URBAN NATURE PLANS +

European-wide surveys on skills, capacity and training needs for Urban Greening (D5.1)

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Abstract	Outputs of two surveys which were undertaken to inform the development of the UNP+ (Urban Nature Plans Plus) Capacity Building Programme for cities. Overall, this aims to increase capacity of city authorities, planners and consultants for integrating biodiversity and ecosystem service delivery within UNPs, spatial planning and other related policies.
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EDITOR'S NOTE

In this document the authoring entity of UNP+ shares with the partners the outputs and analysis of two surveys which were undertaken to inform the development of the UNP+ (Urban Nature Plans Plus) Capacity Building Programme for cities. The Capacity Building Programme forms the essence of Work Package 5 (WP5) of the UNP+ Project. Overall, the Programme aims to increase the capacity of city authorities, planners and consultants for integrating biodiversity and ecosystem service delivery within UNPs, spatial planning, and other related policies.

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TABLE OF CONTENTS

1. Introduction

1.1 Aims and objectives of the report

This report provides the outputs and analysis of two surveys which were undertaken to inform the development of the UNP+ (Urban Nature Plans plus) Capacity Building Programme for cities. The Capacity Building Programme forms the essence of Work Package 5 (WP5) of the UNP+ Project. Overall, the Programme aims to increase capacity of city authorities, planners and consultants for integrating biodiversity and ecosystem service delivery within UNPs, spatial planning, and other related policies through promoting communities of practice, webinars and online training modules which are integrated in the Urban Nature Platform toolkit.

Each of the two European-wide online surveys run by UNP+ was addressed to a different target group. The first survey focused upon local authorities with the aim of identifying:

(i) the needs for training and capacity building at local authorities for drafting and implementing effective Urban Nature Plans, and

(ii) existing capacity building and training tools used by cities for drafting and implementing effective Urban Nature Plans.

The second survey focused on NBS designers, developers and suppliers (e.g. Nature-based enterprises, architects, landscaping contractors). It aimed to explore industry's skills and capacity needs for delivering urban nature plans and for implementing the interventions included in the UNPs.

The surveys were drafted by UNP+ project partners (EFI, Horizon Nua, ICLEI, UEL, LUND) and were tested with the UNP+ Lighthouse and Greening Cities, and selected industry partners. Following this process of testing and improving, the surveys were distributed through multiple networks focussing on local authorities and/or NBS or urban greening, with the initial aim of collecting input from up to 200 cities and at least 100 industry partners. Analysis from the surveys forms the basis of this report. The surveys were designed with consideration of the needs to develop UNP Capacity Building programmes to be:

- Available in local languages and targeted to local needs.
- Resulting in the production of practical outputs and resources
- Engaging for stakeholders
- Likely to increase understanding and UNPs being endorsed by local decision-makers
- Able to provide accreditation, where deemed beneficial
- Complementary to existing initiatives and programmes
- Unique, whilst still adding value
- Consistent with locally relevant approaches

1.2 Background to the UNP+ project and Capacity Building Programme

The EU-funded Urban Nature Plans plus (UNP+) project works with cities to address gaps in biodiversity protection at both the implementation and policy levels. By coordinating both bottom-up and top-down initiatives, UNP+ links city and community-led efforts with national sustainability plans. The UNP+ Project explores innovations that help cities overcome barriers when integrating more or enhancing existing natural spaces in cities. During the 3 year project lifecycle, the role of UNP+ is to:

- Lever the power of co-creation to test, assess, and ultimately improve the UNP framework, supporting partner cities in achieving ambitious EU environmental targets.
- Facilitate peer-to-peer and reflexive learning opportunities for participating cities.
- Support participating cities in integrating justice and equity into spatial planning processes.
- Foster public-private partnerships, inspire collaborative business models, and encourage innovative financing within the field of nature-based solutions.
- Create, and test, planning and evaluation tools that link social, environmental, and more-than-human justice and resilience perspectives.

UNP+ has brought together 11 academic partners and 5 European cities to test and implement the UNP framework previously developed by ICLEI and the European Commission[1].

By leveraging the power of the UNP framework to foster collaboration and bridge capacity gaps, UNP+ aims to create a next-generation strategy for transforming urban ecosystems. Through extensive partner networks and resources, the project ensures that the findings will continue to influence policy and practice, promoting sustainable urban development well into the future. WP5 of the project also aims to build capacity on financing the delivery of UNPs and NBS for mainstreaming biodiversity through communities of practice, webinars and online training modules which are integrated into the Urban Nature Platform toolkit, and will be made available via the UrbanByNature programme. Furthermore, it will develop the potential for job creation in NBS and biodiversity giving due emphasis to opportunities for marginalised communities.

[1] Previously called 'Urban Greening Plans' (UGP). In this regard, see: https://environment.ec.europa.eu/topics/urban-environment/urban-nature-platform_en

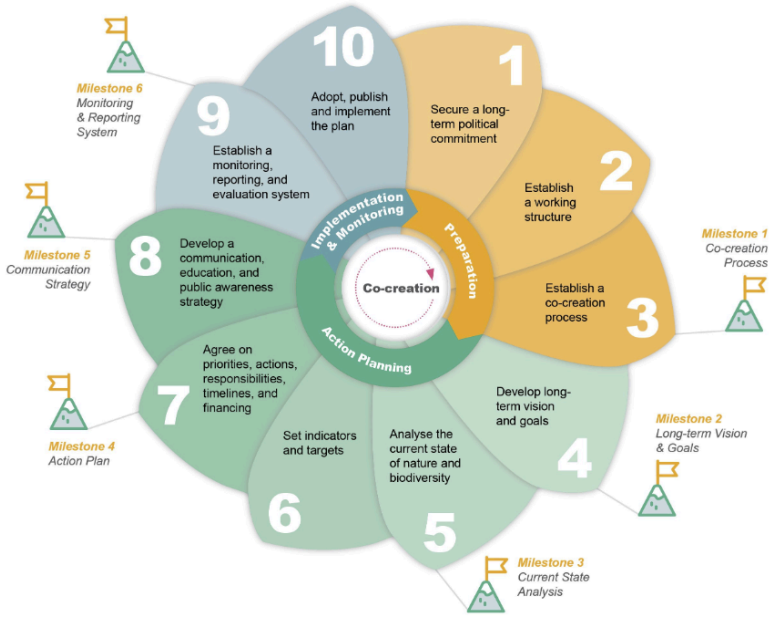


Fig.1. Steps in the UNP process

1.3 Related evidence from previous surveys

It is important that the outputs of the survey complement work already undertaken with relation to the development of UNPs and urban greening processes in general. The authors of this report are aware of the following previous relevant work which has helped to inform the development of this questionnaire survey:

Greening Cities Thematic Partnership of the Urban Agenda of the EU: Urban Greening Survey

Survey Overview: Distributed across the European Union and the European Economic Area, the survey collected responses from **193 authorities from 160 local, 23 regional, and 10 national authorities.** The diversity of participation, encompassing **20 different countries**, underscored the widespread recognition of the importance of urban greening. The survey produced key findings relating to the following themes:

- Progress and barriers on the implementation of Green Infrastructure Plans and the EU Nature Restoration Law
- Methodology for Quantifying the Demand for Green Infrastructure
- Funding Models
- Indicators Systems for Monitoring Urban Greening Plans

The survey provided valuable insights into the current state and challenges of urban greening across Europe. The findings underscore the necessity of an integrated approach that encompasses robust systems to facilitate the implementation of Green Infrastructures,

effective methodologies for quantifying green infrastructure demand, diversification of the funding models focusing on market-based instruments, and comprehensive indicator systems for monitoring progress. For further information see:

https://www.urbanagenda.urban-initiative.eu/news/unveiling-path-urban-greening-insights-greening-cities-partnership-survey

ERASMUS+ Uforest Project: The Uforest Training Needs' Assessment and Stakeholder Analysis (TNA)

This survey provided an overview of the existing demand on training needs to promote innovation and entrepreneurship in urban forestry and nature-based solutions (NBS). The survey targeted university students, professionals and citizens from different countries. It was translated in 8 languages, corresponding to the native languages of Uforest partners. In the end, **246** valid questionnaires were filled out by respondents from **27** different nationalities.

Most common knowledge gaps were identified in relation to **transversal concepts**, such as socio-economy, urban design, and artificial intelligence. In addition, little familiarity was noted for marketing, socio-economics, urban design, environmental justice, emerging technologies and AI, governance and policy. Finally, the need emerged for more knowledge on urban food forests and related services.

The results on training needs were in line with those on knowledge gaps. The TNA identified a high demand for developing skills related to **economics** – leadership and management, business modelling, financial planning, entrepreneurship – **social context** – cooperative leadership, societal impact, social business – and **communication and information technologies** – storytelling, cutting-edge technologies, marketing and communication strategies, and networking.

https://www.uforest.eu/news/project-updates/training-needs-in-urban-foresty/

NBS EduWORLD: Assessment Framework

This report provided an overview and analysis of assessment tools for NBS education in the European region. Based on mapping, desk research and interviews, it found that most of the reviewed student assessment tools constitute authentic assessment. Online NBS courses are more likely to adopt conventional assessment methods, such as formative and/or summative tests, due to the nature of the online learning environment.

There was an unequal distribution across education levels, with continuous professional development for teachers and vocational education and training providing very few examples of assessment tools. In institutional assessment, there is a clear lack of incorporation of NBS education, although many NBS evaluation frameworks exist. The report also presents the guiding framework for NBS EduWORLD, built upon a project intervention logic, lessons

learnt from previous project tasks and consultations with the Consortium and Advisory Board members. They are structured according to crucial project stages: Strategic vision and leadership; Understanding NBS education; Implementing NBS education, and Building the NBS EduCommunity.

https://www.researchgate.net/publication/372140786_NBS-EduWORLD_D22-Assessment-Framework-Guidance

Invest4 Nature: Survey of Nature-based Enterprises

Invest4Nature is an EU Horizon project looking to understand the economics of nature-based solutions and contribute to the development of a flourishing market for nature-based solutions in Europe. Investment in the nature-based solutions market is set to triple by 2030, driving exponential market demand. However, very little is known about how this demand will be met across the region. Therefore, the survey looked to understand the supply side of nature-based solutions. Questions focused upon: financing and investment; business models and growth; training and other market gaps; and support required by professional nature-based solutions suppliers and providers who are working with and for nature across Europe.

The final results of this survey are being utilised to **inform EU policymakers** who are working to increase support for a flourishing nature-based solutions market.

https://invest4nature.eu/outcomes/

Conexus – Report on NBS Professional Skill Gaps

This survey report identified nature-based solutions (NBS) professional skill gaps in order to give guidance on how Nature-based Thinking (NBT) can be better integrated into higher education and professional training. To identify the skill gaps, two different approaches for data collection were deployed: two workshops addressing specific target audiences (students and young professionals; and NBS specialists), and an online survey.

The need for more transdisciplinarity, and for the ability of the concept's translation according to different contexts, were recurring answers. Often professionals lack the skills to navigate through different knowledge systems and political contexts, which hinders their capacity for cross-sector and transdisciplinary engagement, as well as the capacity to communicate and make the case for NBS to different stakeholders. Alongside NBS implementation and knowledge literature gaps, the results of the survey highlighted the need for NBS evidence and its valuation against Grey Infrastructure. Data analysis - development of ecological, economic and social metrics; and data modelling skills were also mentioned.

https://static1.squarespace.com/static/60376fb54cb28b6baf1d9dfd/t/66d087e17571dc003658b19c/1724942311323/D3.1a.pdf

2. UNP+ Survey 1: Cities Survey

Capacity building at local authorities for drafting and implementing effective Urban Nature Plans, and existing capacity building and training tools used by cities.

2.1 Survey structure and methodology

The content for the cities survey was developed by the UNP+ partners responsible for the delivery of the task, i.e., EFI, ICLEI, and UEL. Additional input was provided by LUND with regard to the development of questions 19-26 on specialist data tools and analysis. The survey utilised the EUSurvey Platform, which provides an accessible and reliable survey format combined with high-quality outputs and analytics.

Survey Content and Themes

The survey featured 28 questions based on the following themes:

- **Background Information on Respondents** (Q. 1-4)
  e.g., role, location
- **Familiarity with UNPs** (Q. 5-8)
  Assessing the knowledge and engagement of participants with Urban Nexus Projects (UNPs).
- **Existing Capacity and Familiarity with Tools and Training Programs** (Q. 9-18)
  Evaluating the respondents' prior experience with urban development tools and training opportunities.
- **Use of Specialist Data Tools and Analysis** (Q. 19-26)
  Insights into the usage of advanced data tools and methods for urban planning.
- **Indication for Future Contact/Participation** (Q. 27-28)
  Willingness to engage further with UNP+ activities or collaborate on future initiatives.

Question Formats

The questions were structured in a variety of formats appropriate to the information required. The formats included:

- **Predefined Answer Selection**
  Both single and multiple-choice options were used to simplify data collection and analysis.
- **Tables for Detailed Feedback**
  Respondents were asked to provide more nuanced feedback, particularly for complex topics like data tools.
- **Ranking of Predefined Options**
  Certain questions required the prioritisation of various items, providing insights into respondents' preferences and challenges.
- **Open-Ended Questions**
  A limited number of open-ended questions were included to allow respondents to elaborate on key issues, providing richer qualitative data.

Data Collection and Security

Data collection was conducted via the EUSurvey Platform, which ensured the secure handling of respondents' information. Compliance with GDPR and ethical guidelines was strictly maintained throughout the process.

Response Analysis

The collected data was analysed using both quantitative and qualitative techniques. Statistical analysis was performed to derive trends and patterns from predefined answers, while thematic analysis was used to interpret open-ended responses. Advanced data visualisation tools provided by the EUSurvey platform facilitated comprehensive reporting.

Limitations and Bias Control

Efforts were made to mitigate any potential biases, such as ensuring a diverse range of respondents from different geographic regions and sectors. However, some limitations may include self-selection bias and the availability of respondents with prior knowledge of specialist data tools.

Reporting and Future Use

The results of the survey have been compiled into this final report to inform the development of future UNP+ projects. The findings will help in tailoring training programs and improving the use of specialist data tools in urban planning.

2.2 Survey testing and distribution

Survey Testing Process

The surveys were thoroughly tested through online discussions with each of the UNP+ Lighthouse and Greening Cities to ensure clarity and accuracy. These discussions provided valuable feedback, allowing for refinement of the questions, especially from a language perspective, ensuring that they were clearer and more understandable for respondents across different regions. The testing process resulted in only minor adjustments to the original survey structure.

Survey Testing Schedule

The interviews for testing the survey were conducted on the following dates with key city partners:

- **Paris:** 16.05.24
- **Mannheim:** 16.05.24
- **Burgas:** 17.05.24
- **Belgrade:** 14.05.24
- **Barcelona:** 31.05.24

These testing sessions involved gathering feedback from stakeholders directly involved in urban planning and green initiatives, ensuring that the survey questions were relevant and accessible.

Survey Timeline and Deadline

The initial deadline for the survey was set for **31.07.2024** but, due to participant requests and further outreach efforts, the deadline was extended until **15.09.2024**. Participants were informed that the survey would take approximately **30 minutes**, though it might take slightly longer depending on the number of attempts.

Distribution Channels

The survey was distributed through various channels including partner social media networks and direct email to ensure a broad representation of respondents. Invitations were sent to key stakeholders within urban development sectors, including local governments, research institutions, and NGOs. A reminder schedule was implemented to maximise response rates. Following the successful testing phase, the survey was distributed widely

through various established networks. These channels were chosen to ensure maximum visibility and participation across a broad spectrum of stakeholders involved in urban planning, environmental sustainability, and urban forestry.

The survey was disseminated through the following key networks and platforms:

- **UNP+ Partners**
  Direct engagement with partners involved in the Urban Nexus Projects ensured widespread participation from urban development stakeholders.
- **EFI Blog and Social Media Accounts**
  The European Forest Institute (EFI) leveraged its blog and social media platforms to promote the survey, reaching a wide audience interested in urban forestry and sustainable cities.
- **Network Nature**
  A prominent network focusing on nature-based solutions in urban planning. Links were shared through newsletters, blogs, and social media.
- **EFUA (European Forum on Urban Agriculture)**
  An organisation dedicated to promoting urban agriculture across Europe, further expanding the survey's reach.
- **Flemish Networks**
  Engaging the **VVSG Flemish Network**, the survey was also featured in the network's news outlets to encourage participation from Belgian cities.
- **Invest4Nature**
  A network focused on fostering investments in nature-based solutions, offering access to professionals involved in nature-positive development.
- **Covenant of Mayors – Europe**
  A key European network bringing together local and regional governments committed to climate action and sustainable urban development. Distribution occurred through **direct emails** and internal channels.
- **European Forum on Urban Forestry**
  A network focused on urban forestry, engaging professionals and researchers in promoting urban green spaces.
- **CLEARING HOUSE**
  A project platform aimed at fostering urban forestry initiatives.

- **Connecting Nature Enterprise Platform**
  A platform supporting enterprises focused on nature-based solutions in urban settings.
- **ICLEI Cities Mission**
  Direct contact and promotion to cities and relevant stakeholders were coordinated via ICLEI, with multiple rounds of communication ensuring continued visibility.
- **Medforest**
  A digital platform dedicated to Mediterranean forestry issues, contributing to the outreach of urban forestry professionals in the region.
- **OPPLA**
  A knowledge-sharing platform on nature-based solutions, connecting researchers and practitioners across Europe.
- **FAO/IUFRO Urban Forestry Networks**
  Mailing lists were used to extend the outreach to urban forestry professionals globally.
- **Urban by Nature and Cities with Nature**
  Platforms that provide capacity-building support for cities, ensuring distribution among engaged municipalities.
- **Project Partners' Newsletters and Distribution Lists**
  Regular updates were disseminated through the newsletters and mailing lists of project partners, ensuring continuous engagement.
- **EFI Internal Communications**
  The survey was featured several times in the **EFI internal newsletter**.

Survey Promotion and Engagement Strategy

The survey promotion included the use of **newsbits** and templates tailored for different networks. Personalised email campaigns, blog posts, and social media graphics were used to maintain engagement. Networks like **LinkedIn** and **X** (formerly Twitter) were also utilised for external promotion.

