



Analysing governance, institutional and economic frameworks for Urban Forests as Nature-Based Solutions (M1.6)

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EXECUTIVE SUMMARY

This document (M1.6) describes the methodology for analysing governance, institutional and economic frameworks for Urban Forests as Nature-Based Solutions (UF-NBS) in European and Chinese cities. It is focused on multi-level and networked governance dynamics in relation to urban development and contextual differences concerning UF-NBS between countries, cities and regions in China and Europe. The analysis will result in a report on governance, institutional and economic frameworks in respect of UF-NBS in China and Europe that summarises key findings and provides an overview of comparative perspectives (Deliverable [D]1.4).

KEYWORDS

Governance, Institutional and economic frameworks, Nature-based solutions, Case histories, UF-NBS, China, Europe

ABBREVIATIONS

UF-NBS: urban forests as nature-based solutions

NBS: nature-based solutions

KEY DEFINITIONS

Urban forests: tree-based urban ecosystems that address societal challenges, simultaneously providing ecosystem services for human well-being and biodiversity benefits. Urban forests include peri-urban and urban forests, forested parks, small woods in urban areas, and trees in public and private spaces.

Urban forestry: the practice of planning and managing urban forests to ensure their health, longevity and ability to provide ecosystem services now and in the future.

Nature-based solutions (NBS): Nature-based solutions (NBS) are defined as “*actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits*” (IUCN, n.d.).

Urban tree(s): usually long-living woody organism(s) including woody shrubs, frequently single stemmed, with the potential to grow at a site in an urban or peri-urban area. Examples include roadside trees, trees in squares or in parking areas, in parks and private gardens. Urban trees appear as individual trees or as groups of trees.



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VERSION HISTORY

Version	Date	Author	Partner	Description
1.0	26/03/2020	Clive Davies	EFI	First complete written draft for comment and feedback by work package 1 (WP1) partners.
2.0	06/04/2020	Clive Davies	EFI	First revised draft with amends from WP1 partners.
Final draft	24/04/2020	Clive Davies	EFI	Revised draft with amends from WP1 partners.
Final	28/04/2020	Clive Davies	EFI	Final.

REFERENCE

Davies, C., Laforteza, R., DeBellis, Y., Jin, J., Haase, D., Kronenberg, J., Roitsch, D., De Vreese, R., Krajter-Ostoić, S. (2020) *Analysing governance, institutional and economic frameworks for Urban Forests as Nature-Based Solutions (M1.6)*. H2020 project CLEARING HOUSE, agreement no. 821242.

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1 Governance, institutional and economic frameworks for UF-NBS

1.1 Introduction and objective

It is believed that governance, institutional and economic frameworks are decisive in the design, implementation and impacts of UF-NBS. To test this an overall **objective** for D1.4 in CLEARING HOUSE has been developed: *An analysis of governance, institutional and economic frameworks in relation to UF-NBS through study and information ingathering at different levels (including European, national, regional, metropolitan and city).* It is intended that the analysis feed into other CLEARING HOUSE work packages, notably task 1.5 (see Figure 1).

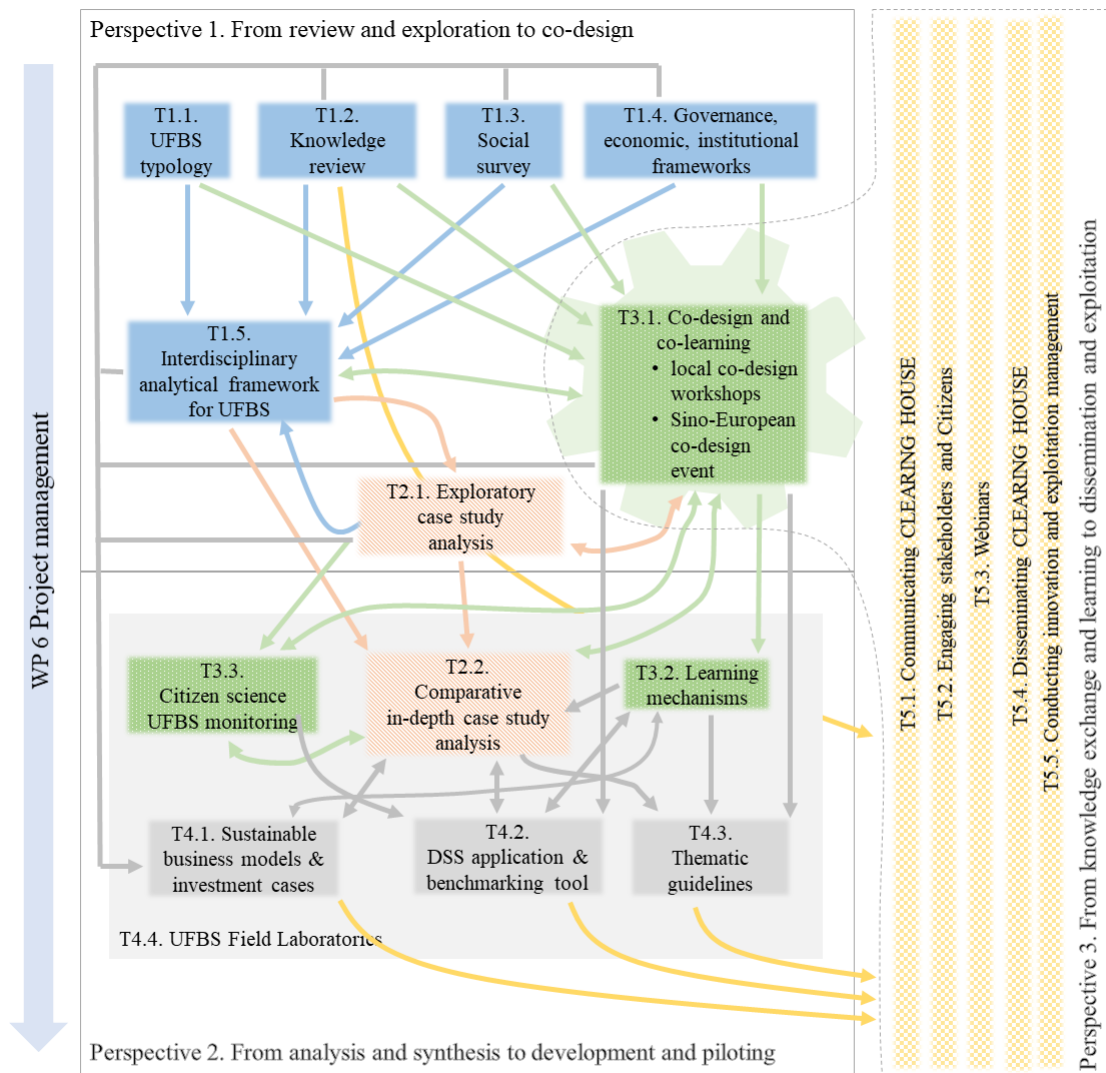


Figure 1: Diagram showing how the tasks in WP1 of CLEARING HOUSE feed into Task 1.5. Milestone 1.6 (this document) is part of Task 1.4 shown above. Note that UFBS shown in figure 1 is now referred to as UF-NBS.

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1.2 Definitions for CLEARING HOUSE WP1.4

The key concepts addressed in this work package are *Governance, Institutional and Economic frameworks in relation to UF-NBS*. In the context of UF-NBS and the CLEARING HOUSE project they are considered to be intertwined concepts (Figure 2).

