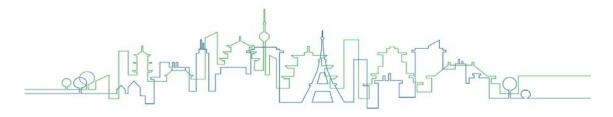# REGREEN
NATURE-BASED SOLUTIONS

Fostering nature-based solutions for smart, green and healthy urban transitions in Europe and China

Deliverable N°6.1.

WP N°6 NBS based governance and planning

Research protocol for the analysis of governance systems in European ULLs

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EXECUTIVE SUMMARY

Urban governance and planning studies focus increasingly on the inclusion of urban nature in the governing and development of the city and its liveability, and as element in building urban resilience to major challenges. Through engagement with the REGREEN ULLs and academic literature, WP6 examines the governance systems and cultures (architectures), adaptive and experimental governance, and policy learning of cities that include, or plans to include, NBS in their management of major urban challenges. The latter include environmental, social and economic challenges, and links NBS directly or indirectly to sustainable transitions, thus also considering issues such as social equality, business innovation, etc.

In this report, we outline the conceptual and methodological framework for examining how city governing and planning institutions within different systems and cultures of governance do this through integrating NBS as issue and solution across multiple policy sectors, as well as through processes of co-creative and experimental NBS based governance that integrate institutional leaning and adapting decision making and implementation to new and dynamic solutions. We use a literature study as point of departure for developing conceptual frameworks in the context of the REGREEN WP6 objectives and of NBS as an emerging, multi-sectoral and Multi Level Governance (MLG) phenomenon in public urban governance, and link this to analytical frameworks, which systematically structure the collection of data in the ULLs and guide the analysis towards responding to the WP6 objectives. Due to the early stages of REGREEN, this report presents an outline, while research on especially Task 6.1 in the ULLs will help us navigate and specify the conceptual and analytical frameworks.

Research is based on jointly developed conceptual and analytical frameworks for each task and common methods for data collection. Data is produced and collected using mixed methods, with a focus on qualitative methods: qualitative semi-structures in-depth, face-to-face interviews, qualitative structured and coded policy document analysis, co-creative policy development and design workshops. These methods are combined with a quantitative survey among a selection of European and Chinese (as far as possible) cities and statistical analysis of results.

The ULLs are at situated at local/urban level of governance while the NBS based policies, measures and initiatives targeted in the study is situated in a multi-level governance context, i.e. interact with policy making and governance at regional, national, European and international level of governance. Based on the conceptual framework, the report moreover lists a number of criteria that are applied to select the NBS measures for each ULL, which WP6 focusses on. The cities (ULLs) represent different sizes, e.g. the European ULLs from small (Velika Gorica) over medium (Aarhus) to large (Paris region) urban areas, and moreover represent different stages of working with NBS in the public policy and governance, from very early plans (Velika Gorica), over experiences with developing and designing (Paris region) to implementation and on-going development through also feedback (Aarhus). The Chinese ULLs also represent different size and maturity of NBS governance.

TABLE OF CONTENTS

LIST OF TABLES

1 INTRODUCTION

Urban governance and planning studies focus increasingly on the inclusion of urban nature in the governing and development of the city, and on the role of nature and green spaces as integrated part of the city and its liveability, and as element in building urban resilience to major challenges. Building on these trends, REGREEN will examine how city governing and planning institutions within different systems of governance do this through integrating NBS as issue and solution across multiple policy sectors, as well as through processes of institutional leaning and adapting decision making and implementation to new and dynamic solutions, including the uptake of tools, methods and approaches for applying NBS in urban strategic and land-use planning.

WP 6 will employ methods of qualitative policy document analysis, semi-structured face-to-face interviews and workshops in the REGREEN ULLs, supplemented by a quantitative survey among a wider selection of cities enabling us to collect data, which is analysed jointly across the ULLs. This approach will make it possible to provide answers to the local challenges of improving urban liveability and living conditions, with special focus on mitigating climate change, adapting to the impacts of climate change, ensuring clean water and air, halting the loss of biodiversity, reducing social inequality and improving social cohesion at community level.

This document is an outline and specification of the conceptual and methodological framework that is developed for WP6. We develop and structure the framework to respond to the objectives for WP6, namely

1. To evaluate how governance systems work in urban areas to promote integrated policy approaches (planning, health, conservation, transport etc.) for NBS-based long term transitions taking full advantage of the Ecosystem Services framework (ESS)
2. To explore how experimental governing approaches can engage public and private stakeholders in innovative and novel activities to foster policy learning around how to adapt NBS to local and future challenges
3. To examine the feasibility of transferring NBS-related policy ideas and learning approaches among urban policy institutions
4. To stimulate novel methods for planning of NBS in cities

In this deliverable and due to the early stages of the project, we focus on objectives 1 and 2, and thus present the theoretical argument for working with contextualised architectures of governance linked to governing and policy processes with nature-based solutions (NBS) at local/urban level, while situated in a multi-level governance (MLG) system of governance. In doing so we also aim to produce findings and learnings that can be transferred to similar systems of city governance. Equally, we provide the provisional argument for investigating processes of adaptive governance aimed at developing and implementing NBS based policies in city/ULL settings, in the context of MLG and the specified governing architectures. This conceptual framework is operationalised and connected to selected methodologies for data generation. Hence, the latter part of D6.1 summarizes the methods which will be applied in conducting WP6 task 6.1 and task 6.2.

