

NATURE



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Health and Social Benefits of Nature and Biodiversity Protection



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with thanks for inputs by colleagues:

Konar Mutaoglu & Jean-Pierre Schweitzer (IEEP) and building on work of wider team

Green Week: *Nature – our health, our wealth*

Nature & Health – Session 3.3

4 June from 9.30 – 11.00



ESP / Rudolf de Groot

Objectives of the ongoing study

Understand and communicate benefits of nature for health and social inclusion.

Understand the different stakeholder roles in promoting the health and social benefits of nature.

Assess the scale of the benefits to help communicate the **opportunities of integration** and **taking action** and **improve political will** for action.

Identify the tools that have been (or could be) **successfully used to help map and estimate the health and social benefits of biodiversity.**

Direct and Indirect Health Benefits

Improved **air quality** & health benefits

Noise reduction benefits

Improved **climatic conditions** & avoiding heat stress

More **pleasant & peaceful**, less stressful **environment**

Healthier lifestyles – nature experience

Outdoor recreation and **physical activity**

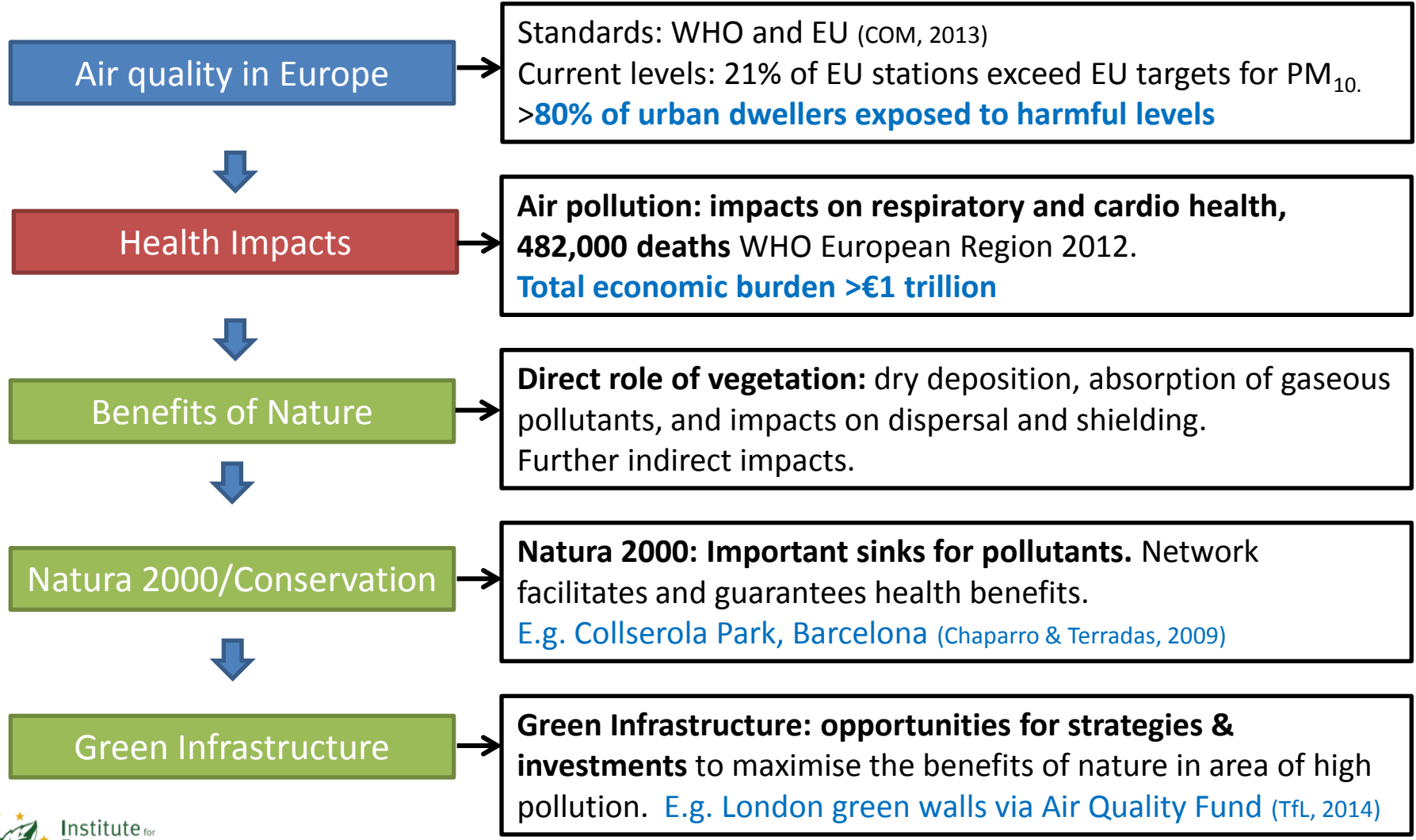
Wellbeing – **living in attractive location**

