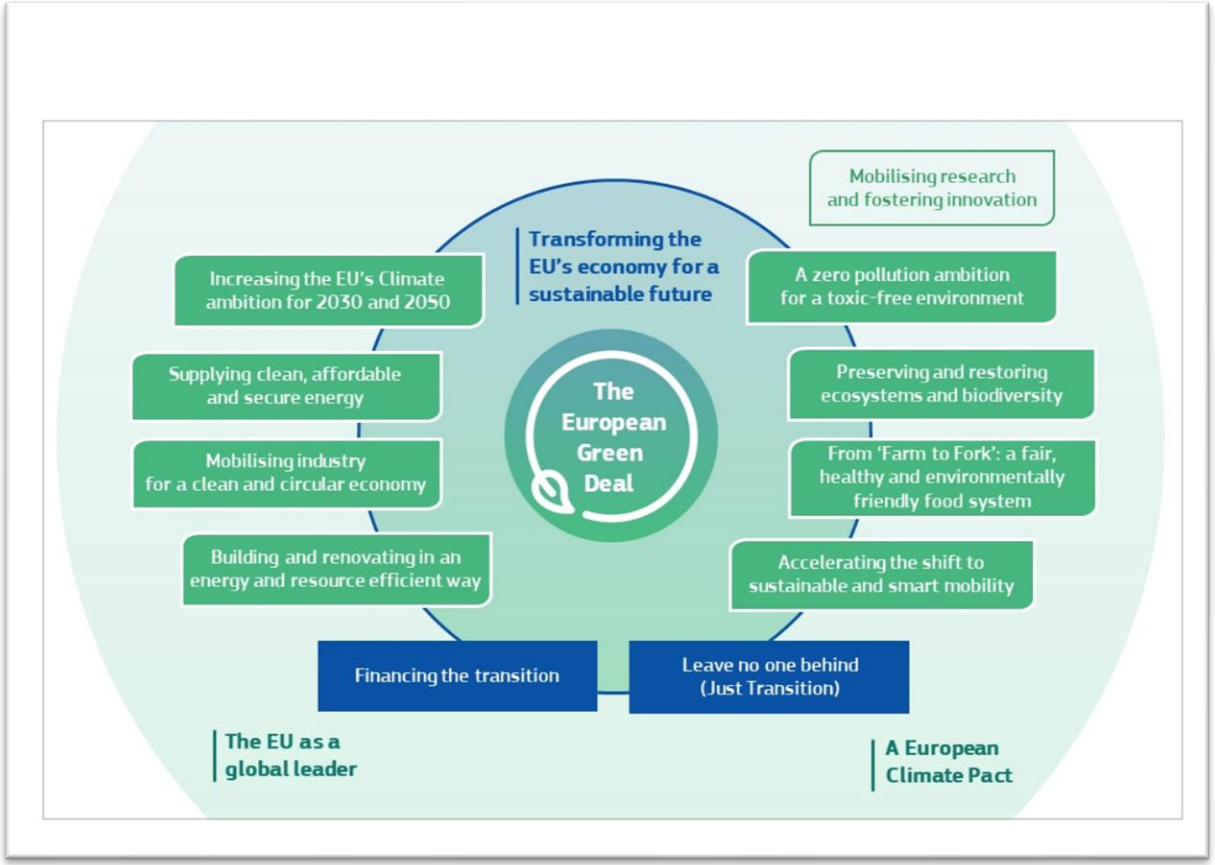
Final remarks

The new EU forest strategy for 2030 is one of the flagship initiatives of the European Green Deal and builds on the EU biodiversity strategy for 2030.

The strategy will contribute to achieving the EU's biodiversity objectives as well as greenhouse gas emission reduction target of at least 55% by 2030 and climate neutrality by 2050.

It recognizes the central and multifunctional role of forests, and the contribution of the entire forest-based value chain for achieving a sustainable and climate neutral economy.

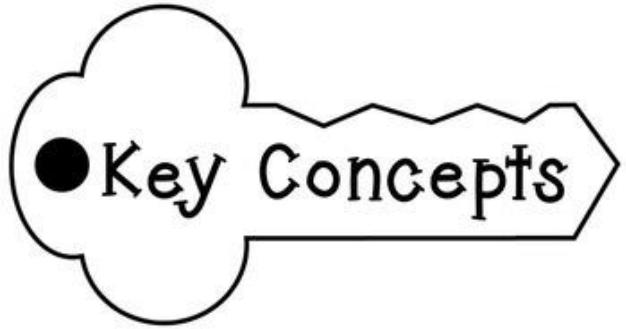
https://environment.ec.europa.eu/strategy/forest-strategy_en



Key concepts

Urban forestry

A specialized branch of forestry which has as its objectives the cultivation and management of trees and forests within cities for their present and potential contribution to the physiological, sociological and economic well-being of urban society.



Urban Green Space (UGS)

Urban land, partly or completely covered with grass, trees, shrubs, or other vegetation. Urban Green Space includes parks, community gardens and cemeteries, but also rooftop gardens and vertical gardens, meadows and woods. UGS is also referred to as blue-green zone, because urban water such as ditches, canals, inland waterways and rivers and riverbanks, is considered as UGS.

Green infrastructure (GI)

A strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services such as water purification, air quality, space for recreation and climate mitigation and adaptation. This network of green (land) and blue (water) spaces can improve environmental conditions and therefore citizens' health and quality of life. It

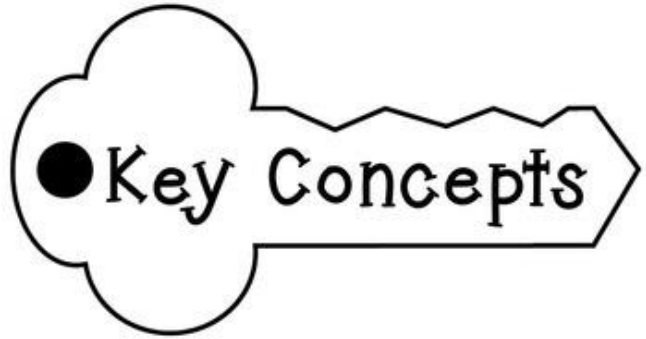
Key concepts

Ecosystem services

The benefits that flow from nature to people. They can be provisioning (e.g. the supply of food, clean air and water and materials), regulating (e.g. water and climate regulation, nutrient cycling, pollination, or the formation of fertile soils), or cultural (e.g. recreation opportunities, or the inspiration we draw from nature).

Economic benefits of green space

Values quantified in monetary terms. Placing accurate economic values on green infrastructure or its greenspace components is far from easy, but is becoming more important to support the case for sustained investment. Although the vast majority of the evidence points to green infrastructure benefiting many vital aspects of social and environmental sustainability, the challenge is to make decision-makers and others aware of the evidence, including the economic value of such benefits, and to help the Government to meet policy objectives in the best possible way.



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QUESTIONS & ANSWERS

THANK YOU

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Co-funded by the Erasmus+ Programme of the European Union