Since this is still very early stages of the REGREEN and of WP6 activities, the framework is firstly kept at a generic level, and will be adjusted as it is applied. Secondly, the six ULLs in REGREEN fall into two categories, namely those located in EU member states and those located in the Chinese mainland. Below, we will thus specify how the theoretical framework is operationalized with respect to Europe and China as a context for NBS based governance and for data collection.

2   WP6 CONCEPTUAL FRAMEWORK AND INTERNAL TASK LINKS

Task 6.1 examines how different systems of governance work at the city level (Bulkeley and Betsill, 2005) and the impact this has on the capacity of cities to include NBS-based approaches, tools and measures in the design of transition policies for the planning of a sustainable, climate resilient and just city. The research identifies and assesses key mechanisms of urban governance architectures aimed at integrating NBS (WP6 objective 1), as set, in a multi-level governance perspective, thus acknowledging the embedding of urban governance institutions in the local context while also being integrated with national (member-states, China), regional and supra national (e.g. European Union) governance. Thus, the path-dependency of policy institutions (i.e. resistance to change) is mixed with institutional change in local governing institutions and is orchestrated by national-local architectures of governance (Howlett et al, 2017).

The task examines firstly how governance systems work in the urban areas of the European ULLs to promote integrated policy approaches for NBS-based long-term transitions through taking full advantage of ESS. The analysis focuses on institutional logics of operation (Peters and Pierre, 2012), including examination of processes of policy integration of NBS in urban policies (Knill and Lenschow 2000; Adelle and Russel, 2013) and institutional arrangements of urban governance (Healey et al, 2017). Secondly, the research in task 6.1 examines in the ULLs how different administrative approaches, including planning, decision support systems, methods for assessing NBS outcomes, participatory approaches, different funding environments, can or will deliver different outcomes. This additionally links to interaction with start-up milieus in the ULLs, and thus interacts with WP8. Finally, a baseline assessment of the governance context of the Chinese ULLs will be conducted and be compared with the more in-depth insights from European ULLs to establish overlaps and divergences in their governance contexts and approaches to including NBS. This deliverable draws on findings from Task 2.1 on drivers and pressures related to NBS in the ULLs. The main method in the task is to produce in-depth case studies of governance systems in all the European ULLs. Data for the analysis is collected through policy document analysis at European, national, regional and local level, and qualitative in-depth interviews and surveys in the European ULLs. Baseline data from the Chinese ULLs will mainly cover document analysis and supplementary interviews.

In co-creation processes with the European ULLs, Task 6.2 seeks to explore how experimental governing approaches (James et al, 2017) can be used to foster innovative solutions and policy learning among the public, stakeholders and city authorities to nurture innovative and novel governance and policy approaches to NBS (objective 2 of the WP). The first aspect of this task will be to conceptualise what we understand by experimental leaning in policy institutions dealing with NBS, drawing on insights on recent literature (e.g. Radaelli and Dunlop, 2013), existing assessment of experimental approaches, and from WP5 on nature related learning, with the intention of using this conceptualisation to devise an evaluation tool for assessing experimental learning approaches to NBS policy innovation. The next step is to use this evaluation tool to test and co-design – in co-creation with public administration partners and other stakeholders – within the European ULLs experimental policy innovations, taking in findings from WP4 on wellbeing of urban citizens, and the NBS knowledge base developed in WP2. This work will entail methods such as field trails in which workshops, qualitative interviews and surveys will be used to explore how different policy interventions or treatments (James et al., 2017) can lead to policy learning around different NBS policy outcomes

(relative success or failure), and thus be based on co- creation with the European ULLs (WP7) in the research activities. The governance experiments will be based on novel approaches co-created by the city authorities and the project team and/or on approaches undertaken. Drawing on the base line assessment of the governance of the Chinese ULL in T6.1, the task will explore possibilities for experimental learning around innovative NBS governance in the Chinese ULLs. Key aspects of Chinese urban governance architectures will be included, based on the baseline survey of the Chinese ULLs. The findings from this task will feed into WP7 work on implementation strategies.

3   CONCEPTUAL FRAMEWORK FOR TASK 6.1 AND TASK 6.2

In this section we outline the conceptual framework for Task 6.1 and Task 6.2, based on the literature review of governing architectures, here understood as governing cultures and systems specifically within environmental policy areas, and on experimental and governance. Findings are integrated in the conceptual framework which guides the empirical work and is used in the analysis of the ULLs.

