



INTERLACE
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RECUPERANDO ECOSISTEMAS URBANOS

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Executive Summary

The INTERLACE project has been proactive in targeting citizens as part of its objective to increase public awareness and understanding of urban ecosystem restoration and the importance of nature in cities more generally. This objective has been delivered via a **Citizen Engagement Programme**, which has been co-developed and delivered by the project's communication specialists (Work Package 5) alongside representatives from each of the six participating case studies: Envigado (Colombia); Granollers (Spain); Metropolia Krakowska (Poland); Chemnitz (Germany); Portoviejo (Ecuador); and Corredor Biológico Interurbano Río María Aguilar (CBIMA) (Costa Rica).

The Programme has resulted in a series of events and activities designed to mobilise local communities at neighbourhood, locality and city-wide level in recognising and seeking solutions to common challenges such as climate change, biodiversity loss, urban sprawl and pollution. It has given opportunity for citizens to get involved in the discussion and design of democratic and inclusive spaces that respond to the needs of local people and nature, seeking to foster a sense of stewardship and in many cases 'prepare the ground' for ongoing and long-lasting citizen engagement beyond the project itself. It has also provided an outlet through which communities have expressed, shared and celebrated their love of nature and the important contribution it makes to public wellbeing. All this has been achieved with an emphasis on imagination, inclusivity and fun, especially with regard to young people who are often underrepresented and have been a key target audience of this work.

The Citizen Engagement Programme has consisted of four workstreams, namely Community Art, Citizen Science, Digital Gaming, Outdoor Learning Tours. In addition to these workstreams that focused on implementing activities in the cities, a Business Insight workstream has targeted business and financial stakeholders through a series of webinars, enabling knowledge sharing on Nature-based Solutions (NbS) financing and business models. The workstreams have been led by specialists in each field, involving a high degree of innovation and experimentation through which new methods have been tested and refined.

NbS have been at the core of the Programme and central to its aim of fostering meaningful connections between people and their environment: presenting nature as not only intrinsic to people's quality of life, but a rich source of solutions to the common challenges faced by cities in both Europe and Latin America. This project deliverable summarises the results of implementing the Citizen Engagement Programme in the five INTERLACE cities and peri-urban areas as well as the Business Insight workstream through five thematic webinars.

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1. Introduction

The rationale behind developing the Citizen Engagement Programme was to develop and test methods for increasing public awareness of the value of nature in cities; and where possible to engage citizens in urban ecosystem restoration: transforming citizens from passive recipients of NbS to active participants in their design and implementation. From the outset, young people were identified as a key audience and nearly all of the Programme's workstreams placed emphasis on engaging this target group. In addition to the Citizen Engagement Programme, a Business Insight workstream was set up that targeted the business and financial sectors through a series of thematic webinars.

The Citizen Engagement Programme has been delivered as part of the INTERLACE project, which itself aims to strengthen the restoration of urban ecosystems in the European Union and Latin America, supporting actions that restore, rehabilitate and reconnect ecosystems, where humans and nature are intrinsically linked. The Programme has been led by WWF Colombia, supported by Oppla and other partners under Work Package 5: INTERLACE Hub for Innovation and Outreach.

Six case studies have participated in the Programme, comprising four cities (Granollers, Envigado, Portoviejo, Chemnitz) and two inter-municipal associations (Metropolia Krakowska and Corredor Biológico Interurbano Río María Aguilar-San José). A common thread uniting these cases is the ambition of their respective municipal administrations to involve residents in urban ecosystem restoration and promote active citizenship. With respect to this, implementation of the Programme has sought to equip municipal staff with the tools needed to:

- a. Provide citizens with opportunities for reflection, collaboration and self-expression.
- b. Promote participation and exchange among a diversity of people, including underrepresented groups (such as young people).
- c. Develop activities supporting outdoor learning and encouraging people to explore nature 'on their doorstep'.
- d. Provide opportunities for young people to become active participants in urban ecosystem restoration (as opposed to being only passive recipients of education on the subject).
- e. Motivate citizens to become stewards of their environment.

Overall, the Citizen Engagement Programme has sought to empower citizens through nature; to provide benefits such as strengthening community cohesion, fostering stronger relationships between citizens and their environment; and improving people's wellbeing and quality of life. The underlying assumption is that meaningful outdoor experiences can improve the relationship between people and nature (Shwartz, et al. 2012, Hoover, 2021), and can have significant positive effects on mental and physical health (Coventry, et al. 2021).

There are three main benefits the Programme has aimed to achieve through its implementation, as agreed upon with representatives of the INTERLACE cities:

- a) **Recognition:** strengthening people's sense of belonging to the city, as well as the sense of community as a source of positive social and cultural activities.
- b) **Understanding and participation:** involving a diversity of people – and especially young people - in urban planning through digital tools.
- c) **Commitment and action:** implementing outdoor activities with different stakeholder groups that have an overall positive impact on the actions and behaviour of citizens.

The Citizen Engagement Programme has been implemented via four workstreams which are summarised below:

a. CITIZEN SCIENCE

In the context of NbS, citizen science is an opportunity to increase public awareness of nature conservation, sustainable use of biological resources and strengthen their connectedness to nature (Pocock, et al., 2023). It can also help drive processes or projects that, due to their time and/or cost requirements, may be difficult for local governments to implement; for example, biodiversity monitoring to assess the impacts and outcomes of NbS.

b. DIGITAL GAMING

The INTERLACE project has used the video game Minecraft to help young people in partner cities discover, learn, plan and design NbS in a playful and engaging way.

c. COMMUNITY ARTS

Using art as part of the learning and engagement process can be an effective strategy to promote citizen participation and environmental education (Song, 2012). The Citizen Engagement Programme has sought to achieve this in two ways: (1) through citizen becoming artists by creating artworks in public spaces; and (2) through citizens engaging with artwork as onlookers.

d. LEARNING TOURS

This workstream has focused on the use of outdoor Learning Tours as method for increasing public awareness and understanding of nature in cities. It has involved use of digital applications (apps) to teach young people about NbS for urban ecosystem restoration while participating in guided walks and scavenger hunts

Each participating case study was required to implement the digital gaming workstream plus one other activity. The Programme exceeded this expectation with two cases delivering a total of three activities. The activities chosen by each case are summarised in the table below.

| Case Study | Digital Gaming | Community Arts | Citizen Science | Learning Tours |
|--------------|----------------|----------------|-----------------|----------------|
| Granollers | X | X ¹ | | |
| Portoviejo | X | X ² | | |
| Envigado | X | X | X | |
| M. Krakowska | X | | | X |
| CBIMA | X | X | X | |
| Chemnitz | X | | | X |

Table 1: Streams of the Citizen Engagement Programme

This report is based on the experiences of the cities and inter-municipal associations that have implemented the Citizen Engagement Programme. It contains information that has been gathered through participant interviews and data collected while implementing the activities across the six participating cases (e.g. number of events and citizens engaged). Reporting from each case study is not wholly consistent as each municipal authority has its own localised reporting methods and procedures, with further variations between EU and CELAC countries. This report has nevertheless endeavoured to present the results of the Programme in a way that highlights its common successes, impacts and lessons learned for other similar studies to gain insights from.

In addition to showcasing the results from implementing the Citizen Engagement Programme in the six cities, this report summaries the implementation of the **Business Insight** workstream (see chapter 6 of this report). This workstream was not implemented at city level, but through a series of webinars which aimed at stakeholders from the private sector as well as policymakers and urban planners with an interest in business models for urban restoration. In the Business Insights webinar series, small and medium enterprises (SMEs) from Europe and Latin America were invited to share their successful projects and discussing barriers and enablers to their business and more generally to the NBS sector in their city and country.

