

Nature-based Solutions: A New Urban Planning Process that Facilitates Implementation

The Poznań Experience



1 Introduction

What are nature-based solutions?

The European Commission defines nature-based solutions as solutions to societal change that are "inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions. Hence, nature-based solutions must benefit biodiversity and support the delivery of a range of ecosystem services."

What is the Connecting Nature Framework?

Designing and implementing nature-based solutions on a scale that delivers economic, environmental and social co-benefits, while also building resilience and benefiting biodiversity, is complex, with many different issues to consider. Many questions arise and need answers.

What is the best solution for the area?

Who will manage it?

How will it be financed?

Who needs to be involved in the design, implementation and maintenance?

How to measure the economic, environmental and social impact?

Will it support innovation and generate jobs?

How can we manage change?

Even identifying where to start can often be a challenge!

In response to this uncertainty, Connecting Nature has developed a process tool to help cities and other organisations navigate the path towards implementation of nature-based solutions on a large scale: the **Connecting Nature Framework**.

The Framework identifies **three distinct phases of development** for a nature-based solution: **planning**, **delivery and stewardship**.

Throughout each phase there are **seven separate elements** that cities and other entities need to consider when shaping their individual nature-based solution: **technical solutions, governance, impact assessment, finance, entrepreneurship, co-production and reflexive monitoring**.

Cities may choose to start with any element of the Framework process and consider the others in the order that suits their context. What emerges from the Framework process is a comprehensive 360° overview of each stage of development of the nature-based solution.



Guidebooks

To assist you in developing your nature-based solution, Connecting Nature has produced a series of

mini guidebooks. The overall Connecting Nature Framework Guidebook is a good starting point. There is also a guidebook for each element of the framework process describing the implementation steps and providing case studies to show how it works in practice. A step-by-step how-to manual on the Connecting Nature Framework process is also available.

All the Connecting Nature guidebooks and the manual may be downloaded from <u>www.connectingnature.eu</u>.

Nature-based solutions therefore provide multiple benefits for biodiversity. Any approaches that do not improve biodiversity or are not based on or delivering a range of ecosystem services are not nature-based solutions.

Nature-based solutions protect, sustainably manage and restore natural or modified ecosystems, which address challenges facing humanity (e.g. climate change, food and water security or natural disasters). At the same time, nature-based solutions bestow wider benefits to human well-being and biodiversity.

Nature-based solutions are quite a new concept and the phrase is not widely used. This is changing however, as society seeks to effectively tackle environmental issues through innovation.

So, what does an urban nature-based solution look like? Street trees, parks and urban green areas are examples of nature-based solutions. They provide a range of natural benefits such as intercepting dust, toxins and noise, sheltering and cooling property, sinking carbon and buffering flooding. They also provide spaces for recreation, fostering well-being, and a host of other social benefits.

However, thinking on nature-based solutions has evolved to include more benefits, such as increased biodiversity, species conservation, energy production and waste management, while promoting social cohesion using collaborative processes.

This means that the ideal nature-based solution uses a process of comprehensive co-design and cocreation of ideas, with strong innovation possibilities, leading to multiple ecological, environmental and social gains. It is a big task, but this approach will ultimately change the way we make and manage our urban areas and lead to more resilient and sustainable urban living.

2. Poznań: The city of green adventure

The city of Poznań (pop. approx. 540,000) is located in central-western Poland, in the central part of the Wielkopolska province. It is a major business and academic centre with a rich historical heritage, a varied cultural life and leisure opportunities. It is rich in green spaces but they are not equally distributed – the densely built-up districts in the crowded city core lack green spaces – or are precarious; for example, a well-developed green infrastructure system (called "green wedges") in the Warta river valley is threatened by development.

Why are nature-based solutions beneficial for Poznań?

Nature-based solutions fulfil many strategic objectives in Poznań. In particular, they improve quality of life while responding to the impacts of climate change. It should be pointed out that to address environmental, social and economic goals, it is necessary to approach the city as a whole.

CASE STUDY: Multi-functional benefits of the Warta River Valley

The Warta Valley is the main hydrological, ecological and recreational axis of Poznań. Etched in the city landscape from the very beginning of its existence, it is inexorably linked with the location and development of the city. The green areas of the city of Poznań are the result of historical conditions, especially in the city centre, and the natural features of the landscape. The effect of these conditions is the existing ring-wedge green system.

The City of Poznań has made the Warta a part of its identity as a zone of sport, rest, relaxation and ecology. For many years there has been a "return to the river" - a strategy of making the Warta River accessible and integrating it with the rest of the city. This process is already bringing tangible results. City beaches, the "Wartostrada" cycling path, and recreation and relaxation zones are already undisputed elements of municipal investment.

The high rate of soil sealing (the covering of the ground by an impermeable material such as concrete) in the city centre's densely built-up residential areas limits the potential for water retention and has resulted in unfavourable conditions when it comes to heat and moisture. High temperatures in the city, especially in summer, are not conducive to the health and well-being of the inhabitants. The Warta River Valley counters these effects.