We use the conceptual frameworks to structure the description of the ULLs from a governance perspective, with specific attention to policies and measures that are based on or integrate NBS, and the identification of key aspects of the governing processes, systems and cultures is in this process. Furthermore, the framework is used as basis for specifying a set of criteria for selecting specific policies, measures, and/or strategies that will be analysed in depth in each ULL and which provides the starting point for assessing the governing architecture of each city.

Governance

We build on Challiers et al. (2017:290) and Gjaltemann et al (2019) in defining governance to denote 'governing arrangements encompassing institutions and actors both within and beyond government, wherein the traditional governing roles and responsibilities of various actors become increasingly blurred, and governments make greater use of instruments and techniques to 'steer and guide', rather than to command and control. Governance thus to a large extent includes networks, and has often been termed network governance. Where some scholars see governance to be beyond the state, and with public policy makers and govenors having little or no de factor role, we stress the central role of public policy makers in extending the governing of the city to encompass other semi-public and private actors, in networks, participatory, collaboratory and/or co-creation processes of governing. Urban governance should then be understood of as a process blending and coordinating public and private interests in the process through which local authorities, in concert with private interests, seek to enhance collective goals.

3.1   Governing architectures: systems and cultures of governing with NBS

3.1.1   Governing with NBS in cities

Cities struggle with major social and environmental challenges that threaten the cohesion, prosperity and liveability of cities, and increasingly engage with urban nature in developing approaches, solutions and strategies to address the challenges, i.e. NBS based governance. Such policy and governing engagements involve not only new solutions at a fundamental level but also novel approaches to and procedures of policy making, and interaction with societal actors and structures, thus potentially also stimulating sustainable transitions. However, Folke et al. (2010) argue, in order to maintain the resilience of urbans system it is not enough to just be able to adapt to small changes in the current (stable) urban   system. Instead, transformational   change   is   crucial   and requires the capacity 'to   cross   thresholds   into   new   development trajectories' (Folke et al., 2010:1). While transformative change thus suggests radical change, it does not necessarily imply sudden, large-scale change. It has been argued that local-level policy experimentation is well-suited
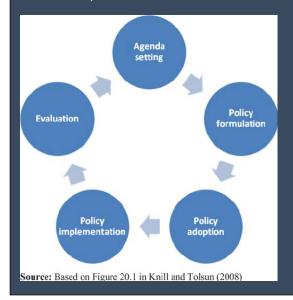
to develop and test innovative and novel solutions and thus facilitate development of longer-term transformative change (Huitema et al. 2018; Folke et al. 2010).

The integration of NBS in urban governing follows the policy circle, where e.g. Knill and Tosun (2008) point to the main stages of public policy: Starting with agenda setting, it goes over policy formulation based on alternative policy options, and policy adoption which includes decision making, policy implementation, evaluation of effectiveness. This process is iterative with parallel stages of ongoing maintenance and adaptation, and feedback to policy making and new agendas, which then again leads to policy formulation, and so on. This means, that different issues may be contested or under development at the individual stages of developing NBS and in the processes of governing with NBS and for example the co-creation of measures with citizens and other stakeholders.

Policy circle

The main stages of public policy making follows a 6 stage-circular logic. In the first stage, agenda setting takes place, in the second stage policy is formulated based on alternative policy options, followed by the third stage where policy adoption including possibly decision-making takes place. Then in the fourth stage policy is implemented, effects, impacts and success of policy implementation is evaluated, with a concomitant fifth stage of ongoing maintenance and adaptation of the policy and its implementation. In the sixth stage, feedback to policy making and new agendas happens, which then again leads to altered or new policy agenda setting, policy formulation, and so on.

Source: Based on Figure 20.1 in Knill and Tolsun (2008)

From a governance perspective, the inclusion of NBS in urban policy and planning also involves conflict, tensions and political aspects around the questions of what urban nature is, how it interacts with human society and who benefits from the manner in which nature is nurtured or neglected through NBS based policies. There are thus multiple policy areas which potentially gain from development of NBS based urban policy approaches. Working with NBS in local policy institutions thereby entails multiple processes; the inclusion and qualification of NBS in the particular city is in itself a process. When policy making and planning integrate participatory processes and engagement, it reflects these aspects of on-going development, tension and potential conflict which may surface.

Policy makers who integrate urban nature actively in developing strategies, processes and measures is complex. Climate change policy offers an exemplary case. When looking for transformative policy solutions, the climate problem is often portrayed by scientists and policy advocates alike as one where the solutions are readily available and that it is simply a matter of instrumentally feeding the latest science into the policy process. However, the nature of climate policy in itself presents many policy changes. It is a complex, knowledge intensive policy area that cuts across many public and private interests. These conditions mean that it is more susceptible to being side-lined or weakened to an extent that it falls short of what the latest science says is needed. Moreover, the literature on public policy generally argues that an instrumental views of climate policy is likely to be the exception rather than the norm.