Regular updates and reminders were sent via social media channels, newsletters, and direct emails to key participants. In some cases, specific templates were provided to simplify distribution for networks like **Network Nature**, **ICLEI**, and **Cities Mission.**

2.3 Analysis and results

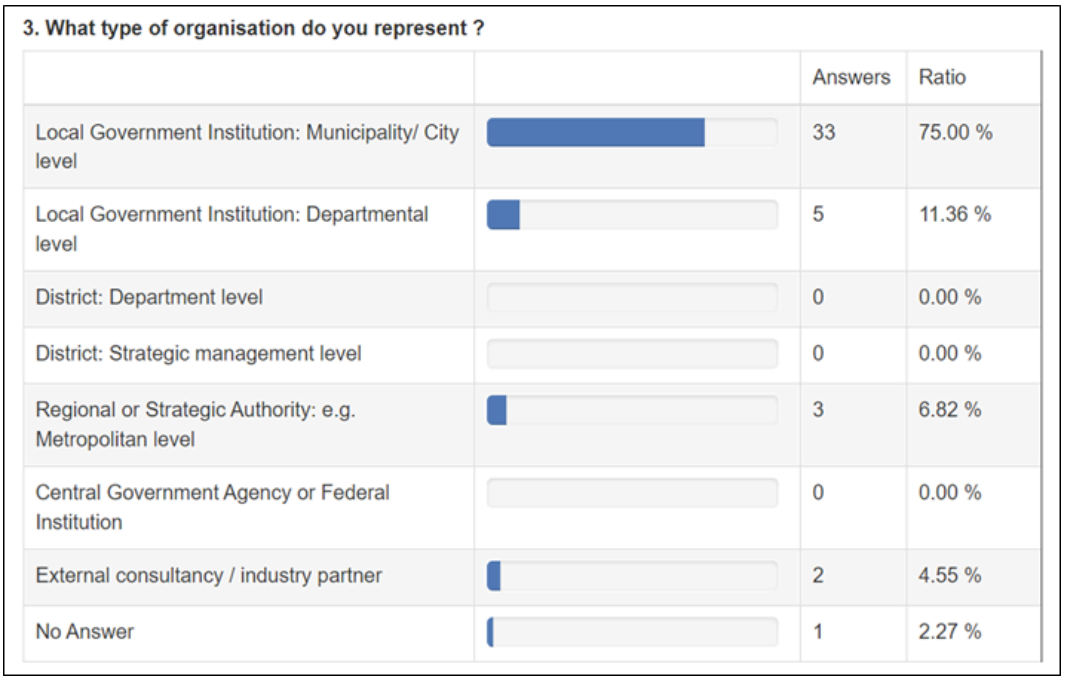
2.3.1 Background information on respondents e.g. role, location (Q. 1-4)

Country	City	Population Size
Switzerland	Luzern	82,000
Ethiopia	Addis Ababa	8,000,000
Belgium	Genk	68,000
France	Saint Quentin en yvelines	228,300
Belgium	Gent	270,000
Belgium	Waasland	300,000
Italy	Genova	762,800
Serbia	Paraćin	48,800
Sweden	Malmö	350,000
Belgium	Hoogstraten	22,318
Ireland	Tullamore Co. Offaly	20,000
Romania	Sfantu Gheorghe	55,000
Serbia	Subotica	140,000
Spain	Metropolitan area of Barcelona	3,300,000
Greece	City of Patras	210,000
Spain	Cieza	35,000
Belgium	Limburg	1,128,400
Serbia	Kragujevac	180,000
Belgium	Igean	1,000,000

Belgium	*Not specified*	44,000
Belgium	Genk	68,000
Germany	Mannheim	310,000
Greece	Municipality of Paggaio	32,100
Serbia	Ivanjica	35,000
Bosnia Herzegovina	Sarajevo	275,000
Denmark	Kolding	100,000
Serbia	VRŠAC	47,000
Denmark	Kolding	62,500
Serbia	Belgrade	1,198,000
Serbia	Arandjelovac,	41 000
Serbia	Ivanjica	27,700
Cyprus	Nicosia	400,000
France	Paris	2,200,000
Spain	Valencia	800,000
Croatia	Zadar	70,829
Italy	Arezzo	99,000
England	Essex	1,800,000
Bulgaria	Burgas	200,000
Hungary	Ajka	26,500
Hungary	Szeged	157,000
Denmark	Aarhus	367,000
Scotland	Glasgow	650,000
Algeria	Batna	290,645

Fig.2. Country, City and Population Size (Q1/2)

Forty-four responses were received from the survey. This was a lower number than expected given the extensive outreach campaign through the networks listed previously and extension of the survey deadline. The responses came from 21 different countries mainly from the EU, but also included 2 responses from the UK and 2 from African countries. Promotion through local networks provided a higher response rate from certain countries with 8 responses received from Belgium, 7 from Serbia, 3 from Spain and 2 from France, Italy, Greece, Denmark and Hungary respectively. Only one response was recorded from other countries, with one location unspecified. The responses represented a diverse range of spatial scales from relatively small cities of 20,000 inhabitants to large metropolitan regions of more than 3,000,000 citizens.

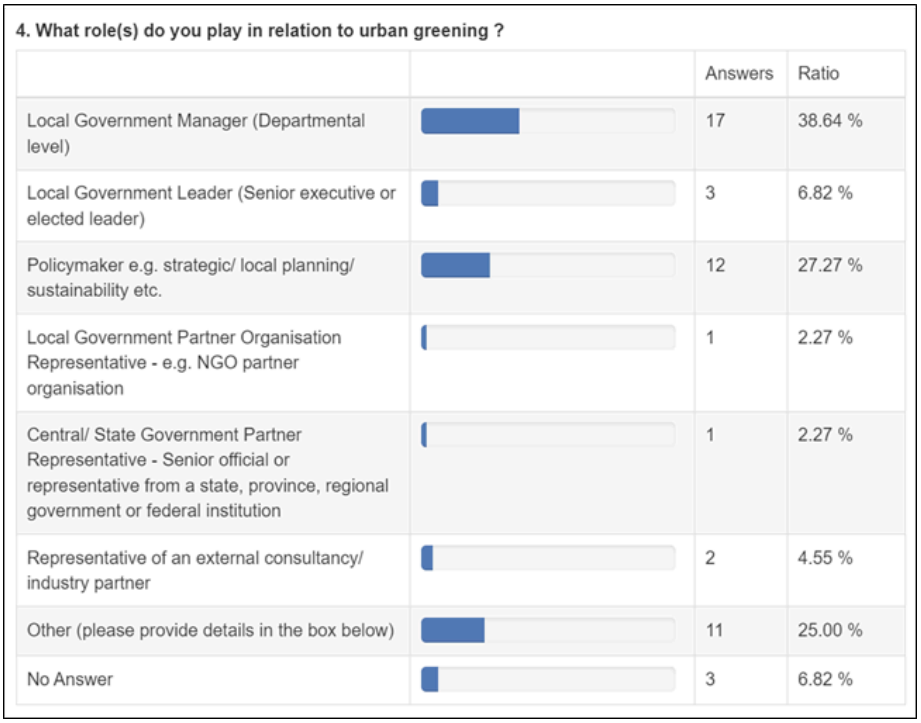


3. What type of organisation do you represent ?

	Answers	Ratio
Local Government Institution: Municipality/ City level	33	75.00 %
Local Government Institution: Departmental level	5	11.36 %
District: Department level	0	0.00 %
District: Strategic management level	0	0.00 %
Regional or Strategic Authority: e.g. Metropolitan level	3	6.82 %
Central Government Agency or Federal Institution	0	0.00 %
External consultancy / industry partner	2	4.55 %
No Answer	1	2.27 %

Fig.3. What type of organisation do you represent ? (Q3)

The vast majority of responses were received from local Government Institutions working at City and Municipality level accounting for 75% of the responses received. A lower number of responses were also received from departmental level structures of City administrations (11%), from regional or strategic authorities (7%) or from external consultancies (5%).



4. What role(s) do you play in relation to urban greening ?

		Answers	Ratio
Local Government Manager (Departmental level)		17	38.64 %
Local Government Leader (Senior executive or elected leader)		3	6.82 %
Policymaker e.g. strategic/ local planning/ sustainability etc.		12	27.27 %
Local Government Partner Organisation Representative - e.g. NGO partner organisation		1	2.27 %
Central/ State Government Partner Representative - Senior official or representative from a state, province, regional government or federal institution		1	2.27 %
Representative of an external consultancy/ industry partner		2	4.55 %
Other (please provide details in the box below)		11	25.00 %
No Answer		3	6.82 %

Fig.4. What role(s) do you play in relation to urban greening ? (Q4)

The majority of respondents were either local government managers (39%) or policymakers (27%). Local government leaders accounted for 7%, with other categories recording lower figures. Those who fulfilled a role which was not listed were invited to provide more information through an open question - respondents specified the following:

Reviewer/editor of management plans; Civil servant; Junior urban planner; Green and open space policy adviser; Consultant with Project Development and Implementation Department of the Municipality; Advisor to the Mayor; Coordinator for biodiversity; Civil servant representative in contact with political decision-makers; Head of Sector for environmental protection; Manager of environmental office, contributing to environmental strategic planning; Local Government Officer; Project manager at the Development Department. Overall, the survey reached the targeted group.

2.3.2 Familiarity with UNPs (Q. 5-8)

5. What is your existing level of knowledge of Urban Nature Plans (UNPs) ?

	Answers	Ratio
This is the first time I have heard the terms	11	25.00 %
I have previously heard the term or read it somewhere	19	43.18 %
I have previously read the UNP guidance	5	11.36 %
My organisation is already actively involved in projects related to UNPs	6	13.64 %
My organisation has already completed an UNP	2	4.55 %
No Answer	1	2.27 %

Fig.5. What is your existing level of knowledge of Urban Nature Plans? (Q5)

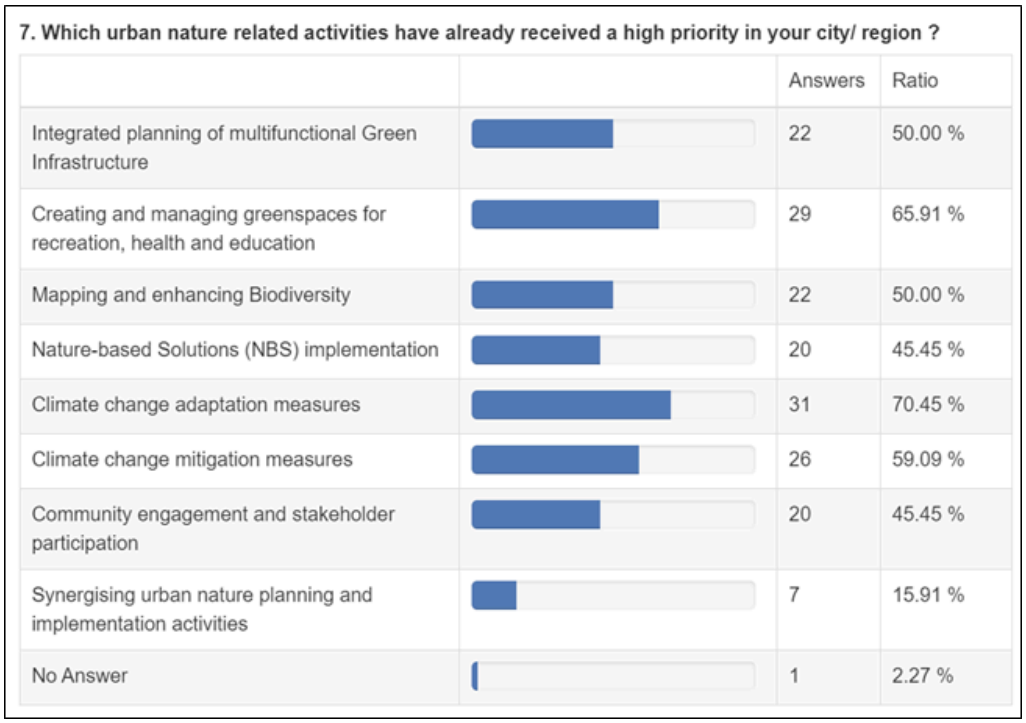
The responses indicated a general lack of detailed knowledge of UNPs with 25% of respondents indicating that they had not previously come across the term and 43% indicating that they had heard or read about the term. 11% had already read the UNP guidance whilst 14% were already involved in related projects. The organisations of only 5% of respondents had already completed a UNP.

6. Has your organisation already made clear links between the planning and implementation aspects of urban nature planning, both within your organisation and with external partners ?

	Answers	Ratio
There are few or no linkages between these service delivery activities	15	34.09 %
The responsibilities are clearly demarcated, but there is dialogue between the service delivery activities	14	31.82 %
There is a formalised communication structure and strategy between responsible authorities for UNPs	4	9.09 %
A more comprehensive partnership of diverse stakeholders is established with clearly defined objectives and goals	7	15.91 %
Planning and implementation are done by the same department	3	6.82 %
No Answer	1	2.27 %

Fig.6. Has your organisation made clear links between planning and implementation aspects of Urban Nature Planning, within your organisation and external partners? (Q6)

There were mixed responses: 34% of respondents indicated a lack of connection between those involved in planning and implementation aspects of urban nature whilst 32% indicated a strong demarcation, but with a dialogue between these functions. 10% indicated a formalised communication structure, whilst 16% had already established a more comprehensive partnership of diverse stakeholders. In some cases (7%), planning and implementation were actually undertaken by the same local government department.



7. Which urban nature related activities have already received a high priority in your city/ region ?

	Answers	Ratio
Integrated planning of multifunctional Green Infrastructure	22	50.00 %
Creating and managing greenspaces for recreation, health and education	29	65.91 %
Mapping and enhancing Biodiversity	22	50.00 %
Nature-based Solutions (NBS) implementation	20	45.45 %
Climate change adaptation measures	31	70.45 %
Climate change mitigation measures	26	59.09 %
Community engagement and stakeholder participation	20	45.45 %
Synergising urban nature planning and implementation activities	7	15.91 %
No Answer	1	2.27 %

Fig.7. Which urban nature related activities have already received a high priority in your city/region? (Q7)

The responses showed a very diverse spread of urban nature related activities. Climate change adaptation measures currently receive the highest level of priority by 70% of respondents, closely followed by managing greenspaces for recreation, health and education by 66%. Climate change mitigation is also considered to be a priority by 59%. Integrated planning of multifunctional green infrastructure and mapping and enhancing biodiversity were both considered a priority by 50% of respondents. Other activities including NBS implementation and community engagement were both prioritised by 45% of respondents, whilst synergising urban nature planning and implementation was only identified as a priority by 16%.

8. Which urban nature related activities have so far received lower priority in your city/ region ?

	Answers	Ratio
Integrated planning of multifunctional Green Infrastructure	13	29.55 %
Creating and managing greenspaces for recreation, health and education	7	15.91 %
Mapping and enhancing Biodiversity	10	22.73 %
Nature-based Solutions (NBS) implementation	19	43.18 %
Climate change adaptation measures	8	18.18 %
Climate change mitigation measures	11	25.00 %
Community engagement and stakeholder participation	20	45.45 %
Synergising urban nature planning and implementation activities	19	43.18 %
No Answer	3	6.82 %

Fig.8. Which urban nature related activities have so far received a lower priority in your city/region? (Q8)

Responses to Q8 reflected and complemented those already provided in Q7. Community engagement and stakeholder participation is a low priority for 45% of respondents whilst NBS implementation and synergising urban nature planning and implementation activities are accorded lower priority by 43% of respondents. Integrated planning of green infrastructure was accorded a low priority by 30% and climate change mitigation by 25%.

2.3.3 Existing capacity and familiarity with tools and training programmes (Q. 9-18)

9. What existing capacity building tools and programmes do you use related to the development and enhancement of nature in the urban environment ?

	Answers	Ratio
Green Infrastructure mapping tools and spatial data analysis e.g. Integrated habitat mapping, greenspace mapping, i-tree etc.	21	47.73 %
Implementation guidelines, toolkits and check lists (e.g. biodiversity enhancement/Green Infrastructure/urban forestry etc.)	18	40.91 %
Mentoring/ capacity building services for staff and external stakeholders	13	29.55 %
Community engagement approaches/ co-design workshops	19	43.18 %
Citizen science approaches and training	9	20.45 %
Webinars and online courses from external providers	16	36.36 %
NBS design and implementation approaches	14	31.82 %
Funding advice for urban greening initiatives; including external funding	5	11.36 %
No Answer	2	4.55 %

Fig.9. What existing capacity building tools and programmes do you use related to the development and enhancement of nature in the urban environment? (Q9)

This question revealed a diverse range of capacity building tools and programmes already in use by respondents. Green infrastructure mapping tools and spatial data analysis were used by 48% of respondents whilst community engagement approaches and co-design workshops were used by 43%. Implementation guidelines, toolkits and checklists were another popular resource used by 41% of participants. Other resources which were commonly utilised included webinars and online resources by 36%, NBS design and implementation by 32% and mentoring and capacity building services at 30%. Other approaches such as citizen science and external funding advice showed lower rates of usage.

10. Think about the 10 steps of the UNP cycle. Which of the 10 steps have you been supported in through capacity building tools or programmes ?

		Answers	Ratio
Step 1 - Secure a long-term political commitment		18	40.91 %
Step 2 - Establish a working structure		14	31.82 %
Step 3 - Establish a co-creation process		14	31.82 %
Step 4 - Develop a long-term vision and goals		16	36.36 %
Step 5 - Analyse the current state of nature and biodiversity		14	31.82 %
Step 6 - Set indicators and targets		11	25.00 %
Step 7 - Agree on priorities, actions, timelines and financing		8	18.18 %
Step 8 - Develop a communication, education and awareness raising strategy		8	18.18 %
Step 9 - Establish a monitoring, reporting and evaluation system		8	18.18 %
Step 10 - Adopt, publish and implement plan		7	15.91 %
No Answer		9	20.45 %

Fig.10 Think about the 10 steps of the UNP cycle. Which of the 10 steps have you been supported in through capacity building tools or programmes? (Q10)

Responses to Q10 reveal that the earlier steps in the UNP cycle have been better supported through capacity building tools or programmes. In particular, 1-5 have been supported with 41% receiving support for developing the political process and over 30% for each of the following 4 steps. Step 4, Developing a long-term vision and goals, has also been well supported as indicated by 36% of respondents. From Step 7 onwards, the level of support drops to only 18% or less in each case.

Fig.11 For each of the steps you selected, what tools or programmes did you use that you found to be useful ? (Q11)

UNP Step No:	UNP Tools and Resources:
Step 1. Secure a long-term political commitment	Municipal decisions
	• Allocate financial resources • Long-term program
	• Adoption of green management regulation
	• Mission Statement Mannheim 2030 • Edinburgh Declaration
	• Municipal Operational Programme
	• Signing of the Memorandum of Understanding • Meeting and evaluation of the status and capacity of the station
	• Development of the Paris Biodiversity Plan • Development of the Climate, Air & Energy Plan • Resilience Strategy
	• EGCA 2024 • Green City accord • Cities Mission • Adaptation Mission • Green and Biodiversity Plan
	• Signed Covenant of Mayors
	• LIFE project GreenMe5 • Green City accord
	• ICLEI cities with nature • UN generation restoration

Fig.11.01. Step 1.