2. Arts Programme

Using art as part of the learning and engagement process has been an effective strategy for promoting citizen participation during the implementation of INTERLACE. Citizens can either act as artists or observers, creating art themselves and/or experiencing the art produced by other members of the

¹ Action to be implemented in the coming months.

² Action to be implemented in the coming months.

community. This is where art begins to take on more relevance in cities: “Using the arts for conservation can help attract new audiences, increase understanding, introduce new perspectives, and create a dialogue among diverse people” (Jacobson, et al. 2015).

The objective was to implement arts Programmes that allow studying, strengthening, and promoting the relationships between people, their city, and nature; contributing to social transformation while taking care of nature.

Some ways to engage citizens through art are:

- a) **Urban art:** such as graffiti, murals, sculptures, dance, film festivals, street theatre, art exhibitions, and concerts.
- b) **Sustainable ventures:** crafts, handicrafts, or works made with recycled materials and other natural resources.
- c) **Green infrastructure:** vertical gardens, green walls, community gardens, or orchards.
- d) **Community education workshops and activities:** conservation education activities, tree adoption, outdoor activities to connect with nature, recycling workshops, and guided tours, among others.

2.1 Design and implementation

Arts Programmes by the nature require flexibility and creativity in terms of process design and delivery. In this context one size rarely ‘fits all’ and the INTERLACE Citizen Engagement Programme has recognised the need to be adaptable through its implementation.

It has however proved beneficial to help guide and inform city partners using a series of common steps, which are summarised below.

1. Establish a theme and an objective: it is important to first establish an overall theme for the Arts Programme (a topic area and choice of artistic medium: drawing, painting, sculpture, performance, etc) and also an objective for what the Programme aims to achieve. In this regard it has proved helpful to provide context and understanding first, such as giving an overview of the city’s current infrastructure and its strengths and challenges related to its urban ecosystems.

In the case of Envigado, one of the objectives identified was to increase participant knowledge of local animal and plant species, since many found in rural and peri-urban areas and are not recognised by inhabitants of more urbanised areas. The city project team sought to use art as a way of making these species visible on murals along the city’s streets.



Painting a mural in Envigado

ENGAGEMENT PROGRAMME IMPLEMENTATION

2. Discuss the 'how': Planning how arts-based activities should be undertaken has proved to be a key second step of the INTERLACE process, not least because such activities can vary considerably in terms of overall logistics. At this stage we define:

- Who will be in charge of leading the activities;
- The audience targeted for engagement, their specific needs and interests;
- When and where the activities will be carried out (mindful of audience needs);
- What technical skills and financial or personal resources are required for the activity; and whether there is a need to involve professional artists and/or facilitators.

In Envigado, the participatory processes focused on school children. Involving them became a key objective of the project in the city, taking environmental education to another level, as they went from having single-day activities to developing more long-term processes fostering environmental education through art-based and other approaches (including digital gaming).



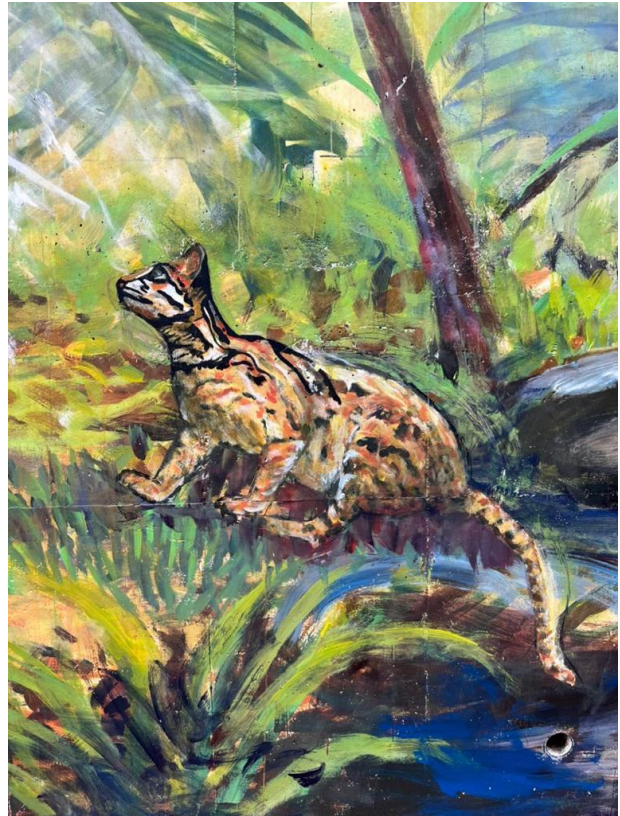
Arts programme in action

3. Consolidate the working group: Once the logistical phase is completed, it has been necessary to guide cities in forming and consolidating the 'working group' of activity leaders/facilitators and participants – in the case of schools, this has involved engaging both teachers and students.

Also in the context of schools, the selection of students has proved to be an important step at this stage in the process. Specifically, it has been necessary to identify students that are interested and motivated, and also to ensure diversity in terms of gender and ability (including engagement of SEN students). In some schools, this recruitment process has involved a 'competition' through which participants have been recruited. Some participating schools also awarded participation in the project to students exhibiting good behaviour as an incentive.

At this stage it has also proved useful to consult with experts to ensure the proposed methods, logistics and working group are suitable for the activity to be undertaken – e.g. consultation with artists, facilitators, teachers and other specialists.

In the case of Envigado, children were recruited from an environmental youth group, which resulted in a high level of enthusiasm for the project and a rich source of ideas as a starting point for activities.



Mural in Envigado

2.2 Implementation in the cities

Envigado



Bringing the Arts Programme to Schools in Envigado

A major challenge faced by Envigado in the implementation of the Art Programme was that this new approach conflicted with traditional methods of environmental education that had been used previously. Traditionally, environmental education was conducted through isolated events. However, with this new approach, it has evolved into more sustained and participatory processes.

Urban art interventions were developed with local artists to highlight the beauty and importance of wildlife and biodiversity. Three murals were painted and drawings were added to three stairways in well-frequented parts of Envigado.

A citizen engagement activity called “Guardians of the Ayura” was set up to raise awareness of Ayura creek’s importance to those living locally to it. Our research

had found that many children living less than 100 meters away did not know about it and Ayura Creek’s ecological importance. Throughout this activity, which involved workshops about the importance of the creek as an environmental backbone of the city, children increased their understanding of the creek and started recognising the privilege of living close to it. In total, 15 workshops took place.

Some of the topics that were touched upon in the arts Programme were:

Cartography, from global to local: Many children in Envigado have never been exposed to a map of their region, leaving them disoriented about their surroundings. Therefore, this initiative utilises maps to help children comprehend their geographical location while empowering them to recognise their potential impact on the local landscape."



The Arts Programme in Envigado

Silape Kids: Children enhanced their knowledge and understanding of the Local System of Protected Areas, using drawings of the local flora and fauna.

One of the main lessons learned so far is that children have begun to question and reflect upon unsustainable urban development processes that have led to deforestation and the degradation of surrounding ecosystems.

To date, more than 23 schools, with more than 1,000 children, have been involved in these activities.