3.1.2 From policy institutional perspective to urban governing architectures

Public policy scholars have often pointed to the recursive nature of policy making which is dominated by compromises by policy makers and interested parties and is thus incremental rather than transformative in nature (Lindblom, 1979), and most often takes place within specific policy areas, i.e. creating silos of policy making. Indeed, compromise, tensions and eventually conflicts linger on how to spend limited public finances and on questions around how to prioritise different areas of public interest within the confines of urban budgets, city consent and electoral cycles. In this sense climate policy and other environmental policy problems have to compete with other often more shorter-term policies which tend to be prioritised highly by the electorate (e.g. the economy, welfare services and health), which can see environmental policy goals all too often being weakened (See Russel and Benson, 2013). These processes interact with institutional aspects of governance and policy making, thus pointing to the significance of rules and procedures, norms and roles, as well as the structure, organisational and relationships with societal actors (i.e. citizens, communities, organisations, businesses, and knowledge institutions) and public policy in relation to how policy problems are addressed within specific contexts.

> **Policy maker**
>
> Policy makers are those actors involved in putting a policy problem on the agenda, formulating the policy and deliberating alternatives, adopting the policy and implementing the policy. Often policy makers work closely with other policy makers, experts and consultants, citizens and stakeholders, especially when implementing the policy.

In taking an institutional approach as point of departure, we define an institution as a setting wherein an established or ad-hoc configurations of 'systems of rules, norms and cultural systems of meaning that shape the courses of action' (see e.g. Scharpf 1997: 38) develop towards achieving common goals. Concerning policy institutions, these common goals are linked to the public management of processes, challenges and management of society, at the basic level towards a common good. Thus, generically, institutions are understood as constructs consisting of formal and informal rules, norms, roles and cultural systems that, for example, include common framing of policy issues that have a regulating impact on the behaviour of actors who are involved in policy making and implementation. This means that (policy) institutions are dynamic social entities that over time attain a relatively high degree of

resilience (Scott 2001: 51), and which coordinate behaviour across policy through harmonized perceptions and scripts for action (Aspinwall and Schneider, 2000; DiMaggio, 1997).

> **Institutions**
>
> We follow Scharp (1997:38) in defining an institution as a setting wherein an established or ad-hoc configurations of 'systems of rules, norms and cultural systems of meaning that shape the courses of action'. Policy institutions are thus understood as constructs consisting of formal and informal rules, norms, roles and cultural systems that, for example, include common framing of policy issues that have a regulating impact on the behaviour of actors who are involved in policy making and implementation.

Institutions surface at different levels in urban governance. The micro level is concerned with the individual behaviour of officials working in the separate parts of the city administration. Ideas on policy actions (in this case NBS) need transmitters (individuals or groups) to promote the idea, influence behaviour and build coalitions (Oliver and Pemberton, 2004). However, institutions place constraints on the (rational and irrational) actions (Torfing, 2001) of individual actors in policy making because of the informal and formal decision-making rules often operating at the meso level (see below). The agency of individual policy makers to engage with an issue such as NBS is also bounded by factors related to knowledge management and the individual cognitive capacities of policy actors that can shape the way in which an issue like urban nature and related policy problems, it may provide solutions is readily taken up by individual actors in their decision making. Moreover, individual policy makers are only capable of processing and interpreting a given amount of data (Béland, 2005) meaning decision makers can only focus on a few core issues at one time. Thus, if an issue like urban nature is not seen as core to an official's job, it can all too easily be ignored. What and how policy makers process and embed issues like NBS can be shaped by individual expertise and professional identity (Torfing, 2001), beliefs (Hall and Taylor, 1996) and ideologies about what public administrations should do within a narrow area of expertise (Christensen, 2013) and the associated fixed preferences of actors (Hall and Taylor, 1996). For example, Torfing demonstrates how expertise shapes interpretative frames, and how professional identity can direct policy makers to pursue some reforms over others (Torfing 2001). For example, an official with a background in law may prioritise legal reform whereas an economist would prioritise efficiency around climate change adaptation.

At the meso level, behaviour is driven by formal and informal decision-making rules and goals of decision-making organisations, which in our case is the city administration and national frameworks for public administration. Rules make it possible to coordinate simultaneous activities, avoid conflict and help to mitigate against unpredictability (March and Olsen, 1989: 24), and to reduce "the time and energy otherwise used on thousands of decisions about how to perceive and evaluate an otherwise unintelligible stream of information (March and Olsen, 1994: 253). While, over time or in times of acute crisis, these rules and routines can change, it is said that they tend to have a "surprising durability" (March and Olsen, 1994: 262), which may even give the impression of inertia (Smith et al., 2000). Institutional literature suggests that rules develop for a number of reasons. On the one hand they are shown to develop from the more rationally-orientated goal of structuring interactions to stop free-riding and to pursue organisational goals. In this situation, rules shape decision making around a logic of consequence where decisions are framed around achieving rational instrumental goals and