Promoting social cohesion

Quality of green public spaces, **reduced social tension**

Opportunities for **involvement** from all sectors of society – **volunteers and employment.**

Improved air quality & health benefits: Causal links



Improved air quality & health benefits: Stuttgart KlimaAtlas



Air quality in Stuttgart

Stuttgart has had the worst air quality of any Germany city. Suffers from **high levels of industry and particular geography**. PM and NO₂ exceed EU and WHO limits by up to 4x. **In 2013 the city exceeded PM limits on 91 days.**

Benefits of Nature

In 2008 developed **Klima Atlas to map air pollution and local climate**. Using **software to generate a conservation/GI strategy to improve air quality**. 2013-2014 saw **both of its measurement sites fall below 100 µg/m³ for the first time for NO₂**.

Green Infrastructure

Stuttgart is **zoned according to role in developing clean air flows**. **Green space now covers 60% of the city, 300,000 m² of rooftops have been greened, and 40 out of 250 km of tram track have been greened** (Baden-Württemberg, 2012)

Natura 2000/Conservation

Whilst the city does not contain a Natura 2000 site, **39% of the city's green space is now under conservation**, a record for Germany. In 2010 60ha of development projects were prevented to preserve green corridors and spaces. **Large trees are all protected** (WWF, 2012)

Improved climatic conditions & avoiding heat stress

The Problem:

- Climate change implies higher average and extreme temperatures for most of Europe.
- An estimated up to **70,000 people died during the 2003 heat wave in Europe**.
- **Urban heat islands can be between 2 to 12 degrees warmer** than peri-urban, low-density areas with ample green spaces.
- **Further urbanisation** contributes to **more pronounced urban heat** islands.

Nature based solutions: The evidence from literature suggests that:

- **Protected areas & wider Green Infrastructure** can contribute to **mitigating urban heat islands**. **Urban parks particularly important**, but **also green streets/corridors & roofs**.
- Benefits are **observable for nature on a larger-scale** (e.g. **protecting coherent and connected undeveloped land**) & **small-scale** (e.g. **tree lined streets, urban parks, green roofs and facades**)
- A study in **Manchester, UK**: an **increase of green areas by 10 %** would keep the **maximum temperatures by 2080 at nearly the same level as 1961–1990 baseline conditions** and **mitigate expected temperature rise of 4°C** (Gill et al., 2007).

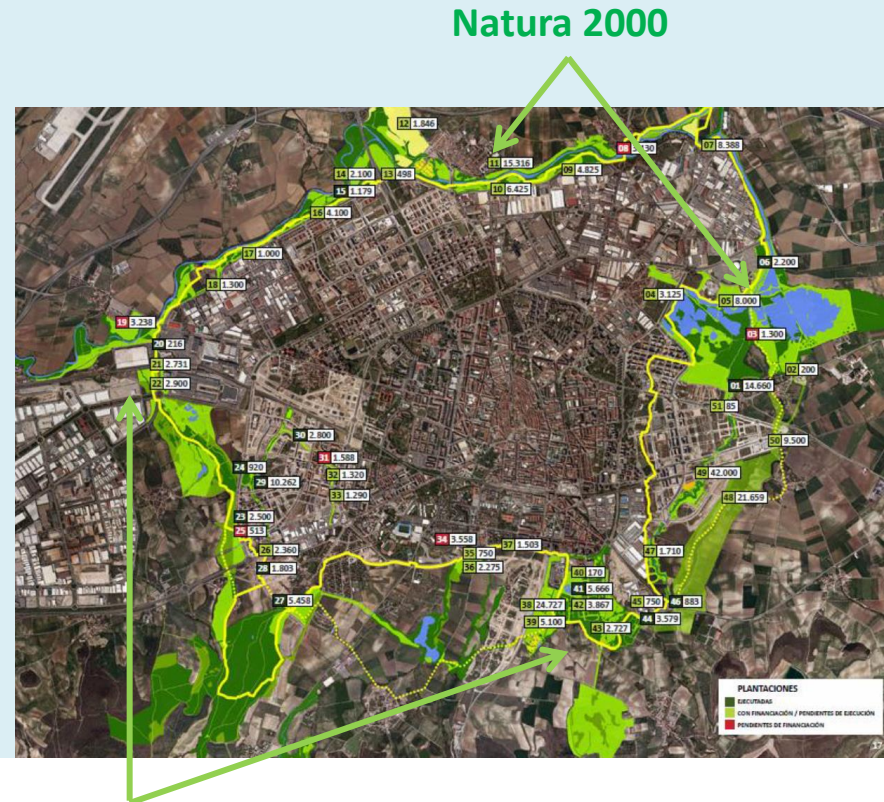
Improved climatic conditions & avoiding heat stress