UNP Step No:	UNP Tools and Resources:
Step 2. Establish a working structure	• Connecting Nature Framework
	• Planning process drawn up by external consultants
	• Inventory of municipal green spaces • Capacity and knowledge building of staff • Toolkits and guides
	• Actors map • Focus group • Inter-administrative agreement • Inter-departmental team
	• Internal Green Space Management/Planning Committee
	• Local Green Deal • Biodiversity manager
	• Form a group of local government and local representatives • Consolidate existing capacities
	• The Urban Ecology Agency within the Green Spaces and Environment Department • Ecological Transition Department
	• Urban Agenda 2030 • Cities Mission • EGCA 2024
	• LIFE project "GreenMe5"
	• Green Infrastructure mapping tools and spatial data analysis • Implementation guidelines, toolkits and checklists • Webinars and online courses from external providers
	• Open Space Strategy Delivery Plan • Forest and woodland strategy delivery plan • Development plan delivery plan • Climate plan and climate adaptation plan

Fig.11.02. Step 2.

UNP Step No:	UNP Tools and Resources:
Step 3. Establish a co-creation process	• Connecting Nature Framework
	• Participation process including Gecoro and Minaraad involvement • Various city services and public information opportunities
	• Living labs • Co-creation workshop
	• Stakeholders consultation group for the promotion of NVS
	• Rules for citizen participation
	• UNDP support • TAIEX
	• Define a plan and programme of action
	• Creation of the Climate Academy
	• Green and Biodiversity Plan • EGCA 2024
	• LIFE project GreenMe5
	• Community engagement approaches/ co-design workshops

Fig.11.03. Step 3.

UNP Step No:	UNP Tools and Resources:
Step 4. Develop a long-term vision and goals	• Connecting Nature Framework
	• Long-term vision to 2030 • Concrete objectives and actions
	• Inventory of municipal green spaces • Capacity and knowledge building of staff • Toolkits and guides
	• Scenario planning • Vision statement • Strategic planning
	• Strategic Plan for Biodiversity and Urban Ecology
	• Municipal Operational Programme • Preparation of related co-financed projects through INTERREG
	• Various educational programmes (seminars, webinars, study visits, etc.)
	• Set deadlines for implementation
	• Development of the 300 ha Strategy for Paris
	• Green and Biodiversity Plan
	• LIFE project GreenMe5 • Green City Accord
	• Community engagement approaches/ co-design workshops • Green Infrastructure mapping tools and spatial data analysis
	• Conception
	• Sustainable Urban Development Strategy of the City of Szeged

Fig.11.04. Step 4.

UNP Step No:	UNP Tools and Resources:
Step 5. Analyse the current state of nature and biodiversity	• Biological valuation map • Connectivity analysis • Cultural history survey/landscape map
	• Inventory of municipal green space • Capacity and knowledge building staff • Toolkits and guidance documents
	• Meetings • Knowledge gathered from relevant projects
	• Survey • Official databases • Citizen science
	• Mapping and vulnerability assessment of the important green spaces
	• Courses related to biodiversity enhancement
	• Advice on the ground
	• Portrait of Nature • Atlas of Nature • Scheme of green and blue networks
	• Green and Biodiversity Plan • Tree Inventory and Urban forest • Biodiversity and Data Bank
	• LIFE project GreenMe5 • Green City Accord
	• Green Infrastructure Mapping and Spatial Data Analysis
	• SECAP of Szeged
	• GIS baseline quality and quality • Open space strategy and play Provision Assessment • Forest and woodland strategy • Every tree tells a story • Google EIE canopy cover

Fig.11.05. Step 5.

UNP Step No:	UNP Tools and Resources:
Step 6. Set indicators and targets	• Co-impact
	• Standstill Nature • Woodland expansion objectives • Enhancing quality of Nature and Forest • Green Standard IFV neighbourhood parks + distribution of neighbourhood parks and residential green space and green areas • Green Climate Atlas
	• Meetings • knowledge gathered from relevant projects
	• Available data • Clear objectives
	• Transboundary approach
	• Cohesion for Transitions (C4T) Community of Practice
	• Biodiversity Plan Indicators • Climate Plan Indicators • Scoreboard of the Green Spaces and Environment Department
	• EGCA 2024 • Green and Biodiversity Plan
	• Green City Accord

Fig.11.06. Step 6.

UNP Step No:	UNP Tools and Resources:
Step 7. Agree on priorities, actions, timelines and financing	• Short-term actions, general and area-specific • Green hub in Flemish government: cooperation agreement and land development projects
	• Inventory of municipal greenspaces • Capacity and knowledge building of staff • Toolkits and guides
	• Stakeholder consortium • participatory process
	• Municipal Operational Programme
	• Involvement of higher levels of government in financing
	• Annual budget and vote by the Paris Council • Annual 'Climate Blue' budget and vote by the Paris Council
	• EGCA 2024 • Green and Biodiversity Plan • Renaturing Valencia
	• Green Infrastructure mapping tools and spatial data analysis • Community engagement approaches/ co-design workshops

Fig.11.07. Step 7.

UNP Step No:	UNP Tools and Resources:
Step 8. Develop a communication, education and awareness raising strategy	• Communication plan IFV reaching different target groups
	• Set goals and target audience • Design communication materials
	• To include Unions and the non-governmental sector
	• In line with the actions of the Paris Biodiversity Plan • In line with the actions of the Paris Climate Plan
	• EGCA 2024 • Green and Biodiversity Plan • Renaturing Valencia
	• Climate Strategy of Szeged

Fig.11.08. Step 8.

UNP Step No:	UNP Tools and Resources:
Step 9. Establish a monitoring, reporting and evaluation system	• 5 year monitoring Biological valuation map • Annual evaluation of actions green structure plan (via green policy document)
	• Data frequency collection • Design reports and evaluation system
	• CAF training and methods
	• Working group through performance reports, press coverage
	• Cohesion for Transitions (C4T) Community of Practice
	• Biodiversity Plan • Regulatory assessment of the Climate Plan
	• EGCA 2024 • Green and Biodiversity Plan • Renaturing Valencia

Fig.11.09. Step 9.

UNP Step No:	UNP Tools and Resources:
Step 10. Adopt, publish and implement plan	• Municipal Decision • Report published / available online
	• Official approval • Dedicated team
	• Development of strategic tools
	• To establish a project plan through the various phases and to implement it after each phase until the completion of the project
	• Paris Biodiversity Plan voted on by the Paris Council • Paris Climate Plan voted by the Paris Council
	• Green and Biodiversity Plan
	• Climate Strategy of Szeged

Fig.11.10. Step 10.

Question 11 provided some very detailed information on specific tools and resources used by respondents for each step of the process. Some of the responses provided are generic in nature and apply to processes which might be applicable across a broad range of situations. Other responses refer to more structured programmes/ processes or tools (e.g. local biodiversity plans) which are used in specific locations, with many of these being unique to the local country, region or individual location. Where acronyms have been provided by respondents, these have not been elaborated as their meaning is often not clear. In terms of developing the capacity building programme, some responses will be of greater value. However, an understanding that many UNPs will adopt local approaches, methodologies and tools for capacity building is in itself very useful information for development of any future programme which must be adaptable to locally appropriate circumstances.

12. For which steps should the UNP+ project develop specific tools and programming for ?

		Answers	Ratio
Step 1 - Secure a long-term political commitment		16	36.36 %
Step 2 - Establish a working structure		18	40.91 %
Step 3 - Establish a co-creation process		11	25.00 %
Step 4 - Develop a long-term vision and goals		20	45.45 %
Step 5 - Analyse the current state of nature and biodiversity		23	52.27 %
Step 6 - Set indicators and targets		26	59.09 %
Step 7 - Agree on priorities, actions, timelines and financing		24	54.55 %
Step 8 - Develop a communication, education and awareness raising strategy		23	52.27 %
Step 9 - Establish a monitoring, reporting and evaluation system		27	61.36 %
Step 10 - Adopt, publish and implement plan		17	38.64 %
No Answer		3	6.82 %

Fig.12. For which steps should the UNP+ Project develop specific tools and programming for? (Q12)

Responses to Question 12 highlight the fact that capacity building work is required across all the UNP steps in the cycle. Steps 5-9 around the middle of the process however, appear to see higher demand for further development of tools and programming, with Step 9 (monitoring, evaluation and reporting framework) and Step 6 (setting indicators and targets) being the areas of greatest demand with 61% and 59% respectively. The capacity building programme should not only focus on hard skills regarding planning, analysing the baseline, indicators and monitoring, but should also provide training on soft skills such as communication, awareness raising and finding consensus.

Dept/ Section	Score
The tools are user friendly	11.08
The tools can provide convincing outputs for policymakers	10.51
Language is understandable and non-technical	9.45
Guidelines are easily understood and communicable	9.32
Key points are presented clearly and concisely	8.43
Information is presented by independent and enthusiastic experts	6.7
Learning is a stimulating and fun experience	5.89
The tools are complimentary and build upon one another	5.72
Tools are available in my own language and are tailored to local circumstances	5.29
Reference to (best/good practice) examples (e.g. maps or figures from other cities) are provided	5.27
The tools recognise existing complimentary resources/initiatives. They do not reinvent or duplicate	4.91
Professional development/ accreditation is available	4.7
Guidelines are illustrated graphically	3.67

Fig.13. What makes the capacity building tools and programmes you use successful? Rank in order of importance (Q13)

Question 13 provides valuable information about the attributes which respondents value for the purposes of developing capacity building programmes. The favoured attributes were ranked in order of importance by respondents. "User friendliness" of the tools and their ability to provide convincing outputs to policymakers were ranked as most important with respective scores of 11/37 and 10.5/37. Other important factors were the use of non-technical language and the fact that the guidelines were easily communicable. Of lesser importance was the fact that the guidelines are illustrated graphically which scored only 3.7 out of 37. Additional comments received included the following:

- (Programmes should) link with other EU plans such as climate plans; everything around Water Framework Directive; one reporting system.
- Tools can provide clear and convincing outputs for non-policy stakeholders e.g., other professionals and community groups.
- (Programmes should) consider the demands and when we need to deliver. Why do we need to deliver?

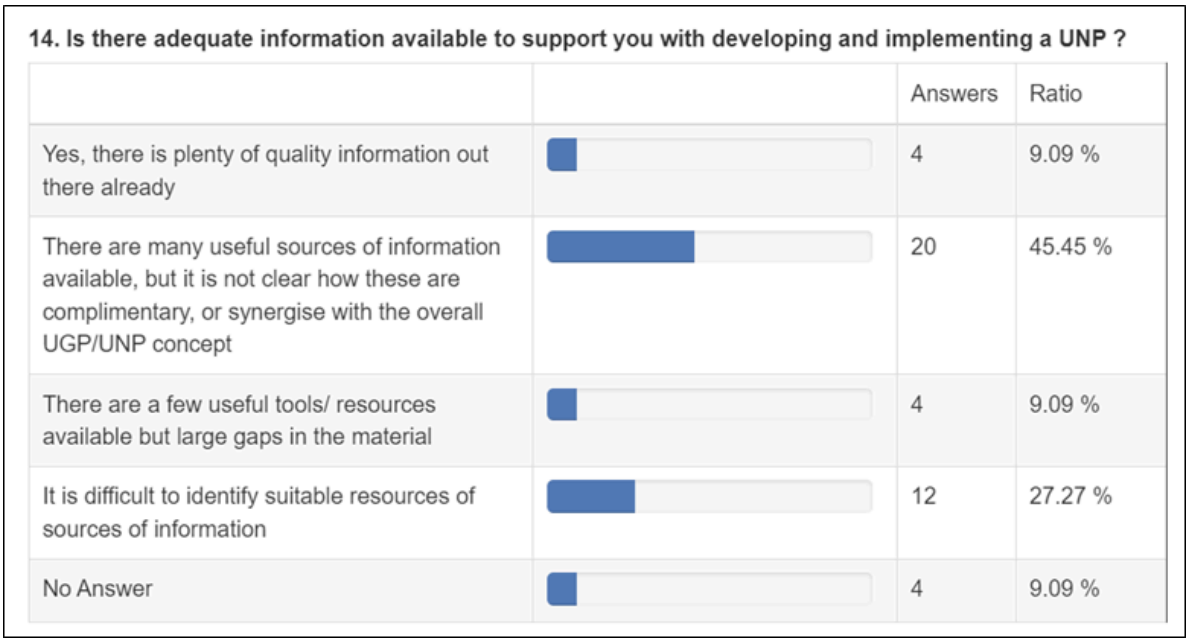


Fig.14. Is there adequate information available to support you with developing and implementing a UNP? (Q14)

The results showed that 45% of respondents believed that there are many existing sources of information available, however it is not clear how these are complimentary or synergise with the overall UNP concept. However, 27% of respondents found it difficult to identify suitable sources of information. This suggests that capacity building initiatives might assist through collating sources of information and through providing guidance as to how these fit into the UNP structures as a whole.

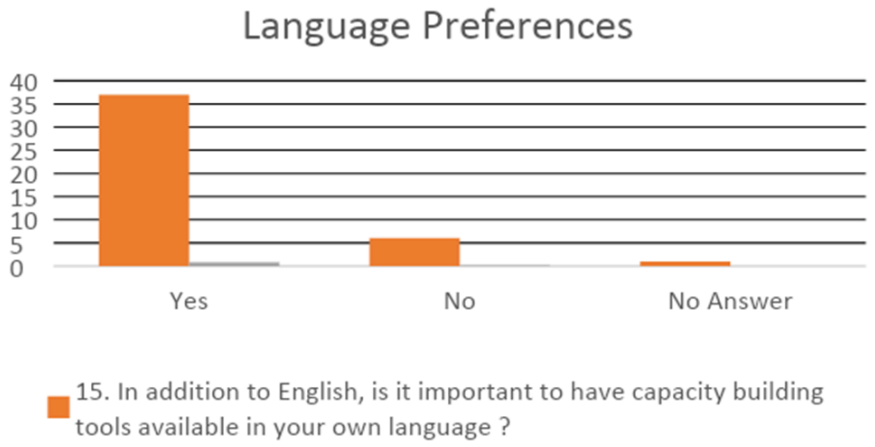


Fig.15. In addition to English, is it important to have capacity building tools available in your own language? (Q15).

The survey revealed there was a very clear preference expressed by respondents that capacity building tools should be made available in local languages i.e. other than in English. It is envisaged that this would enable a much wider impact to be achieved by the Capacity Building Programme.

Training Format	Score
Online	4.81
In person	4.59
Hybrid	3.78
Textbook based (self-study)	2.27
Video and graphics e.g. online courses	2.97
Mixture of above formats	2.56

Fig.16. What training formats do you most prefer based upon previous experience? (rank in order of importance)? (Q16)

Responses to Q16 on training formats revealed that all formats are considered to be of value. However, online training and in-person training were deemed to be of the greatest benefit by participants, scoring 4.8 and 4.6 respectively. Although hybrid training scored slightly lower at 3.8, it is likely that any programme involving a mixture of online and in-person training would achieve the capacity building goals of the UNP programme.

Dept/ Section	Score
City Planning and Strategic Development	9.56
Forestry/Greenspaces Dept.	8.1
Building Management/ Development Control	7.82
Grounds Maintenance/works inspection	7.07
Environmental Protection Agency	5.84
Property and Housing Dept.	5.43
Highways Dept.	4.87
Education Dept.	4.84
Community Development/ Social Services	4.41
Chief Executive/ Corporate Services	4.12
Financial/ Procurement/ EU Funding	3.89

Fig.17 Which departments/sections of your organisation do you think would derive the greatest benefits from training? (rank in order of importance). (Q17)

Question 17 aimed to establish which local authority departments could most benefit from training. The responses to this question suggested that it was important to involve a wide range of departments in the process and not just to focus upon the "usual suspects". However, certain departments were accorded a higher priority in the participants' rankings: these being City Planning at 9.6 followed by Forestry/Greenspaces at 8.1, Building

management at 7.8 and Grounds Maintenance at 7. Corporate Departments such as Finance and the Chief Executives Departments recorded lower figures of 3.9 and 4.1 respectively. Other departments to involve, suggested through the open question, included the Department for Sustainable development, the Innovation Department, Municipal Foundations. It is important to note that there is a diverse range of department structures and that not all will be applicable in every case.

18. Which forms of accreditation would be beneficial ?

	Answers	Ratio
Formal accreditation of trained persons	21	47.73 %
Simple self assessment	9	20.45 %
No accreditation is required	10	22.73 %
Variable according to training topic	12	27.27 %
No Answer	3	6.82 %

Fig.18. Which forms of accreditation would be beneficial? (Q18)

Respondents were asked to indicate whether some form of formal accreditation would be beneficial. There was a positive indication from 48%, whilst 27% believed that the need for accreditation would vary according to the individual training topic. 10% believed that no form of accreditation was actually necessary.

2.3.4 Use of specialist data tools and analysis (Q. 19-26)

19. To what extent do you have existing in-house access to high quality mapping/ Geographical Information Systems (GIS) baseline data of the local Green Infrastructure and greenspace networks?

	Answers	Ratio
No existing access	9	20.45 %
Some limited access	9	20.45 %
Good access	16	36.36 %
Excellent GIS resources and capabilities	9	20.45 %
No Answer	1	2.27 %

Fig.19. To what extent do you have existing in-house access to high quality mapping/ Geographical Information Systems (GIS) baseline data of the local Green Infrastructure and greenspace networks ? (Q19)

Access to quality baseline GIS data on GI is an important factor for the development of a UNP. In this context, 57% of respondents already have good or excellent access to GIS data. Meanwhile, 21% only have limited access to data, with another 21% having no access at all.