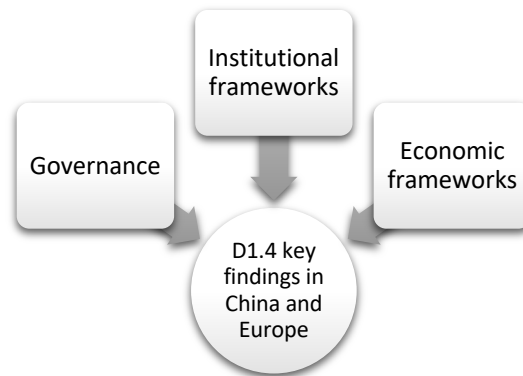


Figure 2: The three frameworks are the focus of investigation in T1.4. Analysis is focused on their role in the design, implementation and impacts of UF-NBS.

1.2.1 Governance

Governance can be broadly defined as “any effort to coordinate human action towards goals” (Rayner et al., 2012). Oftentimes, governance is defined based on the role of the state in the governance arrangement. In that sense governance is a continuum from ‘governance by government’ (also known as old or hierarchical governance), to ‘governance with government’ (co-governance, network governance) to ‘governance without government’ (self-governance) (Kleinschmit et al., 2009; Kooiman, 2003). With their multiple benefits urban forests contribute to meeting multiple policy goals. Urban forest governance is multi-actor, multi-sector and multilevel in respect of governance (e.g. Lawrence et al., 2013) and may involve both governmental and non-governmental actors. In the context of NBS governance is not limited to how ‘humans are governed’ but considers how ‘nature is governed’ either through natural biotic processes or abiotic human designed and operated systems. With regards to UF-NBS and Sino-European comparison, WP1 is also interested in innovative forms of governance such as ‘mosaic governance’. Mosaic governance aims for a context-sensitive way of urban green infrastructure planning, enhancing relationships between the diversity of landscapes and communities across cities (Buijs et al., 2017).

1.2.2 Institutional frameworks

Institutional frameworks are the formal and informal rules of a governance system that shape human choices, behaviours and interactions (Biernacka & Kronenberg, 2018). They specifically involve organisations (governance actors), laws, regulations and social norms. Hence, the institutional frameworks for urban forests describe the governance actors (e.g. local authorities, national and regional agencies, special purpose organisations, etc.), laws and regulations (e.g. tree preservation orders and tree felling licences, et al.) and social norms (i.e. the unwritten rules that govern how we behave towards the urban forest such as respect for new tree planting and volunteering to be active in tree care in the local neighbourhood, etc).

1.2.3 Economic frameworks

Economic frameworks refer to the different economic aspects related to the functioning of UF-NBS. These primarily concern funding mechanisms and sources, economic benefits and costs including



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broad economic issues such as local branding and related business opportunities and economic models. Among other things we wish to investigate how UF-NBS has been integrated into real economies (adapted from GREEN SURGE D4.1; Andersson et al., 2015).

1.3 Approach to the development of the methodology

To enable co-development of the methodology two online web meetings were held to determine a broad approach. This was then supplemented by individual contributions and dialogue within and between European and Chinese partners. Through this process of co-development, it was identified that there were benefits in approaching the methodology jointly with CLEARING HOUSE Task 1.2; *reviewing the knowledge on the importance of UF-NBS for resilient cities*. It was determined that this would allow for some resource efficiency and for the governance, institutional and economic frameworks of UF-NBS to be seen in a wider context. To facilitate this a joint meeting was held on the 6th and 7th of February 2020 in Bari, Italy between Task 1.4, co-leader EFI, and Task 1.2, leader UNIBA, to agree on a common approach. The results of the meeting were then shared and discussed with CAF-RIF, the Chinese lead for Task 1.4.

A key outcome of the meeting was to work towards a methodology that could work in both Europe and China whilst being flexible enough to address ‘cultural’ and ‘information availability’ differences. Nevertheless, it was determined that the framework should, as a priority, first meet the demands of CLEARING HOUSE as too much attention to cultural and information availability differences could hamper evaluation of the performance of UF-NBS. It was concluded that it may be necessary in some instances to accept that an evaluation is not possible given lack of data. This debate helped to clarify a conceptual point which is that CLEARING HOUSE can undertake analysis on two spatial transects, firstly within Europe and China and secondly between Europe and China. Hence, if cultural or data sets prove too restricting for an analysis between Europe and China, then analysis within Europe and China should still be achievable with the resources available.

Following the meeting on the 6th and 7th of February 2020, an information gathering template was created by EFI and UNIBA to satisfy the combined needs of Task 1.2 and Task 1.4. The template is common to both tasks (WP1.2 and WP1.4). It was tested on two well-known European and Chinese examples of UF-NBS (see Appendices 1 and 2). In support of the role out of the template, a glossary of terms was also created (Appendix 3) to support the preparation of these. To check the information received through the template, including hearing critical opinions, and to clarify uncertainties a questionnaire and follow-up interview will be conducted with the lead delivery person for each case history.

Lastly, an additional benefit of the joint approach in WP1 is that it has reunited researchers who had previously been involved in the GREEN SURGE FP7 project, the findings of which had been analysed in terms of urban green space governance (Buijs et al., 2015; Davies et al., 2015). Hence, the potential exists to extend the work of this previous project beyond Urban Green Infrastructure and to UF-NBS.

1.4 Information needs and sourcing

As described above, an information gathering template was created to satisfy the combined needs of Task 1.2 and Task 1.4. To distinguish between CLEARING HOUSE T2.1, which is undertaking an exploratory analysis of 10 cases (five in Europe and five in China), the decision was made to focus Tasks 1.2 and 1.4 on ‘projects’ within the context of governance, institutional and economic frameworks and to use these to understand the frameworks above them. Furthermore, and as far as possible, the case histories should NOT be located in the case study cities being addressed in Task 2.1. The benefit of this



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distinction is twofold – first to extend the scope of investigation and secondly to avoid duplication of effort.

It should be noted that the completed templates are referred to as ‘Case Histories’ and explicitly include path dependencies. The choice of terminology was made not only to distinguish between these and the case studies (Task 2.1) but also because they are historical and/or current examples of where an UF-NBS has been or is still in use.

The case histories do not simply record Urban Forestry projects but also those where evidence of an UF-NBS approach has been used in part or in whole. To achieve this an UF-NBS information table (section 11 of the template) was constructed based on 17 ‘sections’. Senior researchers determined these to be the key issues needed to understand how, when, and why UF-NBS were being used in a given project and provide a level playing field for more detailed investigation. The sections were drawn from the CLEARING HOUSE design of works (CLEARING HOUSE DoW, 2018), CLEARING HOUSE Milestone 1.1 [typology as amended] and the GREEN SURGE FP7 Project (Pauleit et al., 2019a, 2019b).

The case histories template encompasses guiding questions, whereby information on the following key items will be collected:

- Title of case history area
- Introduction (maximum 300 words)
- Key facts and figures of the case history area
- Location map(s)
- Name of municipality and website address
- Lead organisations
- Local contact(s)
- Principle UF-NBS action(s)
- Other principle NBS action(s) – non-UF
- Local stakeholders/description
- UF-NBS framework compliance
- Lessons and transferability (maximum 100 words)
- References (Harvard style)

The intention is to ingather between 10 and 20 completed case histories using the CLEARING HOUSE project partners in Europe and China as data collectors along with wider network members, such as the EFUF (European Forum on Urban Forestry) and the Asia-Pacific Urban Forestry Meeting as additional contributors. Each contributor will primarily focus on prominent examples in their mother tongue, but then provide the case history in English.

The reference document will be for use within CLEARING HOUSE but also made available as a resource for researchers. The structure of the case history template should also facilitate the integration of collected data into the OPPLA database (<http://www.oppla.eu>). This has already been agreed with OPPLA. In a wider perspective, the template can be converted into a web-based form if deemed beneficial.

