Valuing the health and wellbeing benefits of Nature based Solutions

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Photo credit: Ben Wheeler

This part of REGREEN was designed to take a holistic approach to developing our understanding of the health and wellbeing values of nature based solutions, especially in the context of the Urban Living Labs. NbS are often undervalued because the holistic values across multiple domains (e.g. social, environmental, health) are not taken fully into account. Valuing benefits properly is required in order to inform decision-making, especially with increasing pressure on space and the use of terrestrial and aquatic systems. A key challenge is that, in the context of competition for space, it is much simpler to articulate and monetise the value of development of housing and other built infrastructure compared to the complexity and multiple functions of nature. Given their complexity, the health and wellbeing values of NbS are frequently undervalued, and therefore warrant a substantive focus in a project such as REGREEN.

The REGREEN approach to tackle this shortcoming has been to adopt a mixture of complementary methodologies, both quantitative and qualitative. We have taken this 'plural' approach to recognise and communicate that the evaluation of these benefits should not necessarily involve valuing 'everything' in monetary units. Monetary values are useful in many ways, and frequently drive policy and decision-making. However, solely focussing on monetary values risks missing those that may be most important to the population, or specific communities.

We started our journey with a focus on theory building and developing our understanding of the ways in which NbS and wellbeing are intertwined in complex systems. This is especially useful when developing frameworks and hypotheses relating to the complex relationships between NbS and our desired wellbeing impacts. We conducted a synthesis of existing NbS evidence to develop

'Causal Loop Diagrams' (CLDs), which were refined in consultation with ULL partners. CLDs are a valuable visual method of communicating the dynamic and complex relationships between NbS and wellbeing.

You can read more about this method here:

https://beyondgreenspace.net/2023/12/14/new-paper-using-systems-thinking-when-evaluating-nature-based-solutions/

and our exemplar application to street trees and mental health here:

https://ecologyandsociety.org/vol28/iss2/art1/

Building on this work we carried out a number of linked studies within the ULLs:

Understanding perceptions and experience of NbS using different approaches

We used two methods to develop our understanding of people's perceptions and experiences of NbS in their cities. Firstly we used an on-site questionnaire survey within public green spaces. The survey work was based on an Ecological Momentary Assessment (EMA) framework, and assessed the perceptions of residents in the European ULLs while they actively engaged or interacted with that environment. The survey work was conducted in parks in Aarhus, Paris and Velika Gorica. We found, for example, that a majority of participants were local individuals using the space predominantly to travel through to other areas, but that also more than 75% of them reported that the experience of being in the park helped them to feel happy and relaxed.

We also used a qualitative approach, photo-elicitation focus groups, to explore in-depth residents' perceptions and experiences of their local NbS. Photographs provided visual stimulus for rich conversations in the focus groups, and transcripts of the discussions were analysed as qualitative (textual) data. Using photographs of areas known to focus group participants is an effective way of helping to transport them to these places and reconnect with feelings, and experiences they have had in-situ. Building on the CLD work, findings highlighted some of the experienced benefits of street trees; closeness to nature, shade, and contribution to a sense of place are reported by participants. Our analysis also found that experienced benefits shift with seasonality, and with much longer timeframes; a preference for older trees which have become ingrained in the fabric of cities was consistent.

Understanding the economic value of NbS for wellbeing

We applied two further methods to explore the benefits to people from NbS in terms of their monetary value.

Firstly we applied a deliberative valuation method, a hybrid of political and economic approaches to valuing the environment. It uses both qualitative and quantitative approaches in a workshop setting to form improved understanding and to establish preferences of participants for different options. Workshops were held in each of the European Urban Living Labs, and in Beijing, following the same structure and valuation approach but taking into account the differences in local contexts and languages. The results of this valuation method highlighted several areas of concern for the citizens including experiencing climate pressures, a lack of trees, and a lack of

investment in blue spaces for health and well-being benefits. Specifically, there were positive preferences toward increasing tree canopy cover and implementation of lakes and ponds in parks.

Secondly, we used an ecosystem services economic valuation approach to look at urban heat, mortality and green space with a focus on Paris. Urban heat is a key challenge in Paris and other cities, which can cause severe health impacts including death in extreme cases. Green spaces can provide cooling benefits to residents living nearby, and can therefore be protective against heat-related mortality. We have valued this cooling effect in terms of the reduced risk of mortality. We modelled the cooling impacts of parks and other green spaces, then estimated the associated reduction in heat-related mortality. We then applied the Value of a Statistical Life, a standard method which ascribes a monetary value to a 'typical' human life and aims to reflect the amount that society is willing to pay to save a life. While there may be ethical considerations around such a practice, the method is frequently used in health economics, and can help to compare between different options and can help summarise the health benefit of an NbS.

Conclusions

The health and wellbeing values of NbS are significant, and through REGREEN we have demonstrated the importance of understanding these values from multiple perspectives. Monetary values are crucial and often are the primary driver of decision-making. However, other approaches add important dimensions to our understanding, provide opportunities for local citizens to be involved, and ultimately will result in better, more sustainable decisions.