efforts to reduce transaction costs of action (Torfing, 2001). On the other hand, through more sociological processes (Hall and Taylor, 1996) rules are argued to evolve as social processes, images, symbols and rituals that combine to form rules of behaviour which lead to the development of shared meaning (Morgan, 1997: 132) or to "webs of meaning" (Marsh et al., 2001: 21). These webs of meaning then shape the rules through which networks and collectives of policy making actors develop cognitive scripts; this process and the resulting rules and scripts are then used to tackle policy problems (Hall and Taylor, 1996). In this situation, rules conform to a logic of appropriateness rather than a logic of consequence. This means that actions are expressions of appropriateness or acceptable behaviour within the norms and routines of a given context rather than achieving instrumental rational goals (March and Olsen, 1994: 252; 1996: 250).

Institutional rules act as external constraints that define the repertoire not the choice of action (Torfing, 2001: 286) and, as such, affect the range and sequence of alternative actions when confronting policy making (Hall and Taylor, 1996). Indeed, such institutional rules structure how policies are made, the policy objectives addressed, the resources allocated to given issues and the (dis)incentives under which policy makers operate (Torfing, 2001: 293). Thus, rules either allow space or crowd out (rule in/rule out) initiatives like NBS measures, depending on how the issue fits with established practice (Russel and Jordan, 2009; Torfing, 2001). Rules also shape the relations and interactions of policy makers within different policy sectors and levels, and with societal actors (Richards and Smith, 2002).

At a macro level, institutional organisation of the polity, society and the economy structures behaviour, and promotes certain values and ideas over others (Christensen 2013; Hall and Taylor, 1996; Weir and Skocpol, 1985). Moreover, institutional organisation at the macro level can embed power asymmetries allowing some groups disproportionate access to decision making over others (Hall and Taylor, 1996). This situation leads to the creation of constraints and opportunities for embedding new ideas, as the historical sequence of decisions structure political debate and related dominant paradigms and values in society (Béland, 2005). In such situations, problems can arise with the embedding of cross-cutting goals like urban nature and NBS related policy issues (biodiversity, climate change adaptation, social community cohesion) adaptation into policy making when that issue is too far from the dominant policy paradigm. As Niemelä and Saarinen (2012) note, this maintenance of the dominant norms is akin to the production of cognitive locks, so that rather than a change in the policy making approach, policies and existing institutions are reproduced over time. Thus, there is a risk of path dependency (Béland 2005; Hall and Taylor 1996) which can be modified or challenged through innovative processes and learning. In this perspective, we focus on experimental policy making as adapted to the specific governing institutions in cities that engage with NBS.

> **Governing architecture**
>
> Governing architecture is understood to comprise the setup for governing in a particular city, as this is part of the national governing and regulation policy and frameworks. Thus, governing architecture comprises governing structures, including legal frameworks and procedures, as well as governing culture, including norms for behaviour, roles, collective codes, values and identity markers, shared practices and memory, level of trust and where for example norms for governing behaviour, levels of trust and consensus are central.

Governing architecture is based on this institutional perspective understood to comprise the setup for governing in a particular city, as this is part of the national governing and regulation policy and frameworks. Thus, governing architecture comprises governing structures, including legal frameworks and procedures, as well as governing culture, including norms for behaviour, roles, collective codes, values and identity markers, shared practices and memory, level of trust and where for example norms for governing behaviour, and levels of trust and consensus are central.

3.1.3   NBS and multi-level governance in cities

With the gradually increasing recognition of urban nature as integrated part of the city, its infrastructures, communities and everyday life, and with the increasing attention to stimulating liveable urban spaces and cities for people (Gehl, 2013), governance turns to urban nature as a fruitful aspect of managing current major challenges of e.g. climate change, biodiversity, social cohesion and rising inequality, which is also adopted in EU policies and initiatives as NBS.

The governance of complex urban challenges will thus figure in policy issues and involve objectives and actions beyond the policy in question, which suggests that policy integration, and coordination, of objectives measures and initiatives within polices and strategies in other areas is central for addressing complex policy problems (Adelle and Russel, 2013). We understand policy integration along the generic lines of Howlett et al., who denote it to be 'smooth coexistence of the different elements of policy, including goals, policies and government levels involved in policy…design and creation' (Howlett et al. 2017:70). For a policy issue, e.g. in climate change (Mickwitz et al., 2009), biodiversity or social inequality, or the redirection of urban governance to include urban nature and ecosystems, this horizontally involves other policy areas (sectors) where the policy is or may be relevant.

