Nature based solutions and ecosystem-based approaches in an urban context

Ine Vandecasteele – Expert, Urban Adaptation

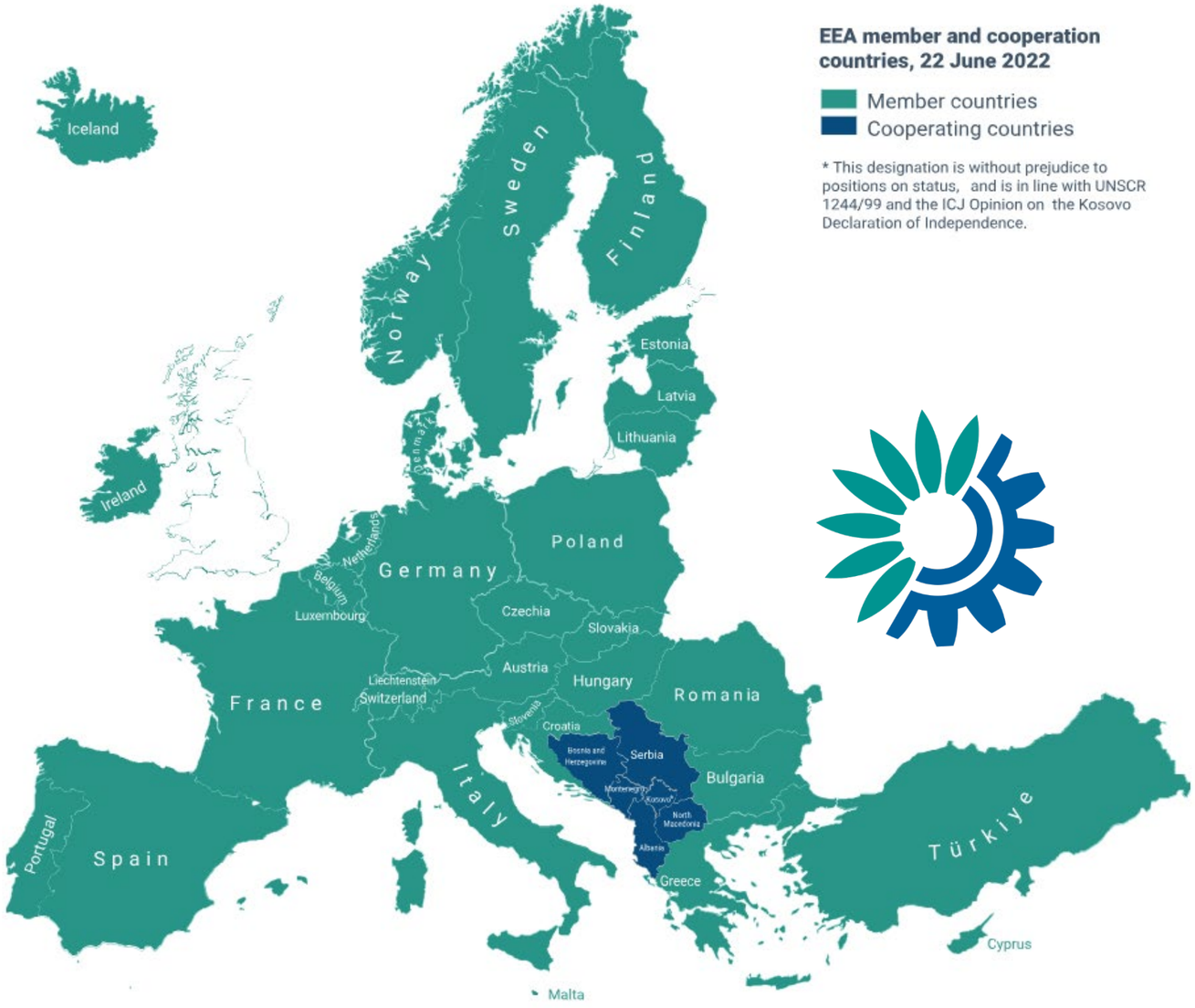
Interreg webinar: Greening the urban landscape, 24 October 2024

European Environment Agency

European Environment Agency

- An agency of the European Union that delivers data and knowledge to *inform decision-makers and the public* about the state of Europe's **environment** and **climate**.

- In collaboration with the ***European Information and Observation Network (EIONET)***, >1000 experts from 350 institutions in 38 European countries



European Environment Agency

highlighting the need for accelerated climate action

[European Climate Risk Assessment]

[Urban adaptation in Europe: What works?]

[Responding to climate change impacts on human health]

[*Preparing society for climate risks in Europe – lessons and inspiration from Climate-ADAPT case studies]