20. Are you using ecosystem service models ?

		Answers	Ratio
Yes		10	22.73 %
No		32	72.73 %
No Answer		2	4.55 %

Fig.20.1. Are you using ecosystem service models? (Q20)

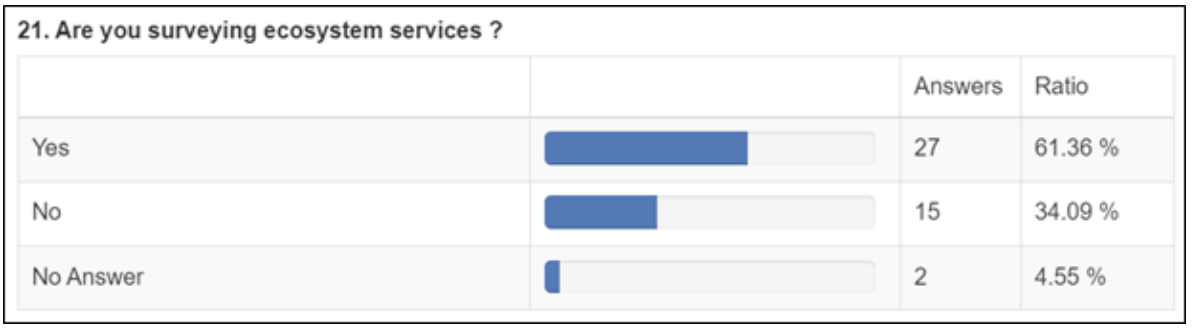
If "yes" which of the following is your organisation using:

		Answers	Ratio
iTree (e.g. carbon storage, cooling)		5	11.36 %
inVEST (cooling and storm water retention ecosystem service models)		0	0.00 %
ENVI-met (urban cooling ecosystem service models)		0	0.00 %
Mike+ (urban storm water flooding model for green and blue ecosystem services stormwater management)		1	2.27 %
SWIM (as Mike+, above)		0	0.00 %
We have outsourced a study (if possible add link to report, or mail report below)		4	9.09 %
Other - please add details in the text box below		5	11.36 %
No Answer		32	72.73 %

Fig.20.2. If "yes" which of the following is your organisation stage (Q20)

Responses to question 20, revealed that 73% of respondents are not currently using ecosystem services models. Of the 23% who indicated positively, iTree was the most commonly used, by 11%, whilst another 11% utilised other approaches whilst 9% had outsourced a study. The other models listed in the survey were not largely utilised by respondents. Relevant additional responses received included the following:

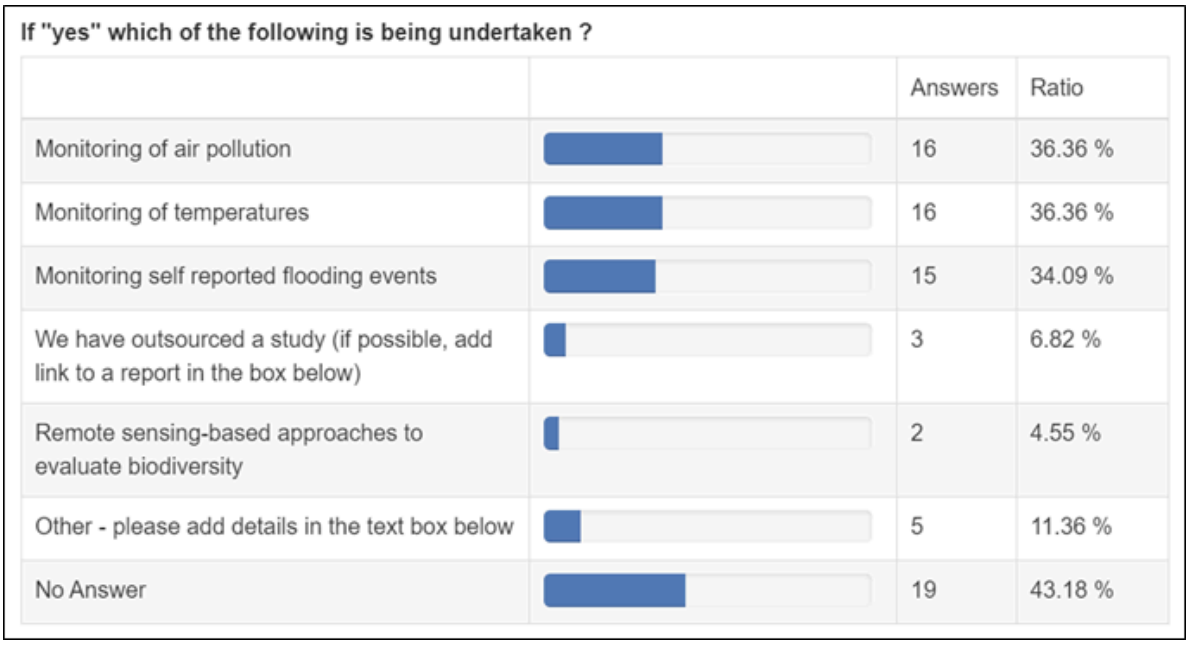
BWK Biologische waarderingskaart (Biological Value Map), information on hydrology and soil; NDVI; Land Cadastre system; Tools developed in-house, in particular at the Atelier Parisien d'Urbanisme (APUR); Environmental Benefits of Nature Tool (EBNT) - quite new and available in England



21. Are you surveying ecosystem services ?

		Answers	Ratio
Yes		27	61.36 %
No		15	34.09 %
No Answer		2	4.55 %

Fig.21.1. Are you surveying ecosystem services? (Q21)



If "yes" which of the following is being undertaken ?

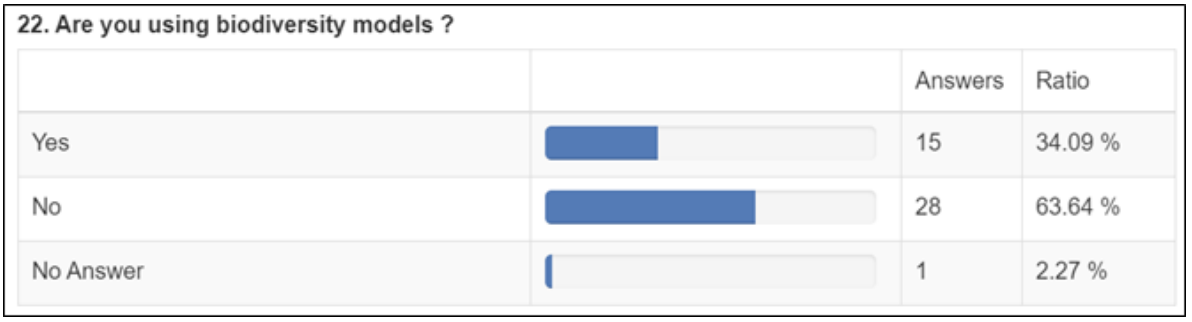
		Answers	Ratio
Monitoring of air pollution		16	36.36 %
Monitoring of temperatures		16	36.36 %
Monitoring self reported flooding events		15	34.09 %
We have outsourced a study (if possible, add link to a report in the box below)		3	6.82 %
Remote sensing-based approaches to evaluate biodiversity		2	4.55 %
Other - please add details in the text box below		5	11.36 %
No Answer		19	43.18 %

Fig.21.2. If "yes" which of the following is being undertaken? (Q21)

Responses to Q21 revealed that 61% of respondents were surveying ecosystem services whilst 34% indicated that they were not undertaking this. Of those who answered positively, 36% were monitoring air pollution, whilst 36% were measuring temperature. Meanwhile, 34% were measuring flood events. A much more limited percentage were using remote sensing to evaluate biodiversity or had outsourced a study. A high percentage, 43%, did not answer this question. Additional responses included:

We are using i-Tree Eco's stratum feature to further define landscapes in terms of high, medium or low probability of flooding and the resulting impact on tree health and resulting ecosystem services. Air pollution is monitored through installations of meters; Noise/quiet levels, groundwater levels and infiltration; Biodiversity transect monitoring; City of Sarajevo

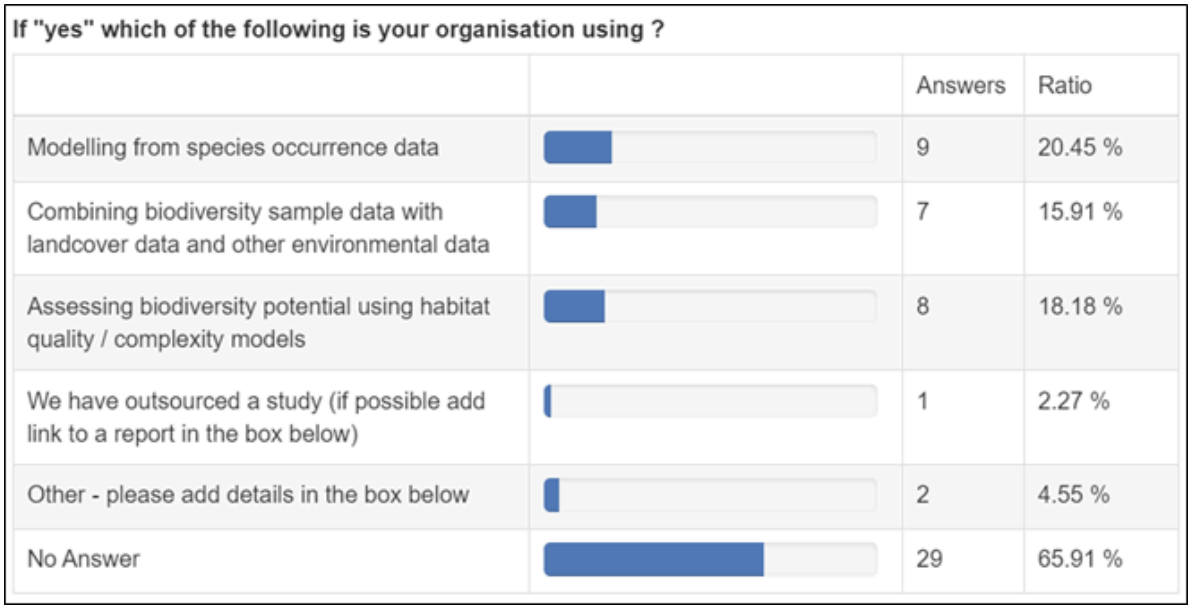
doesn't do these monitoring services, they are done by separate institutions; Tree canopy index:
https://geoportal.valencia.es/apps/GeoportalHome/es/inicio/ ; Monitoring of pollen, Monitoring of the sanitary quality of the sea on the beaches during the summer; A project for biodiversity and nature monitoring is about to start. Based on tree canopy cover, trees and greenery state variation, birds, butterfly and ants species variations; Roads and flooding monitored.



22. Are you using biodiversity models ?

	Answers	Ratio
Yes	15	34.09 %
No	28	63.64 %
No Answer	1	2.27 %

Fig.22.1. Are you using biodiversity models? (Q22)

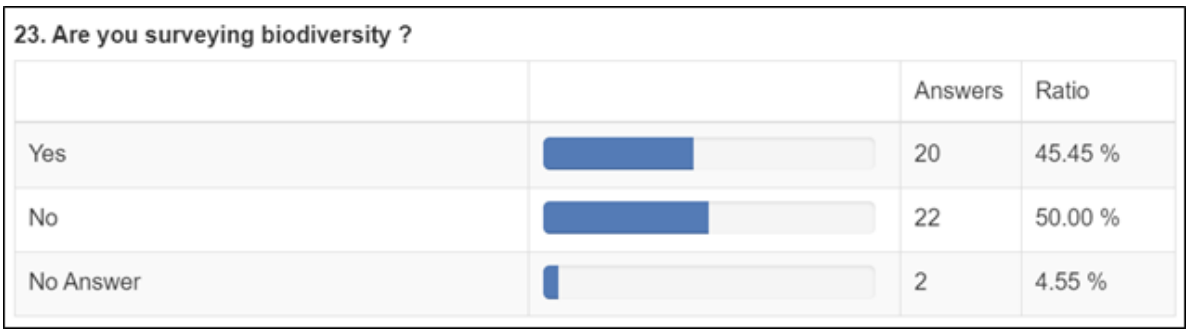


If "yes" which of the following is your organisation using ?

	Answers	Ratio
Modelling from species occurrence data	9	20.45 %
Combining biodiversity sample data with landcover data and other environmental data	7	15.91 %
Assessing biodiversity potential using habitat quality / complexity models	8	18.18 %
We have outsourced a study (if possible add link to a report in the box below)	1	2.27 %
Other - please add details in the box below	2	4.55 %
No Answer	29	65.91 %

Fig.22.2. If "yes" which of the following is your organisation using ? (Q.22)

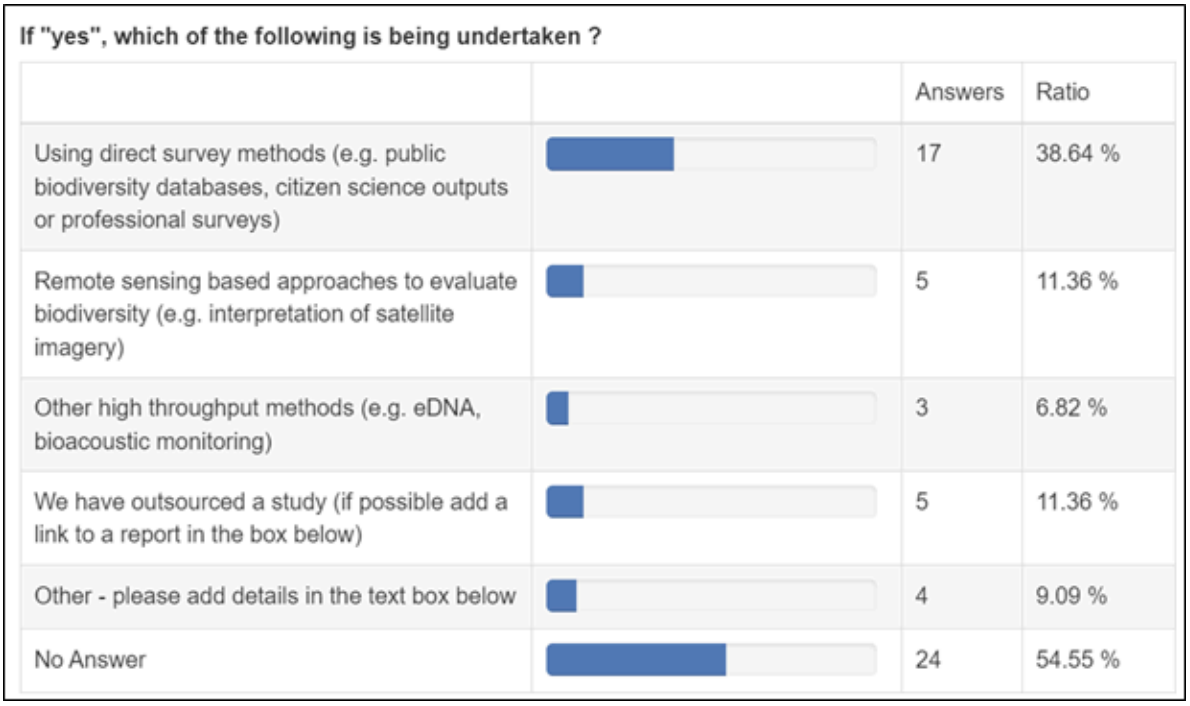
It is clear from Q22 that the majority of respondents are not using biodiversity models, with 63.6% answering negatively to this question. and only 34% answering positively. Those using biodiversity modelling appear to use a range of approaches such as from species occurrence data, but with no single dominant approach. Additional Feedback received (open question) included:
Modélisation du déplacement des espèces cibles pour l'étude de la trame verte; https://bdb.gva.es/; For one project (stream revitalisation), we assessed biodiversity; We have created an environmental digital model



23. Are you surveying biodiversity ?

		Answers	Ratio
Yes		20	45.45 %
No		22	50.00 %
No Answer		2	4.55 %

Fig.23.1. Are you surveying biodiversity? (Q23)



If "yes", which of the following is being undertaken ?

		Answers	Ratio
Using direct survey methods (e.g. public biodiversity databases, citizen science outputs or professional surveys)		17	38.64 %
Remote sensing based approaches to evaluate biodiversity (e.g. interpretation of satellite imagery)		5	11.36 %
Other high throughput methods (e.g. eDNA, bioacoustic monitoring)		3	6.82 %
We have outsourced a study (if possible add a link to a report in the box below)		5	11.36 %
Other - please add details in the text box below		4	9.09 %
No Answer		24	54.55 %

Fig.23.2 . If "yes", which of the following is being undertaken? (Q.23)

Biodiversity was being surveyed in 45% of cases, with 50% registering no activity. Where surveys were taking place, this was mainly being achieved through direct survey methods including public databases, citizen science and professional surveys. Remote sensing and more technical approaches were in the minority. Open answers recorded included:
Own observations; Transect survey with local staff and NGOs; Biological Valuation Map; Project is about to start in collaboration with CREA a public research centre on nature, forestry and agriculture; Outsourced surveys; For one project (stream revitalisation), we have assessed biodiversity; We've also used an expensive lidar done by Glasgow university, a fly-by done by Scottish forestry and more usefully, the Google EIE canopy cover.

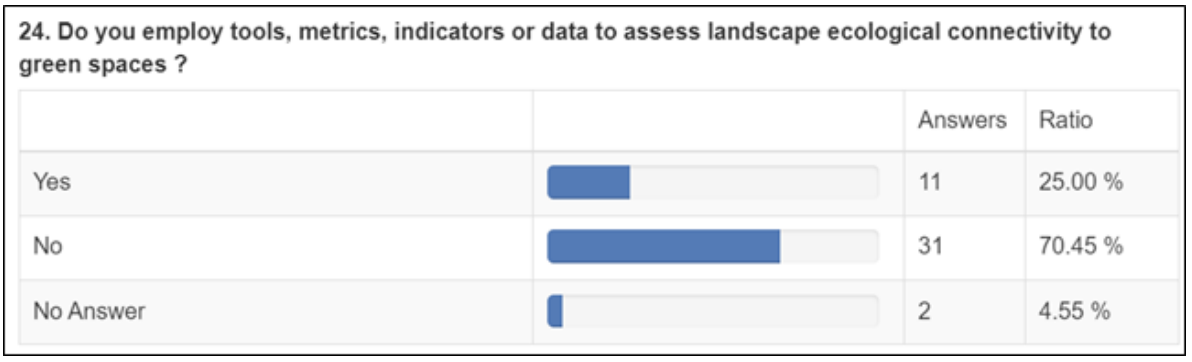


Fig.24. Do you employ tools, metrics, indicators or data to assess landscape ecological connectivity to green spaces? (Q.24)

From the responses received, it appears that 71% of respondents do not make use of tools, metrics, indicators or data to assess landscape ecological connectivity to green spaces. By contrast, 25% indicated positively, whilst the rest provided no answer.

