

## Factsheet 4

This factsheet explores the potential impacts of nature-based solutions in four key social and economic facets of urban regeneration to create a shared understanding and common approach within the CLEVER Cities project. Along with the overarching concept of urban regeneration, the following sub-themes are explored: human health and well-being; sustainable economic prosperity; social cohesion and environmental justice; and citizen safety. Each concept includes a definition and highlights which benefits are expected to emerge through the cities' planned NBS interventions.

# ESTABLISHING A FRAMEWORK TO MEASURE THE IMPACT OF NATURE-BASED SOLUTIONS ON URBAN REGENERATION WITHIN CLEVER CITIES

## Urban regeneration

Urban regeneration<sup>1</sup> encompasses the idea of improving, reorganising and upgrading an undesirable urban context (as opposed to planning new urbanisation). It can refer, for example, to the redevelopment of overcrowded areas of a city, economic growth in an area, or property development. Areas targeted for regeneration can be spaces that have been abandoned (e.g. disused factory sites and buildings) or neglected (e.g. rivers that have been polluted); places facing particular environmental challenges, such as lacking quality green spaces or high vulnerability to climate change impacts; or areas facing social and economic issues, such as reduced human health and wellbeing, inequality and crime.

In order to transform these areas from an undesired state into one offering diverse benefits, urban regeneration utilises multi-faceted interventions whose objectives and activities cut across traditional functions and responsibilities. The underlying idea

<sup>1</sup>Other related terms which are often used interchangeably include: urban revitalisation, urban renewal or renaissance. The CLEVER Cities project has chosen to focus on the term urban regeneration as it is the most widely recognised and used by both policy makers and in academia.

### Dimensions of urban regeneration and corresponding aims and activities

<b>'People' (social, cultural, employment)</b>	Increased/secure income, employment/employability, skills, capacities, aspirations, participation in local decision making, community building/ social cohesion, equity, quality of life, health, education, crime mitigation, housing, quality of public services
<b>'Business' (economic, employment)</b>	Economic competitiveness, business performance, local business development, job creation and prosperity
<b>'Place' (built and natural environment)</b>	Improved Infrastructure, resilient built and natural environment, housing growth and improvement, sustainable transport and communications, improve general appeal of place to attract people and business

is to make improvements to the economic, physical, social and environmental conditions of an area that has been subject to negative change, and is considered vulnerable (non-resilient). Regeneration activities are further intended to promote engagement with stakeholders from public, private, voluntary and community sectors (ideally creating a collaborative, inclusive process), and to establish institutional structures that encourage lasting partnership amongst these groups.

Urban development discourse and related publications increasingly emphasise the need for sustainable urban regeneration. This approach strives to bring about lasting improvements to a locality by considering interrelated dimensions in regeneration activities, focusing in particular on environmental protection. Aspects such as reducing environmental impact, mitigating environmental risk, and improving environmental quality of urban systems, lifestyles and assets are to be considered high priority. This is a critical consideration as there are often conflicts between the more commercial drivers of urban regeneration, and environmental and social goals.

Sustainable urban regeneration requires changes to institutional behaviour and presents a growing opportunity for utilising NBS as a tool to achieve urban development goals while also benefiting society and

the environment. Implementing NBS can support a more inclusive urban regeneration towards a greater sense of community, combating social exclusion and inequalities within and between cities and regions. In the context of urban regeneration, NBS can be used to:

- **Ensure sustainable growth** that enables an inclusive city, with healthy places to work and live in
- **Promote healthier living**, providing spaces for physical activity and relaxation
- **Cool the city**, clean the air and absorb stormwater to lessen the impacts of climate change
- **Sustainably regenerate** deprived and neglected residential and industrial areas
- **Demonstrate the multifunctional value of green** as a complement or substitute to grey infrastructure
- **Utilise underused and unused land** to provide community green spaces

The capacity of NBS to provide multiple benefits for people, business and place can serve to help overcome the potentially negative broader impacts of urban regeneration, such as small dwellings, lack of affordability, shortage of green space, risks to respiratory health and increased crime. As such, NBS should be (1) utilised to support more informed decision-making processes that minimise undesired eventualities and (2) encouraged as a tool for supporting the sustainable urban regeneration.