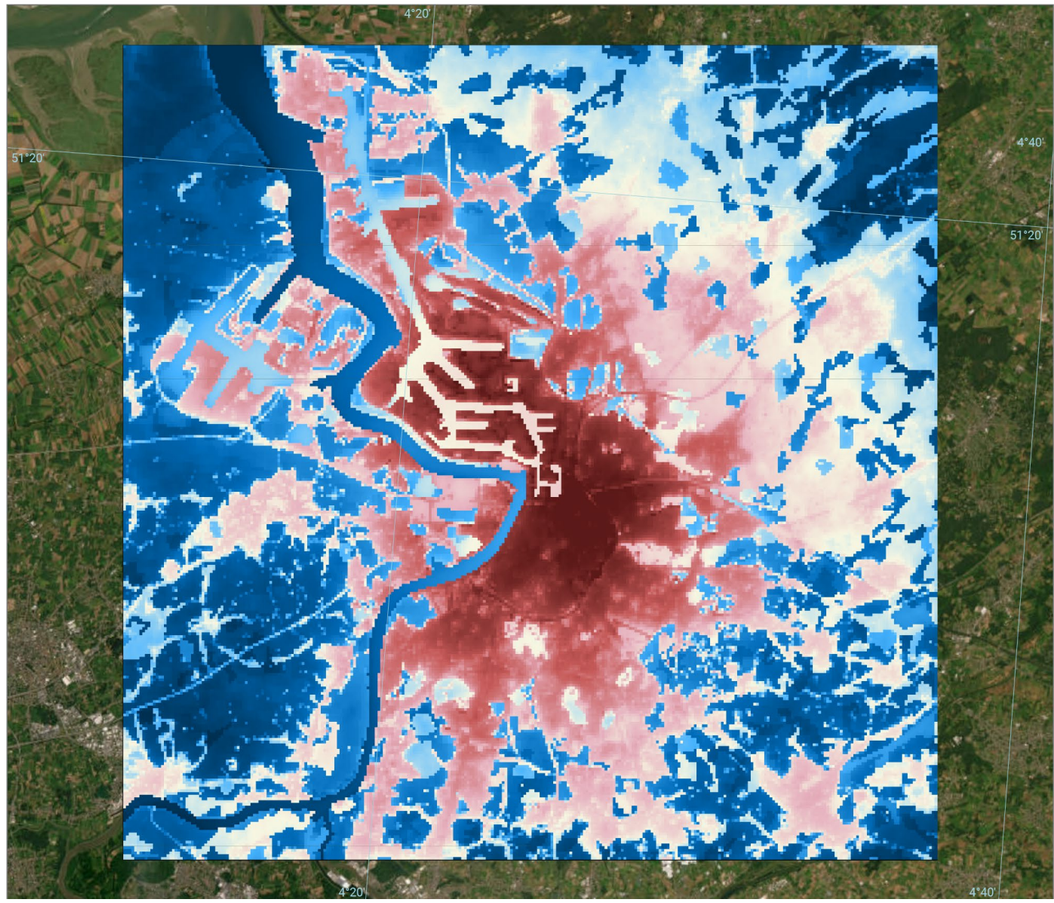
European Climate Risk Assessment

A comprehensive assessment of current and future climate risks in Europe

Leena Ylä-Mononen

EEA Executive Director

> Our new analysis shows that Europe faces urgent climate risks that are growing faster than our societal preparedness. To ensure the resilience of our societies, European and national policymakers must act now to reduce climate risks both by rapid emission cuts and by strong adaptation policies and actions.



Urban heat island effect, Antwerp, Belgium.
Copernicus Health Services/VITO

European Climate Risk Assessment

How are cities adapting to climate change?

35%

Physical & Technological

- Grey Infrastructure
- Early warning systems

27%

Nature-based Solutions

- Green & Blue infrastructure

Governance & Institutional

- Planning, regulations, networks

20%

3%

Economic & Finance

- Incentives, insurance

15%

Knowledge & Behavioural

- Awareness raising
- Capacity building

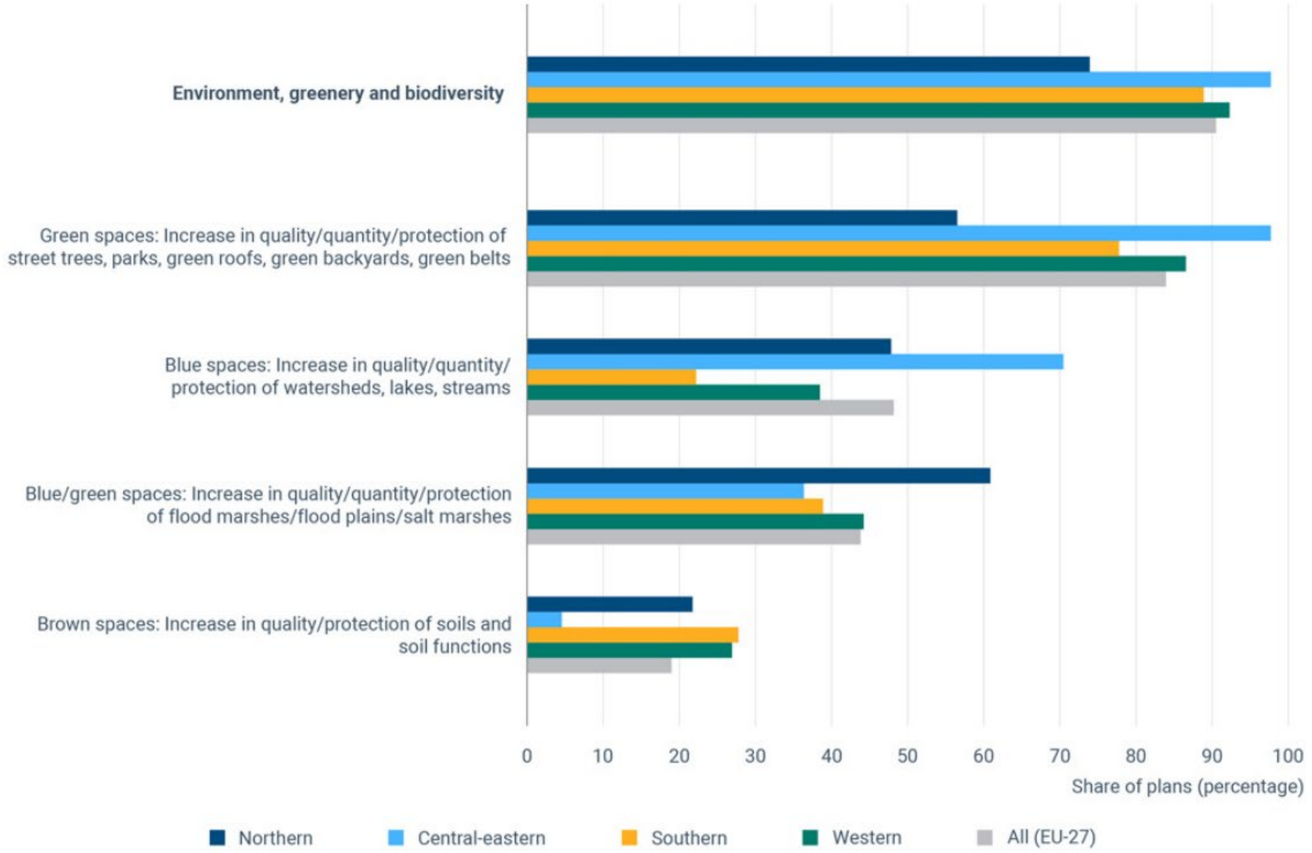
Share of reported actions by cities
CDP, 2022

Urban adaptation in Europe: what works?