The areas along the Warta River constitute a buffer zone for controlling flooding in the city; they can mitigate the considerable heat-island effect; control point-source pollution (pollution from a single identifiable source), and diffuse pollution run-off. At the same time, they offer recreation zones for citizens, such as Poznań's regenerated beach front.

The city has put in place urban furniture that facilitates relaxation and social integration, while allowing citizens to benefit from the cooling effect of the river. Other benefits arising from the solution have been experienced. The close proximity of the waterfront to housing has reduced the volume of car travel to other recreational areas. In addition, bicycle paths along the river support and enable environmentally friendly active transport and reduce CO_2 emissions.

3. Project Goals

Open gardens and nature-oriented playgrounds in kindergartens

The city of Poznań's long-term vision is to be a city of interconnected green spaces that reconcile high quality of life with sustainable infrastructure and economic development. The focus for its nature-based solutions was on two types of action that contribute to achieving the vision:

1. Open gardens in kindergartens and other public institutions that provide publicly accessible green space, thereby increasing access to previously restricted green space. The institution responsible for the functioning of the green space ensures that users follow safety rules that are co-designed by the interested stakeholders.

2. Nature-oriented playgrounds that promote nature-based solutions in the architectural design and modernisation of playgrounds for children. This is complemented by ecological education programmes to improve the relationship of Poznań's youngest citizens with nature and empower citizens to set up their own initiatives to create nature-based solutions.

Poznań seeks to increase the number of small-scale naturebased interventions, with a special focus on those areas that are densely urbanised and inhabited by citizens who currently have limited access to greenery. Such an



by citizens who currently have Image 1: Kindergarten No. 42 in Poznań before work commenced on the NBS (Marchlimited access to greenery Such an April, 2017). Source: City of Poznań; Ogrody Odnowa

"up-scaling approach" extends the network of green infrastructure in Poznań and also complements the green wedges that run through the city from north to south and from east to west. In this way, they act as stepping-stones for inhabitants.

To begin upscaling, Poznań has constructed an open garden and nature-oriented playground in one of the city's kindergartens in the densely urbanised district of Wilda. Previously in this area neighbours had limited access to green space. The Project Coordination and Urban Regeneration Office at Poznań City Hall led the process.



Image 2: The open garden at kindergarten No. 42 after the modernisation work (July, 2018). Source: <u>City of Poznań</u>

4 The Nature-Based Solutions Framework Building Blocks – how Poznań realised its solution, step by step

4.1 Indicators

Establishing the baseline and measuring the transformation achieved

While we may believe that nature-based solutions have the potential to yield social, environmental, health and economic benefits simultaneously, the evidence for multiple benefits is rather scarce and highly fragmented. More robust frameworks for the monitoring and assessment of their impacts are needed to provide solid evidence.

The key to a robust impact-evaluation framework is the choice of appropriate indicators by which to capture impacts across multiple categories, along with flexible and cost-effective methods for the monitoring and evaluation of those indicators.

Why use indicators to monitor the impact of the open gardens and nature-oriented playgrounds? – It allows cities to assess the effectiveness of the nature-based solutions in achieving strategic city goals.

 It can support the decision-making process when designing and implementing interventions for urban regeneration and resilience.

- It provides a basis for the making of adaptations in real time, improving the performance of the nature-based solution in terms of the benefits it brings.

– It supports cities in building the case for investments in nature-based solutions by providing evidence that they can deliver on the multiple objectives and interests their stakeholders have.

- It encourages planning for urban resilience and regeneration by integrating ecological, social and economic objectives and linking them to the different departments that can benefit from the intervention(s) in Poznań.

– It encourages the transformation from traditional planning practices – still dominated by silothinking and a lack of joint consideration for ecological, social and economic objectives – to planning practices that ensure urban resilience and regeneration.

How will the indicators be used?

Indicators will be identified to measure the benefits at every phase in the lifespan of nature-based solutions, namely in the co-creation (planning), delivery and stewardship phases.

By monitoring and evaluating the indicators, we will understand what contributes to the nature-based solutions' success. We will also build the evidence base regarding benefits, synergies between benefits, and trade-offs, thus informing knowledge-based practice in the future.

A first step was to select indicators for different impact categories (developed in CONNECTING Nature project) – health and well-being, social cohesion, the environment, and the economy. It was important to identify indicators that are already used as well as those that could be used for evaluating the impact on the objectives of the open garden and nature-oriented playground. Based on this information, a preliminary set of the most important indicators was selected. After the final selection of indicators was made, existing data-gathering methods were defined and gaps where further data-collection might be required were identified.

Is analysis necessary for identifying and prioritising indicators?

Thorough analysis is key. Linking city strategic objectives to expected outcomes is demanding because of the diversity of the objectives but it is a valuable exercise because it cuts through the complexity. -

The first step was to analyse strategic city documents and priorities for the objectives they set out. The next was to check whether the given nature-based solution achieved any of those objectives. This check provided an opportunity to think about potential co-benefits, the multiplier effect and potential trade-offs associated with objectives.

Such an analysis turned out to be relevant and allowed for the determination of various indicators (environmental, social and economic) that already exist at the level of strategic documents, as well as those that were identified as being useful for determining the effectiveness of activities but require additional research and development.

How can data gaps be recognised and dealt with?