Further information was received from a number of the respondents who indicated:

In my position as a advisory Consultant, I can only make recommendations to pursue this type of data collection but those recommendations have yet to be realised; Buffer zones around forest and natural areas (very limited, to be improved); Have used the HUGSI connectivity measure, based on the CBI one; Recognition of nature reserves, biodiversity data; Ecological connectivity index: types of land cover, existence and quality of wildlife crossings under infrastructure, existence of physical barriers of urban type, hydrographic network; We have developed our own system: more info at https://www.provinciaalnatuurcentrum.be/themas/natuurverbindingen
Using GIS to calculate the excess widths of ecological continuities
https://plaverdvalencia.com/es/documentacion/
We will use satellite images, soundscaping, direct surveys. Indicators: those of Green City Accord, tree canopy cover within the city, protected, recovered or naturalised areas, variation of number of birds and butterfly species; Combination of GIS, Biodiversity Net Gain Metrics, and Local Nature Reserve Strategy indicators, as no single one provides clear data on connectivity; Visual Mapping; We've got metrics within delivery plan for OSS and FWS. The metrics in our LBAP (Local Biodiversity Action Plan) are a bit woolly

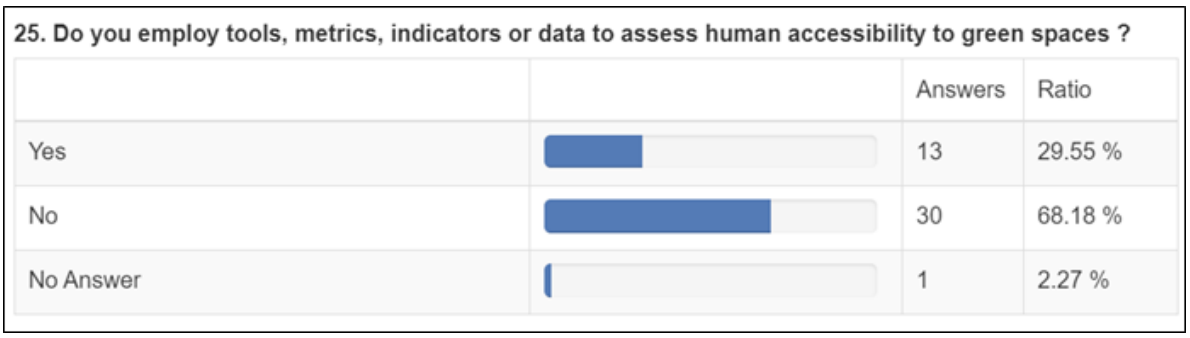


Fig.25. Do you employ tools, metrics, indicators or data to assess human accessibility to green spaces ? (Q25)

The responses to Q25 indicated that the majority (68%) of respondents do not employ tools, metrics, indicators or data to assess human accessibility to green spaces. Those that indicated positively (29.6%) provided the following feedback on their methodologies:
Distance analysis for residential green space (150m) neighbourhood parks (400m) and green poles (5km); Have our own policy for access,
https://malmo.se/Stadsutveckling/Sa-utvecklar-vi-staden/Stadsplanering-och-bostader/Oversiktsplanering/Oversiktsplan-for-Malmo-2023/Gronmodell.html#:~:text=Gr%C3%B6nmodellen%20%C3%A4r%20ett%20redskap%20f%C3%B6r,fr%C3%A5n%20bostad%20till%20respektive%20gr%C3%B6nyta.

Accessibility Schemes; Counters; GIS spatial analysis; Site visits; GIS mapping and social data for the area: number/m² of green spaces per inhabitant and accessibility of green spaces:
https://plaverdvalencia.com/es/documentacion/
Mainly mapping tools that have accessibility indicators built in such as Ordnance Survey MASTER through DigiMap; Visual Map; Open space strategy has quantity, quality and accessibility data

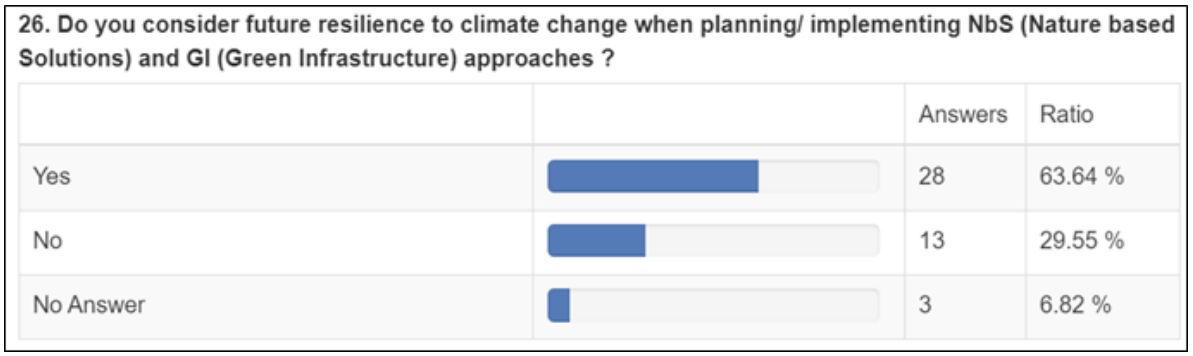


Fig.26. Do you consider future resilience to climate change when planning/implementing NBS (Nature based Solutions) and GI (Green Infrastructure) approaches? (Q26)

The responses revealed that 64% have not considered future resilience to climate change when implementing NBS and Green Infrastructure approaches.

3. UNP+ Survey 2: Skills and capacity needs of NBS designers, developers and suppliers

To complement the data on training and capacity building provided by local authority respondents through UNP+ Survey 1, a second survey focused on industry respondents - specifically enterprises engaged in designing, developing, and supplying NBS in urban areas.

3.1 Methods

3.1.1 Survey design

The survey design was led by Horizon Nua, building on and updating previous research with relevant target populations (Kooijman et al., 2021[2]; McQuaid et al., 2021[3]).

In order to optimise distribution, and reduce risks of research fatigue, UNP+ coordinated with other Horizon Europe projects (Invest4Nature, NBS EduWORLD, C-FAARER) to design and circulate one combined survey to this shared target population. The questions generating data for UNP+ were on the following themes:

- Enterprise characteristics (Q1, 2, 4, 5, 7, 8)
- Types of involvement in NBS (Q12, 13, 17)
- Markets, financing and business model (Q14 - 16, 19, 20 - 26 - analysed with respect to capacity support factors and interactions with local authorities)
- Education, training and support (Q 27 - 32)

The questions were structured in a variety of formats, appropriate to the information required. The formats included:

- A selection of predefined answers (both single and multiple selection options)
- Tables for gathering detailed feedback
- Ranking of predefined options
- Optional open-ended questions, where further elaboration was invited. This included providing an optional free text comment box / 'Other' option alongside many of the more structured questions, to ensure respondents had the ability to provide information according to their own preferred categories and priorities.

The draft survey was tested during an in-person meeting, where 10 users from partner organisations completed the survey while taking notes, followed by an open feedback session in which remarks were recorded. This feedback was used to refine the survey content and format, and the survey was then shared by email with a wider group of

[2] Kooijman, E. D. et al. (2021) "Innovating with Nature: From Nature-Based Solutions to Nature-Based Enterprises," Sustainability, 13(3), p. 1263. doi: 10.3390/su13031263.

[3] McQuaid, S. et al. (2021) "Innovating with Nature: Factors Influencing the Success of Nature-Based Enterprises," Sustainability, 13(22), p. 12488. doi: 10.3390/su132212488

organisations working on NBS for feedback. Once this feedback had been incorporated, a final version was tested from a function/usability perspective by four users before the survey link was distributed publicly from January 16th 2024.

3.1.2 Survey distribution and response screening

The survey used the SurveyMonkey platform to provide an easily accessible secure interface, and was distributed through the networks of Connecting Nature Enterprise Platform (CNEP) members, Invest4Nature partners, at events such as Nature Futures 2024, during webinars hosted on CNEP, and via social media (LinkedIn and X). There were no geographical restrictions to participation, but recruitment prioritised European networks.

This report is based on responses received between January and April 2024. Of a total of 175 responses received, 91 were eligible for inclusion in the UNP+ analysis. Reasons for exclusion were:

- low data quality and completeness (9 exclusions);
- duplicate responses from one organisation (3 exclusions);
- organisations not meeting the survey 'industry' target population as set out in the task - "NBS designers, developers and suppliers (e.g. Nature-based enterprises, architects, landscaping contractors)". Excluded responses came from e.g. Universities, public sector bodies, organisations not engaged in economic activity or the design, development or supply of NBS. Responses from professional associations for key industry sectors such as landscape architecture and green roofing were included (38 exclusions)
- organisations with minimal involvement in NBS in an urban context. This was assessed by reviewing the respondent's answer to the sector involvement question, and including those who had indicated that urban was their 'main market sector', or that they had a 'strong presence' or 'reasonable presence'. For completeness, free-text detail provided in the 'Other' comment box was screened for those who had ticked the boxes for little or no presence in the urban sector. This resulted in the inclusion of one further respondent who had used the comment box to describe providing consultancy on urban NBS (34 exclusions)

Inclusion/exclusion decisions were assessed by a minimum of two members of the research team.

3.2 Results and analysis

3.2.1 Respondent organisation characteristics

Location, size and legal form

Ninety-one survey responses met the inclusion criteria described above. Seventy-nine of the responding organisations were established in European countries - distributed across 22 of these. Data also included respondents from 12 organisations established outside Europe - USA (4), Canada (2), Brazil (1), Peru (1), South Africa (1), India (1), Australia (1), and Mauritania (1). Please see figure 27.

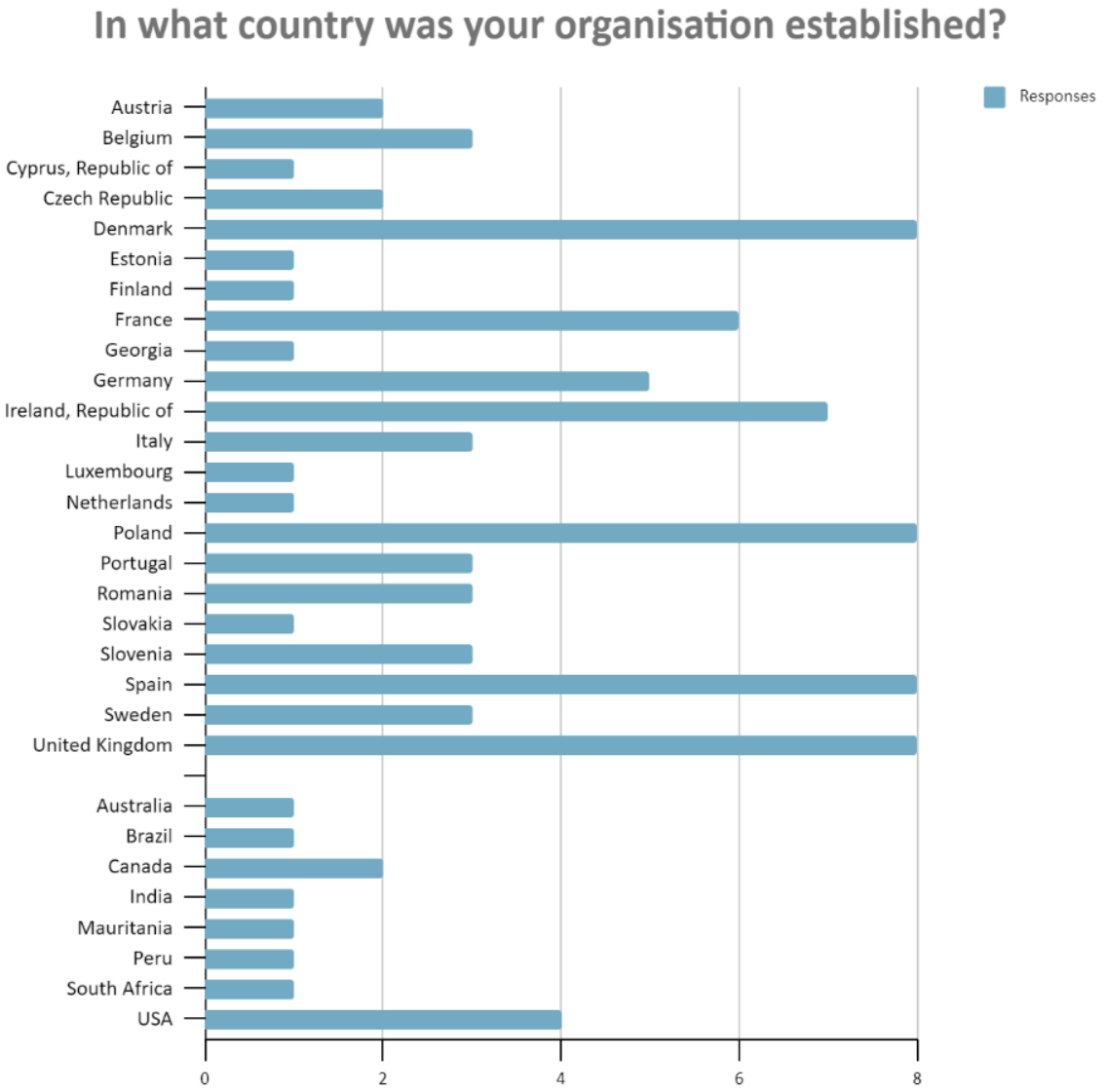


Fig.27. In what country was your organisation established?

Respondents were based in organisations with a range of legal forms - more than half (54%) indicated that they were a 'Private limited company', with 'Non-profit' (19%) and 'Sole trader' (13%) the next most common categories (see Figure 28)

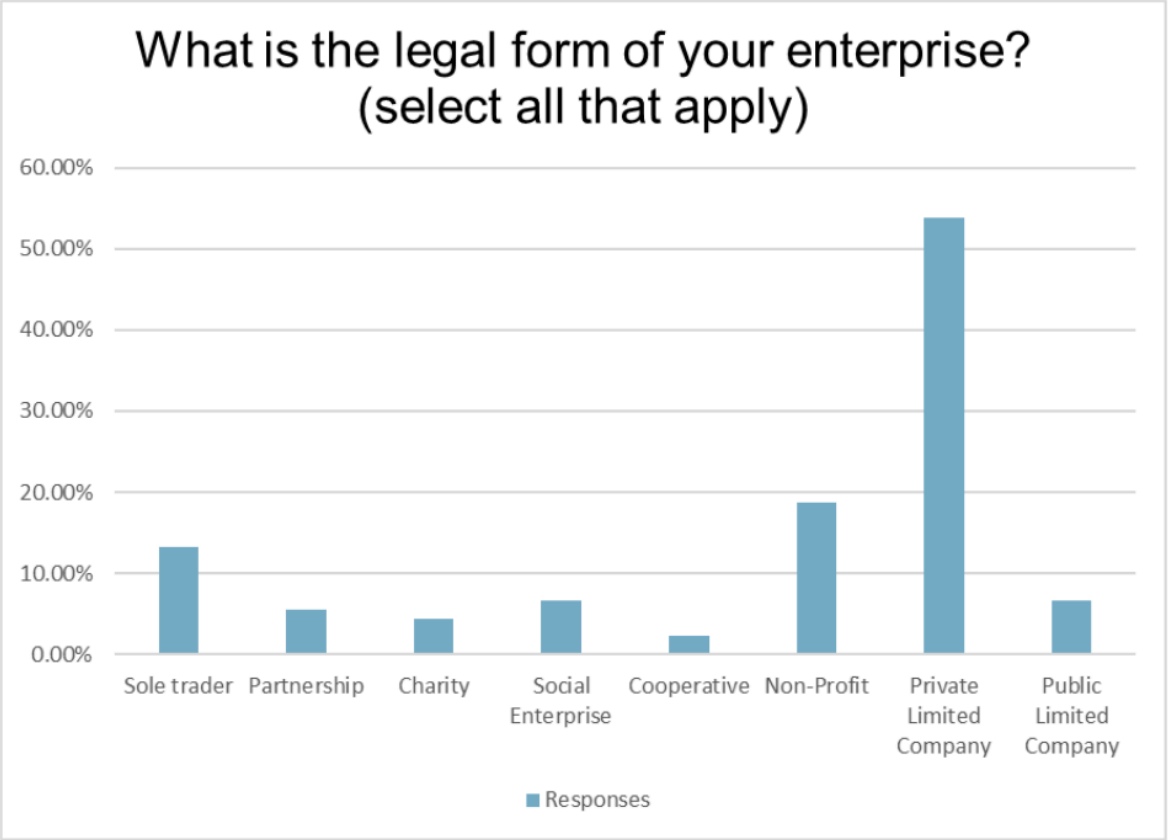


Fig.28. What is the legal form of your enterprise?

When considering employee numbers, the majority (68%) of responding organisations were micro-enterprises as defined by the European Union. A further 28% of respondents were from small enterprises (10-49 employees), and the remaining 4% were medium-sized enterprises (50-249 employees). Eighty-four percent of respondents reported a turnover of less than 2 million euros, placing them in the micro-size financially. A further 14% reported a turnover of between 2 and 10 million, with just 2% reporting turnover above 10 million euros.

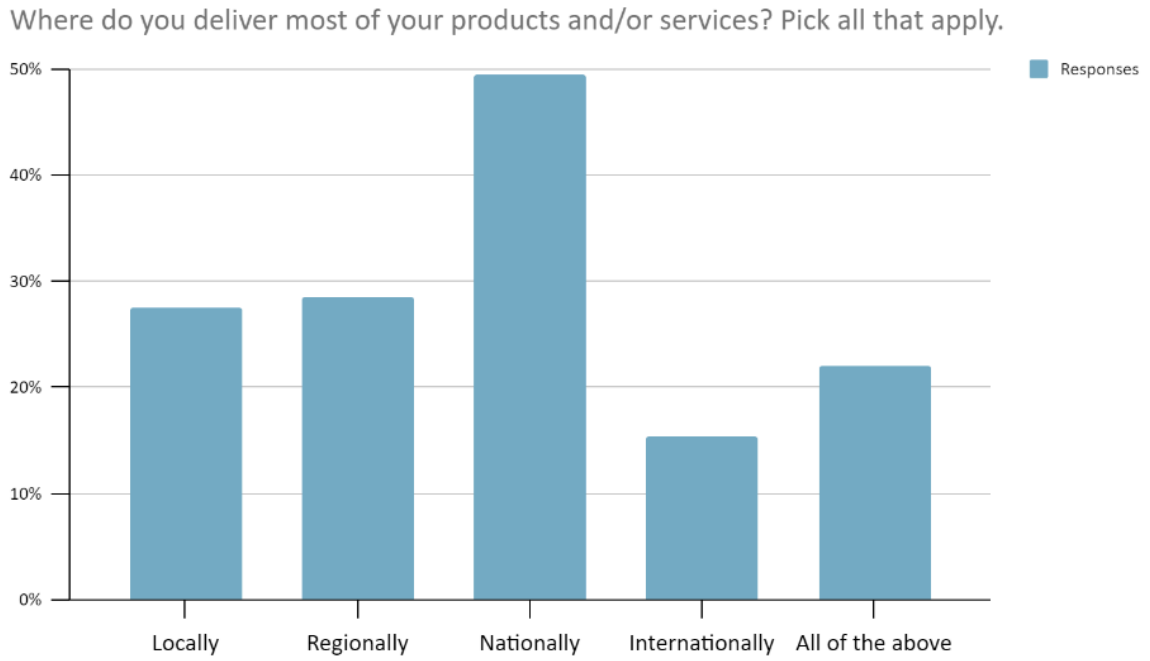


Fig.29. Where do you deliver most of your products and/or services ?