Nature-based solutions in urban areas

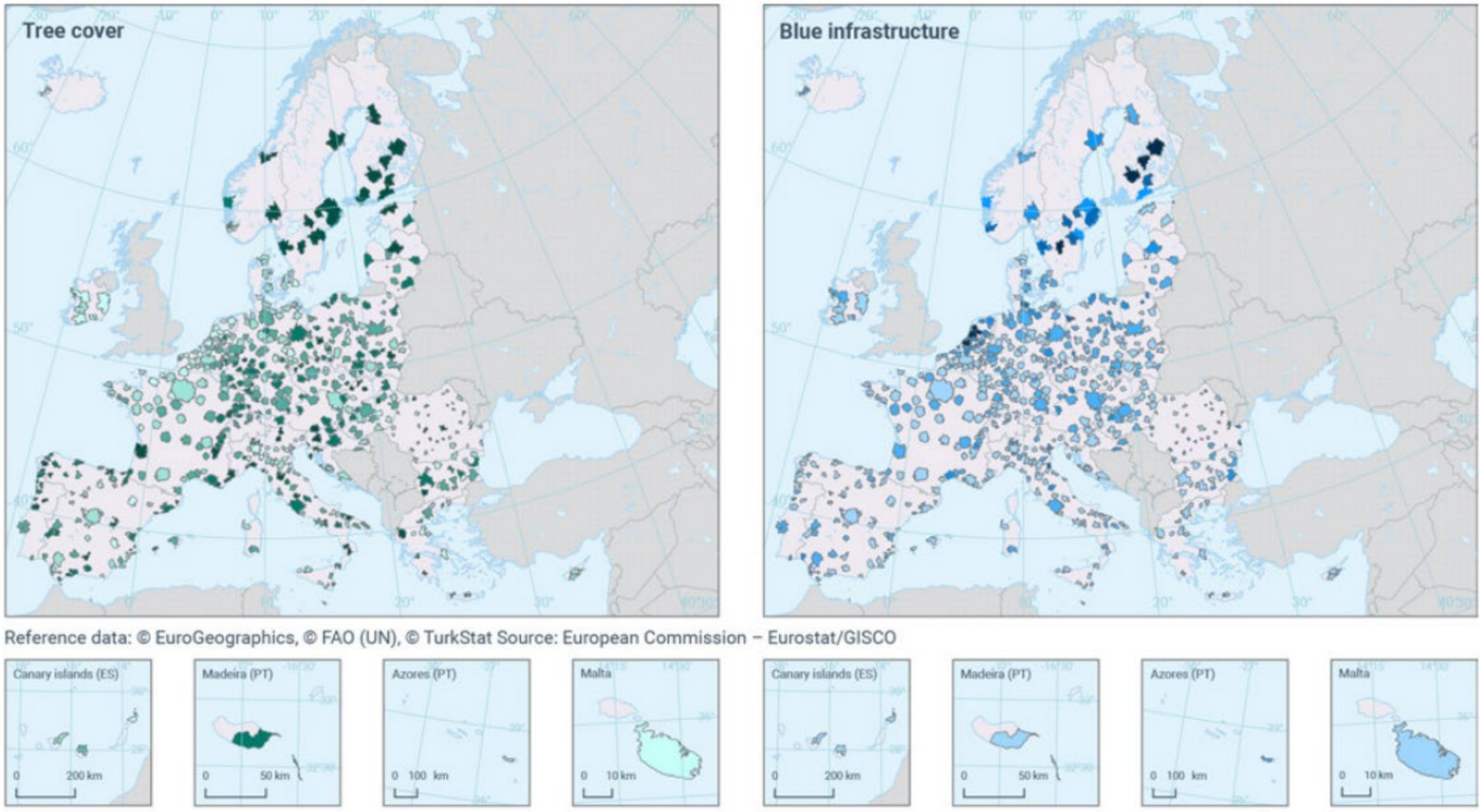
Sub-KTM	Elements	Urban examples
Green options	Creation of new/ improvement of existing green infrastructures	• afforestation • revegetation • green roofs and facades • urban farming
	Natural and/or semi-natural land-use management (Brown Options)	• avoidance of soil sealing • soil remediation
Blue options	Creation of new/ improvement of existing blue infrastructure	• retention ponds • blue-green roofs • aquatic buffer strips • rainwater harvesting • sustainable urban drainage systems
	Natural and/or semi-natural water and marine area management	• wetland restoration • flood plain restoration

Figure 8.1 **Share of local climate adaptation plans that include actions categorised as 'environment, greenery and biodiversity', by European region**



Source: Reckien et al., 2022.

How green are our cities?



Source: EEA, derived from Urban Atlas, Copernicus, 2018.