For the multi-layered investigation, the speed interviews are designed to maximise the opportunity to capture instances of innovative approaches to UF-NBS from the perspectives of governance, institutional and economic frameworks and especially to gather deeper insights on UF-NBS ‘plan and



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policy nesting’ at different administrative tiers. It should be noted that an UF-NBS might be the result of a local initiative with no policy support and this is an important finding if so. Most projects sit within a wider multi-layered system that depends on the country and may include the (i) city/town, (ii) metropolitan region/region, (iii) national and (iv) international contexts. This can be illustrated by Appendix A where the well-known Parco Nord Milano sits within seven municipalities, the Metropolitan City of Milan, the region of Lombardy, the country of Italy and a Member State of the European Union.

The gathered information will be quality assured by the leads and co-leads of Task 1.2 and Task 1.4 along with invited experts from the wider CLEARING HOUSE partners.

2 Governance, institutional and economic frameworks investigation

2.1 Approach

The investigation of the governance, institutional and economic frameworks will be undertaken by a core group of WP1 project partners coordinated by EFI and CAF-RIF. It will serve as grounded knowledge for subsequent detailed comparative case study analysis and UF-NBS scenario and benchmarking development relevant in Europe and China. The investigation report (D1.4) will be used as a guide for a workshop at the annual EFUF in May 2021 (this event attracts numerous Chinese contributors).

2.2 Research questions

For Task 1.4 the following research questions underpin the investigation. Hence, **in relation to governance, institutional and economic frameworks:**

1. Which institutions, actors, resources, ‘rules of the game’ and discourses are involved in UF-NBS, how are they characterised and how are these institutions inter-related, if at all?
2. What governance arrangements are in place that impact on the potential or actual delivery of UF-NBS at the project level and multi-tiered levels above the project?
3. What positive and negative economic effects do institutions determine as arising from the delivery of UF-NBS?
4. In respect of governance, analysis and economic, what elements of UF-NBS can be considered as novel or innovative?

2.3 Framework development

The investigation is to be undertaken through a staged approach (Figure 3).

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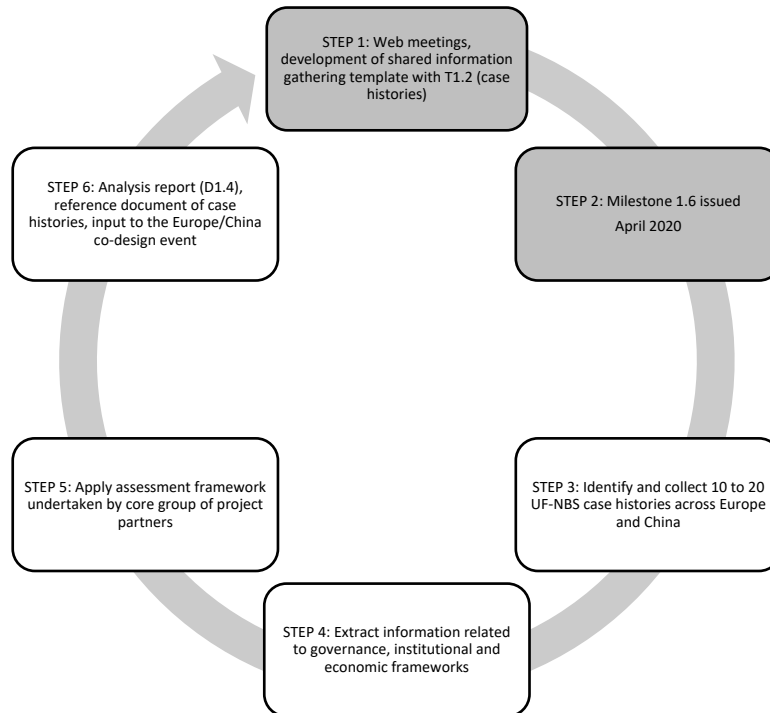


Figure 3: Flowchart of the methodology for the development of D1.4.

2.3.1 STEP 1

The first step was completed in project month five (see Figure 3 above)

2.3.2 STEP 2

Some delays were experienced on the original timescale (*Milestone 1.6 was due to be issued at the end of February 2020*). This was largely due to the impact of COVID-19 in China and later in Europe, which led to limited availability of some partners especially in the period immediately after the Chinese New Year. The delay was overcome through home-working and appreciation is given to the flexibility of the research partners who showed rapid adaptability to their new working environments. Note however that the timescale for D1.4 (M17, i.e. end of January 2021) remains unchanged, but COVID-19 is now included in the CLEARING HOUSE risk register and could lead to other delays.

2.3.3 STEP 3

The third step is subdivided into two parts.

2.3.3.1 Part 1:

Is to identify and then collect between 10 and 20 ‘case histories’ based on the template shown in Appendices 1 and 2 with guidance on terminology from the glossary in Appendix 3. An iterative approach, combined with the expertise of co-leads EFI and CAF-RIF, will be used to identify the projects for the case histories. The co-leads at EFI and CAF-RIF will also retain a ‘guiding hand’ to ensure that the case histories are sufficiently diverse geographically and any innovative approaches are also captured.

To guide them in this the ‘planning families’ In Europe used in GREEN SURGE, as adapted from Nadin and Stead (2008), will be used. For Europe these are the Nordic, British (including the Republic of

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Ireland), New Member States (post-socialist), Central and Mediterranean planning families. For China, which was not part of the work of GREEN SURGE and has a centralised approach linked to the 13th five-year plan, the approach will be informed by national through to local administrative division-based plans and special administrative area-based plan(s).

CLEARING HOUSE research partners within WP1 will co-populate the template with assistance from local actors and through a literature review.

2.3.3.2 Part 2:

To gather hierarchical information, including that above the project level, an online questionnaire along with a follow-up telecon will be conducted by CLEARING HOUSE researchers in Task 1.4 using remote working, since face-to-face meetings are considered impossible in the timeframe due to the measures put in place to tackle COVID-19. The follow-up telecon will be used to confirm and nuance the results and gather any critical comments. The questionnaire and interview will be limited to a single informant per case history to allow as many as possible to be prepared. A key aspect of this is to use the informant as a knowledgeable local expert to gather information on the tiers of governance above the project level (see Figure 4).

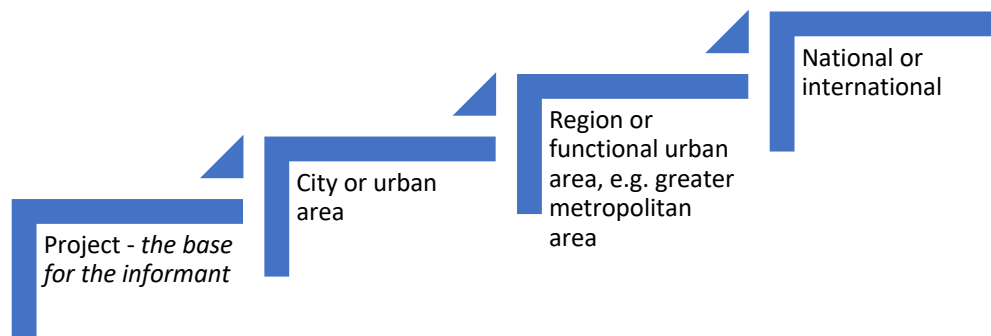


Figure 4: A questionnaire and follow-up interview with a local expert will be used to secure insights of the layers of governance, institutional and economic frameworks above the project.

The plan is to have step 3 complete by the end of project month 11 (July 2020), although some flexibility is necessitated due to the uncertainty and impact of COVID-19.