A mural in Envigado

CBIMA

In CBIMA, murals were painted by local citizens as part of the Arts Programme. One of the characteristics of the Programme in CBIMA has been the integration of different ages in the implementation of the activities. Citizens of all age groups, from school children to senior citizens were invited, and as proposed in the methodology, which brought together different worldviews and perspectives on the multifaceted challenges the communities are facing.

To date, more than 100 people have participated in CBIMA-led Programmes.



A mural in CBIMA

ENGAGEMENT PROGRAMME IMPLEMENTATION

According to the CBIMA implementation team, murals allowed citizens to participate in creating a more liveable environment and beyond that, helped to develop a sense of community as well as fostering intergenerational integration.

According to the CBIMA project team, the activity has had an impact on the connection to public spaces and nature and has improved the sense of belonging to the city and on the interdependency of nature and people. As a result, citizens that participated are more aware that participation is important to have a stronger community and better understanding of the natural context they are living on.



Children painting a mural in CBIMA

Art has also made it possible to keep alive the memories that people have of some areas of the city. In the context of La Unión municipality, a methodological approach was implemented that started with neighbourhood meetings to validate designs and sketches of murals developed by local citizens before inviting them to participate in painting on walls.

Portoviejo

Workshops were planned for children/young people in public spaces using an educational brochure. Young people could paint trees and animal species that they could identify in the brochure, thus raising awareness of – and developing a sense of the importance of – local flora and fauna.

As part of INTERLACE, Portoviejo has also organised a contest called "my river, my city and me" based on drawing and photography. The numerous submissions exemplified the awareness of young citizens about the importance of conserving local ecosystems and the active engagement of humans in stewarding these environments. The awards ceremony was held in February 2023.



Outdoor workshop with children in Portoviejo

Granollers

Granollers has planned an intervention incorporating art, the community and nature, especially involving its major water way, the Congost River. It consists of two processes: community research and artistic production based on the results of the community research. It started in late 2023 and is scheduled to end in the autumn of 2024.

2.3 Impact and lessons learned

- The implementation of the Arts Programme has had an impact on the ownership and connection with public space and has enhanced the awareness of the interdependency of nature and people in urban environments.
- Art is a tool that awakens a lot of interest in the community, especially in children. Thus, once the implementation of the Programme is finalised, follow-up activities can ensure a lasting mobilisation of local communities around nature topics.
- Art invites people of different ages to connect, exchanging knowledge and visions around nature in the city.
- Art promotes the understanding of complex concepts for children and youth such as biodiversity, connectivity and NbS in a simple way. Art makes their benefits understandable to different audiences.

3. Gaming Programme

The INTERLACE Gaming Programme has used the Minecraft video game as a medium for involving young people in ‘reimagining’ real world locations with NbS.

The inspiration for using Minecraft was taken from earlier work by UN-Habitat (2021) in using Minecraft as an enabler to encourage community participation in urban design and governance, entitled ‘Block By Block’.

The Block By Block methodology was integrated into UN Habitat’s Global Public Space Programme in 2012 and was successful in helping to develop local policies, plans and designs for accessible public spaces that are resilient to climate change.

The Block By Block Programme has since been discontinued, but has provided a rich source of ideas and methods for us to draw upon as a starting point for INTERLACE’s own gaming Programme.

Video games have evolved dramatically since their early inception in the late 1970s/early ‘80s with the advent of ‘home computing’. Modern games are highly advanced and their mechanics now often involve interacting with 3D environments; problem solving and creative thinking; resource management and prioritisation; teamwork; world-building and more. Contrary to the outdated perception that video games are a “bad influence” on young people’s education, they are now seen as an important asset in the education toolbox, to the extent that Microsoft has a dedicated Minecraft Education Edition specific for this purpose.

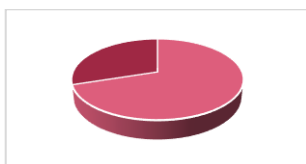
Importantly, video games are a medium that most young people are familiar with and understand. Video games are a medium in which young people consider themselves to be ‘experts’; and this perception of expertise gives them a significant boost in confidence when approaching new tasks that involve a games-based approach. It is a medium they enjoy outside of the traditional education environment and as such is an ideal vehicle for engaging young people “on their own terms” using a tool they already consider to be fun and enjoyable.

Minecraft excels in this regard. It is the world’s most popular video game, enjoyed by over 140 million monthly players, and its core gaming mechanic – of building and creating 3D environments using a wide variety of ‘blocks’ – makes it an ideal environment in which to approach the topic of NbS.

Minecraft is also widely accessible and its player base is one of the most balanced and representative of all gaming communities:



UN-Habitat’s Block By Block Methodology (UN-Habitat, 2021)



50-70% of children aged 6-12 years plays Minecraft



Approximately 60% of players are boys and 40% girls



11% of parents play Minecraft with their children



Average player age is 24 years – it is not only young children who play Minecraft, but many adults too.

Minecraft is similar to LEGO in its application. Players can build, re-shape and create 3D environments using 'blocks' of approximately 1x1 metres in scale, and then populate these environments with a wide variety of objects including plants and animals. This provides a rich and creative 'palette' for imagining NbS.





Examples of Minecraft building blocks and objects.

3.1 The INTERLACE Method

A key innovation of the INTERLACE method has been the use of real-world map data as a basis for creating semi-accurate representations of real-world places.

Minecraft uses a system of procedural-generation to create 'fantasy' environments in which the game is set. For using Minecraft in the context of NbS, we felt it important to use representations of 'real world' environments that participants would be familiar with. This was achieved with the involvement of GeoBoxers³, a company based in Denmark with expertise in using spatial data to generate the 3D environments used by Minecraft.

The INTERLACE method combines data from OpenStreetMap⁴ (buildings, roads, green spaces and other basic city infrastructure) with topography data from NASA's Shuttle Radar Topography Mission (SRTM), resulting in Minecraft environments of the type shown below at scales of up to 5km².



1x1km² of Chemnitz, Germany, created in Minecraft using data from OpenStreetMap and NASA SRTM

These representations of real-world environments were generated for each of the six participating cities and used as the 'canvas' on which NbS were designed and built by the school groups.

Activity process

- 1) **Introducing the activity to schools.** Participating schools were selected and approached by the project's city partners, targeting children aged between 7-14 years in groups of up to 30 participants. A 'Welcome Pack' was prepared to facilitate this introductory process, providing a brief summary of the method; what would be required from the schools in terms of facilities and IT; and a summary of the potential learning outcomes. In most locations, multiple schools were selected (up to 3) and involved children of different ages.

³ <https://geoboxers.com>

⁴ <https://www.openstreetmap.org>

INTERLACE
DIGITAL GAMING PROGRAMME

The INTERLACE project is using the video game Minecraft to help young people discover, learn about, plan and design nature in cities.

The aim of the project is to unlock young people's creativity and imagination, whilst teaching them about how nature can be used to solve challenges like climate change in the places where they live.

Participation is free and you will receive all the support and resources you need for your school to get involved.

Requirements

To participate in the project you need:

- A group of approximately 10 - 40 young people aged 11+ years
- A minimum of 4 classroom hours to work on the project. This can be spread out over several days or weeks.
- A good internet connection and access to computers or tablets that meet Minecraft's minimum requirements. The project can help to provide your school with IT equipment.
- To be located in one of the following cities: Granollers, Envidós, Partovlejo, Chasmitz, Metropolia Krakowska or Corredor Biológico Interurbano Dto Maria Aguilar - San José.