A lack of specific indicators for specific Poznan's NBS in addition to significant data gaps, necessitates the collection of new data. Cooperation across city departments is required to identify the departments responsible for, or interested in, gathering the data and indicators.

The solutions implemented in Poznań – pre-school gardens, an open garden and pocket parks – are of a local character. Since the effects of such interventions are difficult to capture on a city-wide scale, monitoring in dynamic terms the impact of small, green interventions on the environment, well-being and social cohesion can be achieved only on a site-specific basis. Thus, it has been important to adapt the indicators to suit the scale of nature-based solutions implemented in Poznań.

4.2 Technical solutions

What is the nature-based solution design?

The technical design of a nature-based solution needs to ensure that the desired outcomes are achieved and sustained in the long term and that trade-offs are avoided where possible. This includes both the practical construction aspects and the character and needs of the locality, region, and landscape into which the solution is being introduced – the context in other words.

The practical construction will be influenced by the answers to questions such as What kind? Where? How big? What plants? What additional infrastructure is needed?

How do open gardens and nature-oriented playgrounds fit into Poznań's urban environment?

Nature-oriented playgrounds and open gardens at kindergartens represent a "small-scale" approach to nature-based solutions, which, when replicated, changes the overall urban fabric substantially. This

is because kindergarten playgrounds are often the largest green spaces in neighbourhoods. Their ecological condition, including the quality of the greenery, biodiversity and permeability of surfaces, must be constantly improved. The use of nature-oriented ideas in modernising them has positive physical and ecological impacts and changes users' (especially children's) perception of nature. It can also open up green spaces to citizens close to where they live.





Images 6 and 7: Concept drawings for natural playgrounds – the different areas are presented in different colours (education area, relaxation area, recreation area).

What are the multiple benefits of open gardens and nature-oriented playgrounds? *Rainwater management and microclimate mitigation:* increasing the biologically active area and permeable surface, storing rainwater, mitigating the urban heat-island effect and introducing plant species adapted to climate change.

Biodiversity regeneration: introducing native and multi-species greenery with diverse vertical and horizontal structure, providing convenient living conditions for urban fauna (e.g. hotels for insects). **Social benefits:** strengthening social cohesion and providing a place for social activities, improving health and well-being of children and adults, increasing ecological awareness and nature education. **Economic benefits:** promoting entrepreneurship and professional development for the design and implementation of nature-based solutions.

New social relations: increasing cooperation among different actors in the city "on the ground".



How can technical design help to mobilise social, health and well-being benefits?

It was important in the nature-oriented playground to make use of eco-demonstrators that would complement and enhance the educational benefits. Eco-demonstrators are installations that educate children on nature through observation, experimentation and fun. These are elements made of wooden and plant materials like living tables – tables planted with evergreen vegetation, houses for insects, vegetable beds, willow huts etc. They form part of the design of the playgrounds.



Images 8, 9, 10: Examples of eco-demonstrators installed in preschools in Poznań. Source: Piotr Bedliński and Made in Art Foundation.

How can soundness, replicability and flexibility be balanced in the technical design?

The City of Poznań has created a guidebook entitled *Preschool Gardens* (*Ogrody przedszkolne*. *Poradnik*) which contains a description of how to arrange and equip a natural playground, and a nature-based solutions catalogue, which presents the eco-solutions that are possible to implement in the city. In addition, in cooperation with Poznań's Adam Mickiewicz University, a database of all nature-based solutions in the city has been created. Architects, teachers and practitioners may use this catalogue when developing open gardens and nature-oriented playgrounds.

Despite the need for verifiable and replicable standards, flexibility and openness to new ideas and opportunities are needed to facilitate different approaches to design among kindergarten managers and other local stakeholders. After all, a key principal of nature-based solution production is co-production, which involves multiple actors not only in the design and implementation but also, and especially, in the identification of financing opportunities. On this last point, it is important that the nature-based solution be actively promoted among stakeholders and institutions who might be able to support the funding of the idea.

Dealing with trade-offs between different user interests

Conflict can arise owing to differences in user interests. For example, there could be conflict over an increase in noise levels owing to events in the open gardens or over what are considered to be the best solutions for area development.

During a family event in the Poznań kindergarten, a neighbour complained about the high noise level. The solution was to better inform those living in the vicinity about upcoming events and to organise workshops and events targeted at a variety of neighbour groups to involve them in the garden's activities.

Gentrification, leading to dramatic changes in population structure, might become a risk for neighbourhoods with open gardens. Therefore, urban regeneration should be community-led, focusing on building social and relational capital, strong involvement of non-governmental organisations and bottom-up initiatives, in order to counteract the exclusion of low-income groups.

4.3 Governance

Creating conditions for collaboration and coordination for multifunctional nature-based solutions

Because of the multifunctional benefits that can be achieved from nature-based solutions, their delivery is often aligned with broader social, political and business priorities and the goals of a city and

of city-regions. Such alignment requires cross-sectoral, multi-scale and inclusive approaches in terms of who is best placed to ensure development, delivery and the ongoing sustainability of the naturebased solution. New partnerships and collaborations may need to be formed in order to foster effective coordination and collaboration.