*__Green infrastructure__ is **42%** of the city area in 38 EEA member countries. (96% in Cáceres, ES; just 7% in Trnava, SK)

*average __urban tree cover__ **30%,** (highest in Finland & Norway; lowest in Cyprus, Iceland & Malta)

Implementing Nature-based solutions

Opportunities

*__Essential adaptation measures__: providing additional cooling and water regulation, combatting heatwaves and both flooding and droughts

*__Multi-functionality__: recreation potential, mental health, biodiversity gains

*Transformative, '***No regret***' measures, contributing towards both mitigation and adaptation goals, as well as longer-term environmental sustainability and quality of life

**May be more efficient and cheaper*

! Potential for the integration of 'green with grey'

A smart blue-green roof in Amsterdam © Dakdokters

Residents and visitors alike are encouraged to pick whatever they like from Andernach's gardens

Implementing Nature-based solutions

Challenges

***Long-term political and financial support**

***Technical capacity needed**

*Potential health concerns

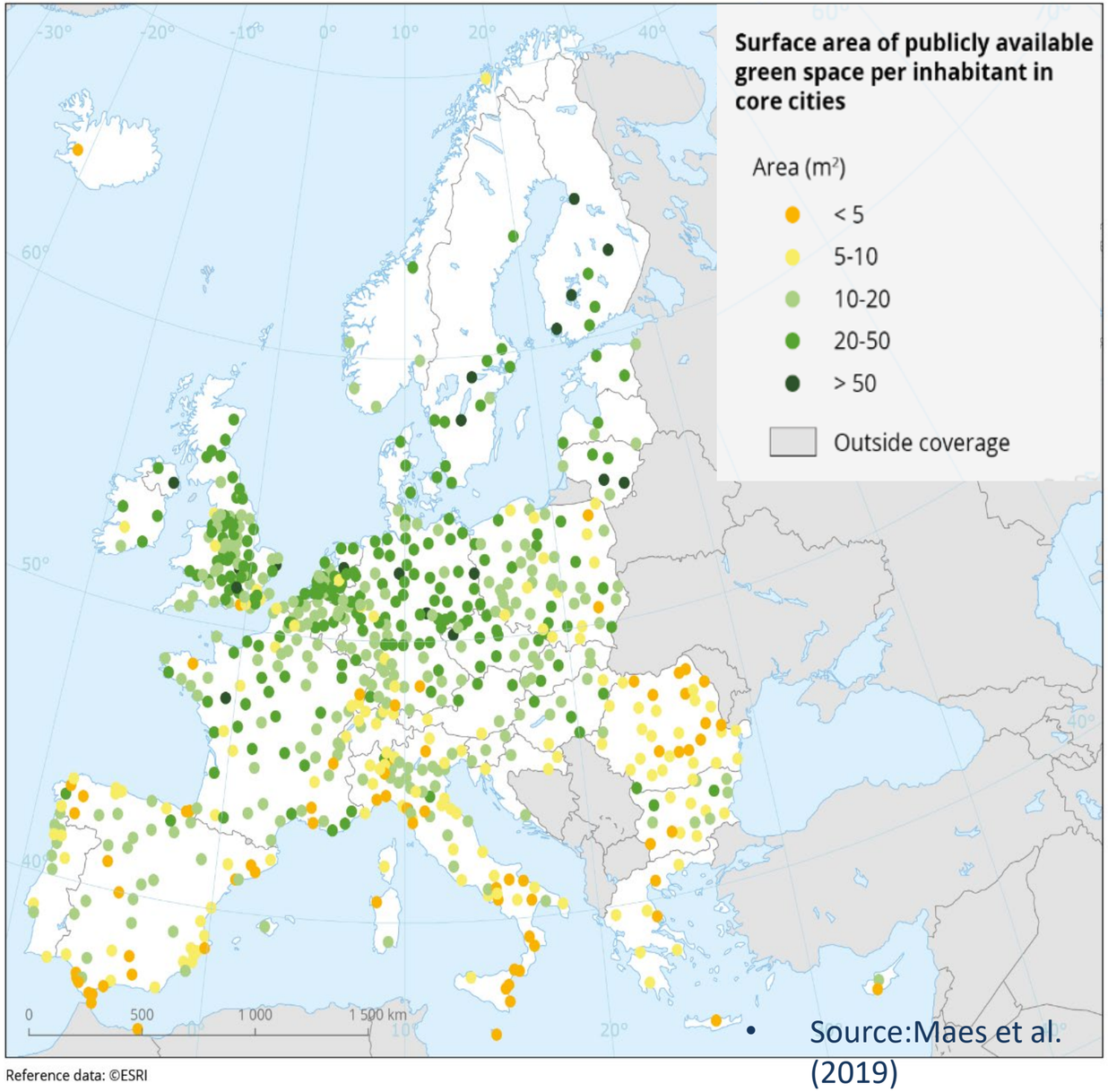
*Competition for space

*Suitability of GI for future climate

*Maintenance

Equity: green space is less available in lower income neighbourhoods

**Only 44% of Europe's urban population reside within 300m of green space.*



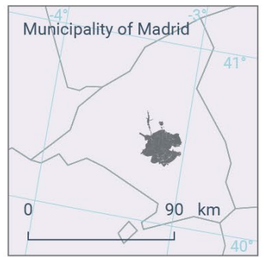
- Source:Maes et al. (2019)

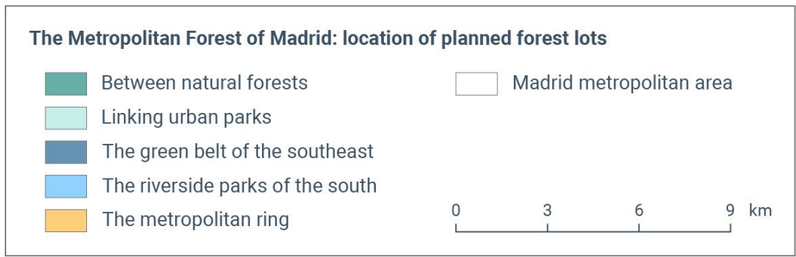
Example: The Metropolitan Forest of Madrid

The City of Madrid promoted the creation of a forested green ring around the dense urban centre known as the Metropolitan Forest of Madrid. It is part of the municipal plan Madrid 360 drafted to meet emission reduction targets agreed by the European Commission and the Climate-KIC Sustainable and Healthy Cities Demonstrator, and developed with the scope of becoming a climate-neutral city. The forest should bring multiple benefits such as climate change mitigation and adaptation, biodiversity support and social cohesion.