Support

Participating schools or youth projects will receive:

- IT equipment (computers and tablets)
- Minecraft licences
- Lesson plans and guidance
- Training for teachers and other staff
- Specialist support throughout the process

Learning outcomes

Students and young people will learn:

- Some of the challenges their city faces including flooding risk, urban heating, access to green spaces and more. These challenges link to geography and science studies.
- An introduction to 'nature-based solutions'. These are solutions to challenges faced by society that are inspired and supported by nature and science.
- How to use Minecraft. Although Minecraft is a video game, there are educational benefits to using it, including enhancing creativity, problem solving and teamwork.

What is Minecraft?

Minecraft is a video game in which players build with various types of blocks in a three-dimensional world. Similar to physical LEGO blocks, Minecraft blocks can be assembled in an unlimited number of ways - meaning the only limit to player's creations is their imagination! Minecraft can be played offline as a single player game or online where multiple players can get together to collaborate on creations.

Since its release in 2011, Minecraft has recorded worldwide sales of over 200 million units, making it one of the best-selling games of all time. It is available on most consoles, computers and mobile devices.

Minecraft is now being used in the classroom as a fun and interactive tool for teachers and students. Educational Minecraft worlds have already been created to teach students about mangrove restoration (<https://www.minecraft.net/en-us/mangrove-trees-build-a-better-world>) and climate change and flood risks (<https://news.microsoft.com/en-gb/features/turning-the-tide-a-new-minecraft-world-is-inspiring-children-to-tackle-flooding-and-climate-change/>).

Here is an example of how Minecraft has been used for this purpose in Kosovo, Southeast Europe (<https://youtu.be/hwGz39j3j3I>) (to view subtitles in YouTube, click on the settings button (cog symbol) and select 'subtitles').

INTERLACE DIGITAL GAMING PROGRAMME Welcome Pack

Excerpts from the INTERLACE Gaming Programme Welcome Pack

- 2) **Logistics and preparation of necessary IT.** We needed a method that could be used with all participating schools, mindful that the IT systems and facilities at each school were likely to be highly variable. Minecraft is available as an Education Edition, which is an ideal format purpose-built for schools, but requires schools to operate a Microsoft 365 Education Tenant (software environment) for this version of Minecraft to be used. Because not all of the participating schools used 365 Tenants for their day-to-day IT, we needed a solution that was portable and not dependent on schools' own IT systems. Hence it was decided to use the public version of Minecraft, known as Bedrock Edition, which could be pre-loaded onto tablet PCs and brought into the schools by the activity facilitators and required only a standard WiFi network to operate (a "Plan B" was also developed in cases where the WiFi network was insufficient, through which Minecraft was used in offline mode). This approach greatly reduced the IT burden for the participating schools and made the activity more accessible and much simpler for schools to engage with, resulting in a high level of uptake (all schools that expressed an interest took part in the activity).
- 3) **Data processing and preparing the Minecraft environments (aka "Realms").** The city partners worked with participating schools to select real-world locations with good potential for NbS. These were typically public spaces close to the schools that had a lack of biodiversity and/or facilities for people, and which offered good potential for improvement through NbS. In some cases, the locations selected were the schools themselves; in Metropolia Krakowska the area was chosen through a schools competition.

The chosen locations were marked on OpenStreetMap and where possible, additional data was added to the OpenStreetMap dataset prior to the data being exported for use in Minecraft. This enabled additional details to be added, such as missing buildings and other useful information. The OpenStreetMap data was then converted into a Minecraft-readable format and uploaded to a persistent online server, known as Minecraft Realm, through which the location could be accessed via a series of Minecraft user accounts controlled by Oppla (enabling safeguarding of the environment

and its participants). The Oppla team then further developed the Minecraft Realms in preparation for the classroom activities – for example, adding familiar landmarks and other details to the Minecraft environment to make the world more immediately recognisable to the participants.



Example of a landmark added by Oppla team to the Minecraft Realms

- 4) **Facilitating the activity in schools.** Each Minecraft activity spanned approximately half a day (3-4 hours) and involved:
- Welcome and introduction, during which a member of the city team gave a short presentation on NbS (pre-prepared by Oppla) and introduced the purpose of the activity.
 - Field trip, led by the city team, during which the school children visited the location that was to be used as a case study for implementing NbS. This involved a “walk and talk” discussion, plus opportunity for the school children to explore the site themselves in small groups and take notes / make sketches of features to inspire their ideas.
 - Classroom activity using Minecraft, during which the children worked in small teams (3-4 students) to design and build their ideas for NbS in Minecraft. The teams were first invited into the Minecraft Realm for their city – i.e. the digital, 3D representation of the real world place they had visited during the field trip. Once familiar with the digital world, the groups were invited to build their NbS with the objective to “benefit both people and nature” through their solutions. Teams were free to collaborate and this often happened naturally – i.e. unprompted by the facilitator – resulting in some very novel and integrated solutions.
 - A presentation session to finish the activity, during which each team stood at the front of the class and gave a ‘walkthrough’ of their idea in Minecraft, explaining the rationale of the NbS and the benefits it offered to people and nature. These presentations were recorded and are being used to create video content as part of ongoing reporting in WP5.



Designs for an 'eco house' incorporating NbS, created by a school group in Envigado, Colombia

Like art, games are a powerful tool to mobilise people. In the framework of INTERLACE we developed a strategy to use the video game Minecraft to help children in partner cities discover, learn about, plan and design NbS. Hundreds of children in different cities have used the game so far as part of INTERLACE.

This section introduces the INTERLACE Gaming Programme and outlines the first steps for bringing Minecraft to young people in your city.

3.2 Implementation in the cities

CBIMA (June 2023)

The feedback from the CBIMA team underscores the effectiveness of utilising Minecraft as a strategic tool, albeit hindered by licensing obstacles. However, the potential of Minecraft extends far beyond a singular activity, holding promise for long-term use. Schools are eager to sustain their engagement with Minecraft, viewing it not merely as a one-off endeavour but as an ongoing resource.

The pilot phase was deemed successful by participating schools, demonstrating its capacity to involve children from diverse social backgrounds and age groups. Moreover, beyond its immediate application within the project, Minecraft serves as a gateway to forging partnerships with organisations unrelated to its primary objectives.

A total of 60 youth and children from various educational institutions, including Liceo Alejandro Quesada La Unión, Escuela Barrio Pinto, and Instituto Educativo Moderno, were actively engaged in the initiative, showcasing its broad reach and impact across different settings.



Minecraft activity in CBIMA

Granollers (April and May 2023)

40 school students from Celestí Bellera actively engaged in a comprehensive Programme focused on the River Congost, featuring a diverse array of activities. This Programme encompassed citizen science initiatives, immersive Learning Tours, informative conferences, and an innovative Minecraft session facilitated by Oppla.



Minecraft activity in Granollers

Envigado (March 2023)

A virtual 3km² map of Envigado in Minecraft was prepared by the Oppla team. This allowed participants to place NbS on familiar and previously visited sites. The first workshops reached more than 150 children and 20 teachers and allowed the capture of innovative ideas. Another Minecraft workshop aimed at increasing awareness of land use planning with emphasis on water resources protection using the example of the Ayurá stream in Envigado.

ENGAGEMENT PROGRAMME IMPLEMENTATION

Chemnitz (September 2023)

In Chemnitz, the Minecraft activity took place during a youth film festival. Overall, 48 children from the second and fifth grade participated. The workshop was well received by students, teachers and the festival organisers.