Policy makers and climate governance scholars alike have engaged in the enduring debate over the roles of different policy levels in climate governance, particularly evident concerning what governance level can most effectively address environmental and climate policy problems (Ostrom 2010; Bulkeley, 2013; van der Heijden et al. 2019). Regulation of and interventions in (urban) nature are as other environmental policy areas decided, made and conducted at national and European levels of policy making, often under the umbrella of international conventions, as well as regional and local/urban levels. The main strategies, overall objectives and policy frameworks for managing urban nature and environmental challenges are developed and decided at other levels while specific measures and initiatives, plans and implementation is carried out in local governance, as is e.g

evident with climate policy (Jordan and Lenschow, 2008) or biodiversity. Urban NBS based policies potentially rest on a variety of environmental areas and services of nature, and has thus links to policy making, decisions and regulation taking place in other policy areas. Likewise, feedback on the efficiency of measures, the impact of implementation of policies as well as input and knowledge/data on environmental problems as these emerge at local level inform and feed back to European and national policy making on nature and environmental issues.

Moreover, there is the crucial question of boarders when it comes to considering the positive and negative spill-over effects of policy. For instance, high climate standards can spill over into neighbouring countries in a race to the top, as can be seen in many European countries or on a more regional level in the United States. In such situations, administrations can learn from each other, leading to policy ideas being transferred from one jurisdiction to another. Trading relationships can particularly lead to higher standards as countries with ambitious climate change goals, strong economies and large markets can demand higher standards from imports. However, policy spill-overs can also be negative. Rather than a race to the top situation countries can competitively weaken their climate policy to be more economically efficient than their neighbours and rivals. Strong climate policy policies in some regions could also push production of high carbon products (e.g. steal production) to regions with weaker policies and thus costs, so called carbon leakage.

However, an alternative strand in the governance literature represented by e.g. Harriet Bulkeley (2013) argues that cities and local communities may be the most suitable entry point for tackling environmental problems because the local level is better suited to experiment and develop new solutions (see van der Heijden et al 2019; Biesbroek and Lesnikowski 2018; Ostrom 2010 for discussions), and because the local and regional level is closer to implementation and alignment with local contexts. Moreover, they claim that cities, contrary to theoretical expectations, have become de-factor leaders in climate governance (Bulkeley. 2013). Ostrom (2010) argues that in fact climate governance offers potential benefits across multiple scales, providing incentives for lower level action even in the absence of global coordination.

With regard to NBS, the local incentive to undertake action would appear even stronger as local communities face immediate benefits from measures, as for example demonstrated by climate adaptation measures to prevent damage from flooding or adapting agriculture to higher temperatures and different precipitation patterns. But to ensure the most efficient solutions, policies also point to action across multiple levels of government as well as regional solutions that coordinate across administrative boundaries. The collective action problem not only relates to the levels of governance, but to individuals, organisations and businesses. Conventional collective action theory suggests that many major environmental problems, such as biodiversity, climate change and air pollution, require a global treaty (Ostrom, 2010). While individual countries can develop targeted policies and initiate the necessary transformations towards a e.g. low carbon economy or wide implementation of NBS, this may have little impact on biodiversity, air quality or climate change unless a global approach is taken that meaningfully includes e.g. the largest greenhouse gas emitters or preserve rainforests and green spaces across the globe.

3.1.4 Participation and stakeholder involvement

Our perspective on NBS based governance in an MLG perspective raises two issues: how to ensure an appropriate distribution of decision-making competencies and how to ensure coordination across actors. In order to reap the benefits of multi-level governance, actors across different levels must have the political and institutional space to act (Biesbroek and Lesnikowski, 2018). For local actors this could mean having decision making power over relevant aspects of climate policy, but it also means that there needs to be an enabling national or international/interstate framework to support local action (Keskitalo et al. 2016). In addition, the development of novel forms of governance at local level may be developed. Likewise, from the international perspective, e.g. the United Nations or the European Union, there must be mechanisms in place that ensure implementation on the ground. In other words, actors across all levels of governance must possess appropriate governance resources, stressing participation of citizens and other stakeholders.

While there are numerous studies and theoretical approaches which address core perspectives, issues and debates in participation, participatory governance (see e.g. Læssøe, 2007; Lane, 2005) is underdeveloped in our framework. The crucial concepts and for our framework will emerge as we develop the research in both Task 6.1 and Task 6.2. We will thus return more substantially to the conceptual debates on participation and citizens/stakeholder engagement in public policy making and urban governance in the next steps of WP6 research.

3.1.5 Implications for the analysis in WP6

Urban governance denotes the complex processes that public policy engages with to tackle policy problems in a context of networks with policy makers in other policy areas/sectors and at other levels of policy making than their own, often using a myriad of policy approaches, including participation of citizens and other stakeholders, and multiple instruments to implement the policies in real urban contexts. Thus, researching NBS based policy and planning in cities, their governing architectures and experimental aspects and policy innovative potential is hence situated in a multi-level governance context. Altogether, then, to integrate urban nature in the light of current social and environmental challenges in cities presents a multi-level governance challenge. It is multilevel in that it connects policy action from the most local level to the international level. It is a governance challenge as it not only involves the actions of government actors but is also dependent on the behaviour of a myriad of private actors from individuals through to corporations.