In terms of process, Step 3 will commence with an online web-meeting in May 2020 of European partners with CAF-RIF as co-lead and a separate online web meeting in China led by CAF-RIF. At this meeting individual researchers as, contributing partners will be nominated to work on one or more case history templates and to undertake one or more follow up questionnaires/interviews on a burden-sharing basis.

2.3.4 STEP 4

The fourth step will overlap with the third with the aim for it to be completed by the end of project month 12 (August 2020). The information gathered will be entered into an EXCEL spreadsheet and made available for comparative study purposes in Step 5. The spreadsheet will be prepared by EFI and CAF-RIF.



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2.3.5 STEP 5

The analysis of governance, institutional and economic frameworks will be undertaken by a core group of researchers from WP1 coordinated by EFI and CAF-RIF with the overall aim of answering the four RQ's set out in section 2.2 above. This work is scheduled to be carried out in project months 13 to 15 and followed by a writing up stage with the intention to issue the analysis report (D1.4) and the compilation of case histories at stage 6 in project month 17.

A rapid evaluation, assessment and appraisal (REAM) approach will be used to undertake the analysis (McNall & Foster-Fishman, 2007). The REAM criteria to be used in the analysis are:

- Typologies of UF-NBS in case-history situations related to Task 1.1
- Level of understanding of the terms governance, institutional and economic frameworks in the context of UF-NBS at different tiers (i.e. local project, city, regional, national, etc.)
- Evidence of the positive application of UF-NBS as distinct from a more general application of NBS that can be related to governance, institutional and economic frameworks
- Capturing evidence of novel or innovative approaches for later study in CLEARING HOUSE and to inform Task 4.3.

2.3.6 STEP 6

The analysis report (D1.4) will be an illustrated text document following the CLEARING HOUSE house-style with the spreadsheet available as a stand-alone resource and a compendium of the case studies.

CONCLUSION

This document describes the approach to investigating governance, institutional and economic frameworks. It further serves as grounded knowledge for detailed comparative case study analysis and UF-NBS scenario and benchmarking development relevant in Europe and China in later work packages.

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APPENDIX 1: CASE HISTORY (EUROPE VERSION): PARCO NORD MILANO - ITALY

Section	 CLEARINGHOUSE 中欧城市森林应对方案 <i>This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 821241</i>
1	TITLE OF CASE HISTORY AREA: Parco Nord Milano, MILAN, Italy Project X City-wide <input type="checkbox"/> Urban region-wide <input type="checkbox"/> (please tick appropriate box)
2	INTRODUCTION (max. 150 words) Parco Nord Milano ('North Milan Park', PNM) is located on the eastern-northern outskirts of Milan in the Lombardy region of Italy, covering 790 ha in a highly urbanised context. Established in 1975, PNM is a regional park involving seven municipalities. It consists of urban green infrastructure (UGI) and is significantly wooded (urban forest plantations [101 ha], species-rich grasslands [3.500.000 m ²], wetlands [35 ha], river corridor [4 km], allotment gardens [n. 350], agricultural fields [120 ha] and other natural elements that were once industrial, agricultural or uncultivated lands. Site management focuses on nature-based approaches to attract public benefits and deliver ecosystems services. The consolidation of the Metropolitan City of Milan in 2015 led to the creation of a single metropolitan park uniting PNM and South Milan Agricultural Park.
3	KEY FACTS AND FIGURES OF THE CASE HISTORY AREA Biogeographic region¹: Continental/Mediterranean Surface area: 790 ha Country: Italy Region/Province: Lombardy/Milan
4	LOCATION MAP(S)

¹ <https://www.eea.europa.eu/data-and-maps/data/biogeographical-regions-europe-3>

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	<p style="text-align: center;">Parco Nord Milan</p> <p style="text-align: center;">Location of the study area – Parco Nord Milano, Italy (Panno et al., Environ. Res., 2017).</p>
<p>5</p>	<p>NAME OF MUNICIPALITY AND WEBSITE ADDRESS Metropolitan City of Milan: http://www.cittametropolitana.mi.it/portale</p>
<p>6</p>	<p>LEAD ORGANISATIONS:</p> <ul style="list-style-type: none"> • Metropolitan City of Milan • The Lombardy Region - Directorate General for Landscape, Urban Planning, and Soil Conservation
<p>7</p>	<p>LOCAL CONTACT(S) Riccardo Gini Director, Consortium of Parco Nord Milano Milan, Italy Tel: + 39 (02) 241016203 riccardogini@parconord.milano.it</p>
<p>8</p>	<p>PRINCIPLE UF-NBS ACTION(S)</p> <ul style="list-style-type: none"> • Forest plantations • Water retention basins (under development) to counteract frequent flooding • Ecological corridors and a series of interventions, e.g., planting tree rows to overcome barriers that prevent ecological connectivity • Annual implementation of new plants/trees
<p>9</p>	<p>OTHER PRINCIPLE NBS ACTION(S) – non-UF</p> <ul style="list-style-type: none"> • A soft mobility plan that introduced a bicycle path network to encourage bike riding/sharing to impact climate change adaptation as well as connectivity



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	<ul style="list-style-type: none"> Recreational and environmental educational activities (e.g., bowls on park grounds; workshops and organised tours of the park) 				
<p>10</p>	<p>LOCAL STAKEHOLDERS / DESCRIPTION</p> <ol style="list-style-type: none"> Governing authorities: The Lombardy Region - General Directorate for Landscape, Urban Planning and Soil Conservation; Metropolitan City of Milan Associations: E.g., farmers’ associations, educational, cultural, and sports, local, NGOs; The Consult of Associations, Friends of Parco Nord Milano Association, Koinè Social Cooperative, Demetra social cooperative Onlus Citizens: (mostly volunteers) Park wardens (GEV), gardeners for allotment gardens, State police on horseback (not volunteer), citizens who are association members Municipalities: Municipalities of local interest (Bresso, Cinisello Balsamo, Cormano, Cusano Milanino, Milano, Sesto San Giovanni) Public/private institutions: Public institutions: Office of Urban Planning; City counsellors; Municipalities of local interest; University of Milan, University of Bari A. Moro; Private: Cariplo (bank) Foundation Park planner and authorities: Planner: PNM Management Unit; Authorities: Park Community (i.e., Metropolitan City of Milan and Municipalities’ mayors) and Management Board; Public Relations Dept. “Vita del Parco” (engages associations, institutional bodies, visitors in its promotional and educational activities); Administrative Division; Park Development Division; Financial Division; GEV security Technicians for park maintenance/monitoring and to educate and support citizens: Management Division (technicians, administrative personnel, and workers); Environmental Education Centre 				
<p>11</p>	<p>UF-NBS FRAMEWORK</p> <ul style="list-style-type: none"> ➤ Please leave blank if the principle does not apply to the case study ➤ Refer to separate document for definitions/glossary of terms <table border="1" data-bbox="320 1319 1382 1998"> <tr> <td data-bbox="320 1319 743 1823"> <p>UF-NBS typology</p> </td> <td data-bbox="743 1319 1382 1823"> <p>Parks and Gardens (i.e., large urban public park, amenity green spaces, local areas for play [LUP], woodland play area, forest plantations, tree rows, hedges, species-rich meadows); Structures characterized by food and resources production (i.e., agricultural field, designated allotments, foraging area for wild berries and fruits and mushrooms); Natural and semi-natural water bodies and hydrographic networks (i.e., river corridor, lake banks, pond); Constructed wetlands and built structures for water management (i.e., upgraded canal system, water retention basins); Choice of plants (i.e., indigenous tree species, non-indigenous ornamental tree and plant species)</p> </td> </tr> <tr> <td data-bbox="320 1823 743 1998"> <p>Integration</p> </td> <td data-bbox="743 1823 1382 1998"> <p>Water management system (e.g., water retention basin); Built-up structure (e.g., soccer field, footbridge, kiosks, theatre, playground farmhouse and farm); Transport infrastructure (e.g., seven parking lots, underground system and above-</p> </td> </tr> </table>	<p>UF-NBS typology</p>	<p>Parks and Gardens (i.e., large urban public park, amenity green spaces, local areas for play [LUP], woodland play area, forest plantations, tree rows, hedges, species-rich meadows); Structures characterized by food and resources production (i.e., agricultural field, designated allotments, foraging area for wild berries and fruits and mushrooms); Natural and semi-natural water bodies and hydrographic networks (i.e., river corridor, lake banks, pond); Constructed wetlands and built structures for water management (i.e., upgraded canal system, water retention basins); Choice of plants (i.e., indigenous tree species, non-indigenous ornamental tree and plant species)</p>	<p>Integration</p>	<p>Water management system (e.g., water retention basin); Built-up structure (e.g., soccer field, footbridge, kiosks, theatre, playground farmhouse and farm); Transport infrastructure (e.g., seven parking lots, underground system and above-</p>
<p>UF-NBS typology</p>	<p>Parks and Gardens (i.e., large urban public park, amenity green spaces, local areas for play [LUP], woodland play area, forest plantations, tree rows, hedges, species-rich meadows); Structures characterized by food and resources production (i.e., agricultural field, designated allotments, foraging area for wild berries and fruits and mushrooms); Natural and semi-natural water bodies and hydrographic networks (i.e., river corridor, lake banks, pond); Constructed wetlands and built structures for water management (i.e., upgraded canal system, water retention basins); Choice of plants (i.e., indigenous tree species, non-indigenous ornamental tree and plant species)</p>				
<p>Integration</p>	<p>Water management system (e.g., water retention basin); Built-up structure (e.g., soccer field, footbridge, kiosks, theatre, playground farmhouse and farm); Transport infrastructure (e.g., seven parking lots, underground system and above-</p>				