Minecraft activity in Chemnitz

Portoviejo (December 2023)

This activity was carried out as pilot workshops in two educational units of the locality, Unidad Fiscal Uruguay with approximately 30 young people and Unidad Fiscomisional Mercedes de María with approximately 30 young people accompanied by the teachers of the educational unit. These institutions are located near the Portoviejo River and the Bijagual estuary, respectively. In these workshops, the participants were made aware of the importance of the river and the potential of NbS, which sparked the creativity and imagination of young people towards the care of the rivers and the conservation of the area where they live.



Minecraft activity in Portoviejo

Metropolia Krakowska (June 2023)

Over 20 students of various ages took part in the workshops. They listened with great interest to the presentation about NbS and the benefits they can bring to their city. The visit to the Market Square in Niepołomice was an opportunity to discuss the problems that may be caused by a vast, open space without greenery and permeable surfaces. Using the Minecraft video game, students designed their own NbS proposals on the Market Square in Niepołomice and then presented their projects justifying how the proposed solution would help residents deal with the problems of climate change.



Minecraft activity in Chemnitz

3.3 Working with adults

In addition to the school activities, three workshop were facilitated using the same method with adult participants:

- A workshop with school head teachers in Envigado, Colombia, to demonstrate the potential of Minecraft in the classroom. This workshop resulted in an expression of interest from the teachers to rollout the Minecraft activity across all schools in Envigado going forwards.
- A workshop with INTERLACE project partners to familiarise the consortium team with the method and Minecraft itself. This resulted in several innovative ideas from partners who were previously unfamiliar with Minecraft, who then put forward suggestions as to how it might be applied in other areas.
- A workshop with representatives of stakeholders at the Cities Talk Nature conference in Colombia (2023), including representatives of the Envigado municipality planning department (now interested in using Minecraft for the purpose of citizen engagement in planning in the city).

3.4 Impact

- The INTERLACE gaming activity has engaged more than 380 young people and 100 adults across 6 cities, generating more than 100 ideas for NbS. The students involved have learned about the concept of NbS and moreover, have learned to apply their understanding in solving real world challenges relevant to the cities where they live. It has been successful in transforming the students from being passive recipients of knowledge to active contributors of ideas and solutions.
- The gaming activity has resulted in a tried-and-tested methodology that can be applied in any context that requires community engagement in urban design and NbS. The method is highly replicable and can be implemented without prior experience of the software and systems involved, requiring only basic training and a moderate / non-technical competency in IT.
- The activity has sparked significant interest from the participating schools to continue using Minecraft in an educational setting – for further exploration of NbS and other applications. All of the participating schools have expressed an interest in further engagement around the activity; 4 of the 6 city teams have expressed an interest in helping to facilitate further work with schools in their area using this method; and so far 3 cities are actively exploring use of Minecraft Education Edition as part of a longer-term Programme. In addition, there has been significant interest from representatives of other schools to which the method has been demonstrated, and also from representatives of city planning departments and other municipal stakeholders (as evidenced in Envigado).
- The INTERLACE method has captured the interest of other projects and Programmes, and is being showcased at The Nature Of Cities festival in Berlin (June 2024). Oppla are actively exploiting the method through other EU Horizon projects in which they are involved, notably NetworkNature which has a gaming component and via which the INTERLACE method will be further developed targeting adults as well as young people. Oppla is publishing a separate method handbook as an additional output of INTERLACE for this purpose; they are also seeking

funding to develop a Minecraft Education Edition lesson plan on NbS (with potential to reach millions of students worldwide).

3.5 Lessons learned

- The Minecraft activity has been highly successful and exceeded initial expectations in terms of its accessibility to both schools and the children themselves, both in terms of the extent and depth of engagement with students that it has enabled, as well as in terms of the outputs generated. It has been successful in not only educating students about NbS, but in empowering them to design NbS for real world locations. As such, it holds strong potential as a method for involving young people in city planning and urban design applications.
- The quality of ideas and designs created by the students has also exceeded expectations. That is not to say that we doubted the abilities of the students involved! More that their grasp of NbS – and the application of their understanding to using NbS to solve real world challenges – has been exceptional, and this has been facilitated by using Minecraft as an expressive medium that students are already very familiar with. The quality of output has of course varied with the age of the students, but overall, we have been delighted to see the variety and imagination put forward: from urban farms designed to safeguard animals whilst providing produce for people; to complex drainage and water treatment solutions; to designs for modern buildings incorporating NbS for heating, cooling, habitat creation and more.
- The IT requirements for using Minecraft are very flexible, scalable and in most cases, affordable. A strong WiFi connection is a key consideration and at some locations it was not possible to access the online Realms that had been created for the cities, but it was still possible to carry out the activity (though not to its full extent). The approach used by Oppla team, involving tablet PCs pre-loaded with Minecraft, proved highly dependable and could be replicated in most locations for a cost of around 1500-2000€ (for the necessary tablets, licensing and data). Longer-term applications of Minecraft would require use of the Education Edition, specifically designed for schools, which has a steeper learning curve and cost to implement. Schools running a Microsoft 365 Tenant, however, can access the Education Edition quite easily, with support from Microsoft, and often at no additional cost. We are exploring this option with some of the schools involved in the INTERLACE Programme going forwards.
- The learning curve for data processing and IT set up required by the method is somewhat steep, but is accessible to non-technical personnel. The learning curve for using the Minecraft software itself can appear steep to non-gamers, but is in fact very accessible and suitable for a 'train the trainer' approach. This was proven in the case of Chemnitz and Portoviejo: two INTERLACE cities where the activity was facilitated by city partners, without in-person support from the Oppla team. Both cities successfully completed the activity with no prior experience of using Minecraft or other video games in this context, which is a positive testament to both the approach itself and the abilities of these city teams to lead activities.
- The activity has generated tremendous interest from the participating schools, but unfortunately there is no capacity within the project to capitalise on this enthusiasm and undertake follow-up activities. This is an oversight and on reflection it may have been better to implement a more in-

depth process with fewer cities/schools, which would have also presented opportunities to engage other stakeholders – e.g. city planning departments. Oppla is seeking opportunity to exploit the INTERLACE method through other projects, notably NetworkNature, and implement a more in-depth, multi-stakeholder approach on this basis.

4. Learning Tours

4.4 Introduction

The Learning Tours are part of the Outdoor Activities Programme. They aim to teach young people about NbS for urban ecosystem restoration whilst participating in (digitally assisted) guided walks/treasure hunts. This section introduces the Learning Tours and provides some general information on their goals, content, target groups, methodology and technical realisations. Each participating city was free to adapt the concept and methodology to local conditions and to change or add ideas.

The Learning Tours have the following goals:

- Young people become familiar with NbS (what are they, why are they important, what are the problems etc.).
- Young people learn about already existing NbS in their respective city (what has been implemented, how and by whom, what are the positive effects etc.).
- Young people learn about the further potential of local NbS in the respective city (what could be done, are there plans to implement new projects, possible problems, obstacles and conflicting goals, who should be involved, etc.).
- Young people can connect NbS with the broader discourse on climate protection and adaptation.
- Young people get to know the work of city planners, climate protection managers, planning bureaus, and civil society organisations.
- Young people critically discuss the different aspects of the topics.