For WP6 activities, the MLG aspect of NBS governance implies that when investigating governing structures and cultures, and specific NBS measures, the traces and links to regional, national and European levels of governing is considered and taken into account. The same applies for the specific areas of nature and environmental policy, which are relevant for particular strategies and NBS measures. Additionally, there is a political element to NBS as these are integrated in policies, planning and governance processes, as reflected in participatory process.

3.2 Experimental governance: Adaptable governing and co-creative policy development

In this section, we outline what we understand by experimental governance and how it applies to our approach in the REGREEN project. As we argue above governing for NBS requires a different approach by policy makers, which suggests that more experimental, innovative or adaptive policy approaches are required by public administrations seeking to use nature in urban contexts to derive benefits, broadly defined, for the well-being of their constituents. However, experimental or innovative approaches to policy carry some element of risk administrations as there are more unknown elements that increase the risk of failure. For this reason, policy making institutions tend to be risk adverse and disinclined to experiment. However, experimentation does happen at all levels of policy making from the EU's emissions trading scheme, through to the restoration of wetland in urban areas to act as a store for flood water as well as a recreational resource for residents. This section therefore explores the emerging literature on policy experimentation and innovation and what this means for the research in Work Package 6 of REGREEN.

For this section, a total of 52 articles were analysed, based on an extensive search of relevant data bases (web of science, google scholar. The majority of the sampled research focused on more developed regions in such North America (in 28 of the studied pieces of research), Europe (26 of the studied research articles) and Australia (2 of the studied articles). There were also 2 international case studies, 1 case study each for Japan, Singapore Japan, Taiwan and Brazil. One studied country, Burkina Faso, is categorised as 'low human development' and is 183th of 189 on the United Nations Human Development Index. Most of the research focused on single cases but 5 did conduct comparative research between 2 (4 studies) to 3 (1 study) countries. The policies areas addressed in the articles (as shown in Figure 2 below) included; climate policy (26) (Bulkeley and Betsill, 2005; Chan et al., 2012; Fiorino, 2014; Karapin, 2016a; Karapin, 2016b; Krause, 2011; Massey et al., 2014; McGreavy et al., 2016; Mormann, 2017; Pidgeon, 2012; Rafaty, 2018; Karapin, 2016c; Shin, 2018; Sills et al., 2015; Steelman, 2010; Torfing and Ansell, 2017; Upham et al., 2014), general policy (19) (Ansell and Torfing, 2014; Archer and Maxwell, 1980; Carstensen and Bason, 2012; Grillitsch et al., 2019; Higdem, 2017; Noda, 2018; Strumpf, 2002; Tolbert et al., 2008; Welch and Thompson, 1980; Zhu, 2013), welfare/social policy (13) (Baglioni and Sinclair, 2018; Boehmke and Witmer, 2004; Breznitz and Ornston, 2013; McKeown, 2016; Potter and Wolf, 2014; Smith, 2013), health policy (4) (Rocco et al., 2018; Shearer et al., 2018; Sørensen and Waldorff, 2014), immigration policy (2) (Middleton, 2014; Newton, 2012) and youth policy (2) (Hinterleitner, 2018). Crucially, none of the studies analysed focused on NBS, suggesting that exploring policy experimentation from the perspective of NBS is a novel research area.

3.2.1 Factors facilitating or retarding policy experimentation

Given that policy making institutions tend to be risk adverse meaning that there is a disincentive to undertake experimental policy approaches which have a high risk of failure, what does the literature say about why experimentation may or may not occur? In the 52 research article examined, the types of barriers and facilitators can be divided into three main categories: 1) external factors outside the control of an administration such as problem events and other countries'/states' policy. 2) societal factors such as economic growth, public perception, interest groups, public distrust and

socioeconomic components, which can be altered but is difficult and time consuming. 3) governing factors such as governance structure, policy framing, collaboration in governance and political leadership, which can be modified but often will encounter political obstacles.

Some of the facilitators and barriers considered here are issue area specific, whilst others are across-the-board. This is important to distinguish because it enables us to determine elements which facilitate or bar innovation inherently, and those which are more impediments to the policy issue than policy experimentation in and of itself.

3.2.2   External factors

Problem events are considered in some of the studied articles as a facilitator of policy innovation because they reinforce the need for change in order to address the issue. This driver of policy experimentation seems to be largely cited in the research on climate change, where the occurrence of problem events such as a severe, flood, drought or heatwave demonstrates vulnerability to a changing climate and thus spurs more innovative policy responses (Feindt, 2010; Hinterleitner, 2018; Karapin, 2016a; Karapin, 2016b; Massey et al., 2014; Middleton, 2014; Newton, 2012; Pidgeon, 2012; Welch and Thompson, 1980). The lifespan for subsequent policy experimentation in light of problem events is only mentioned within some of the literature, but the concept of the 'window of opportunity' [3] is often cited. In this sense, it is argued that problem events in the form of, for example, extreme weather act as an enabler through creating windows of opportunity for pioneering policy makers to pursue more experimental policy approaches to climate change (Karapin, 2016a; Pidgeon, 2012). However, among the sample, there is less clarity in terms of whether enablers can affect the length of the policy window. For instance, one article suggests that problem events can elongate policy windows, citing the 2005 US hurricane season as an example. However, the majority of articles focusing on this issue suggest the enablers' effect is subject to short opportunity windows (Karapin, 2016a; Karapin, 2016b). Thus, we can draw from the literature that, while problem events encourage policy experimentation and create windows of opportunity, more research is required to determine whether these enablers affect the policy windows.