Which collaborations and partnerships were put in place to deliver the open gardens and natureoriented playgrounds in Poznań?

The nature-oriented playgrounds and open gardens projects are led by the Project Coordination and Urban Regeneration Office at Poznań City Hall. The office established strong collaboration with other partners; the Department of Education manages the budget for the implementation of the nature-oriented playgrounds while kindergarten management is critical in obtaining support, especially for the open garden.

A variety of other stakeholders were required to become involved at various stages of the design and implementation – a landscape architect supported the design processes, a non-governmental organisation facilitated workshops in the open gardens, and environmental experts underpinned the provision of ecological education.

It is important to clearly assign roles and responsibilities among these different actor groups. For example, the open garden remains in the care of the kindergarten management. The kindergarten management, in cooperation with chosen NGOs, works very actively for the garden, encouraging residents to visit – to this end, numerous meetings and creative workshops are planned for the summer. The city of Poznań is responsible for monitoring and evaluation but also for enforcement, that is, ensuring that activities comply with local law, applicable rules and regulations.

Which strategic city goals does the nature-based solution help to deliver?

Poznań's city policies are very much greenery oriented. The creation of open gardens and natureoriented playgrounds has potential for achieving other city development goals and it is included in a variety of strategic objectives, such as developing a green city, supporting ecological education for citizens and influencing the character of the city and the health and well-being of its residents. This shows how nature-based solutions can offer creative, innovative and effective ways to deliver on many strategic goals and how they can be incorporated into a range of policies.

There are strong links between Poznań's strategic goals and nature-based solution goals formulated and pursued at European level. This supports the planning of nature-based solutions and the evaluation of their many benefits.

How can collaboration across different city departments be facilitated?

The organisational structure of Poznań's city government is hierarchical and complex, with rigid work procedures and competencies distributed within and across relevant departments. The key to the successful creation of open gardens and nature-oriented playgrounds is smooth cooperation and the transfer of information among relevant departments.

The experience of the City of Poznań (and the Connecting Nature team in Poznań City Hall) is that to overcome existing barriers, it is important to communicate often; provide information on the projects and goals; arrange meetings and brainstorm with a view to meeting common goals; evaluate and monitor plans and actions; and create the unified vision that will be led by competent and informed management.

How to ensure financing and maintenance?

There are currently no legally binding means for the creation of open gardens and natural playgrounds. Embedding such mechanisms or financing processes into the investment planning for the municipal kindergarten budget could support their upscaling. To ensure funding, it is important to clarify long-term city's visions, strategies and goals with a view to identifying those activities that will help to realise them and identify the financial opportunities for leading future projects.

Identifying who is responsible for upscaling could prevent a loss of momentum. While the local government is important for the initiation of new projects, the kindergarten management is responsible for maintaining the pre-school gardens. Therefore, to ensure delivery, it is recommended that a financial and management "map" be created to support directors and managers of kindergartens.

4.4 Financing and business models

Mobilising resources for implementation and long-term sustainability

Planning for up-front financing of nature-based solutions and long-term sustainability are a critical element of nature-based solution implementation. To ensure that they do not rely on public sector funding alone, there are several support tools to help cities put together a long-term business model for their nature-based solution, which includes assessing the potential of alternative sources of funding such as philanthropic or crowd-funding.

The Business Model Canvas: stimulating innovative financing and business models

Working through the Nature-based Solutions Business Model Canvas tool¹ (a visual way of describing, assessing and scoping out business models) has allowed Poznań to explain the wider value proposition of its nature-based solution (in other words, who will benefit from it in the widest sense) and to clarify how this will be delivered through key activities and key partners.

¹ <u>https://connectingnature.eu/financing-and-business-models</u>



Poznan, Kindergarten: Nature-based Solutions Business Model Canvas

Key activities Surface desealing, improvement of soil and environment New planting Equipping the garden with natural elements Creating natural playgrounds for children Making the green area better available for residents/children Cooperation with the preschool's management Activities involving and engaging	Key resources Kindergarten area Organizational assis- tance Technical advice Monay supply Garden maintenance programme Organisational assis- tance Administrative and con- tent related support Money supply	Value proposition Access to high quality nature/environment in the city Biodiversity (including beediversity) Free access to nature Decrease of temperature during summer Desealing of the surface Bigger area of greenery Conservation of the kindergarten's infrastructure linked with education Social inclusion Meeting place Space adopted to different needs of children and adults Education	Key Partners Designers(experts and preschoolers) NGOs Green and clean services providers Poznaf City Hall Environmental Protection National Fund / Environmental Protection Volvodship Fund Councilors Media Kindergartens Housing & cooperatives (institution) Housing community group organized by	Key Beneficiaries Residents Children, parents and seniors Teachers Kindergarten management Polinators and local fauns<ora Green enthusiasts City as a whole Visitors from other pre- schools Neighbours Service providers Safety auditors
residents Activities promoting health and outdoor playing Job creation Greating a market for new services and products Exchange of knowledge and experience Adjusting the market and law to emerging services and products Looking for sponsors	Human resources Financial resources Incentives (job creation) Adjustment of public procurement Human resources Financial resources transport programme Incentives for public institutions	Improved health and well-being of users free of charge Direct economic: Free of charge but generating other services - Interestin Kindergarten with higher green standards - Job creation (maintaining) - Increased property values Indirect economic: - Transfer of skills, knowledge and expertise - Increase of attractiveness of area Increased quality of neighbourhood Small architecture for users	residents Local activities Land owners Higher education providers Sponsors(including CSR) Information providers	Local small business Politicians Tourists Scientists
Cost Structure ERDF Urban Innovative Actions Non-EU funds planning Environmental Protection National Fund / Environmental Protection Voivodship Fund Adaptation to climate chance	Cost Reduction 1. Shared coordination 2. Negotiation price 3. Social economy operator 4. Funding	Capturing value Environmental value A. Direct - New fundings sources/opportunities - District councils, banks, firms - District councils - District councils - District councils - District councils - Crowdfunding - Cr		ucation
programmes Strategy of rainwater management Department of education Eufunds(on) Crowdfunding Altematives sources(for foundations, artists, philanthropista) Cooperation with universities	programmes 5. Volunteers 6. Contributions in- kind/time-banking	Ecological effect inducators Formation Fain value Formation For	ex opinions in media (social) - Positive opinions set he local dentity - increase the local er of users/visitors - Number of users/ social indicators - Other social indic	in media (social) identity visitors ators