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		ground railway system connecting to the park are planned)
	Network/connectivity	Connectivity is considered a fundamental prerequisite of forest management and planning. For PNM authorities, nature in the park is to be considered in a connected framework (not isolated) and as a strategy for addressing issues of connectivity/climate change. Connectivity is ensured by identifying transition zones between built-up urban and peri-urban areas. PNM is part of a green belt system to ensure continuity within the ecological network. Instruments that secure the ecological network and connectivity are: the Regional Ecological Network [RER], Provincial Ecological Network [REP].
	Multifunctionality	Multiple functions of green spaces are combined (air water quality, biodiversity with the needs of the community (recreation, social activities, environmental education, areas for dogs)
	Multi-scale	The park's UGI is protected through the coordination of strategic (RER, REP) and nesting of plans at different levels: local, municipal and regional
	Strategic planning processes	The park's implementation strategy has been characterized by a strong participatory approach in terms of promotion and planning. Park authorities, associations, and bank institution are the main actors enabling the strategic approach (including raising citizen awareness). Park authorities and related stakeholders envision PNM planning as a continuous, long-term process supplemented by actions and means for implementation.
	Inter- and transdisciplinary	The project brings together, in a synergistic participatory process, a variety of actors and their knowledge from different disciplines, which include park planners and authorities, citizens, associations, administrative authorities, the agricultural sector, municipalities, and the Municipality of Milan, technicians who educate and support citizens/groups who help maintain the initiatives as well as undertake monitoring activities, and landscape architects who work with park authorities in planning and management.
	Social cohesion and biocultural diversity	Milan's citizens initially became aware of the need to transform abandoned land into biodiverse green spaces; at the same time, this initiative fostered social cohesion and biocultural diversity as the citizens come from various, even ethnic,



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		backgrounds. Today, social cohesion occurs by sharing the park's services (e.g., popular events, workshops) and through their cultural know-how and practices within the park (e.g., managing allotment gardens, plant/tree planting, sports, picnicking).
	Governance arrangements	Participatory governance: shared management of costs, safety management of green areas, organisation of environmentally sustainable activities
	Institutional frameworks	Consortium, institutions (local/regional bodies, funded by the Lombardy Region, that define the budget and finance the consortium annually); Guidelines, recommendations, and principles laid down by the EU objectives: Habitat Guideline 92/42/CEE, EU Biodiversity Strategy to 2020. The implementation of new multifunctional green infrastructure is proposed by Reg. Law no. 31/2008 ("Consolidated regional laws relating to agriculture, forestry, fishing and rural development").
	Economic frameworks	Economic factors (e.g., public funding, private sponsoring, carbon dioxide compensation) are the main drivers that will influence the quantity and quality of UF-NBS in the future.
	Sino/European comparative relevance	In European terms PNM is a large project and relatively long established. However, in comparison with Chinese cities Milan is small. It is a good example of a multi-functional approach and warrants comparison with Chinese examples. PNM also exemplifies how residual green spaces left over from urban expansion can be used to provide defined green belts that avoid settlements growing together.
	UF-NBS valorisation	The promotion and dissemination of respectful and environmentally conscious behaviours with a view to sustainability. Urban parks are green spaces that can contribute to the maintenance of animal and plant biodiversity in a highly anthropized environment such as the city. Green spaces, like PNM, play a fundamental role as they improve air quality, absorb carbon dioxide and consequently contribute to breaking down the greenhouse gases responsible for climate change and also to counteract the "heat island" effect in cities through shading and the transpiration of plants, mitigating the temperature of the surrounding environment and improving human health and wellbeing.



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	<p>Procurement of UF-NBS</p> <p>A joint effort among citizens, NGOs, and planning and government authorities which is ongoing. The Consortium Parco Nord of Milan (CPNM) was entrusted with the task of building a park by removing industrial debris and planting forest trees. Governance tools to promote and sustain development of the park are employed; these are the Regional Ecological Network (RER) - the primary regional planning instrument, and Regional Agency for Agricultural and Forestry Services (ERSAF) of the Lombardy Region.</p>
	<p>Financing of UF-NBS</p> <p>The Municipality, the Cariplo bank institution, stakeholder funding, a consortium of five municipalities, the Lombardy Region</p>
	<p>Ecosystem services (list the three most important services being provided in no more than 50 words)</p> <p>1) the provision of recreation and educational facilities for local residents and visitors; 2) the health and wellbeing benefits gained through the use of the recreation facilities; and 3) the landscape benefit of creating a functional green boundary between built-up areas which acts as a wooded regional park</p>
	<p>Renaturing</p> <p>Reforestation and environmental redevelopment of areas that were once industrial (with removal of industrial debris) or uncultivated lands</p>
12	<p>LESSONS AND TRANSFERABILITY (max. 100 words)</p> <p>PNM demonstrates increased citizen participation in UF-NBS planning and that awareness of connectivity and climate change adaptation is needed. Citizens using PNM realize that connected UGI improves quality of life and should be implemented to address issues of connectivity/climate change. PNM is a good example of UF-NBS planning that can be applied to other city-regions. Important factors are a bottom-up approach, synergy of multi-scale stakeholders, streamlined political, scientific and planning instruments for setting norms and guidelines in cooperation with stakeholders, a knowledge base of connectivity/climate change adaptation, and awareness. A network of institutions, NGOs and initiatives providing constant funding is warranted.</p>
13	<p>REFERENCES (Harvard style)</p> <p>1. European Environment Agency (2012). <i>Biogeographic regions in Europe</i>. Available at: www.eea.europa.eu/data-and-maps/figures/biogeographical-regions-in-europe-1 (Accessed: 18 September 2014).</p> <p>2. Parco Nord Milano. Available at: http://www.agenziainnova21.org; http://www.parks.it/parco.nord.milano/Eser.php; https://parconord.milano.it/come-funziona-il-parco/lente-parco/# (Accessed: 17 January 2020).</p>