## Human health and well-being

Health is defined as a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity. Well-being is seen as a broader concept which relates to positive physical, social and mental states due to the fulfilment of basic needs, the achievement of important personal goals, and an integration and participation in society. These personal and social aspects are enhanced by economic benefits as well as access to healthy and attractive surroundings.

One important aspect of urban environments which support health are accessible urban green spaces. While urban green spaces are important for ecosystem services, their impact goes beyond environmental or ecological aspects through the provisioning of social and health benefits to urban residents.

A significant evidence base exists which highlights the influence of urban green spaces on both physical and mental health, resulting in reduced morbidity and mortality. Residential proximity to green spaces and their use is related to increased levels of physical activity, which brings positive health outcomes like reduced obesity and cardiovascular disease as well as reduced depressive symptoms.

### Human health and well-being in the CLEVER Cities demonstration sites

The city of **Hamburg** hopes to contribute to human health and well-being in its demonstration site through reduced temperatures from green roofs, as well as the reconstruction of schoolyards as multifunctional recreational green spaces. Attractive pedestrian walks and cycling lanes are supposed to partially change mobility choices of residents and visitors, thus contributing to better health. For **London**, the creation of greened walking routes, rain gardens and swales will soften the hard landscape contribute to well-being of residents in the demonstration site area. The envisioned nature-based solutions in **Milan** will function as noise barriers to the bordering railroad track. Smaller health and well-being benefits will also be generated through a reduction of the urban heat island and air pollution.



Even being in the proximity of urban green and having a view of such spaces is related to psychological relaxation and stress alleviation. These beneficial aspects can be enhanced through targeted NBS design and maintenance.

Green spaces can, however, also generate adverse effects or unintended consequences. Some examples of such side effects include green gentrification processes, health and safety considerations (e.g. fear of crime, falling branches or injuries), allergenic pollen, toxic plant components, or exposure to pesticides and herbicides.

## Sustainable economic prosperity

Economic prosperity refers to a successful, flourishing, or thriving condition in terms of financial means. It is thus a key element to ensuring the quality of life of individuals and a society, but is also necessary for a nation to be competitive in the world economy. For sustainable economic prosperity to be achieved, economic growth needs to be ensured in the long-term as well as ecological health and social equity regarding the distribution of generated benefits. Here, trade-offs or (socio-political) conflicts can occur through competition for space and due to uneven distributions of associated costs and benefits.

The creation of green and blue landscape features or the restoration of existing areas as part of urban regeneration efforts can contribute to sustainable economic prosperity through, for example:

- **Job creation:** NBS and urban regeneration projects can create jobs for the realisation and maintenance of urban green space. They also promote new, often socio-entrepreneurial business ideas (e.g. vertical gardening, urban food production, therapeutic programmes, outdoor workout).
- **Land and property values:** Property values have been shown to increase near green spaces. NBS investment can therefore offer higher returns for the property sector. Higher property values in themselves are also believed to improve an area's image.
- **Labour productivity:** Evidence suggests that being surrounded by urban green and using it for recreational activities makes workers happier, healthier and more productive.
- **Increased consumer spending:** Green space increases the attractiveness of city centres, guides and slows down the flow of consumers

in a city, and leads to a shift of spending power to businesses situated in more pleasant surroundings.

- **Reduced stormwater management costs:** Due to delayed and reduced stormwater runoff and better drainage, new stormwater systems could potentially have a smaller capacity for water flow, while old stormwater systems could support water flow for longer. Moreover, NBS help to reduce the amount of untreated runoff discharged to surface waters.
- **Reduced energy costs:** NBS elements such as green roofs can stop incoming solar radiation and therefore have the capacity to cool buildings in summer and reduce energy consumption. Older buildings also profit from nature-based insulation in winter, thus reducing heating costs.

The manifold economic benefits of NBS highlight that they can save money at both the household and government level when adopting a long-term investment perspective. However, aside from the positive and desired outcomes of economic prosperity, it is also possible that adverse effects or unintended consequences such as gentrification and displacement of long-established residents can occur as a consequence of increased urban NBS deployment.