Image 11: The business model canvas for nature-oriented playgrounds

Identifying new financing and business model opportunities

Poznań is facing severe budget cuts, which makes financing challenging. It is therefore important to identify and mobilise new sources of finance. European Union programmes and initiatives, such as the URBACT and LIFE programmes, and structural funds cannot be overestimated as sources of funding for nature-based solutions. The Multiannual Financial Framework of the EU, starting in 2021, seems to be well placed to respond to Poznań's challenges in terms of both capital expenditure and the operational costs of nature-based solutions.

The diversification of funding sources will remain a priority in further developing the open garden model. This requires match-making beneficiaries and stakeholders and supporting them, as well as being open to funding from other types of institutions and private organisations.

Which model is best to finance the open garden and nature-oriented playground?

The "societal resilience" nature-based solution governance model is characterised by considerable community leadership in governance, with local government playing a responsive, supporting and low-level role.

Thus, in Poznań's case, the lead actors would be community organisations, with support from the public sector. The city hall gives capital to start the initiative, which should function at some point in its lifetime without the help of a government or city budget.

The assumption is that the city's engagement will decrease as the role of non-governmental organisations or community organisations or operators increases. In this way, the maintenance of an open garden would be financed from the kindergarten budget, and the running of workshops, classes or organised events would be taken over by the operator or entity that will manage the garden. Its task would be to look for additional sources of finance to allow the garden to continue to function.

Knowing financing partners and "knocking on doors" to mobilise other streams of financing

To drum up funding and create opportunities for new business models, it is important to identify and collaborate with diverse actors. Approaching other city departments has proven to be a successful strategy in this regard. For example, the nature-based renovation of the pre-school gardens was made possible through informal cooperation mechanisms between the Project Coordination and Urban Regeneration Office and the Department of Education's multi-annual programme for the modernisation of playgrounds.

It is challenging, however, to establish contact and collaborate with the private sector. A first step is to make a list of potential companies but there is not yet a well-developed market for green services offering flexible and innovative nature-based solutions. The joint creation of new financing opportunities and business models is therefore closely linked to co-production, and consequently involving diverse actors in the joint design and implementation will be crucial.

What are the most important services or activities required to deliver environmental, social and economic value?

Co-production workshops were organised to initiate the planning and delivery of open gardens and nature-oriented playgrounds. These enabled the inclusion of stakeholders representing environmental, social and economic aspects. It was critical to involve experts in the design and implementation phases so as to ensure the high quality of the solutions. This is especially necessary in the first pilot activities, because standards employed in the pilots could be easily replicated during upscaling, whether they are appropriate or not.

How can costs be reduced?

Cost reduction can be done in the earliest stages. A basic approach is to undertake research into the opportunities ahead of pricing negotiations. Price negotiations may concern scope of market offers or innovative approaches. - There may be an opportunity for example to share the coordination of tasks with partners, thus strengthening their sense of agency. A consequence of this approach is that the main actor doesn't have to bear all the cost. In some cases, it is possible to obtain a service or product at no costas part of a partner's Corporate Social Responsibility (CSR) policy. A social economy operator, for example, could provide public services using the potential of local communities to get involved on a voluntary basis. Including volunteers not only helps to reduce costs but may also further integrate neighbours and support the development of CSR policies in local companies, which favour the nature-based solution.

One of the most recognisable means of cost reduction, however, involves the use of funding programme opportunities. Such programmes operate on local, regional, national or European level, offering different percentages of co-funding. Programmes supporting climate change adaptation and mitigation, social participation and inclusion, and activation on the local labour market could be good places to look for nature-oriented financial support.