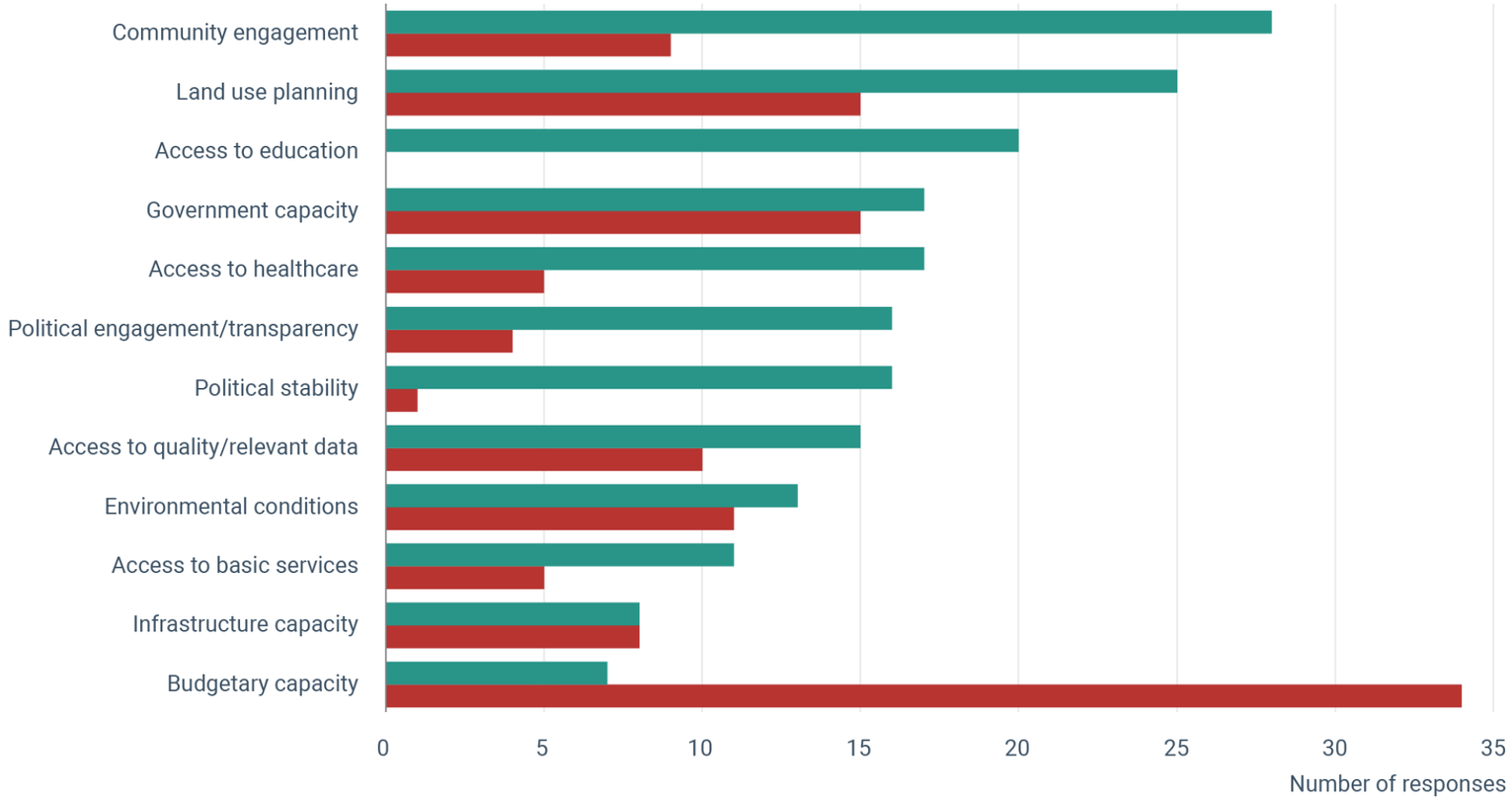
2 million trees will be planted in a 75km forest belt which has a total area of 32,035ha, 81% of which are existing natural environments (Map 8.2). The trees will be planted over the next 10 years in 2,300ha of residual peripheral land, 50% of which is privately-owned. Specific plans for the five parks have been developed through an international competition. The project has recently demonstrated some of the constraints faced by such extensive green infrastructure projects. These include the impact of extreme weather on the newly-planted trees (e.g. during periods of drought, storms or heavy snowfall) and also the struggles related to land ownership.