Further publications from all of this work are forthcoming, and will be shared on the REGREEN website and social media channels. There is also a summary report (Deliverable 4.5) on mixed-method integration of evidence and valuation findings for ULLs that brings the activity across this work package together.

UNDERSTANDING THE MULTIPLE VALUES OF NATURE BASED SOLUTIONS

WHY DO WE VALUE?

Nature based solutions (NBS) have wide-ranging benefits for communities, human health and the environment.
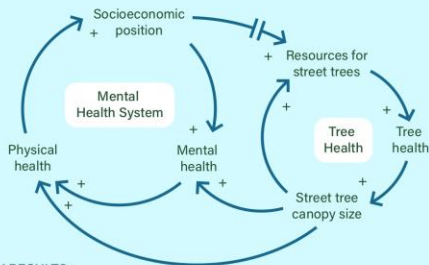
Holistically valuing all the benefits (and disbenefits) can inform decision making. Each of the approaches used here contributes to the collective valuation of nature-based solutions in urban areas.

1 SYSTEMS THINKING THROUGH CAUSAL LOOP DIAGRAMS

Using a systems thinking approach, we reviewed existing evidence and consulted stakeholders on NBS in urban areas to develop our causal loop diagrams. They visualise the outcomes, feedback loops, and unexpected consequences of NBS on communities.

Here's an example that looks at the links between street trees and mental health:

Socioeconomic position
+ Resources for street trees
Mental Health System
Tree Health
Physical health
Mental health
Tree health
Street tree canopy size

KEY RESULTS:

The health of the street trees is important – maintenance is needed to ensure they reach the age and size when the benefits to mental health are realised.

Communities that don't experience benefits may be less likely to advocate for future investment in street trees, ultimately leading to increased inequalities.

2 ON-SITE ECOLOGICAL EXPERIENCES SURVEY

Ecological momentary assessments engage with in-the-moment experiences, behaviours, and moods of people as a means of valuing NBS.

People surveyed within the green spaces were most often local individuals using it to travel through.

>75%
OF PARTICIPANTS FELT HAPPY AND CALM IN THEIR GREEN SPACE
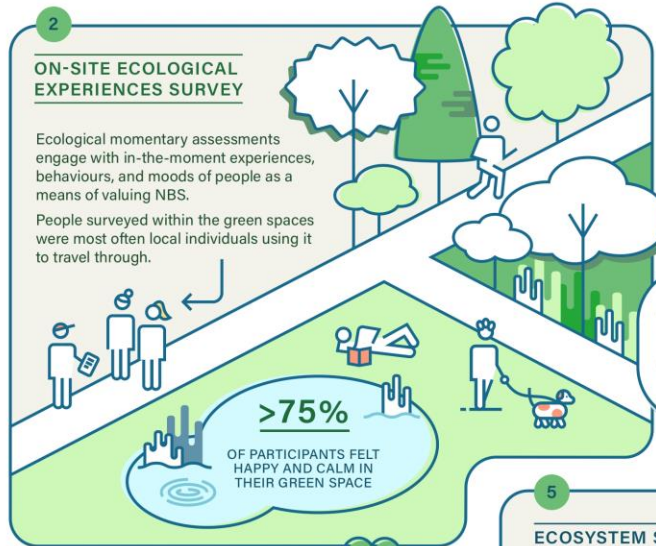
4 DELIBERATIVE VALUATION

Deliberative valuation utilises small groups of citizens who discuss and choose between NBS scenarios and their costs to inform the economic valuation of NBS benefits in urban areas.

This method helps understand preferences and guide environmental policy and decision-making.

CITIZENS ARE WILLING TO PAY FOR A
12%
TREE CANOPY COVER INCREASE

3 PHOTO-ELICITATION WITH COMMUNITY GROUPS

Photo-elicitation uses photographs to prompt discussions to uncover information, feelings, and memories about NBS.

"That experience [moving around in the city] is enhanced by the existence of trees, and you can follow the seasons, when you can see that new leaves are coming out, you can see birds' nests in the trees."
(AARHUS)

"I remember the whole community gathered to plant these trees. I still remember that planting... When I think about it now, it still keeps my heart warm and I'm proud."
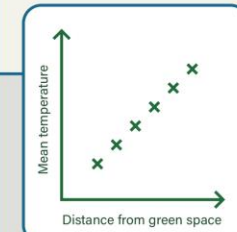(VELIKA GORICA)

5 ECOSYSTEM SERVICE VALUATION

Ecosystem service valuation assigns measurable economic value to the processes through which nature contributes to human well-being.

Our work valued the cooling effect of green spaces for Paris residents and the associated reduced risk of mortality.

Mean temperature
Distance from green space

57%
OF PEOPLE IN CENTRAL PARIS LIVED CLOSE ENOUGH TO GREEN SPACES TO BENEFIT FROM COOLING EFFECTS