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<p>3. GREEN SURGE Report of City Portraits. Available at: https://greensurge.eu/products/case-studies/Case_Study_Portrait_Milan.pdf (Accessed: 17 January 2020)</p> <p>4. Giannico, V., Laforteza, R., Ranjeet, J., Sanesi, G., Pesola, L. and Chen, J. (2016) 'Estimating Stand Volume and Above-Ground Biomass of Urban Forests Using LiDAR', <i>Remote Sensing</i>, 8(4), p.339.</p> <p>5. Panno, A., Carrus, G., Laforteza, R., Mariani, L. and Sanesi, G. (2017) 'Nature-based solutions to promote human resilience and wellbeing in cities during increasingly hot summers', <i>Environmental Research</i>, 159, pp.249-256.</p> <p>6. Pesola, L., Cheng, X., Sanesi, G., Colangelo, G. and Elia, M. (2017) 'Linking above-ground biomass and biodiversity to stand development in urban forest areas: A case study in Northern Italy', <i>Landscape Urban Planning</i>, 157, pp.90-97.</p> <p>7. Marziliano, P. A., Laforteza, R., Colangelo, G., Davies, C. and Sanesi, G. (2013) 'Structural diversity and height growth models in urban forest plantations: A case-study in northern Italy', <i>Urban Forestry & Urban Greening</i>, 12, pp.246-254.</p> <p>8. Sanesi, G., Laforteza, R., Marziliano, P. A., Ragazzi, A. and Mariani, L. (2007) 'Assessing the current status of urban forest resources in the context of Parco Nord, Milan, Italy', <i>Landscape and Ecological Engineering</i>, 3, pp.187-198.</p>



APPENDIX 2: CASE HISTORY (CHINA VERSION): PLANE AREA, BEIJING, CHINA

SECTION	 CLEARINGHOUSE 中欧城市森林应对方案
	<p><i>This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 821241</i></p>
1	<p>TITLE OF CASE STUDY AREA: Plain Area, BEIJING, China Project X City-wide <input type="checkbox"/> Urban region-wide <input type="checkbox"/> (please tick appropriate box)</p>
2	<p>INTRODUCTION (max. 150 words) Beijing faces notable air pollution, urban heat island and other environmental issues. To mitigate these environmental pressures and improve the urban resilience, the municipal government in Beijing launched the largest afforestation programme in its history in 2012, which was called the Beijing Plain Area Afforestation Programme (BPAP). BPAP has proposed green strategies with nine green wedges, multiple greenbelts, and green corridors around the old city centre in Beijing. BPAP plans to plant 66,674 hectares of new trees by converting vacant lots, croplands, sand excavation pits and wastelands to forests, parks and wetlands. By the end of 2015, BPAP had increased the forest coverage from 14.8% (2011) to 25% (2015) in the plain area, more than 70,000 hectares of forest (more than 54 million trees) have been planted and the survival rate has exceeded 95% (Food and Agriculture Organization of the United Nations, 2018).</p>
3	<p>KEY FACTS AND FIGURES OF THE CASE HISTORY AREA</p> <p>Biogeographic region: Humid Continental/North China Plain Surface area: 6338 km² (633,800 ha) Country: China Region/Province: Plain Area/ Beijing</p>
4	<p>LOCATION MAP(S)</p>

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	<p>Location of the study area – Beijing Plain Area Afforestation Programme, China (Jin, Wang and Jia, 2018)</p>
<p>5</p>	<p>NAME OF MUNICIPALITY AND WEBSITE ADDRESS Metropolitan City of Beijing: http://yllhj.beijing.gov.cn/sdlh/zlgcdtxx/</p>
<p>6</p>	<p>LEAD ORGANISATIONS:</p> <ul style="list-style-type: none"> • Metropolitan City of Beijing • Beijing Gardening and Greening Bureau (Capital Greening Office)
<p>7</p>	<p>LOCAL CONTACT(S) Beijing Municipal Forestry and Parks Bureau (Office of Beijing Greening Commission) Beijing, China Tel: + 86 (10) 84273060 bjyl@yllhj.beijing.gov.cn</p>
<p>8</p>	<p>PRINCIPLE UF-NBS ACTION(S)</p> <ul style="list-style-type: none"> • Forest plantations • Restoration of sand excavation pits, wastelands and some urban-built up area (e.g. impervious surface) in cities • Improvement of urban forest landscape connectivity, e.g. planting trees along roads and rivers to create ecological corridors • Construction of multiple scale urban parks • Annual afforestation and reforestation
<p>9</p>	<p>OTHER PRINCIPLE NBS ACTION(S) – non-UF</p>



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	<ul style="list-style-type: none"> • Recycling of construction waste/garbage (e.g. using concrete from removed buildings in landscape architecture such as park paths, garden ornaments) • Recreational and environmental educational activities (e.g., workshops for urban birds, bees or butterfly biodiversity) 		
<p>10</p>	<p>LOCAL STAKEHOLDERS / DESCRIPTION</p> <ol style="list-style-type: none"> Governing authorities: Beijing City - Capital Greening Office, Beijing Gardening and Greening Bureau, Metropolitan City of Beijing Associations: sciences and technology associations (e.g. education and cultural), cultural, and sports, non-government actors (e.g. project contractors, seedling nursery developers, NGO/volunteers, farmers, previous land contractors, scholars and social media) Citizens: Park wardens (mostly not volunteer, usually the government pays for them), citizens for maintain and cleaning gardens (not volunteer, e.g. gardeners), farmers, citizens who are related association members Municipalities: Municipalities of districts (Haidian, Fengtai, Chaoyang, Mengtougou, Miyun, Yanqing, Huairou, Tongzhou, Shunyi, Fangshan, Changping, Pinggu) Public/private institutions: Public institutions: Office of Planning and Development, Office of Voluntary Tree Planting (under the framework of Capital Greening Office); Municipalities of local districts (e.g. District Gardening and Greening Bureaus); Research institutes or universities that have be involved in this project (e.g. Beijing Forestry University, Research Institute of Forestry Chinese Academy of Forestry); no private institutions since this project was mainly funded by municipal and district government revenues Park planner and authorities: Planner: Beijing Beilin Landscape Architecture institute co. (private company); Authorities and administrative Division: Beijing Gardening and Greening Bureau Technicians for park maintenance/monitoring and to educate and support citizens: Office of Park Management (technicians, administrative personnel, and workers); Environmental Education Department 		
<p>11</p>	<p>UF-NBS FRAMEWORK</p> <ul style="list-style-type: none"> ➤ Please leave blank if the principle does not apply to the case study ➤ Refer to separate document for definitions/glossary of terms <table border="1" data-bbox="300 1500 1385 2009"> <tr> <td data-bbox="300 1500 710 2009"> <p>UF-NBS typology</p> </td> <td data-bbox="710 1500 1385 2009"> <ul style="list-style-type: none"> • Forest plantation; • Community parks, green urban areas, pocket parks, historical gardens or country parks with trees (i.e., large urban public park, amenity green spaces, local areas for play [LUP]; • Woodland play area (e.g. urban forest parks); • Tree rows; • Wooded riverbank green and wooded banks of ponds and lakes, natural and semi-natural water bodies and hydrographic networks (i.e., river corridor, lake banks, pond); • Ornamental trees; • Arboretum; • Bioswales with trees and constructed wetlands; </td> </tr> </table>	<p>UF-NBS typology</p>	<ul style="list-style-type: none"> • Forest plantation; • Community parks, green urban areas, pocket parks, historical gardens or country parks with trees (i.e., large urban public park, amenity green spaces, local areas for play [LUP]; • Woodland play area (e.g. urban forest parks); • Tree rows; • Wooded riverbank green and wooded banks of ponds and lakes, natural and semi-natural water bodies and hydrographic networks (i.e., river corridor, lake banks, pond); • Ornamental trees; • Arboretum; • Bioswales with trees and constructed wetlands;
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	<ul style="list-style-type: none"> Choice of plants (i.e., native tree species, non-indigenous ornamental tree and plant species), selected tree species that could avoid the plant source pollutions (e.g. willow, pollen pollutions)
Integration	Water management system (e.g., restoration of wetlands); Built-up structure (e.g., environmental education bases); Transport infrastructure (e.g., parking lots, above-ground roads connecting to the park are planned)
Network/connectivity	The connectivity of urban forests system is one of the most important goals in BPAP. BPAP aims to connect the old urban forests patches with old vegetated areas (e.g. urban parks, urban woodland), and link the fragmented forests patches by planting more tree rows along rivers, roads or highways. Connectivity is ensured by identifying transition zones between built-up urban and peri-urban areas. BPAP is under the framework of Beijing Urban Greenspace Planning.
Multifunctionality	Multiple ecological functions of urban forest and trees are combined such air and water quality purification, biodiversity conservation (Pei <i>et al.</i> , 2018), urban heat island mitigation. BPAP also meet the needs of the community (recreation, social activities, environmental education, areas for dogs)
Multi-scale	BPAP was planned and implemented at different levels: local (community or blocks), municipal/district and regional. It also cover the urban and suburban area in Beijing City.
Strategic planning processes	The Beijing Plain Area Afforestation Program (BPAP) has been characterized by a strong government intervention in terms of planning and implementation. The government launch BPAP based on the demands of urban residents, which aims to create a more livable urban environment (e.g. create more recreation spaces for citizens). Multiple level government agencies (e.g. municipal office, district gardening and greening bureaus), non-government (private project contractors, seedling/nursery companies, NGOs/volunteers, universities/research institutes or groups) and individual citizens (including raising citizen awareness) are the main actors enabling the strategic approach (Yao <i>et al.</i> , 2019). BPAP planning, implementation and management were funded by government revenues.
Inter- and transdisciplinary	BPAP brings together, in a synergistic participatory process, a variety of actors and their knowledge from different disciplines (e.g. ecology, urban planning, urban forestry, forest management, social sciences),