Responding organisations were diverse regarding their geographical market orientation, ranging from a strong local focus to multi-level or international orientations. The national level was the most commonly selected answer, included in 71% of responses (see Figure 29). Information about how respondents' organisations were working with local authorities on urban greening came up in free text answers across several market/finance/business model questions in the survey. For example, a Danish enterprise was already working with city authorities on NBS financing, whereas a German enterprise highlighted *"the lack of budget of municipalities"*, and so was interested in exploring *"crowd-funding to help cities / municipalities to implement our solutions"*. Local authorities featured as important clients for a range of organisations. For example, a Polish Non-Profit reported that their main source of financing had been "*grants and projects and tasks commissioned by public entities such as city offices, communes or marshal offices*"; and a UK-based manufacturer of "*living walls and living roof systems*" reported *"greater interest and increase in orders from local authorities."*

The vast majority of respondents reported that demand for their products and/or services had increased (see Figure 30).

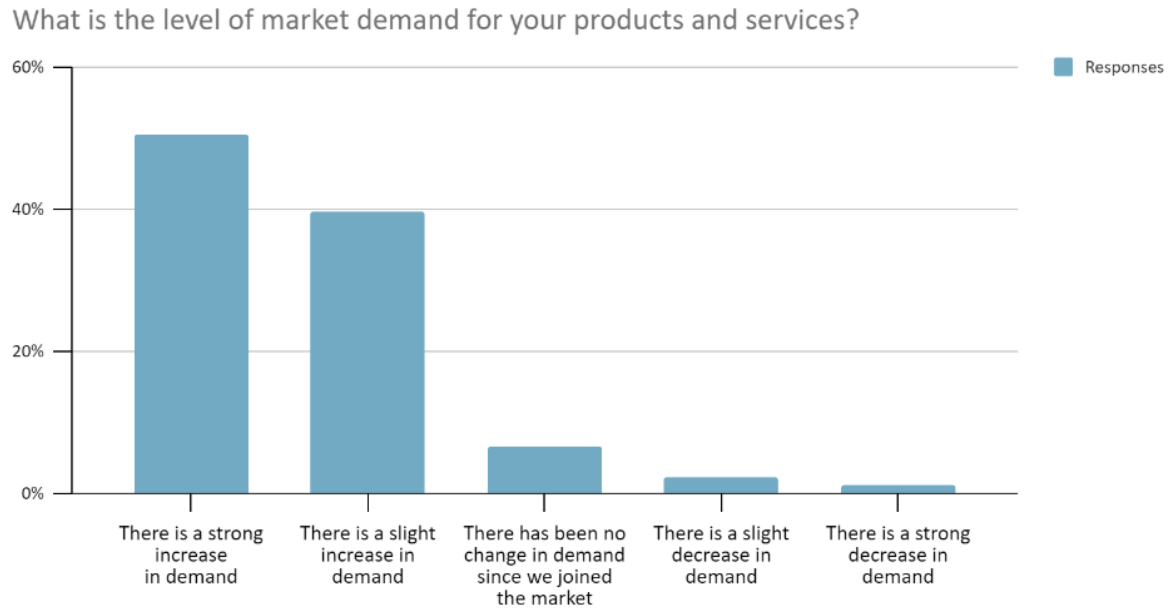


Fig.30. What is the level of market demand for your products and services ?

Optional free text comments elaborating on market demand were provided by almost half of respondents (46%). Many of these specified the types of product/services where they had observed increased demand: green roofs/walls; landscape architecture; nature-based gardens; nature-based health/wellbeing; sustainable drainage systems; treatment wetlands; river and pond restoration; and more sustainable approaches to built environment development in general. In some cases the change in demand had been dramatic:

"Green roofs were just one service that we offered since 2009, now it is the only service that we offer. We no longer engage in ground level landscapes due to demand on rooftops." (UK Partnership)

However other respondents perceived the lack of an enabling policy/legislative environment as limiting potential for growth:

"The demand for biodiverse green roofs is increasing year by year, but without proper legislation it will stay at low level." (Romanian Private Limited Company)

Policy and regulation were also mentioned as drivers of demand by several respondents - in particular demand for support with TNFD, ESG / CSRD requirements, but also in relation to specific local regulations on water consumption, air pollution etc.

"ESG / CSR focus and requirements have driven the demand for our services - both in relation to planting in Denmark and outside Denmark's borders." (Danish Charity)

"With the laws becoming more and more stringent about pollution and air quality, the market requires a solution" (South African Private Limited Company)

Other perceived drivers cited included increased interest internationally in biodiversity and climate change adaptation and mitigation; and increasing visibility of NBS, availability of an evidence base, and standards such as the IUCN Global Standard for NBS.

Several respondents also linked demand growth to negative stimuli such as experiencing drought, the covid pandemic and food security concerns.

"Malaga, where we are based, is facing severe droughts, and new legislation has been implemented in 2023 that restricts water consumption. The water restrictions were implemented in various municipalities. These measures included limitations on non-essential uses of water, such as irrigation, filling and refilling of swimming pools, and use of water for industrial and recreational purposes. our greywater recycling system has therefore increased in demand." (Spanish-based Cooperative / Private Limited Company)

For further information on Nature-based Enterprise markets and financing see Invest4Nature deliverable 'Markets, financing and incentives for NbS' which drew on other questions and respondents to the shared survey.

Types of involvement in Nature-based Solutions

As detailed in the methods, only respondents who indicated that their organisation had at least a reasonable presence in the urban sector were included, with the addition of one respondent who had ticked little/no involvement across the sector options provided, but their free-text description under 'other' indicated that their work included providing consultancy services for NBS in urban areas. This meant that of the wider sample of combined survey respondents, 73% (91 of 125 respondents) had at least a reasonable presence in the urban sector specifically, and this was the 'main sector' for 34% of the wider sample. Of the 91 respondents in the UNP+ subsample (i.e. active in urban NBS), 'Urban' was identified by 46% as their main sector, with 26% each reporting a strong or reasonable presence in this sector. Figure 31 shows that the greatest sector overlap for respondents was in the area of water management (16% selected this as their main sector, 15% reported a strong presence), with a lesser degree of overlap with forestry (10% main sector, 11% strong presence) and agriculture (11% main sector, 3% strong presence), and minimal overlap with the coastal sector (3% main sector, 4 % strong presence).

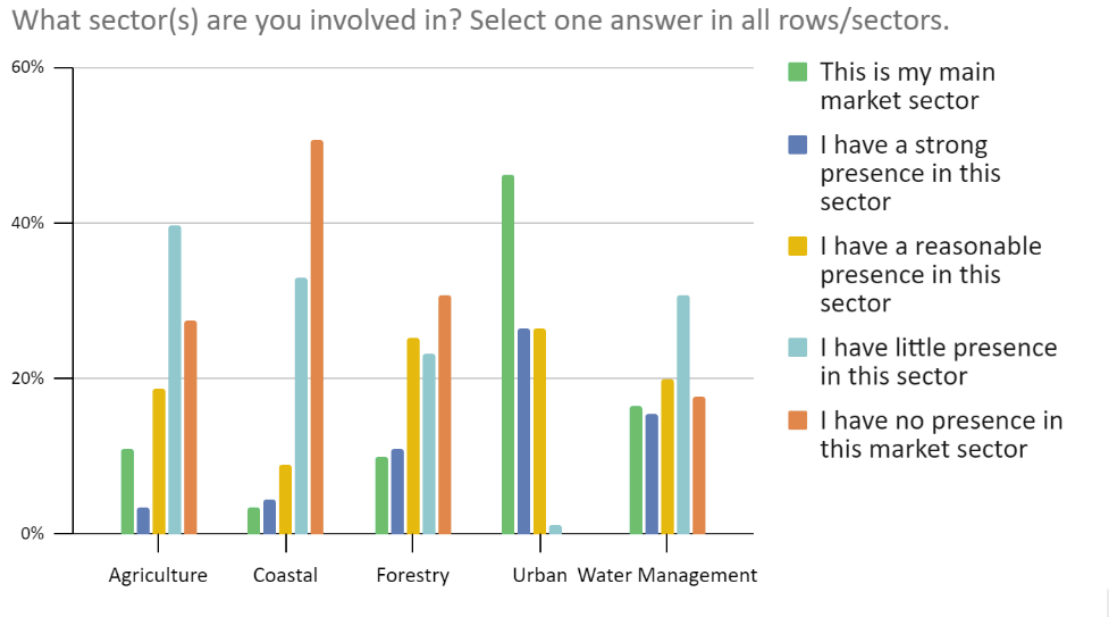


Fig.31. What sector(s) are you involved in ?

Respondents were provided with an optional free text box to provide comments about the sectors they worked in. Several respondents highlighted green roofs / green walls / green or natural infrastructure. Other types of work highlighted included addressing air pollution; health/wellbeing; planning and development sector; mapping, remote sensing, geoinformation and environmental monitoring. Comments also mentioned types of sites worked on - parks, sports fields, roads, corporate lands, and suburban.

Eighty-three respondents provided information on their involvement in different stages of NBS implementation (see Figure 32), with planning/design of NBS a significant activity for a majority of these - 47% indicated that this was their main activity, and a further 29% reported 'a lot' of involvement at this stage. There was also a high level of involvement at delivery/implementation stage (40% main, 25% a lot), with lower levels of involvement at the stewardship/maintenance stage (14% main, 29% a lot). Please note that 18 respondents gave equal weighting to their activity at different stages by selecting 'this is my main activity' for two, or all three, stages.

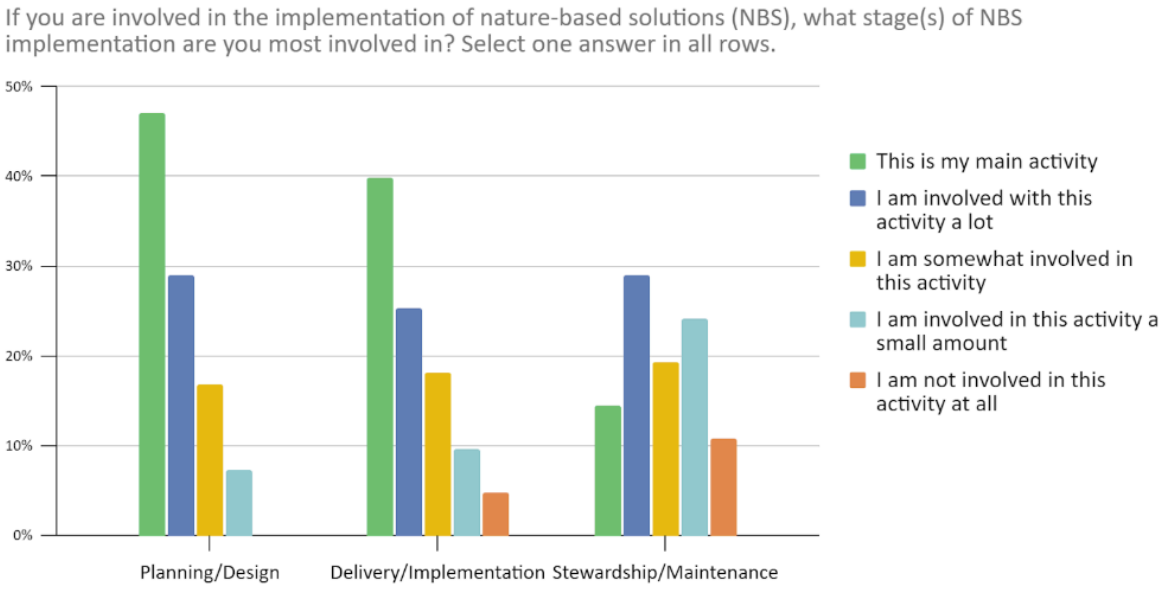


Fig.32. If you are involved in the implementation of nature-based solutions (NBS), what stage(s) of NBS implementation are you most involved in ?

Respondents also had the option of using a free-text box to provide details of other ways they categorised their NBS involvement. Respondents highlighted fundraising; training; consultancy services; research and development; and measurement/monitoring.

Of respondents (65) who answered a question on whether their organisation contributed to biodiversity net gain, 60% reported a direct contribution (e.g. regenerative farmer, tree planting organisation, wetland management), and 55% an indirect contribution (e.g. education, intermediary, impact hub, network building), while 8% were unsure (Figure 33).

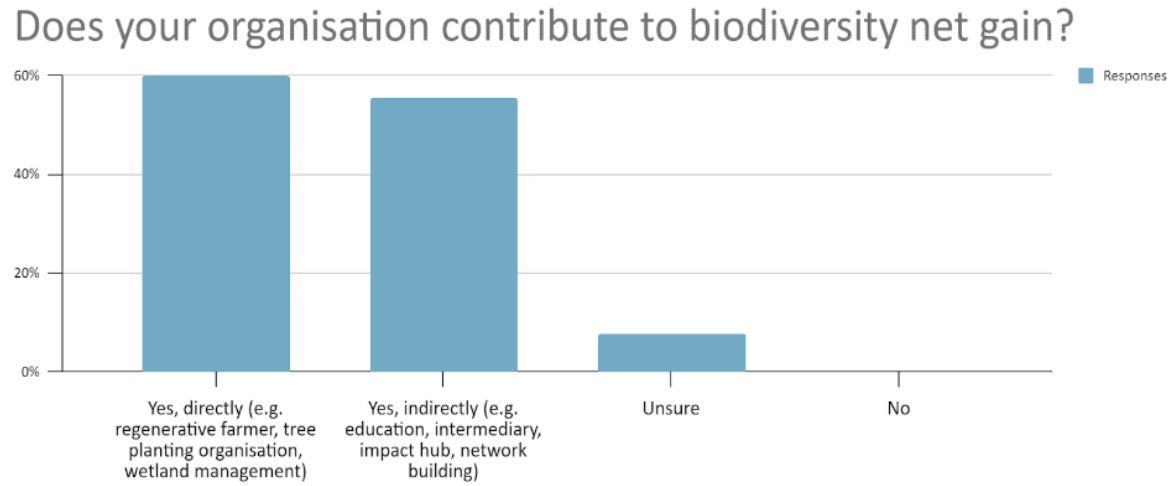


Fig.33. Does your organisation contribute to biodiversity net gain ?

3.2.2 Skills and capacity needs

Education level and NBS knowledge

Respondents were asked to indicate the average level of education of staff in their organisation (Figure 34), and to rate their knowledge in relation to NBS specifically (Figure 35). Of the seventy-nine respondents who provided an answer, 90% indicated third level degree (undergraduate) or higher (master, postgraduate, PhD). This included 11% at PhD level. Those who responded 'Other' reported that education level was too mixed to provide an average.

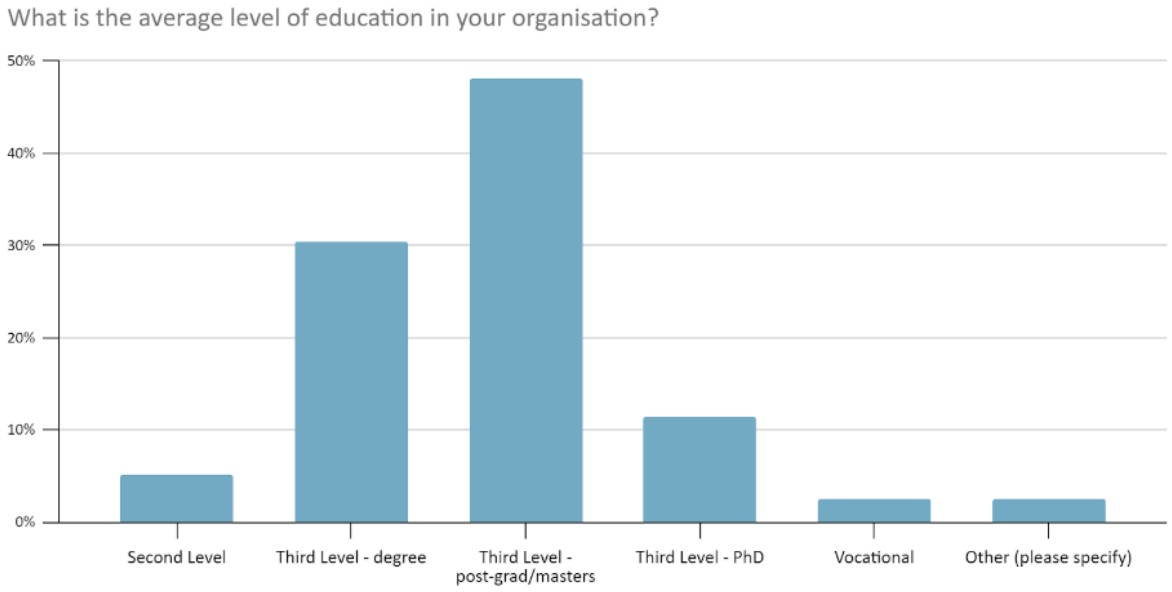


Fig.34. What is the average level of education in your organisation ?

Seventy-seven respondents provided a rating for their existing knowledge on NBS, with 53% reporting a 'high level of knowledge', and a further 34% a 'good level of knowledge'. Two respondents provided comments here, with one noting varying levels of knowledge within the team, and another noting that while they rated their level of knowledge as good, they perceived related EU standards as needing to be harmonised and made more freely available.

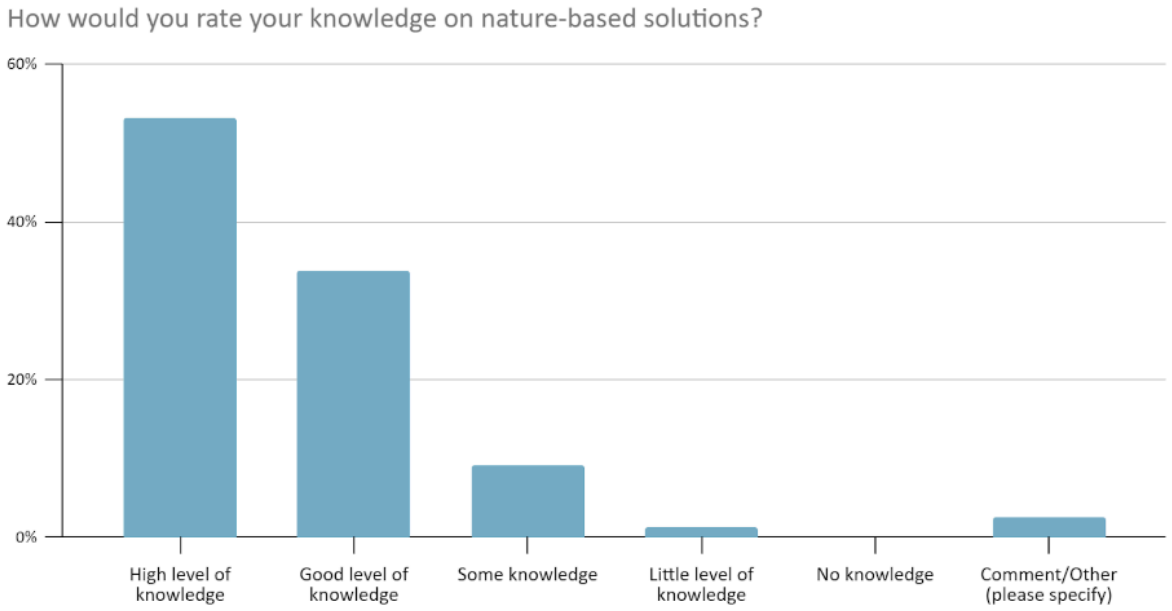


Fig.35. How would you rate your knowledge on nature-based solutions ?