4.5 Target groups and methodology

The Learning Tours in INTERLACE have been targeted mainly at young people, for example in schools or youth clubs, but also the general public. In an educational context, a tour can be divided into three main parts:

- Introduction: A Learning Tour starts with an interactive introduction in the classroom, a moment when the participants exchange their knowledge and expectations. A short presentation on the topic will be held (by the teacher/responsible person). Furthermore, the (technical) procedure of the Learning Tour will be explained.
- The tour itself (visiting for example best practices, bad examples, city planning bureaus or citizen initiatives that deal with NbS), including (digital) exercises such as quizzes.
- A discussion and reflection of the experiences made during the tour.

In the City of Chemnitz and Metropolia Krakowska, the external mobile application LoQuiz was used to create and carry out the Learning Tour. Loquiz is a gamification platform for real-world games. It can be used for example for outdoor educational tours. Features include location-based stations, quizzes, photo and video recording and many more interactive elements.

4.6 Implementation in the cities

Granollers

This Learning Tour aimed to connect people with natural spaces.

120 young people, between 15 to 29, were part of a Learning Tour. This activity aims to increase their knowledge about river management, water reuse and restoration of degraded areas. This activity was implemented with universities UPC Catalonia, UB Barcelona and UNASAM Huaraz (Peru).



Learning Tour in Granollers

Envigado

Learning Tours focused on highlighting, socialising and raising awareness of Envigado's natural ecosystems, biodiversity, wildlife and water resources as well as local myths and legends about them. Community participation was promoted through environmental groups and social organisations. Citizens of the municipality interested in learning about and recognising the environmental and cultural wealth of their community participated in these tours.

Chemnitz

The Learning Tour in Chemnitz is an app-based scavenger hunt about NbS, that will be released in Spring 2024. The tour fosters the understanding and potential of NbS in urban planning for children between 10 and 12 years, in the face of climate change. Besides good examples, there are certain areas in Chemnitz that still lack NbS. It was decided to focus on these “not so good” examples in order to show the potential that NbS can have for a certain part of the city. In the Learning Tour, participants take over the role of a city planner and are asked to choose among different intervention options for the six chosen stations of the Tour (including the concrete-heavy station forecourt, the central bus station and the riverbank).



Participants of demo Learning Tour in Chemnitz

The Tour aims to make young people aware of urban climate change risk, the need for adaptation measures and the potential for NbS. Furthermore, the participants learn about the work of urban planners and political processes that stand behind urban interventions.

Metropolia Krakowska

The Learning Tour in Metropolia Krakowska also uses the LoQuiz application (see above). The preparation of the Tour is currently being finalised and will kick off in Spring 2024. The tour takes place in the meadow park Błonia Skawińskie. Participants will visit six different stations within the park and answer questions related to NbS. The game aims to increase users' knowledge about NbS - what they are, what role they play and what benefits implementing them might entail. By participating in the game, residents will also learn how they can use NbS in their own properties to counteract the negative effects of climate change. The tour will be accessible for educational institutions and the general public.

4.7 Impact and lessons learned

- In contrast to theoretical, classroom-based knowledge, Learning Tours provide a link to the "real world" via concrete examples, which can make complicated concepts more clear, and more understandable. This practical knowledge can then be built upon afterwards in the classroom.
- Quizzes and exercises function very well as entry points for specific topics such as NbS. Questions, and trying to find an answer, encourage individuals to think more deeply about the topic in question.
- The Chemnitz Tour enriched the CitiesTalkNature conference in May 2023. Participants got to know sites in Chemnitz that lack NbS and learned about possible options and solutions.
- Learning Tours are an alternative type of outing for educational institutions.
- The presentation and discussion of the draft Learning Tours created awareness on NbS amongst local stakeholders. Furthermore, new contacts to local (educational) institutions were established.
- The development of the Learning Tours has created knowledge in the city administrations that can also be used for the creation of further tours.
- During the concept phase, participants had good experiences with test runs and through receiving feedback from teaching staff.

5. Citizen Science Programme

The Citizen Science Programme is part of the INTERLACE Outdoor Activities Programme. It aims to engage stakeholders in understanding and monitoring the biodiversity of the areas where each city is establishing NbS. The INTERLACE Outdoor Activities Programme designed an introductory guide on citizen science for biodiversity monitoring so that INTERLACE cities can implement it in their NbS or related activities. This approach provides an opportunity to raise public awareness about nature conservation and the sustainable use of biodiversity, and strengthen the appreciation of nature. It can also help to promote processes or projects that, due to their time and/or cost requirements, may be difficult for local governments to implement. In light of these constraints, citizen science approaches can be applied to support biodiversity monitoring to assess NbS impacts and results.

Citizen science or participatory science is a dynamic and open process based on the dialogue of knowledge, in which citizens with diverse interests and perspectives, knowledge, and cultures voluntarily engage in scientific projects (UNDP, 2015; Soacha & Gómez, 2016).

Its approach is based on a solution-oriented way of tackling socio-ecological problems. Citizen science fosters the empowerment of participants to act together in response to the collective challenges of community well-being, biodiversity conservation, and sustainable development (Bonn et al., 2016; Soacha & Gómez, 2016).

This form of engagement is inclusive, and means that scientific progress takes place beyond the laboratory or traditional fieldwork, thus promoting the collaborative construction of knowledge as a form of social appropriation of science (Inter-American Development Bank, 2017). To this end, communities can participate in different stages of scientific research, from conception and short-term data collection, to intensive participation in the monitoring and use of the results.

Citizens involved can be of any age and educational level as long as they adhere to scientific standards and follow a process that is transparent and follows a specific methodology (Betancur & Cañón, 2016). Citizen science is also an inclusive and articulating process that allows for the construction and strengthening of affective links with biodiversity, awareness-raising and the mobilisation of actors to act in favour of conservation and the sustainable use of biodiversity (Soacha & Gómez, 2016).

5.4 How is citizen science applied in INTERLACE?

The Humboldt Institute (HI) designed a guide for the citizen science component of the Outdoor Activities Programme that includes six steps:

- 1. Choosing** the topic that has scientific and societal relevance to carry out observation activities among scientists and citizens. In the case of biodiversity, the topic to be addressed can focus on different taxonomic groups, for example, birds, plants or insects.
- 2. Forming a core team** that includes INTERLACE and community members. Citizens become voluntary participants in the activity.
- 3. Defining the research question and objectives.** The team and the participating citizens, formulate the research questions and objectives in a structured, clear and precise way.
- 4. Planning** based on the research questions and goals. The participants and their roles, as well as the activities to be carried out in the process should be clearly defined in this step.
- 5. Data collecting and analysing.** Data collection is done by the core team and volunteers. This process should be accompanied by feedback exercises with citizens and scientific participants.
- 6. Evaluating and communicating.** A comprehensive evaluation should assess the relevance, social impacts and feasibility of the programme and communicate its findings, added value and lessons learned.

5.5 Implementation in the cities

CBIMA (2023)

Participants carried out playful learning activities for both children and adults, with the objective of raising awareness of and demystifying bats, in order to change the perception that people have about these mammals.

About 29 institutions and more than 60 people took part in this activity that used citizen participation as a way to collect first-hand information on bats in local neighbourhoods while at the same time increasing the knowledge of citizens' about bats.

Granollers (2023)

Programa Divulga with Celestí Bellera Secondary School (Spring, 2023) was an extensive action Programme delving into the intricate nuances of the River Congost. This initiative comprised conferences by local authorities, immersive field visits, river monitoring, school reports, culminating in a captivating outdoor exhibition during the spring of 2023. As an innovative addition, a digital gaming activity was integrated into the Programme, to gather playful experiences with collaborative NbS co-design.