4.5 Nature-based Entrepreneurship (NBE)

Engaging community and commercial enterprises in the design, implementation and long-term delivery of nature-based solutions

Nature-based solutions can provide opportunities to support nature-based enterprises. Nature-based enterprises are enterprises that can leverage nature-based solutions directly in their product/service offering, for example green wall/roof providers, allotment garden food producers/markets, or eco-tourism providers. Nature-based enterprises may also indirectly contribute to the planning, design, financing and sustainability of nature-based solutions, for example landscape architects, specialist nature-based solutions equipment manufacturers, Community Interest Companies (CICs) managing nature-based solutions, or crowd-funding platforms for nature-based solutions.

Identifying and prioritising innovation and entrepreneurship opportunities

Integrating nature-based solution development with the economic priorities of a city can create new opportunities for entrepreneurship. For example, Poznań identified a link between food and nature and suggested the need for more restaurants and facilities in parks. The city also identified that businesses were attracted to pleasant and appealing locations and therefore suggested that businesses may want to associate nature-based solutions with their corporate image. Along these lines, there are many different types of nature-based enterprises that could contribute to the city's nature-based solution objectives. For example, in the design sector, landscape architects can contribute to environmental and economic goals; furniture designers can contribute to social goals – by introducing functional street furniture, they create places for relaxation and rest for residents.

Linking innovation ecosystem actors to create opportunities for nature-based entrepreneurship

An innovation ecosystem – a business community and environment in which innovation is encouraged – benefits nature-based enterprises. The innovation ecosystem in Poznań is composed of technology parks and research institutions, incubators, knowledge transfer centres, start-ups, clusters, creative sectors, urban projects and social innovation support providers. The key actors in creating and maintaining such an ecosystem are the local government and regional government (Wielkopolska region). However, there are gaps in terms of collaborations between these actors and those responsible for planning nature-based solutions development. - The role of city administration is to identify nature-based entrepreneurs and the needs they have that could be supported by the city, as well as matching city administration demands with relevant business proposals.

Sustaining nature-based entrepreneurship

Some of the main barriers to sustaining nature-based entrepreneurship are a lack of critical mass to sustain SMEs, a lack of awareness of, and demand for, nature-based solutions, and resistance from competing industries, such as the car lobby. Opportunities to surmount these barriers lie in eco-education and awareness-raising associated with the wider challenge of 'branding' nature-based solutions. Another opportunity lies in tapping into the increasing support from citizens for the retention and development of green areas. Citizens in Poznań are becoming increasingly engaged in 'ownership' and contributing to green development. They vote for nature-based solutions in the participatory budget, organise community gardens and food cooperatives and take part in public debates on the creation of public spaces and the importance of nature in such spaces. Public procurement and incentives can facilitate entrepreneurship, building on this public interest.

Example: Eco-garden equipment

When the city of Poznań engaged a landscape architect to design eco-demonstrators for its natural playgrounds, it accidentally discovered a gap in the market. The type of equipment it envisaged did not already exist! Through public procurement, the city supported a local manufacturer to design and develop new equipment to fill the gap. Now, having already supplied more than 10 kindergarten playgrounds with the equipment and with many more interested in installing similar equipment in the coming years, the city has directly contributed to the emergence of a new product line and market opportunity for the local manufacturer. The success of the Poznań natural playground has sparked a lot of interest around the world, creating potential international opportunities for the Polish manufacturer.

4.6 Co-production

Engaging and mobilising diverse parties in searching for and implementing joint solutions

Co-production facilitates collaborative knowledge sharing between diverse actors in cities – such as local policymakers, researchers, citizens and entrepreneurs. In this way, co-production generates shared definitions of the problems being addressed, and shared visions or solutions that are fit for local needs. It fosters new relationships and mobilises and empowers the actors to actively engage in creating better and greener cities.

Why co-produce open gardens and nature-oriented playgrounds?

In the experience of Poznań, co-production was important because it helped to generate new and more complete knowledge, especially about the users' needs, this in turn ensured co-ownership and established new partnerships. The main goal was to involve as many people as possible who could present their point of view and contribute to the project. Co-production afforded more opportunities, in terms of ideas and financial resources, to develop and maintain the place when the project is already created.

Specifically, it was important to collaborate with a variety of stakeholders, including teachers, architects, parents and police. Where the open garden is concerned, the main stakeholder is the kindergarten director and, as such, success depends mainly on her or his flexibility and openness. Opening kindergarten premises to the public is not always perceived as low risk. It demands certain restrictions and cooperation with other stakeholders such as neighbours, the police and the district council. It was particularly important to have police representatives on the advisory board in order to benefit from their knowledge of safety rules and methods of countering vandalism and theft, and also to get their help in maintaining and monitoring the open garden.

How to structure the co-production process

A first important step in structuring the co-production process is to identify the relevant stakeholders and invite them to participate from the outset. In the case of Poznań, stakeholders included the

architect, kindergarten management, civil servants, teachers and children. Employing multiple formats of engagement, including workshops, allows for the integration of the stakeholders' knowledge and needs throughout the initiation, consultation, implementation and operation of the



Image 12: Consultation workshop with civil servants, architects, contractors and residents at Pre-school No 42, Wilda District in Poznań (May/June 2017). Source: City of Poznań.

chance to express their visions and opinions.

nature-based solutions.