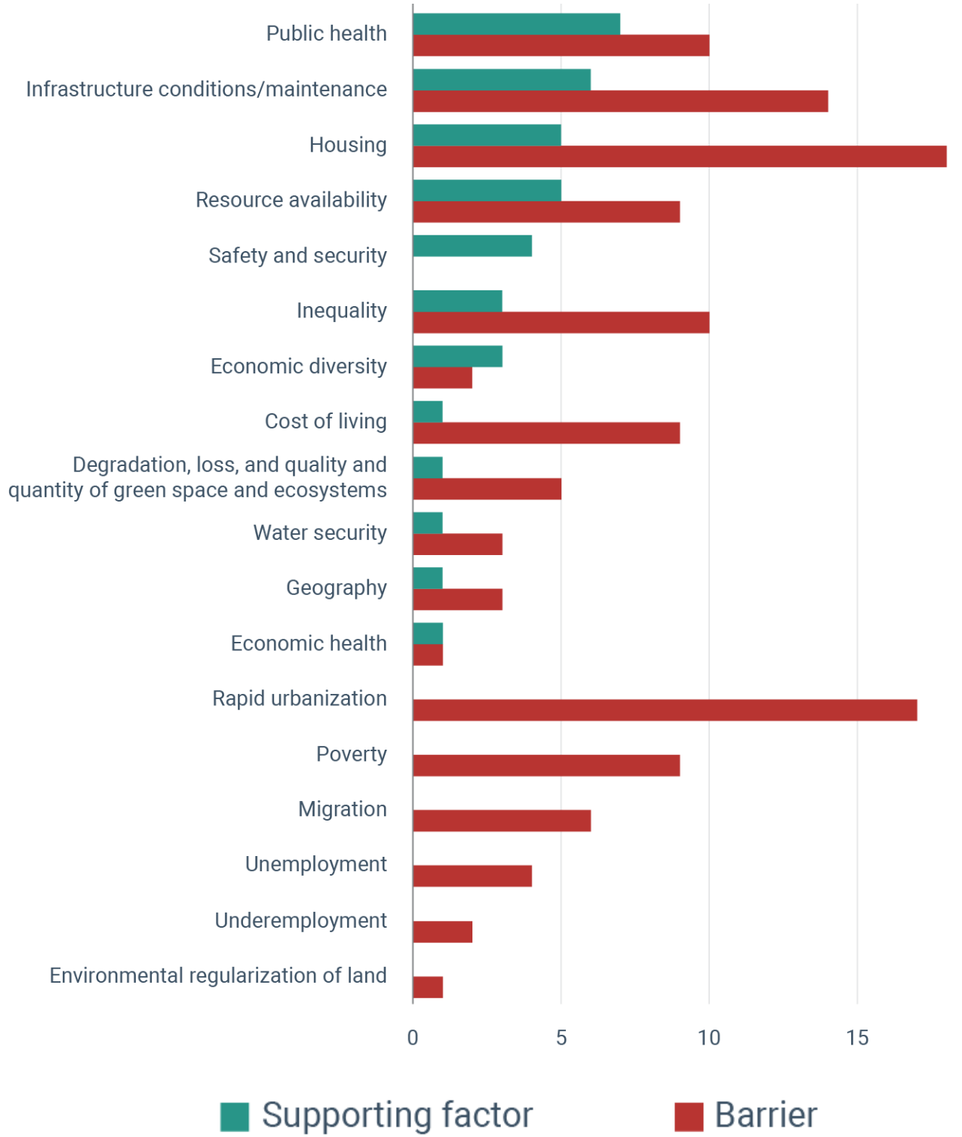
Reference data: © Gob. España, C. y León, Gob. España, Madrid, scne.es, Earthstar Geographics





Planned areas for integration of green infrastructure in Madrid, Spain under the Metropolitan Forest project





Enabling factors

* ***Community engagement***
* ***Budgetary capacity***
* Long-term political commitment
* Knowledge and data
* Networks & peer-learning

CDP, 2023

Enablers: citizen engagement

**Awareness raising can be paired with real action, engaging citizens and achieving tangible results. E.g. 'Tile-tipping' (tegelwippen) championship in the Netherlands – now also done in Belgium – increased the amount of green space by 140,000m2*

**Most reported enabling factor for the implementation of adaptation by cities*

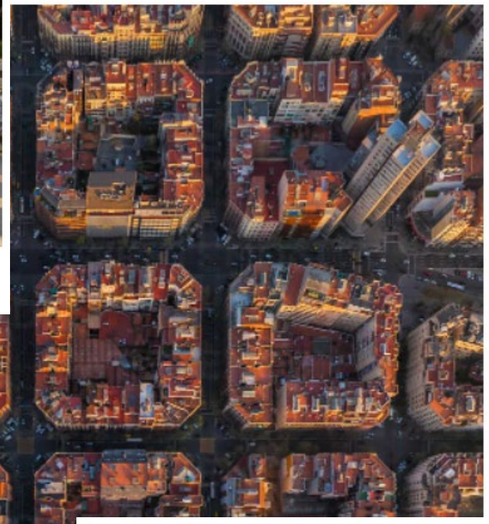
*Awareness of climate change has risen over the last decade and is currently generally high: **80%*** of Europeans scored climate change as 'a very serious problem' (EIB Climate Survey).

*But only ***40%*** of local action plans in Europe identify the public as stakeholders

*Copenhagen May 2022

Enablers: Governance

Public space in a Superblock.
Image source: Ajuntament de Barcelona



Aerial view above of Barcelona superblocks, Spain.
Image Copyright: Westend61 / Amazing Aerial

City Planning → creating space for blue-green infrastructure

Ghent introduced its *circulatieplan* in 2017, transforming the city for its residents. Photograph: Steven Van Aerschot/Alamy

© [illegible] TH Treibhaus Landschaftsarchitektur, Luftbild Matthias Friedel

*Hamburg's green roof strategy, aiming to green 70% of suitable buildings. Munich, Stuttgart & Berlin have mandatory green roof policies on new buildings with large flat roofs. 25% of German cities subsidize green roofs.

*Norway: Central government requires municipalities to first consider NBS options for adaptation, need to justify if they are not used