Sources of knowledge

Respondents were asked how their organisation acquired different types of knowledge, with categories being Technical knowledge; Sales and marketing knowledge; Financing knowledge; and Other business functions (legal, HR, admin etc.). Respondents could choose between three different ways of acquiring this knowledge (Institutional e.g. third level accredited courses; Industry e.g. professional training/CPD, events, networking, webinars; or In-house e.g. knowledge transfer between skilled colleagues, learning-by-doing), or could indicate that it was not applicable to them. A follow up free text 'Other' question allowed respondents to describe relevant types of knowledge, or ways of acquiring knowledge, which were not captured by these options. For all types of knowledge, 'In-house' was the most common answer, followed by 'industry'. 'Institutional' was least prominent across all types of knowledge, but was still a relevant source for 32% of respondents when it came to technical knowledge (see Figure 36).

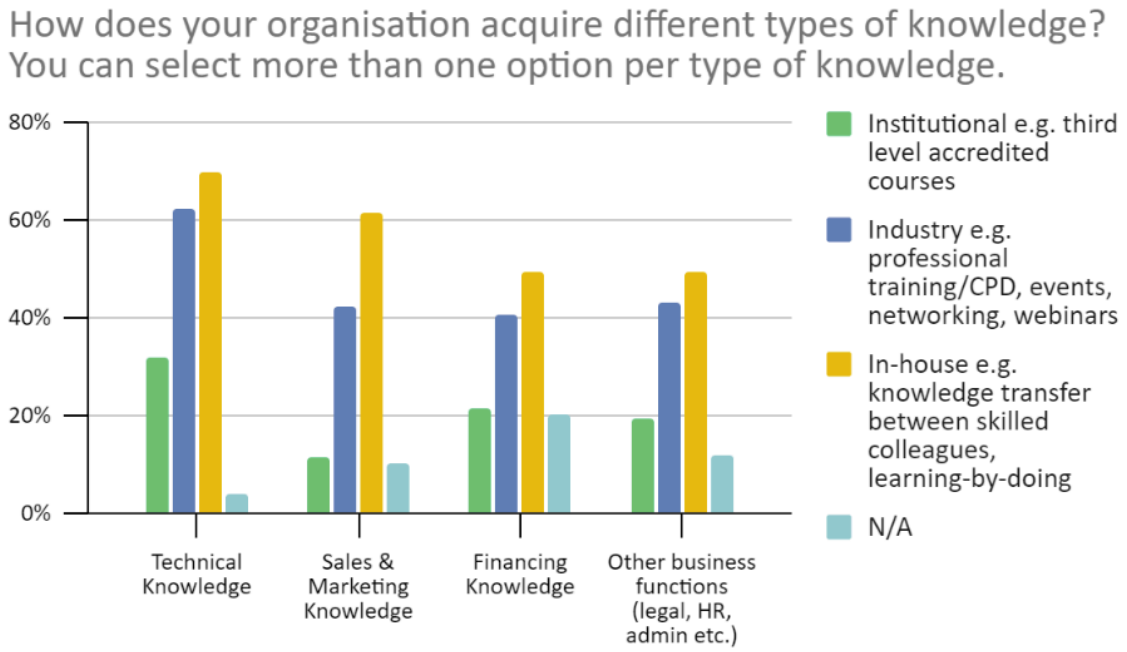


Fig.36. How does your organisation acquire different types of knowledge ?

Support needs

Respondents were asked where they would like to see more support in terms of capacity building and skills development for their organisation, with a question requiring them to rank different areas in terms of importance. This resulted in a relatively flat average rating, indicating needs across all categories: Measuring impact; Technical knowledge; Financing and business models; Communication and marketing skills; and Business and market acumen.

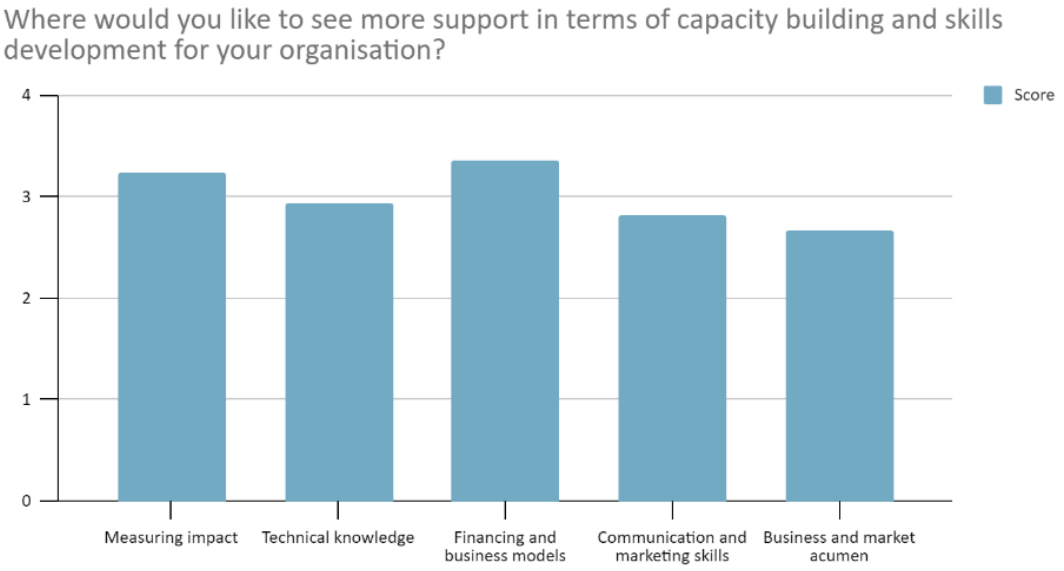


Fig.37. Where would you like to see more support in terms of capacity building and skills development for your organisation ?

Looking at top rankings for each respondent produced a more variable picture, with 'Financing and business models' ranked first by 29% of respondents, 'Measuring impact' next at 24% of respondents, followed by 'Communication and market skills' and 'Business and market acumen', both at 16%. More support on 'Technical knowledge' was ranked first by 14% of respondents.

Financing was a challenge for many of the respondents' organisations, with 39% categorising it as 'the most important challenge we face', and only 16% reporting that it was either a minor challenge or not a challenge at all. Data from a question asking respondents to rank barriers to financing within their organisation indicated that 25% of respondents saw a 'lack of knowledge on different financing options' as one of their top two internal barriers to financing, whereas 48% ranked 'Internal resources i.e lack of time or capacity within your organisation to explore financing options' in their top two barriers here. Another barrier which training/capacity building might contribute to addressing was 'Challenges measuring/monetising impact of your products/services' and was ranked in the top two internal financing barriers by 25% of respondents. See Figure 38 for all the barrier options, and their average scores.

Fig.38. Rank these barriers to financing - within your organisation.

Addressing training/capacity building needs of other stakeholders

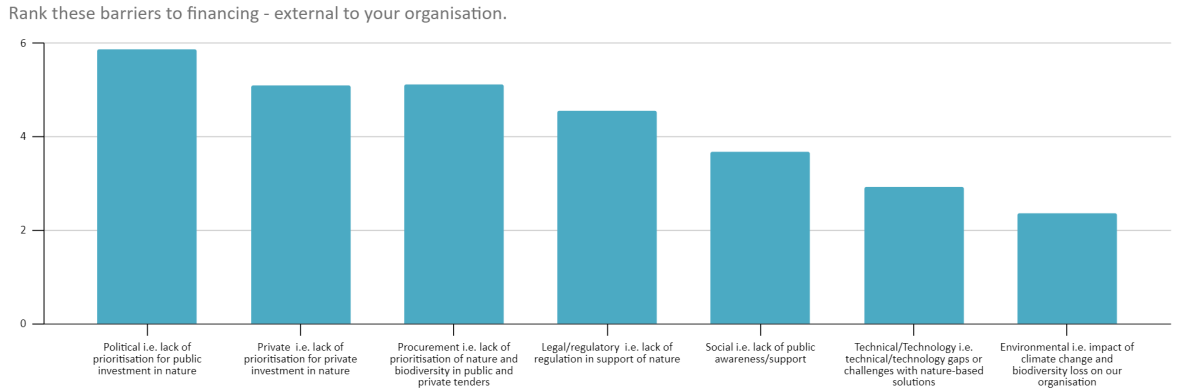


Fig. 39. Rank these barriers to financing - external to your organisation

With regards to perceived external barriers to financing (Figure 39), the two highest average scores were for 'Political i.e. lack of prioritisation for public investment in nature' and 'Procurement i.e. lack of prioritisation of nature and biodiversity in public and private tenders' - which may be relevant to training/capacity building work in relevant public sector organisations.

There were some examples in free text answers to other questions of areas where respondents perceived a knowledge gap/capacity need on the part of another group as a barrier to their own sector's work. A Slovenian respondent saw public sector-driven demand for 'grey' solutions as being due to a lack of understanding of NBS:

"In Slovenia, there is practically [no training opportunities] as practitioners have no incentive to learn NBS, since the state still requires them to implement grey solutions. The most important measure is therefore to educate and train the public sector employees, others will follow." (Slovenian Private Limited Company)

A perceived lack of NBS understanding amongst investors was presented as a challenge when seeking private sector financing:

"I have had 3 business angels but it was quite a challenge. Their lack of knowledge and understanding for the field of NBS created large challenges and forced us to have too much focus on short term revenue instead of a long term sustainable strategy and a nature positive and circular business model." (Danish Private Limited Company)

A UK respondent expressed frustration with the gap between the solutions available and the lack of knowledge on the part of key stakeholders about these solutions and their benefits. They wanted more training, but also closer collaboration between different stakeholders to share knowledge and improve the efficacy of solutions:

"Much more needs to be done and much faster, there are many solutions available but not many people in the business sector really know that much about them and why they are

beneficial. Our whole system in the UK seems to be based on planting trees and yes, this is beneficial but also very limiting. You cannot plant a tree anywhere and they only have a limited shelf life when benefiting the environment. We need many more strategies and we should be looking to train more people about the different benefits other nature-based solutions have to offer. This must include scientists and environmental specialists working closely with businesses and local authorities to help prove efficacy of these solutions. …Only through the correct implementation of education can we hope to change this stalemate of a situation and those educated should be trained better in getting the message across to those who are not educated enough." (UK Private Limited Company)

A Polish respondent whose organisation worked in the education field referred to perceived broader knowledge/education needs relating to climate change, which they saw as particularly pressing for large urban settlements:

"We see a constant need for further education of commercial entities, offices and institutions about the need for urgent actions to improve the climate, especially in large urban agglomerations that are not prepared for global climate change" (Polish Non-Profit)

Many respondents' organisations included provision of NBS-related knowledge, consultancy, and various forms of training and education in their business model, thus there may be synergies in supporting them to contribute to addressing relevant capacity building needs in local authorities for drafting and implementing effective Urban Nature Plans

4. Identifying the capacity building needs and potential

Survey 1 - Discussion

Background Information:

The majority of responses were received from Municipal Authorities with local Government Managers or Policymakers being responsible for providing the bulk of the submissions. As such, the survey reached the intended target group, and is considered relevant to provide input in developing the Capacity Building Programme in Task 5.2, despite a lower than expected level of responses. It is considered that the relatively low response rate (44 answers received) resulted from a combination of survey fatigue, the relative complexity of some of the questions, (particularly in the Specialist Data and Analysis section), and the timing of the survey which included the summer vacation months of July and August.

Familiarity with UNPs:

The results revealed that there is a general lack of detailed knowledge about UNP, though quite a large percentage of respondents had already heard about it. In many cases there are already connections between planning and implementation of urban nature programmes, however in 34% of cases that connection does not exist.

The survey revealed that there are already a very wide range of UNP related activities taking place, particularly in terms of climate change adaptation and management of greenspaces for public benefits including health and recreation. However, some activities such as NBS implementation, community engagement and synergising planning and implementation have received a lower priority.

It is also apparent that there are already quite a diverse range of capacity building tools and programmes in use, though citizen science and external funding programmes showed a lower level of uptake. The earlier steps of the UNP cycle have been better supported through capacity building programmes to date, in particular steps 1-5. From Step 7 onwards support and knowledge reduces.

Many tools and resources being utilised are unique to the local country, region or individual location. An understanding that many UNPs will adopt local approaches, methodologies and tools for capacity building is useful. Future programmes must be adaptable to locally appropriate circumstances, but most probably there is also a lack of knowledge on, and access to, existing tools by local authorities.

Capacity building work is required across all the UNP steps in the cycle. Steps 5-9 around the middle of the process however, appear to highlight the area of greatest demand for further development of tools and programming. The favoured attributes for the capacity building activities were "User friendliness" of the tools and their ability to provide convincing outputs to policymakers. Other factors were the use of non-technical language and guidelines are easily communicable.

In terms of existing access to information, there are many existing sources available. However, it is often not clear how these synergise with the overall UNP concept. In addition, 27% of respondents found it difficult to identify suitable sources of information. Capacity building initiatives might assist through collating access to sources of information and through providing guidance as to how these fit into the UNP structures as a whole.

There was also a very clear preference expressed by respondents that capacity building tools should be made available in local languages, other than in English. In terms of the training format, online training and in-person training were deemed to be of the greatest benefit by participants.

It is considered important to involve a wide range of departments in the process, however Planning, Forestry/ Greenspaces, building management/ Development Control and Grounds Maintenance are all considered to be highly significant. Corporate Departments such as Finance and the Chief Executives Departments were seen as being of lesser importance. Almost 50% could see the benefits of formal accreditation for capacity building activities, whilst 27% believed that the need for accreditation would vary according to the individual training topic.

Use of Specialist Data Tools and Analysis:

The Survey revealed that gaps exist in terms of access to data. Whilst 60% of respondents already have good or excellent access to GIS data, 40% have limited or no access. This disparity should be addressed in order to improve the roll out of UNPs.

In terms of modelling, over 70% of respondents are not currently using ecosystem services models. Of the models used, iTree was the most commonly utilised whilst some had outsourced a study. The other specific models listed in the survey questions were not largely recognised by respondents. Around 60% of respondents were surveying ecosystem services, whilst the monitoring of air pollution, temperature and flood events were undertaken by those who indicated positively. The widespread use of remote sensing to evaluate biodiversity was fairly low. Over 40% did not answer this question, perhaps indicating a general lack of familiarity.

Furthermore, the majority of respondents are not using biodiversity models, with over 60% answering negatively. Those using biodiversity modelling appear to use a range of approaches such as from species occurrence data, but with no single dominant approach.

Biodiversity was being surveyed in under half of cases, with 50% registering no activity. Surveys were mainly being undertaken through direct methods including public databases, citizen science and professional surveys. The use of remote sensing and more technical approaches to record biodiversity were in the minority. Over 70% of respondents do not make use of tools, metrics, indicators or data to assess landscape ecological connectivity to green spaces. Similarly, an equal percentage, do not employ tools, metrics, indicators or data to assess human accessibility to green spaces. The responses also revealed that 64% have not considered future resilience to climate change when implementing NBS and Green Infrastructure approaches.

Survey 2 - Discussion

The second survey was aimed at identifying knowledge and training needs with industry partners. When interpreting the results, it is important to note that the participants in this survey are already active as nature-based enterprises, or are at least interested in becoming active in the nature-based solutions sphere.

Of wider NBS industry respondents, 73% indicated that they were active in *urban* nature-based solutions, with urban the main focus for 34% of this broader population. Another 39% of the industry respondents overall identified agriculture, forest, coastal ecosystems or other nature-based solutions as their main sector, but were also active in the urban area. The urban-active respondents (the sub-sample of 91 analysed in this report) were mainly active in planning, designing, delivering or implementing nature-based solutions, stewardship and maintenance of nature-based solutions are less a focus of the respondents.

Half (53%) of these respondents indicated that they have a high level of knowledge on nature-based solutions, whereas another 34% of the sample indicated having a good knowledge. The technical knowledge required for doing the job is usually acquired in-house (through hands-on experience and on-the-job learning by doing, 66%), closely followed by professional learning and CPD (industry provided training, 62%). Institutional training (graduate or postgraduate courses for instance) is far less important (32 %). Similar distribution is observed for other types of knowledge (sales, marketing, communication, legal, administration).

The respondents indicated that they would appreciate additional training and capacity on (in decreasing order of 'most important' rankings): (1) financing and business models for nature-based solutions, (2) measuring impact of nature-based interventions, (3) communication and marketing, (4) business and market acumen (at similar priority to communication and marketing), and (5) technical knowledge.

Overall, financing was a substantial challenge for many respondents. While wider policy and market factors were important here, they also identified capacity development/training issues. Internally, these included 1) capacity to explore financing options 2) lack of knowledge on different financing options, and 3) being able to measure and monetise the impact of their nature-based products and services (e.g. what is the monetary value of a sustainable drainage system, or a rain garden).

Finally, the industry partners saw a need for training with both the public sector decision-makers (e.g. those setting procurement policy, or planning/commissioning urban development work) and private sector investors, as a way to increase the market for nature-based interventions. Private and public sector investors were seen as needing to become more aware of the benefits of green infrastructure and other types of nature-based solutions; and needed more knowledge about economics of NBS, such as different types and time scales of potential return-on-investment. Public sector bodies were an important existing or potential partner/client for many industry respondents, who were interested in increasing their joint capacity to collaborate on delivering NBS in urban areas.

5. Conclusion

Overall conclusion

This deliverable reports on two surveys on knowledge and training needs for drafting and implementing urban nature plans, one survey focussed on local authorities, and another one focussed on industry partners involved in urban nature and nature-based solutions.

Results from both surveys indicated that there was already a substantial body of knowledge and tools being used for delivering urban nature, but common and consistent knowledge and capacity were lacking (for example 68% of the local authorities participating in the survey indicate a lack of knowledge on urban nature plans).