Natura 2000 and connected wider GI provide oases from heat island effects

Vitoria-Gasteiz, Basque Country, Spain - European Green Capital 2012

- Affected by both floods and heatwaves
- Existing Urban Heat Island Effect: City centre up to 5 degrees warmer than low-density areas
- Duration of heatwaves expected to increase in future
- Green Belt around the city, connecting peri-urban areas, integrating Natura 2000 sites (Salburua Wetlands, Ramsar site; Zadorra River), continuously developed since early 1990ies
- Tree lined corridors connect city centre with surrounding Green Belt, providing recreational opportunities, and offering cooling comfort against urban heat

<http://eucities-adapt.eu/cms/assets/NewFolder-2/NewFolder-3/Conference/Birmingham/Vitoria-Gasteiz.pdf>



Improved climatic conditions & avoiding heat stress

(some examples)

Green Roofs in Sheffield, UK

- Sheffield developed strategies to encourage green roofs, an integral part of the Sheffield City Council Development Framework. It now has highest number of green roofs in a UK city (except for London)
- **Green roofs are multifunctional** (urban cooling, noise reduction, air pollution mitigation, biodiversity)

Green Corridors and Waterfront in Lyon, France

- Lyon has been severely impacted by the summer heatwave in 2003
- Coordinated of initiatives to address the urban heat island effect - green corridors to provide cooling and green spaces along the Rhone river
- These infrastructures are again multifunctional, offering climate and air quality benefits, but also new opportunities for recreation, healthy lifestyles and connecting previously separated neighbourhoods.

Green Room in Ludwigsburg, Germany

- Number of days with extreme heat expected to double until 2100.
- A research project is exploring **new infrastructure** types such as the “Green Room”.
- The “Green Room” helps in cooling urban space, but also **promotes biodiversity and social interaction**.



Noise and human health

The Problem:

- **Hearing loss** linked to one time intense noise event and long term exposure to noise 75 to 85dB.
- Noise also leads to **tinnitus, sleep disturbance, annoyance, impairs children's cognitive development.**
- Road traffic noise is associated with **hypertension, coronary heart disease and strokes**
- **WHO:** in Europe **1 million healthy life years lost per year from traffic noise, 61,000 years for heart disease, 45,000 from cognitive development, 903,000 years for sleep disturbance**

Nature based solutions: The evidence from literature suggests that:

- Access to **quiet urban areas decreases annoyance and supports human health**
- **Vegetation reduces noise levels** by hampering or modifying the propagation of sound
- Trunks and forest floor good at noise reduction – need high density of trees in tree belts. – **a 15m deep tree belt can reduce noise by 6dB at 50m; a 30m deep tree belt by 10dB**

Responses: Parc des Hautes Bruyeres, Paris, France

Former industrial zone in Villejuif converted to a 23 ha park that is a **buffer between a highway and a residential area**. A large earth berm (60m large) acts as sound barrier.

Noise in park 20dB lower than at highway.

There is a “**jardin du silence**” – an **amphitheater 12m below ground level, with additional 20dB lower.**

Outdoor recreation and physical activity

The Problem:

- Almost **two thirds of adults** and **80% of young people** do not reach the minimum recommended levels of **weekly 150 minutes of aerobic physical activity** in Europe (Hallal et al. 2014).
- Globally, **physical inactivity** causes **approximately three million deaths per year**, (Lim et al. 2012) as well as **6–10% of the coronary heart disease, Type-2 diabetes, and breast and colon cancers** (Lee et al. 2012).
- As a cause of death **inactivity is considered as a “new smoking”**. It causes as many deaths (Lee et al. 2012).

Nature based solutions: The evidence from literature suggests that:

- exercising and being physically active in green areas provide not only **physical health benefits** but also **positive effects on mental health**.
- green areas **increase the level of physical activity**.
- **people want to spend more time exercising in green areas**.

Outdoor recreation and physical activity

(with health, employment and integration benefits)

Moved by Nature project, Kuopio, Finland

The Parks & Wildlife Finland conducted the project *Moved by Nature (Luonto liikuttamaan)* as part of the Parks & Wildlife's Healthy Parks, Healthy People Finland programme.