Envigado (2022-2023)

Guardians Of The Ayurá (2022-2023): Guardians of the Ayurá was a environmental education activity born from the need to make children from nearby educational institutions or "neighbours" of the Ayurá Creek aware of the importance of the different natural elements that are part of daily life. Initially, municipal staff were surprised to see how little knowledge children had about the Ayurá Creek, even though they pass it on their daily walk to school. Four workshops were held in each school and one on-site workshop at the Ayurá stream. Within this project, a writing initiative was implemented with a group of 40 children, where each one wrote a story based on the myths and legends of La Ayurá Creek.

SILAPE KIDS (2023): Workshops to raise awareness on the Local System of Protected Areas of Envigado were held with around ten-year-olds, in one of the public schools of Envigado. In addition, cartography workshops presented issues such as protected areas and connectivity, biodiversity, the importance of water, and an experiential workshop about recognising the territory and protected areas of Envigado was held.



Citizen Science Activity on Bats in CBIMA



Citizen Science Activity in Envigado

5.6 Impact and lessons learned

- Citizen Science activities directly impacted nearly 700 people, mostly children and young people. In many cases, schools were key to enabling such activities, together with the representatives of the INTERLACE partner cities. In some cases, such as SILAPE KIDS and GUARDIANS OF THE AYURA, impacts are likely to increase as activities are ongoing until the end of 2024, targeting more than 1000 children and 20 outdoor events.
- In the case of CBIMA, the activity carried out was the first Bat Census for the metropolitan area using citizen science, and they are planning to include other taxonomic groups in the near future.
- Events such as Global Big Days, Bird Census, and the innovative Bat Census are tools for implementing citizen science and strengthening citizens' connection to and awareness of nature. For CBIMA, the activity was of great value because it served to raise awareness among the participants about the importance of bats. Future activities could be improved by bringing supporting material on the taxonomic groups to be monitored.
- In the case of Envigado, places such as a river or an urban protected area are enablers to understand and bring audience together to NbS, using strategies as monitoring, conferences, and other pedagogic instruments. It is necessary to include urban landscape and ecosystem elements into the curriculum so that children and teachers understand their territory in a more complete way and identify such elements as essential for their cities' sustainability.
- NbS and related topics were often unfamiliar to many participants initially. However, their adoption was swift and enthusiastic, attributable to the participatory framework of the activities and their dynamic emphasis on observation and exploration.
- In the case of Granollers, combining citizen science with environmental education improved the learning processes of young people about the river, the water cycle, and the environment.
- To improve the process in Granollers, citizen science activities should be done together with previous sessions about ecology and monitoring, as well as a later presentation of the of results.

6. Business Insight webinar series

As more and more cities’ planning and strategies call for urban ecosystem restoration, sustainable urban drainage systems, and other blue-green infrastructure, business opportunities for nature-based solutions (NBS) are arising. Private sector NBS often depends on initial market-creation through a mix of public regulation and procurement rules, public funding of pilot projects, standards and certification. The possibilities for growing an NBS business vary between cities but are generally more limited in small to medium sized municipalities.

In the Business Insights webinar series, small and medium enterprises (SMEs) from Europe and Latin America who have succeeded also outside capital cities, shared their successful projects and discussing barriers and enablers to their business and more generally to the NBS sector in their city and country. Hence, other than the other workstreams of the INTERLACE Engagement Programme, the Business Insight workstream targeted private sector stakeholders interested in growing an NBS business.

6.4 Overview of webinars

As part of the Business Insight workstream, the INTERLACE project conducted five webinars featuring two NBS business representatives discussing specific NBS policy topics during each session. These policy topics were chosen from the 6-city assessment outlined in INTERLACE Deliverable 3.6 (Barton et al. 2023). A concluding webinar was held to recap lessons learned from the NBS policy mix.

Participants submitted written questions for the presenters, forming the basis for audience discussions and facilitating exchanges among presenters to share their respective experiences. The overview of the different webinar topics can be found in Table 2.

Overall, the five webinars had 199 participants (40 in average). Data on countries of origin and on stakeholder groups is available only for individuals that registered (308 in total) but not for actual participants. Spain (41), Ecuador (38),

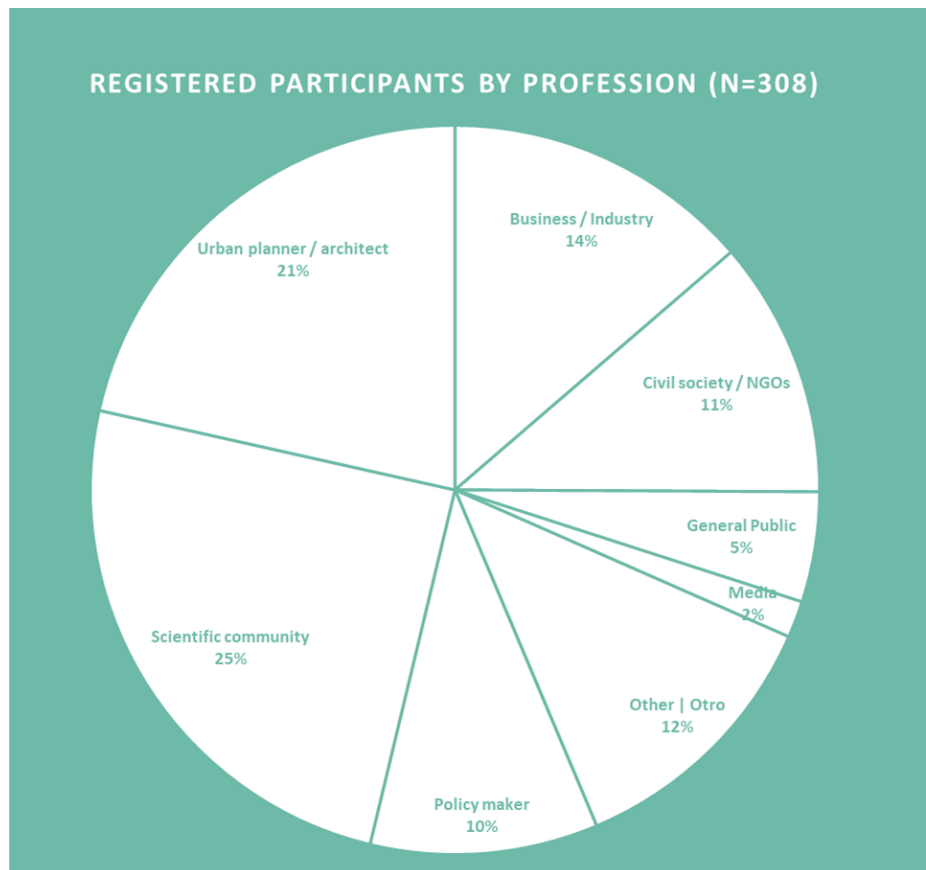


Figure 1: Number of registered participants to business insight webinars by profession

Colombia (32) and Germany (26) were the countries with the biggest shares of registrations. Figure 1 highlights that individuals from different stakeholder groups registered for the webinars. The scientific community accounted for most registrations (25%), followed by urban planners / architects (21%) and business / industry (14%).