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		which include administrative authorities, landscape planners, scholars/professional experts, farmers, individual citizens and technicians who educate and support citizens/groups who help maintain the initiatives as well as undertake monitoring activities.
	Social cohesion and biocultural diversity	A survey conducted by the National Forestry and Grassland Administration Urban Forest Research Centre showed that the BPAP has a very high degree of public recognition: public satisfaction with the project was determined to be 72.3 percent, and public support was at 94 percent. Today, social cohesion occurs by sharing the services in urban parks, urban woodland play area and new afforestation sites (e.g., popular and family events, environmental education workshops, volunteer tree planting and sports).
	Governance arrangements	Participatory governance: all costs during the whole cycle of BPAP (including planning, implementation and management) were funded by the government revenues; safety management of green areas, organisation of environmentally sustainable activities are organized or supported by the municipal or local community/block offices.
	Institutional frameworks	Guidelines, recommendations, and principles laid down by the Beijing Urban Greenspace Planning (2004-2020), Beijing Master Planning (2018-2035) and National Standard of Forest City Construction (GB-T 37342-2019). Other related standard or regulations such as urban parks, wetlands, agriculture, forests.
	Economic frameworks	Economic factors (e.g., government funding, private sponsoring, individual donation, ecological/carbon dioxide compensation) are the main drivers that will influence the quantity and quality of UF-NBS in the future.
	Sino/European comparative relevance	Beijing is one of the world's most populous cities, and it is mega-city in comparison with European cities. BPAP is the largest project in Beijing's history and will continue in the following four years. Like all other UF-NBS projects in Europe, BPAP aims to improve the urban greenspace system that can promote city resilience and meet the demands of citizens. However, the governance, institutional and economic framework of BPAP and a multi-functional approach are quite different from European example, which is valuable for comparison (to find the similarities and differences).



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		BPAP also provide a good example to how to implement a afforestation in high urbanized area that can help to control the disorder urban expansions.
	UF-NBS valorisation	BPAP is a government-dominated (human) interventions that promoting the sustainability and resilience of Beijing city. Increased forests or trees (e.g. woodland, urban parks or other greenspace) can maintain and improve the animal and plant biodiversity in high urbanized area. BPAP also can contribute to purify the air and water quality, mitigate the urban heat island by absorbing carbon dioxide and the shading and transpiration of plants, which can benefit human health and wellbeing. Besides, BPAP provide more job opportunities for social society (e.g. need more workers or staff to manage the new afforestation sites, develop eco-tourism).
	Procurement of UF-NBS	BPAP was organized by four-level hierarchical system, which include municipal level project office (Capital Greening Office-Beijing Gardening and Greening Bureau), 16 district gardening and greening bureaus, 162 community or town forestry agencies and project contractors. The municipal office controlled the whole project by framing the public discourses on it, making rules, appropriating funds and lands, organizing public bidding for project supervision, and evaluating performances of each district. The district gardening and greening bureaus made annual afforestation plans in corresponding district and organized public bidding for site survey, planting design, forest construction and management, as well as providing technical and regulations training for project contractors and workers. Community or town forestry agencies coordinated labour division among local forestry stations (under Gardening and Greening Bureau), Rural Cooperative Economy Management Stations (under Agriculture Bureau) and project contracts (Yao <i>et al.</i> , 2019). Overall, the BPAP has a top down administrative system.
	Financing of UF-NBS	This project was mainly funded by municipal and district government revenues. Total expense of the BPAP reached \$5.0 billion USD from 2012 to 2015. Very few non-government investment also exists, for various economical purposes such as tourism.



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	<p>Ecosystem services (list the three most important services being provided in no more than 50 words)</p>	<p>1) Improved the forest coverage and urban greenspace connectivity in urbanized area by planting more than 54 million trees, which is good for biodiversity; 2) the health and wellbeing benefits gained through the use of the recreation facilities; and 3) the provision of educational facilities for local residents and visitors</p>
	<p>Renaturing</p>	<p>Reforestation and environmental redevelopment of areas that were once low-industrial area, uncultivated lands, wastes sand pits and vacant lots</p>
<p>12</p>	<p>LESSONS AND TRANSFERABILITY (max. 100 words)</p> <p>The strong administrative capacity in BPAP has improved the efficiency and effectiveness of project in high urbanized area. Despite the ecosystem services provide by increased urban greenspace areas, BPAP contributes to improve the citizens’ awareness of environment protection. Through the BPAP, citizens realize that the urban forests and trees can improve the quality of their life and play important roles in urban ecosystem. BPAP is a good example of top down UF-NBS planning that can be applied to rapid urbanized city with limited lands for urban greenspace. However, the citizen participation was insufficient during the planning and implementation of this project.</p>	
<p>13</p>	<p>REFERENCES (Harvard style)</p> <p>1. Food and Agriculture Organization of the United Nations (2018) <i>Forests and Sustainable Cities. Inspiring stories from around the world</i>, FAO. Edited by FAO. Rome, Italy: FAO.</p> <p>2. Jin, J., Wang, C. and Jia, B. (2018) ‘Coupling analysis of landscape pattern and thermal fields after the afforestation in Beijing plain area’, <i>Chinese Journal of Applied Ecology</i>, 29(11), pp. 3723–3734. doi: 10.1017/CBO9781107415324.004.</p> <p>3. Pei, N. <i>et al.</i> (2018) ‘Long-term afforestation efforts increase bird species diversity in Beijing, China’, <i>Urban Forestry and Urban Greening</i>, 29(November 2017), pp. 88–95. doi: 10.1016/j.ufug.2017.11.007.</p> <p>4. Wang, C. <i>et al.</i> (2013) ‘Effect and Development Countermeasures of Beijing Plain Afforestation’, <i>Journal of Chinese Urban Forestry</i>, 53(9), pp. 1689–1699. doi: 10.1017/CBO9781107415324.004.</p> <p>5. Yao, N. <i>et al.</i> (2019) ‘Beijing’s 50 million new urban trees: Strategic governance for large-scale urban afforestation’, <i>Urban Forestry and Urban Greening</i>, 44 (January). doi: 10.1016/j.ufug.2019.126392.</p>	