### Sustainable economic prosperity in the CLEVER Cities demonstration sites

The general objective of CLEVER Cities in terms of sustainable economic prosperity is to reduce poverty rates and create new job opportunities. Through the installation of green roofs, **Hamburg** expects to incur cost savings through improved rainwater management, reduced building temperatures and potentially a decrease in the heat island effect. **Milan's** foreseen green roofs will support a new stormwater management approach that saves money. The focus in **London** will be improving the wellbeing of residents by using NBS to make neighbourhoods more pleasant, feel safer, encourage active travel and make it more environmentally resilient.

## Social cohesion and environmental justice

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Social cohesion refers to the capacity of a society to ensure the well-being of all its members, minimising disparities and avoiding marginalisation. Environmental justice refers to the (in)equality of inclusiveness and fairness in participation and decision-making, distribution of environmental benefits and negative environmental impacts, and acknowledgement of discrepancies between social groups. Contemporary views on environmental justice are expanded to include the equal right to access goods and services as well as to opportunities like education, job and engaged participation in decision-making. Environmental justice is reflected in the broader concept of sustainability by establishing a decreased level of economic and social inequities as a basis for a sustainable society.

Nature-based solutions can improve social cohesion by, for example, creating safe and pleasant connections between neighbourhoods, employment areas, and environmental amenities, or by creating quality public green spaces accessible to all in which social activities can occur. Such solutions can also contribute positively to environmental justice: This can include the remediation of brownfield sites or polluted landscapes or reductions in noise pollution due to absorptive green barriers. NBS interventions like community gardening can also be used to contribute to social cohesion and, in some cases, increase access to nutrient rich food amongst low-income populations.

However, implementing nature-based solutions in urban areas can also have negative societal impacts. In the case of green gentrification, for example, creating new green features or improving the quality

### Social cohesion and environmental justice in the CLEVER Cities demonstration sites

In terms of social cohesion related challenges, the project site in **Hamburg** has a mixed social structure with a high percentage of households with children, 22% of residents under 21 years of age and 60% of residents coming from Russia, Poland, Kazakhstan, and Turkey. In **London**, social cohesion-relevant aspects include anti-social behaviour and intimidation resulting in residents avoiding spending time in communal courtyards or greenspaces and not letting children play freely. The Thamesmead area of London has particularly suffered from lack of investment and maintenance resulting in homes and public spaces that are of poor environmental quality. In **Milan**, social cohesion related issues include a poor sense of place and a lack of community cohesion and social connections.

and aesthetic appeal of existing features can lead to increased property values, rents, competition in housing markets and prices. These changes can in turn displace local populations who can no longer afford to live in the area. It must thus be considered how the environmental quality of different types of urban green spaces and their distribution in the city are linked to (un)equal opportunities among different socio-economic and demographic groups to use and benefit from these spaces, and taken into account in decision-making processes when planning and designing urban NBS.



## Citizen security

Citizen security refers to the actual and perceived freedom of movement and security against violent crime.

In the context of nature-based solutions, the design, maintenance, and local context of NBS projects - including cultural attitudes towards different types of green features - can influence impacts on citizen security. Urban forests, for example, are perceived as relaxing or as places of fear depending on individual viewpoints or perhaps the demographics or cultural background of individuals.

Creating new green spaces in disadvantaged urban areas has been shown to reduce violent crimes and increase perceived security in the area.

However, inappropriately maintained or designed green spaces can also turn into places that decrease the level of actual and perceived security.

Spaces with visual obstacles, such as poorly designed or maintained vegetation or lack of light or which are littered with garbage or dog feces, for example, may not be perceived by NBS users as being safe.

Such areas can provide spaces for anti-social behaviour and crimes, such as vandalism and graffiti, loitering, theft, and underage drinking as well as violent crimes such as assault, homicide, and sexual assault, which jointly deter people from using the green space.

### Citizen security in the CLEVER Cities demonstration sites

In **Hamburg**, areas in the demonstration site are perceived as unsafe due to missing and/or inappropriate infrastructure (e.g. poorly lit pathways and sidewalks). **London** is tackling the perception of high crime risk by greening desired main thoroughfares with the hope to have more people visible in the streets and therefore more natural surveillance. Concerns at the demonstration site in **Milan** relating to citizen security include potentially unsafe areas with high crime risk in abandoned rail yards and poorly maintained railway track banks.

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