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Table 2: Overview of Business Insight Webinars

| Webinar | Topics addressed |
|---|---|
| <p>Growing an NBS company: getting to 20 (19 September 2023)</p> <p><i>37 participants</i></p> | <ul style="list-style-type: none"> • What barriers have NBS SME's 'millennials' overcome to reach 20 years of successful business? • What solutions have the adopted to grow their NBS business the last 20 years? What can NBS start-ups learn? • What policies are needed from government to create continued market conditions for NBS? |
| <p>Private-public innovations: NBS labs (9 November 2023)</p> <p><i>26 participants</i></p> | <ul style="list-style-type: none"> • Demonstration of NBS technologies in-place is key to building market trust in green-blue solutions in the face of established "grey" technologies • How are NBS private-public partnerships in laboratories organised and funded? • How are NBS laboratories contributing to move the NBS agenda in their cities, region, countries? |
| <p>NBS public procurement: experiences (7 December 2023)</p> <p><i>45 participants</i></p> | <ul style="list-style-type: none"> • Public procurement criteria and processes can disadvantage NBS in the face of "grey" solutions • How have NBS SME's overcome public procurement barriers to NBS in their "successful projects?" • What public procurement rules would 'level the playing field' between NBS and "grey" solutions? |
| <p>Standards & Certification: NBS market creation (15 February 2024)</p> <p><i>48 participants</i></p> | <ul style="list-style-type: none"> • Regulatory requirements/standard for NBS and certification schemes can create market demand for NBS. • What are new green points performance indicators used by municipalities? • What are NBS SMEs experiences with the mix of performance indicators and certification schemes? |
| <p>Summing up: policymixes for NBS in the private sector (4 April 2024)</p> <p><i>43 participants</i></p> | <ul style="list-style-type: none"> • We summarise lessons learned from INTERLACE and the Business Insights webinar series • Economic and fiscal instruments for NBS do not work in an institutional vacuum. • What are EU and LA cities' experiences with combinations of instruments to promote demand for NBS on private land, and encourage NBS supply by private enterprise? |

6.5 Impact and lessons learned

- Almost 200 people participated in the five webinars. A diverse array of different stakeholders registered for the webinars (see Figure 1). There was significant student participation, with many requesting webinar certifications from INTERLACE for their studies.
- Business participants who contributed to INTERLACE Deliverable 3.6 were readily available for recruitment to the webinars. The findings from this Deliverable provided a valuable scientific backdrop for the discussions of the webinars.
- The webinars raised awareness among municipal planners about the importance of policy for the private sector and provided a platform for knowledge exchange between European and Latin American small and medium-sized enterprises working on NbS. This is particularly relevant as the D3.6 report highlighted a lack of communication between municipal and private sector suppliers of NBS.

7. Summary of key takeaways and lessons learned

There are several impacts and lessons that have been observed across the participating cities and inter-municipal associations of the INTERLACE Engagement Programme.

According to the data provided by the cities, more than 2,500 people of different ages have participated so far in the Citizen Engagement Programme (some aspects of the Programme are still ongoing at time of writing). The INTERLACE Citizen Engagement Programme, through its diverse workstreams like the Arts Programme, The Gaming Programme, Learning Tours, and Citizen Science, has successfully engaged communities, particularly youth, in understanding and contributing to urban nature solutions. It has demonstrated innovative approaches that are not only educational but also empower communities to actively participate in shaping sustainable urban futures.

The implementation of the Arts Programme has significantly impacted public engagement with urban spaces, fostering a stronger connection and ownership. This initiative has heightened awareness about the interdependency between nature and people in urban settings. Art serves as a powerful tool, especially captivating for children, facilitating community mobilisation around nature-centric themes.

The Gaming workstream has been successful in its objective to engage young people, with close to 400 schoolchildren participating, including some students with special educational needs such as autism.

The quality of ideas from students has been exceptional, varying with age but consistently innovative and imaginative. The Minecraft activity's IT requirements are flexible and cost-effective, making it accessible for schools with varied resources. While there's a learning curve, it's manageable, as demonstrated by city partners who successfully facilitated the activity without direct Oppla team support. This engagement has been notably active, in contrast to the more passive or learning-based impact of more traditional methods. Young people have been engaged as 'actors' in relation to urban ecosystem restoration and the project has captured their knowledge and ideas in designing NbS using familiar tools (e.g. video games) to foster a sense of empowerment. This has led to significant interest from the participating schools (and in the case of Envigado, also the municipal planning department) to continue use of this method beyond the project lifespan. The project is now supporting three schools to implement the Microsoft 365 Education tenant software (needed to run Minecraft more widely) and well as supporting the Envigado team to rollout the programme at municipality level. It should be noted that none of the participating schools had experience of using Minecraft prior to involvement in the INTERLACE project.

Engagement of young people – the key target audience of the Programme – has also been greatly facilitated through use of the digital Learning Tours app, co-developed with the city team in Chemnitz, Germany. The Learning Tours app has been successful in boosting engagement around current city challenges such as climate change and NbS implementation to enhance city resilience, with positive feedback from users in response to using the app at project events. Additionally, they have equipped the city administration with valuable knowledge for future tours.

Integrating children from different social contexts and ages through art and citizen science opens doors to work beyond the project and becomes a tool for making alliances with new organizations. One of the side effects of the people's participation is that children question how the city is built as they understand the pressure on forests from unsustainable development. Citizen Science activities have engaged nearly 700 participants as part of the Programme, primarily children and young people, in various nature-focused initiatives. These activities, such as bird and bat censuses, have strengthened citizens' connection to nature and raised awareness about its importance.

Some key lessons learned are summarised in the following:

- **Follow-up:** Although the activities carried out by the cities have yielded many lessons learned and have succeeded in involving thousands of people, there is a challenge in terms of measuring long-term impact once the project has ended. An added value for similar future activities would be to showcase real-world examples of NbS implementation at neighbourhood level, and provide suggestions for follow-up activity that builds on the activities carried out during the lifetime of the project (e.g. DIY-micro-NbS).
- **Accompaniment:** Continuing to closely accompany each city in the development of the activities provides more support, giving more space for implementation and the design of new solutions.
- **Selection of activities:** The option to select one activity from the Citizen Engagement Programme in addition to digital gaming limited the interest of some cities to participate in more than two activities. However, cases such as Envigado and CBIMA showed that the tools provided were an inspiration to go beyond the implementation as originally foreseen and to make the most of the opportunity to engage citizens with NbS.
- **Development of a guide:** Although not envisaged at the beginning, designing a guide in the form of a 'Handbook' was useful for the cities as a way to understand the Citizen Engagement Programme as a whole and not just as a list of activities to be accomplished.
- **Integration:** There is further opportunity to foster connections (1) between city administrations and their inhabitants and (2) within stakeholder groups themselves through these activities. These opportunities are being exploited where possible – for instance, through ongoing support of city partners to rollout the digital gaming activity amongst local schools.

Despite its success, there's a need for follow-up activities to sustain the momentum created. The activity's popularity has spurred interest in continuing Minecraft-based education and NbS exploration among schools and city planning departments. Opportunities to further develop and showcase the INTERLACE method are being pursued through other projects and will be highlighted at The Nature Of Cities festival in Berlin in June 2024.

The Business Insight workstream with its webinars targeting the private sector allowed to foster knowledge exchange on business models and financing for NbS, bringing together a diverse set of different stakeholders. With almost 200 participants, these webinars helped to raise awareness among municipal planners about the importance of policy for the private sector and provided a platform for knowledge exchange between European and Latin American small and medium-sized enterprises working on NbS.

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INTERLACE is a four year project that will empower and equip European and Latin American cities to restore urban ecosystems, resulting in more liveable, resilient and inclusive cities that benefit people and nature.

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Project Partners



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