APPENDIX 3: CASE HISTORY GLOSSARY OF TERMS

Economic framework	Economic frameworks refer to the different economic aspects related to the functioning of UF-NBS, primarily as funding mechanisms and sources, economic benefits and costs including broad economic issues such as local branding and related business opportunities and economic models. Among other things we wish to investigate how UF-NBS has been integrated into real economies (adapted from GREENSURGE D4.1; Andersson et al., 2015).
Ecosystem services:	The benefits people obtain from ecosystems. These include provisioning services such as food, water, timber, and fibre; regulating services that affect climate, floods, disease, wastes, and water quality; cultural services that provide recreational, aesthetic, and spiritual benefits; and supporting services such as soil formation, photosynthesis, and nutrient cycling. (Source: MEA, 2005)
Financing of UF-NBS:	The provision of funding for UF-NBS using different mechanisms and financial instruments, e.g., public sector grant, private sector capital investment, use of trust funds held by charity (also see Procurement of UF-NBS).
Governance arrangement:	The process by which plans are implemented is linked to governance, since plan implementation involves many actors across all sectors including for example, NGOs, community groups and many departments of municipalities.
Institutional framework:	The formal and informal rules of a governance system that shape human choices, behaviours and interactions (source: Biernacka & Kronenberg, 2018). Specifically, it involves organisations (governance actors), laws and regulations. Governance actors extend beyond the public sector and include companies (businesses large and small), charities and NGOs.
Integration:	The practice of urban forestry is the planning and management of all the trees in and near urban areas; individually, in groups or in recognisable woodlands and forests. Trees in any of these settings do not exist in isolation from adjacent land uses and other infrastructures. The integration of trees with other land uses and infrastructures is key to the successful delivery of the ecosystem services they can provide. Hence, with regards to UF-NBS, integration should involve UF-NBS typologies along with others that are non-UF-NBS such as built-up structures (through sustainable urban designs), transport infrastructure, and water management system amongst others



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<p>Inter, cross and transdisciplinary:</p>	<p>An inter-disciplinary approach in UF-NBS integrates knowledge and demands from different disciplines, such as landscape ecology, urban and regional planning and landscape architecture.</p> <p>The cross-dictionary approach in UF-NBS means that individual researchers in urban forestry should view the needs of other discipline in their research. For example, a researcher looking at the contribution of urban trees air quality should also be considering how their work addresses the needs of public health scientists, who are considering the impact of urban air quality on, for example, on clusters of diseases in neighbourhoods.</p> <p>A transdisciplinary approach in UF-NBS means that different research disciplines should collaborate, normally in advance, to agree shared frameworks, methodologies and research questions on the principle that each researcher contributes equally to the research being undertaken. A key benefit of this approach is to widen the opportunities for peer-review publishing and wider dissemination.</p> <p>All of these approaches share an aim to interlink disciplines, between science, policy and practice. In CLEARING HOUSE we anticipate this being developed in partnerships between the research community with different local authorities and other stakeholders in the private and third sectors.</p>
<p>Multi-scale:</p>	<p>Urban forestry planning should be considered at different spatial levels ranging from city-regions to local projects.</p>
<p>Multifunctionality:</p>	<p>Urban forests provide several ecological, socio-cultural, and economic benefits concurrently. Urban forestry planning aims at intertwining or combining different functions to enhance the capacity of urban green space to deliver valuable goods and services.</p>
<p>Network/Connectivity:</p>	<p>An aim for urban forestry is to seek added values derived from interlinking green spaces with urban forests in a functional and physical way.</p>
<p>Procurement of UF-NBS:</p>	<p>The means by which Urban Forest goods or services are purchased or secured.</p>
<p>Renaturing:</p>	<p>Creation of new natural spaces such as green roofs, areas, or habitats; transformation of grey infrastructures into green spaces (Sources: Davis, M. et al., 2018; European Commission, 2015)</p>
<p>Sino/European comparative relevance:</p>	<p>Specifically UF-NBS which show notable similarities or differences between the two continental situations, e.g. a similarity would be the management of trees in an urban</p>



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	park and a difference would be the scale of projects which are often much larger in China.
Social cohesion and biocultural diversity:	<p>The capacity of a society to ensure the welfare of all its members, minimising disparities and avoiding polarisation. People from different backgrounds have an equal chance to participate in decision-making, have similar life opportunities and equal access to services, including, access to urban forests.</p> <p>Biocultural diversity consists of biological diversity at all its levels, from genes to populations to species to ecosystems and cultural diversity in all its manifestations (including linguistic diversity), ranging from individual ideas to entire cultures and the interactions among all of these. (Source: Loh & Harmon, 2005)</p>
Strategic planning processes:	<p>Planning processes based on long-term spatial visions supplemented by actions and means for implementation but that remain flexible over time. The strategic planning processes are usually led by the public sector, but that does not mean that non-state actors are excluded.</p>
UF-NBS typology:	<p>Allied to all NBS, UF-NBS are actions involving trees, woodland and associated green infrastructure which are inspired by, supported by or copied from nature, and simultaneously provide environmental, social and economic benefits.</p> <ul style="list-style-type: none"> • Forested areas, remnant forests, forested nature reserves, riparian forests; • Forest plantations; • Community parks, green urban areas, pocket parks, historical gardens or country parks with trees (i.e., large urban public park, amenity green spaces, LAPs (local areas for play), LEAPs (locally equipped areas for play) and NEAPs (neighbourhood equipped areas for play)); • Woodland play area; • Tree rows, e.g., promenades or boulevards, street trees, street greenbelts or green verges with trees; • Hedgerows, including hedgerows with standard trees; • Wooded railway banks; • Woodland glade or species-rich meadow influenced by adjacent trees; • Wooded or shrubby foraging area for wild berries, fruits and fungi; • Wooded riverbank green and wooded banks of ponds and lakes; • Ornamental trees; • Survivor trees;



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	<ul style="list-style-type: none"> • Veteran trees; • Rain gardens with trees; • Allotments, house gardens, courtyards, or urban gardens with trees; • Botanical gardens; • Arboretum; • Feng shui garden; • Wooded cemeteries and churchyards; • Fruit orchards; • Bioswales with trees, tree trenches; • Wooded greenways and trails.
<p>UF-NBS valorisation:</p>	<p>Valorisation is the process of creating value from knowledge by making knowledge suitable and/or available for economic and/or societal use and translating that knowledge into competitive products, services, processes and entrepreneurial activity (Source: The Netherlands Government, 2009). Hence, UF-NBS valorization can be considered as the process of creating value from urban forest interventions.</p>