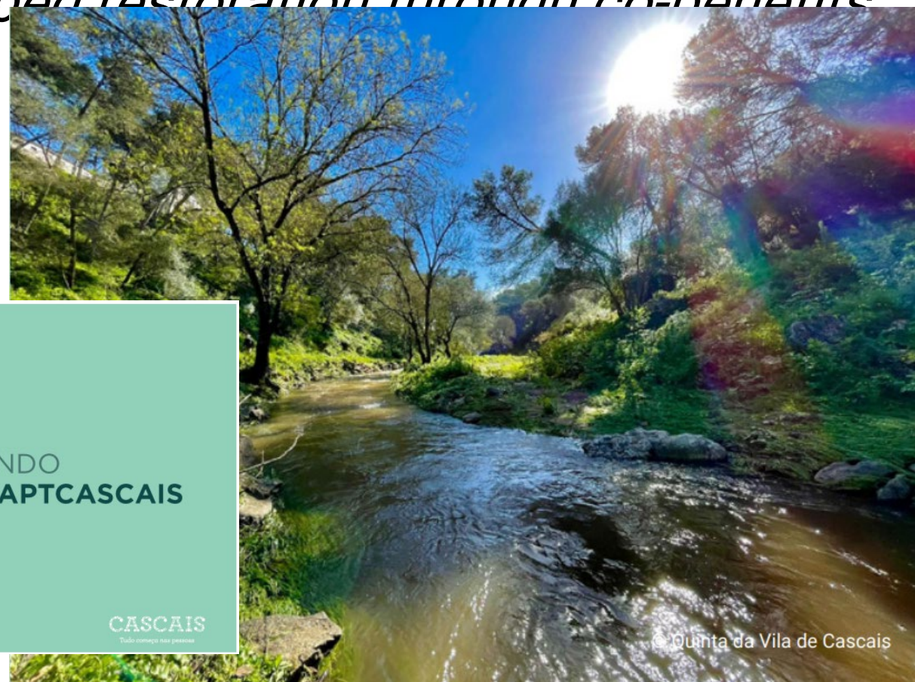
Examples: Long-term financing and funding

**Closely linked to sustained political support as well as size of municipality*

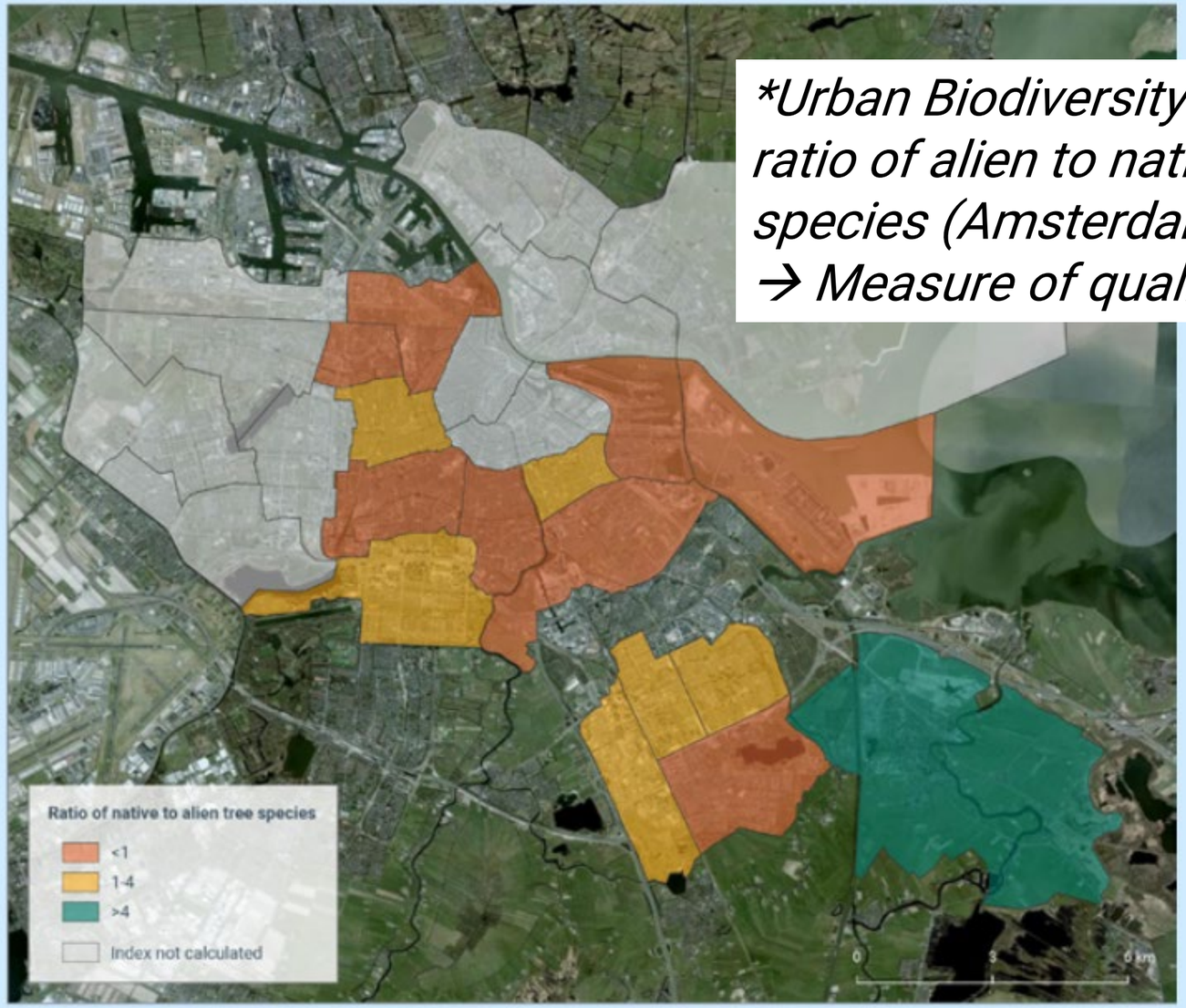
**AdaptCascais Fund – inclusive, dedicated budget for citizen-proposed projects*