Workshops were used for discussion and the exchange of ideas on the design and functioning of an open garden. Not all stakeholders were invited to every engagement. For example, design workshops were held between the kindergarten management, employees of the Project Coordination and Urban Regeneration Office and landscape architects. Only when the design of an open garden was finalised was a series of workshops with citizens organised, at which parents of pre-schoolers, residents from the nearest neighbourhood, and councillors from the housing estate council from Wilda District got a

During the operational phase, it is important not only to have an ongoing discussion on how to proceed (with the director of the pre-school, teachers and parents) but also to discuss finding new governance models that will help to determine who is to be responsible for the management of the nature-based solution in question.

Ensure trust and openness in the process by providing legitimate knowledge and addressing conflicting interests

Challenges can arise when parents have ideas that cannot be implemented in the garden owing to certain conditions or regulations. For example, there may be a water and sewerage system under the surface, which prevents an idea from being realised. Educational workshops could help to overcome some of these kinds of challenges. In the first instance, they could involve teachers and management, who could then pass on their acquired knowledge to parents of pre-schoolers.

For example, many parents initially disagreed with designing insect houses in the garden because they feared stings but when they were informed that the houses would inhabited by mason bees, which do not sting, and that they have several environmental benefits, they agreed the solution was positive.

Such discussions facilitated openness on all sides, and everyone involved learned to listen to different ideas and view them not as threats but as opportunities to create an attractive rest-and-recreation space for children, their parents and grandparents, and local residents.

Ensuring usable knowledge for co-ownership and empowerment

The goal was to create a place where children could have fun, relax and experience nature so it was important to design a garden suited to children's needs. This meant acquiring usable knowledge. Authoritative and useful information was obtained on creating an open garden, including expert knowledge from architects, teachers, contractors and environmentalists. The knowledge and experience of kindergarten management, who know what works for children, and knowledge of how children might learn through playing in the garden, was also drawn upon.

Creating institutional space and skills for co-production

Co-production was a novel process in Poznań. The organisational structure of the city of Poznań is hierarchical and compartmentalised. Many departments work according to traditional methods and maintain a rigid structure that does not contribute to joined-up thinking. Space for co-production was created by establishing several channels of collaboration, such as that developed with the Education Department in respect of support for the open garden. It is important to spend time informing people about the co-production process and to encourage them to engage in consultation. To this end, it is necessary to involve a skilled facilitator who knows how to mobilise participants and involve future users in the design and creation process.

Using diverse communication and information channels to reach 'unusual suspects'

It was a challenge to inform all residents about the open garden and encourage them to participate in workshops and consultation meetings. Despite many efforts to promote the garden and invite stakeholders to workshops, information did not always reach the desired number of people. It is important, therefore, to use as many information channels as possible.

Example method visioning: children draw their dream open garden in Poznań



In Poznań, a series of informational and consultation meetings were held with residents, who were given an opportunity to express their opinions on the concept of the open garden, how it would function and the attractions it would offer to children, parents and other visitors.

During the organised workshops, two methods were used. The first was brainstorming, whereby parents, children and teachers exchanged ideas on how an open garden might look,

what it might

contain and how visitors might spend time or have fun there. The second method was to prepare pictures or drawings of the open garden envisaged, including plants and other elements. The children loved this task and outdid themselves producing ideas.

These methods helped in identifying the needs of residents and future users of the garden, especially children and parents. The ideas presented inspired the designer and architect, who used them to create a project concept for garden.



Images 13 and 14: Children's inspiration – how they imagine the open gardens would look (June, 2017). Source: City of Poznań/Pre-school No. 42 at Wilda District in Poznań.

4.7 Reflexive Monitoring

Systematic and real-time learning about nature-based solutions and the implementation of those learnings

Reflexive monitoring is an evaluation method that measures the progress of a project or programme. The aim is to use the findings to improve the design and any associated follow-up activities. An advantage of this approach is that improvements may be made in real time rather than at the end of the process.

Reflexive monitoring activities stimulate learning, allow barriers and opportunities to be identified as they emerge and enable flexible responses to be found to changing circumstances and objectives.

How does reflexive monitoring contribute to the planning, delivery and stewardship of open gardens and nature-oriented playgrounds?

Reflexive monitoring helped the team to reflect on the process, become more aware of existing barriers and embrace failures as learning opportunities. It allowed lessons to be identified on how to proceed with the creation and stewardship of open gardens and nature-oriented playgrounds. For example, through reflexive monitoring, it became clear that even small changes can have a big impact, for example the addition of micro-installations (eco-demonstrators) that equipped gardens with green elements in ten kindergartens proved a simple way to educate children, teachers and parents on how nature works.

Reflexive monitoring allows small developments to be recognised and barriers that are hindering progress to be identified and it prompts a more proactive search for solutions. Reflexive monitoring makes it easier to "remember" activities that are planned or started in the process, but stall, and lessons learned or ideas that need to be followed-up but are put aside during project implementation. In this way it is easier to prioritise which actions need to be taken to help the scaling of nature-based solutions.