- Most of the activities conducted in **Natura 2000-areas in Lieksa, Rautavaara and Kuopio.**
- Targeted hard-to-reach groups with an increased health risk - **new immigrants, youth at risk of social exclusion, long-term unemployed and obese working aged men at risk of Type-2 diabetes**
- 16 men at risk of Type-2 diabetes participated in the Moved by Nature – weight maintenance pilot. **Statistically significant: group weight reduced by 60 kg in total, BMI, activity level, body composition, visceral fat level, physical fitness classification, and oxygen uptake.**
- Participants considered outdoor activities in nature as the most important reason for participating.
- Finding a new way to active unemployed people into employment activities reduces the costs of the City of Lieksa significantly (330 €/month/unemployed). **The model is now being adopted in the social services of Lieksa.**

<http://www.metsa.fi/sivustot/metsa/fi/hankkeet/rakennerahastohankkeet/luontoliikuttamaan/sivut/default.aspx>

Quality of green public spaces, reduced social tension

The Problem:

With increasingly urban populations in Europe and increased densification, access to quality green space can be limited for certain citizens. **“Access” to a green space generally within 300m or 5m walk.**

Nature based solutions: The evidence from Literature :

- Accessibility depends on multiple factors, such as gender, age, relative income, and education, and that **physical access to green space in itself does not necessarily imply that social benefits will be by all sectors of society / communities** (one needs to use accessible green space).
- Greenspaces, including community gardens and forests are an **important factor in community identity**, and can strengthen peoples **attachment to their communities**.
- Greenspaces, parks and playgrounds can help people form **minority groups or different cultural backgrounds become better integrated** in and identify with their community

Responses: Case Example: Using urban GI to enhance social cohesion: Almada, Portugal

The city of Almada: **managing urban green spaces involves participation of local citizen groups.**

Opportunities for **different cultural and sports activities** as well as for env **education**.

Stimulating social integration of different **ethnic & cultural groups** – by providing varied infrastructures.

A network of **community allotments gardens** were also established, helping **foster social relationships**.

Healthier lifestyles – nature experience

The Problem:

- **Mental disorders account for about 20% of the burden of disease in the European Region**, rising to 26% in the countries in the European Union (EU).
- **Depression alone is responsible for about 15% of all days lived with disability.**

Nature based solutions: The evidence from literature :

- Nature areas related to children's better functioning - **concentration, motoric skills, self-esteem, emotion regulation.**
- Strong **evidence on** natures' positive effects on mental health - nature has **restorative, stress reducing effects** and even short break from work in green area can have positive effects of stress reduction.
- Some **evidence** that nature environments **lower blood pressure** and **pulse rate, reduce cortisol level..**

Responses: Case Example: Community eco gardens foster healthy lifestyles, Coprivnica, Croatia

The “Community of eco-gardens” is a Croatian movement of urban gardening, associated with healthy nutrition and self-sufficient food.

The community currently provides plots for 46 urban gardeners in the City of Coprivnica.

Aim to foster psycho-social wellbeing of people.

More information: <http://koprivnica.hr/en/novosti/projekt-zajednicki-eko-vrtovi-dostupna-jos-jedna-parcela-za-vrtlarenje/>

Opportunities for involvement from all sectors of society – volunteers & employment

The Problem:

With increasingly urban and diverse populations, and with a **reduced “social fabric”** and **often high unemployment**, there is a **need for new means of individual and community engagement**.

Nature based solutions: The evidence from literature :

- **Volunteering in the natural environment can lead to social and community benefits, enabling people to develop **new social relationships**, **build a sense of community**, and **learn new skills**.**
- **Managing and investing in nature** – e.g. managing urban, peri-urban, and rural parks, or planting new tree lined roads or developing roofs – **creates both **direct local employment**** that provide private and public benefits, and **indirect employment** (e.g. recreation and tourism related jobs)
- It makes use of **traditional knowledge** (e.g. forest management) and **new approaches, skills and tools** (e.g. architects, spatial planners, GIS mapping).

Responses: Increasing social cohesion through engagement in forests in Scotland

- Employment resulting from first-round (direct) spending from tourism and recreation attributable to woodland, where woodland was the primary reason for the visit: **~ 17,900 FTE jobs**.
- **7500 volunteers** carried out forest-related work = **~ 47,400 volunteer days**.
- **138 active community woodland groups** with around **13,500 members** were identified

Next Steps of the Study

Completing the evidence base and understanding stakeholder roles in nature based solutions

1. **Seeking additional evidence / case examples to help illustrate the nature based solutions – Natura 2000 and Green infrastructure benefits to health.**
2. **Explore innovative governance solutions – who is doing (can do) what to promise nature based solutions. e.g. which public health stakeholders are driving change.**
3. **Understand practical tools that can help facilitate solutions**
4. **Engage stakeholders to clarify practical ways forward - November workshop – and develop a Health and Nature road map for progress on synergies.**

Health and Social Benefits of Nature and Biodiversity Protection

Thank You!

We are seeking to build on cases from across the EU, build on insights from successful stakeholder cooperation, understand stakeholder roles, tools and measures that can promote synergies and explore what savings can be made through nature based solutions.

So do contact us with your insights & practice.



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