**Riverbed restoration through co-benefits*

**IGNITION project, Greater Manchester*
→ Boosting private investment



Enablers: Knowledge & Data



Reference data: © Esri, Maxar, Earthstar Geographics, and the GIS User Community

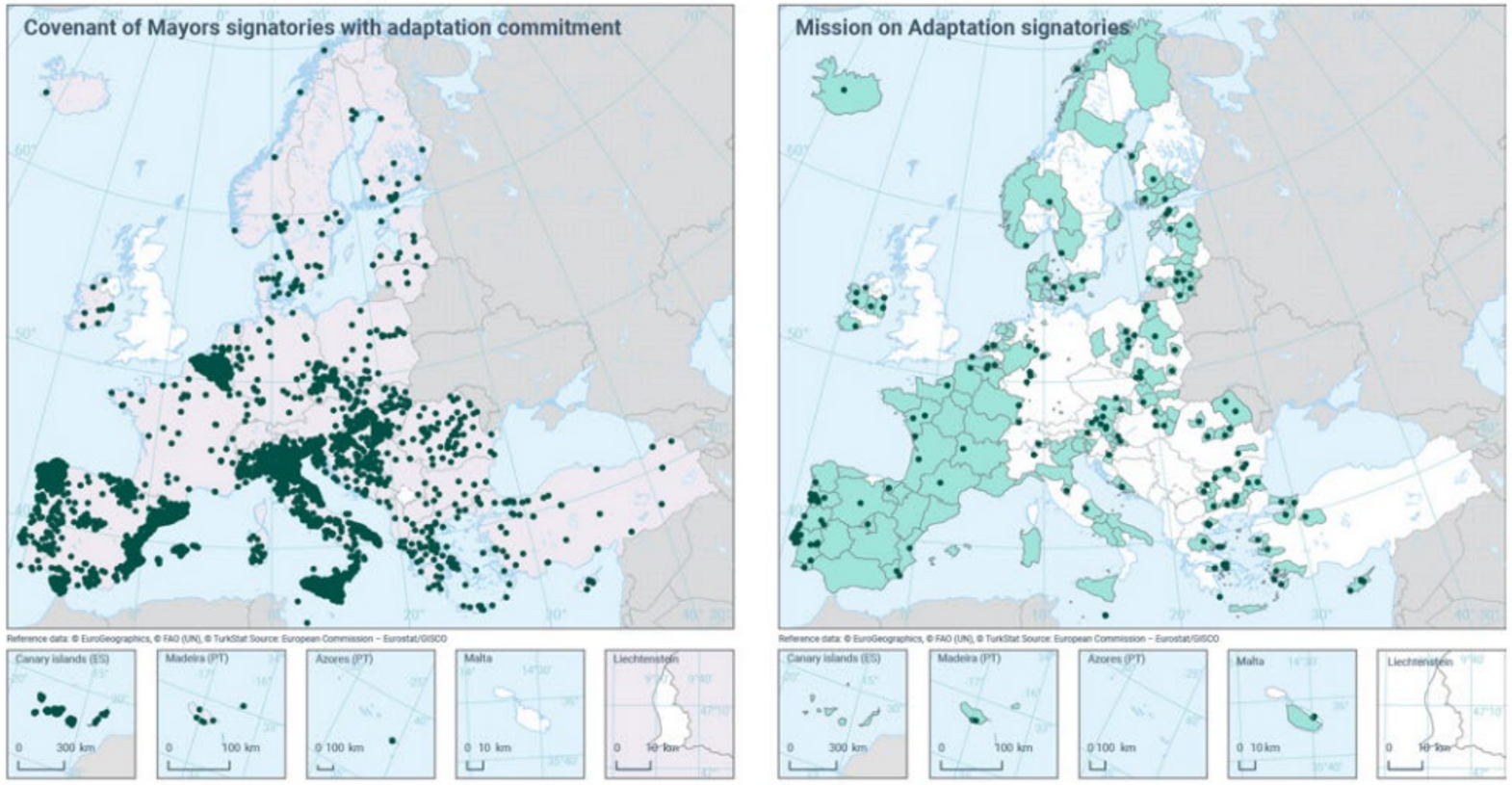
Source: National Observatory of Athens.

**Urban Biodiversity index: ratio of alien to native species (Amsterdam)*
→ Measure of quality of GI

**Overcoming competition for space: proving higher efficiency of solar panels when combined with green roofs (Urban PhotoSynthesis project, Amsterdam)*

! Knowing how to implement and monitoring of outcomes essential

Enablers: Networks & Peer learning



Source: EU Covenant of Mayors for Energy and Climate, Mission on Adaptation Secretariat.

Overview of platforms and repositories on NBS in Europe

The Connecting Nature project aims to position Europe as a global leader in the innovation and implementation of NBS and presents several cases of urban applications.

INTERLACE HUB is a community for sharing knowledge, ideas and stories about restoring nature in cities. The hub is a collaboration between Europe and Latin America in using NBS to solve some of the challenges faced in cities.

GrowGreen aims to create climate and water-resilient, healthy and liveable cities by investing in NBS, and presents NBS demonstration projects of several cities across Europe.

Conexusnbs provide accessible knowledge on how to restore natural ecosystems, improve the quality of life in and around cities, and support collaboration between Latin America and Europe.

Oppla provides a knowledge marketplace where the latest thinking on natural capital, ecosystem services and NBS is brought together. It can be seen as the EU repository of NBS.

NetworkNature is a resource for the NBS community, creating opportunities for local, regional and international cooperation to maximise the impact and spread of NBS.

The European Natural Water Retention Measures platform promotes the use of green infrastructure in a range of policies, and gathers information at EU level.

SOLOCLIM is developed as a doctoral training programme that also enables young researchers to generate solutions for the climate adaptation of urban outdoor environments.

The CLEVER Cities project uses NBS to address urban challenges and promote social inclusion in cities across Europe, South America and China.

Climate-ADAPT features a wide range of NBS-focused cases studies.

What now? Signs of hope…

- Citizens increasingly aware of impacts of climate change, potential also for increased private financing for NBS
- Strong political will at EU level, stepping up of work on climate resilience and integration of NBS - **adoption of the Nature Restoration Law, proposed European Climate Adaptation Plan**
- Cities (and all ages) are experimenting, having fun, making adaptation part of increasing overall quality of life…

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ClimateADAPT Platform - https://climate-adapt.eea.europa.eu/

European Environment Agency