How to set up and do reflexive monitoring

The first step was to identify a reflexive monitor to be in charge of preparing an overall timeline showing each important event in the implementation of the open gardens and nature-oriented playgrounds. The bullet journaling method was used to capture these. This timeline was used to structure regular team meetings and it was an important source of information for further discussion and planning. After each team meeting, a dynamic learning agenda was created whose purpose was to identify the critical turning points that changed how certain practices were handled, for instance, communication with other actors or internal and external collaboration. This helped to formulate learning questions and follow-up actions.

Critical turning points	Learning questions	Follow up actions	Status
Meeting and discussion with specialist who is in charge of green solutions in pre-schools - natural playgrounds in pre- schools using natural and green elements (30.10.2018)	How to ensure that kindergartens selected by Department of Education for investment will implement nature oriented playgrounds?	Influencing management of kindergartens selected by the Department of Education to follow the mechanism of support offered by the Project Coordination and Urban Regeneration Office (support of natural playgrounds designer for investments paid for by the Department of Education	Complete - informational meeting in February (14/02/2019)
		Organising set of consultation meetings of kindergarten management with the contracted landscape designer to design playgrounds for selected	Ongoing - more workshops in the frame of natural playgrounds

	kindergartens in line with their individual needs and enable them to understand the concept of NB playgrounds better.	designing process
How can we financially support the development of pre- school gardens? How can we properly work out a well-functioning financial model?	Developing appropriate financial support tools with the help of experts/professionals	ongoing - analysis
How to find other sources of finance for individual activities?	Identification of other sources of finance in the city that can be allocated to the development of nature-based solutions in Poznań	ongoing - analysis
How to maintain coop- ration between the various stakeholders: Departments, companies, contractors, pre-schools (directors, children and parents)?	Initiate meetings (formal and informal), discuss, share ideas, organise workshops	ongoing - analysis

Embracing reflexivity as a new working principle

Since reflexive monitoring is a new methodology, it challenges existing work practices and can take time to become embedded, especially at the beginning. In Poznań, it took time and patience to understand how it would benefit the day-to-day work. At first, reflexive monitoring meetings were perceived as a burden because daily project tasks already demanded considerable administration. A moment of change came with the failure of one of the initiatives – the temporary summer garden. It was hard to admit failure at first but the methodology allowed for the identification of the reasons for failure, making it much easier to learn positive lessons that would benefit future activities. Reflexive monitoring therefore showed that something is not necessarily a failure if it creates learning opportunities that are taken on board.

5. Impact

The Connecting Nature project, funded by the Horizon 2020 research and innovation programme of the European Union, is realised by the team from the office of Project Coordination and Urban Regeneration at Poznań City Hall. This project affords Poznań opportunities to implement nature-based solutions, both small and large, that effect positive change in the urban environment.

Our knowledge and experience in implementing innovative nature-based solutions grows every time we start new activities at this field. Despite a hierarchical organisational structure and administrative procedures, we look for new eco ideas and methods of implementation in the city.

The importance of our work under the project is evident from the number of natural playgrounds created in Poznań. There are 15 pre-school natural gardens and one open garden. Additionally, 30 pre-schools took part in the eco-demonstrators project.

The various planning processes and steps we have taken to design and implement our green solutions have resulted in multiple innovations and contribute to climate adaptation, biodiversity regeneration, social cohesion and environmental awareness.

The design, implementation, operation and maintenance of nature-based solutions require us to learn about and experiment with new planning approaches and methods. We treat them, however, as new lessons to help us to overcome barriers and challenges and to ensure progress on the activities in Poznań.

Activities initiated in the Connecting Nature project are the basis for cooperation between units in the city of Poznań which deal with green areas in the city. Thanks to the flow of information and experience, we can influence the quality of activities in the city and use our results in other projects. Acquired knowledge and completed actions under the Connecting Nature project have contributed to obtaining funds from other EU and regional programmes.

6 Resources

Internet Resources:

1. Information on the urban regeneration and investment activities carried out in the city of Poznań: https://www.poznan.pl/mim/rewitalizacja/

2. Information on natural playgrounds at preschools in Poznań, how they are created and what they look like: <u>https://www.poznan.pl/mim/rewitalizacja/naturalne-place-zabaw,p,46898,46899.html</u>

3. Information on the idea and process of co-designing of open garden at preschool no. 42 in Poznań: <u>https://www.poznan.pl/mim/rewitalizacja/ogrody-otwarte-i-spoleczne,p,46898,46900.html</u>

4. Information on the eco-demonstrators project in preschool gardens in Poznań: <u>https://www.poznan.pl/mim/rewitalizacja/ekologiczne-demonstratory,p,46898,46899,46967.html</u>

5. Development Strategy for the City of Poznań 2020+ (Strategia Rozwoju Miasta Poznania 2020+): https://www.poznan.pl/mim/main/-,p,14886.html

6. Database and reports of the city of Poznań: https://badam.poznan.pl/en/01_database-of-the-city-of-poznan/

The guidebooks on each of the seven elements making up the Connecting Nature Framework (namely Technical Solutions, Governance, Impact Assessment, Finance, Entrepreneurship, Co-production and Reflexive Monitoring) along with a step-by-step how-to manual on the Framework are available to download on www.connectingnature.eu/resources.

Nature-based Solution Business Model Canvas: https://connectingnature.eu/nature-based-solutions-business-model-canvas