Nature-based enterprises saw a lack of awareness on nature-based solutions and biodiversity with public and private sectors as hindering further investments and implementations; this lack of awareness was also related to the challenge of proving the impact and cost-effectiveness of nature-based solutions and urban biodiversity. This echoed the need for convincing tools directed towards policymakers as identified by the local authorities participating in the survey, and similarly the lack of tools for communication, and monitoring and reporting the impact of urban nature interventions.

For both groups, the necessary technical knowledge was mainly acquired in-house or through the industry (professional training, CPD, webinars ...). The local authorities indicated that they usually apply local tools, either developed by themselves or a regional or national agency, either through outsourcing to a consultancy. Competences and resources for mapping biodiversity (including through citizen science), and environmental variables such as air pollution, climate data, and flood data were widely available, but were not linked to urban nature, green infrastructure, or ecosystem service delivery models. Also access to urban green space and ecological connectivity is less frequently monitored, mapped or modelled.

Overall, the conclusion of the surveys was that knowledge and practical experience was available. Several local approaches and local tools have been developed, and although they have the advantage of being locally relevant, there was a lack of a common and uniform approach. Such an approach can save time and money, and contribute to a wider monitoring of the impact of investing in urban nature (including getting a better insight into the cost-effectiveness of nature-based solutions).

When developing models, tools and capacity building programmes, it is important to make them locally relevant and locally scalable, user-friendly and convincing towards policy-makers

and investors in public and private sectors (including through using non-technical language and by being available in local languages). As local authorities reported to already have support and experience to deliver steps 1 to 5 in the Urban Nature Plan process, the focus of the tool development and capacity building programme should rather be on building support for:

Step 6. Setting indicators and targets for Urban Nature Plans

Step 7. Agreeing on priorities, actions, timelines and financing

Step 8. Developing a communication, education and public awareness strategy

Step 9. Establishing a monitoring, reporting, and evaluation system

The latter includes tools for mapping and modelling biodiversity, ecosystem services, access to green space and ecological connectivity, which are also relevant for Step 5 (Analysing the current state of nature and biodiversity).

6. Annexes

6.1 UNP+ Survey 1 Questions

1. In which country is your city located ?

2. What is the name of your city and the approximate number of inhabitants ?

3. What type of organisation do you represent ?

- ○ Local Government Institution: Municipality/ City level
- ○ Local Government Institution: Departmental level
- ○ District: Department level
- ○ District: Strategic management level
- ○ Regional or Strategic Authority: e.g. Metropolitan level
- ○ Central Government Agency or Federal Institution
- ○ External consultancy / industry partner

4. What role(s) do you play in relation to urban greening ?

- ☐ Local Government Manager (Departmental level)
- ☐ Local Government Leader (Senior executive or elected leader)
- ☐ Policymaker e.g. strategic/ local planning/ sustainability etc.
- ☐ Local Government Partner Organisation Representative - e.g. NGO partner organisation
- ☐ Central/ State Government Partner Representative - Senior official or representative from a state, province, regional government or federal institution
- ☐ Representative of an external consultancy/ industry partner
- ☐ Other (please provide details in the box below)

For "other" please provide details here:

We'd like to know about your familiarity and experience with Urban Nature Plans:

5. What is your existing level of knowledge of Urban Nature Plans (UNPs) ?

- ○ This is the first time I have heard the terms
- ○ I have previously heard the term or read it somewhere
- ○ I have previously read the UNP guidance
- ○ My organisation is already actively involved in projects related to UNPs
- ○ My organisation has already completed an UNP

6. Has your organisation already made clear links between the planning and implementation aspects of urban nature planning, both within your organisation and with external partners ?

- ○ There are few or no linkages between these service delivery activities
- ○ The responsibilities are clearly demarcated, but there is dialogue between the service delivery activities
- ○ There is a formalised communication structure and strategy between responsible authorities for UNPs
- ○ A more comprehensive partnership of diverse stakeholders is established with clearly defined objectives and goals
- ○ Planning and implementation are done by the same department

7. Which urban nature related activities have already received a high priority in your city/ region ?

- ☐ Integrated planning of multifunctional Green Infrastructure
- ☐ Creating and managing greenspaces for recreation, health and education
- ☐ Mapping and enhancing Biodiversity
- ☐ Nature-based Solutions (NBS) implementation
- ☐ Climate change adaptation measures
- ☐ Climate change mitigation measures
- ☐ Community engagement and stakeholder participation
- ☐ Synergising urban nature planning and implementation activities

8. Which urban nature related activities have so far received lower priority in your city/ region ?

- ☐ Integrated planning of multifunctional Green Infrastructure
- ☐ Creating and managing greenspaces for recreation, health and education
- ☐ Mapping and enhancing Biodiversity
- ☐ Nature-based Solutions (NBS) implementation
- ☐ Climate change adaptation measures
- ☐ Climate change mitigation measures
- ☐ Community engagement and stakeholder participation
- ☐ Synergising urban nature planning and implementation activities

We'd like to learn about existing capacity and your experience with capacity building tools and training programmes:

9. What existing capacity building tools and programmes do you use related to the development and enhancement of nature in the urban environment ?

- ☐ Green Infrastructure mapping tools and spatial data analysis e.g. Integrated habitat mapping, greenspace mapping, i-tree etc.
- ☐ Implementation guidelines, toolkits and check lists (e.g. biodiversity enhancement/Green Infrastructure/urban forestry etc.)
- ☐ Mentoring/ capacity building services for staff and external stakeholders
- ☐ Community engagement approaches/ co-design workshops
- ☐ Citizen science approaches and training
- ☐ Webinars and online courses from external providers
- ☐ NBS design and implementation approaches
- ☐ Funding advice for urban greening initiatives; including external funding

10. Think about the 10 steps of the UNP cycle. Which of the 10 steps have you been supported in through capacity building tools or programmes ?

- ☐ Step 1 - Secure a long-term political commitment
- ☐ Step 2 - Establish a working structure
- ☐ Step 3 - Establish a co-creation process
- ☐ Step 4 - Develop a long-term vision and goals
- ☐ Step 5 - Analyse the current state of nature and biodiversity
- ☐ Step 6 - Set indicators and targets
- ☐ Step 7 - Agree on priorities, actions, timelines and financing
- ☐ Step 8 - Develop a communication, education and awareness raising strategy
- ☐ Step 9 - Establish a monitoring, reporting and evaluation system
- ☐ Step 10 - Adopt, publish and implement plan

11. For each of the steps you selected, what tools or programmes did you use that you found to be useful ?

	Tool/ Resource Example 1.	Tool/ Resource Example 2.	Tool/ Resource Example 3.	Tool/ Resource Example 4.	Tool/ Resource Example 5.
Step 1. Secure a long-term political commitment					
Step 2. Establish a working structure					
Step 3. Establish a co-creation process					
Step 4. Develop a long-term vision and goals					
Step 5. Analyse the current state of nature and biodiversity					
Step 6. Set indicators and targets					
Step 7. Agree on priorities, actions, timelines and financing					
Step 8. Develop a communication, education and awareness raising strategy					
Step 9. Establish a monitoring, reporting and evaluation system					
Step 10. Adopt, publish and implement plan					

12. For which steps should the UNP+ project develop specific tools and programming for ?

- [ ] Step 1 - Secure a long-term political commitment
- [ ] Step 2 - Establish a working structure
- [ ] Step 3 - Establish a co-creation process
- [ ] Step 4 - Develop a long-term vision and goals
- [ ] Step 5 - Analyse the current state of nature and biodiversity
- [ ] Step 6 - Set indicators and targets
- [ ] Step 7 - Agree on priorities, actions, timelines and financing
- [ ] Step 8 - Develop a communication, education and awareness raising strategy
- [ ] Step 9 - Establish a monitoring, reporting and evaluation system
- [ ] Step 10 - Adopt, publish and implement plan

13. What makes the capacity building tools and programmes you use successful? - rank in order of importance

Use drag&drop or the up/down buttons to change the order or accept the initial order.

- The tools are user-friendly
- Tools can provide convincing outputs for policymakers
- Language is understandable and non-technical
- Guidelines are easily understood and communicable
- Key points are presented clearly and concisely
- Information is presented by independent and enthusiastic experts
- Learning is a stimulating and fun experience
- Professional development/accreditation is available
- The tools are complimentary and build upon one another
- The tools acknowledge existing complimentary resources/initiatives. They do not reinvent or duplicate.
- Tools are available in my own language and tailored to local circumstances
- Reference to (best/good) practice examples (eg. maps or figures from other cities) are provided
- Guidelines are illustrated graphically

Any other factors - please specify

14. Is there adequate information available to support you with developing and implementing a UNP ?

- ◯ Yes, there is plenty of quality information out there already
- ◯ There are many useful sources of information available, but it is not clear how these are complimentary, or synergise with the overall UGP/UNP concept
- ◯ There are a few useful tools/ resources available but large gaps in the material
- ◯ It is difficult to identify suitable resources of sources of information

15. In addition to English, is it important to have capacity building tools available in your own language ?

- ○ Yes
- ○ No

16. What training formats do you most prefer based upon previous experience ? (rank in order of importance)

Use drag&drop or the up/down buttons to change the order or accept the initial order.

- Online
- In person
- Hybrid
- Textbook based (self study)
- Video and graphics e.g. online courses
- Mixture of the above formats

17. Which departments/sections of your organisation do you think would derive the greatest benefits from training (rank in order of importance)

Use drag&drop or the up/down buttons to change the order or accept the initial order.

- Building Management/ Development control
- Grounds Maintenance Department / Works Inspection
- Property and Housing Department
- Highways Department
- Forestry / Greenspaces Department
- Education Department
- City Planning and Strategic Development
- Community Development / Social Services
- Environmental Protection Agency
- Financial / Procurement / EU Funding
- Chief Executive/ Corporate Services

Other Departments (please name)

18. Which forms of accreditation would be beneficial ?

- ☐ Formal accreditation of trained persons
- ☐ Simple self assessment
- ☐ No accreditation is required
- ☐ Variable according to training topic

We would like to understand what specialist data you have access to (e.g. biodiversity, spatial mapping, ecosystem services) and how you collect and analyse such data:

19. To what extent do you have existing in-house access to high quality mapping/ Geographical Information Systems (GIS) baseline data of the local Green Infrastructure and greenspace networks?

- ○ No existing access
- ○ Some limited access
- ○ Good access
- ○ Excellent GIS resources and capabilities

20. Are you using ecosystem service models ?

- ○ Yes
- ○ No

If "yes" which of the following is your organisation using:

- ☐ iTree (e.g. carbon storage, cooling)
- ☐ inVEST (cooling and storm water retention ecosystem service models)
- ☐ ENVI-met (urban cooling ecosystem service models)
- ☐ Mike+ (urban storm water flooding model for green and blue ecosystem services stormwater management)
- ☐ SWIM (as Mike+, above)
- ☐ We have outsourced a study (if possible add link to report, or mail report below)
- ☐ Other - please add details in the text box below

Please add information about any other models used here:

21. Are you surveying ecosystem services ?

- ○ Yes
- ○ No

If "yes" which of the following is being undertaken ?

- ☐ Monitoring of air pollution
- ☐ Monitoring of temperatures
- ☐ Monitoring self reported flooding events
- ☐ We have outsourced a study (if possible, add link to a report in the box below)
- ☐ Remote sensing-based approaches to evaluate biodiversity
- ☐ Other - please add details in the text box below

Please add additional information here (other survey approaches/ links):

22. Are you using biodiversity models ?

- ○ Yes
- ○ No

If "yes" which of the following is your organisation using ?

- ☐ Modelling from species occurrence data
- ☐ Combining biodiversity sample data with landcover data and other environmental data
- ☐ Assessing biodiversity potential using habitat quality / complexity models
- ☐ We have outsourced a study (if possible add link to a report in the box below)
- ☐ Other - please add details in the box below

Please add information about any other models used here:

23. Are you surveying biodiversity ?

- ○ Yes
- ○ No

If "yes", which of the following is being undertaken ?

- ☐ Using direct survey methods (e.g. public biodiversity databases, citizen science outputs or professional surveys)
- ☐ Remote sensing based approaches to evaluate biodiversity (e.g. interpretation of satellite imagery)
- ☐ Other high throughput methods (e.g. eDNA, bioacoustic monitoring)
- ☐ We have outsourced a study (if possible add a link to a report in the box below)
- ☐ Other - please add details in the text box below

Please add information about any other models used here:

24. Do you employ tools, metrics, indicators or data to assess landscape ecological connectivity to green spaces ?

- ○ Yes
- ○ No

If "Yes", please provide details of the types of tools, metrics, indicators or data that you have used.

25. Do you employ tools, metrics, indicators or data to assess human accessibility to green spaces ?

- ○ Yes
- ○ No

If "Yes", please provide details of the types of tools, metrics, indicators or data that you have used.

26. Do you consider future resilience to climate change when planning/ implementing NbS (Nature based Solutions) and GI (Green Infrastructure) approaches ?

- ○ Yes
- ○ No

6.2 UNP+ Survey 2 questions used

Questions marked with an asterisk * were required, other questions were optional.

1. Name of organisation*

2. Organisation's website or social media page

4. In what country was your organisation established?* Please select from drop down menu [Drop down menu included all EU countries, UK, plus an 'Other' option which allowed free-text entry]

5. What is the legal form of your enterprise?* Select all that apply.

	Sole trader
	Partnership
	Charity
	Social Enterprise
	Cooperative
	Non-Profit
	Private Limited Company
	Public Limited Company

Other (please specify):

7. How many employees does your organisation currently employ* (full-time equivalent)

	0-9
	10-49
	50-249
	> 250

8. What was the turnover of your organisation in the last available accounting year?*

	≤ €2 million
	Between €2 - €10 million
	Between €10 - €50 million
	€50 million

12. Does your organisation contribute to biodiversity net gain?*

	Yes, directly (e.g. regenerative farmer, tree planting organisation, wetland management)
	Yes, indirectly (e.g. education, intermediary, impact hub, network building)
	Unsure
	No

13. What sector(s) are you involved in?* Select one answer in all rows/sectors

	This is my **main** market sector	I have a **strong presence** in this sector	I have a **reasonable presence** in this sector	I have **little presence** in this sector	I have **no presence** in this market sector
Agriculture					
Coastal					
Forestry					
Urban					
Water management					

Other (please specify):

14. What is the level of market demand for your products and services?*

	There is a **strong increase** in demand
	There is a **slight increase** in demand
	There has been **no change** in demand since we joined the market
	There is a **slight decrease** in demand
	There is a **strong decrease** in demand

15. Please briefly elaborate on any change in market demand for your products and/or services, since you joined the market (optional):

16. Where do you deliver most of your products and/or services?* Pick all that apply

	Locally
	Regionally
	Nationally
	Internationally
	All of the above

Other (please specify):

17. If you are involved in the implementation of nature-based solutions (NBS) what stage(s) are you most involved in?* Select one answer in all rows. If you are not involved in NBS implementation, select "not involved" for all three.

	This is my **main activity**	I am **involved** with this activity **a lot**	I am **somewhat involved** in this activity	I am **involved** in this activity **a small amount**	I am **not involved** in this activity at all
Planning / Design					

Delivery / Implementation					
Stewardship / Maintenance					

Other (please specify):

19. Please indicate the most important sources of funding for your organisation at different stages of development.* More than one source of funding can be selected at any stage.

	Personal: personal savings, family/friends loans, bootstrapping etc	**Public:** grants (local, regional, national, EU), accelerator programs etc.	**Institutional:** banks loans, other organisational loans, microfinancing, etc.	**Private:** business angels, investors, etc.	**Profit:** revenue generated from products / services
Start-up					
Current					
Future plans					

Other (please specify):

20. Please briefly elaborate on the specific types of financing you have used at different stages of development (optional):

21. If you do not use private sector funding, please tell us why (optional):

22. How much of a challenge is financing for your organisation?*

	The **most important** challenge we face
	A **moderately important** challenge

	Somewhere in the middle
	A **minor challenge** compared with other challenges
	Not a challenge at all

23. Rank these barriers to financing – *within your organisation.* 1 = the biggest barrier, N/A = not a barrier to finance.

Rank	Barrier	N/A
	Knowledge i.e. lack of knowledge on different financing options	
	Internal resources i.e lack of time or capacity within your organisation to explore financing options	
	Support measures i.e. existing public sector grants/supports aren't suitable for you (and how you are set-up)	
	Investor alignment i.e. disparity between our needs and private investors needs (return on investment etc.)	
	Lack of interest in finding finance within your organisation	
	Challenges measuring/monetising impact of your products/services	

24. Rank these barriers to financing – *external to your organisation.* 1 = the biggest barrier, N/A = not a barrier to finance.

Rank	Barrier	N/A
	Political i.e. lack of prioritisation for public investment in nature	
	Private i.e. lack of prioritisation for private investment in nature	
	Procurement i.e. lack of prioritisation of nature and biodiversity in public and private tenders	
	Legal/regulatory i.e. lack of regulation in support of nature	
	Social i.e. lack of public awareness/support	

	Technical/Technology i.e. technical/technology gaps or challenges with nature-based solutions	
	Environmental i.e. impact of climate change and biodiversity loss on our organisation	

25. Feel free to add any comments regarding barriers to financing (optional):

26. Please briefly describe your business model (optional):

27. Through what networks do you keep informed about current and emerging trends in your sector(s)?* 1= the most important, N/A for networks you don't use at all.

Rank		**N/A**
	Political/Policy e.g. EU/national/regional/local	
	Academic e.g. research publications;	
	Industry/Professional networks e.g. conferences; webinars; client feedback	
	Community e.g. observing and socialising in your networks i.e. conferences and events; webinars	
	Individual initiative e.g. newsletters; subscriptions	

28. How does your organisation acquire different types of knowledge?* You can select more than one option per type of knowledge.

	Institutional e.g. third level accredited courses	**Industry** e.g. professional training/CPD, events, networking, webinars	**In-house** e.g. knowledge transfer between skilled colleagues, learning-by-doing	**N/A**
Technical Knowledge				

Sales & Marketing knowledge				
Financing knowledge				
Other business functions (legal, HR, admin etc.)				

Other (please specify):

29. Where would you like to see more support in terms of capacity building and skills development for your organisation?* 1 = most important, 5 = least important

Rank	
	Measuring impact
	Technical knowledge
	Financing and business models
	Communication and marketing skills
	Business and market acumen

30. What is the average level of education in your organisation?*

	Second level
	Third level – degree
	Third level – post-grad/masters
	Third level – PhD
	Vocational

Other (please specify):

31. How would you rate the current level of training and education on nature-based solutions for practitioners?* [star rating answer format, from 1-10]

Anything you would like to highlight?:

32. How would you rate your knowledge on nature-based solutions?*

	High level of knowledge
	Good level of knowledge
	Some knowledge
	Little level of knowledge
	No knowledge

Comment/Other (please specify):

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