The policies of neighbouring countries, regions or municipalities are also identified in the literature as an enabler for policy innovation throughout various policy areas. However, its saliency is questioned and is infrequently mentioned (7 articles). In some sense, this line of reasoning feeds into classic policy spillover (see above) and policy transfer arguments, whereby neighbouring countries are integrated and interdependent socially, economically, environmentally and geographically and thus share similar problems. This can result in cooperation and collaborative learning, or a race to the top as neighbouring administrations see the success or failure of each other's approaches which can lead to similar policy innovations.

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[3] Window of Opportunity is the concept that after an event or occurrence there is a definitive amount of time for policy to be successfully passed addressing the issue.

3.2.3   Societal factors

While strong economic growth is viewed as a requirement for the possibility of experimental policy occurring in the literature examined, it is seen as an indirect driver. Policy experimentation is seen to occur more frequently if robust economic growth is present, and that further policy development will not inhibit further growth. Economic growth is mentioned throughout various policy areas y (8), but it is more in reference to the detrimental effect of poor growth being a barrier (Strumpf, 2002). While strong growth is viewed more of as a requirement for the possibility of policy experimentation occurring, rather than positively promoting it and therefore cannot be seen a direct facilitator. To illustrate this point, economies which have a high reliance on manufacturing are less likely to invoke further climate policy because it would hinder their future economic performance (Karapin, 2016a; Karapin, 2016b; Krause, 2011; Pidgeon, 2012). Therefore, it is apparent that policy experimentation can be dependent upon the performance and structural components of an economy. Other socio-economic factors cited in the analysed literature include; high income per capita, reliance on fossil fuels and manufacturing, funding from central government and international economic competition (Karapin, 2016a; Karapin, 2016b; Massey et al., 2014; Pidgeon, 2012). These various economic and socioeconomic variables have opposing impacts on policy experimentation. A trend of positive relationships between high income, education, central funding and services industries (Karapin, 2016a; Karapin, 2016b; Krause, 2011; Massey et al., 2014), and policy experimentation is highlighted as being important, with economics often being seen as a primary driver (Fiorino, 2014; Karapin, 2016a; Karapin, 2016b; Krause, 2011; Shin, 2018) for policy innovation.

Public perception of the issue area is referenced as a key driver of policy experimentation across-the-board and therefore can be seen as directly influencing the potential for policy innovation. Although, it is often mentioned concerning negative public perception (Karapin, 2016a ; Krause, 2011 ; Massey et al., 2014 ; McGreavy et al., 2016 ; Pidgeon, 2012 ; Sills et al., 2015 ; Steelman, 2010; Welch and Thompson, 1980 ; Zhu, 2013) (9/13) and thus implicitly suggests it is more of a barrier than enabler, similar to economic growth. However, one of the studies noted that regardless of public perception, without financial backing, innovation will not take place (Newton, 2012). Thus, public perception as an influence on experimentation is dependent on economic-based factors.

Public distrust is only mentioned in articles focusing on climate/environmental policy and in a relatively infrequent capacity (3 articles) (Bulkeley and Betsill, 2005; Newton, 2012; Pidgeon, 2012). Moreover, 2 of 3 articles the articles focus globally (Bulkeley and Betsill, 2005; Pidgeon, 2012) rather than on country or regional case studies. Therefore, whilst public distrust may not be directly influential for policy experimentation, it occurs very broadly, in a geographical sense, with climate policy. Thus, public distrust occurs regardless of geographical location, and affects policy innovation only in a negative capacity, which we can suggest is partially due to the complex nature of the issue.

Interest groups are recognised to influence policy innovation only in research articles which focus almost exclusively on the United States (10 articles). This is primarily in a positive capacity; whereby organised interest groups can put pressure on governing entities to adopt new policy (Breznitz and Ornston, 2013; Karapin, 2016b; McKeown, 2016; Shearer et al., 2018; Sills et al., 2015; Torfing and Ansell, 2017). The reference to interest groups limited innovation is exclusively in connection to fossil fuel interests and climate policy (Chan et al., 2012; Higdem, 2017; Karapin, 2016a; Middleton, 2014).

This is also only mentioned in articles focusing on the U.S., suggesting that this influence may also be related to governance structures.

3.2.4 Governing factors

Political leadership features heavily across-the-board with regard to all policy areas and regions; it is mentioned as an important factor in policy experimentation in 19 of the reviewed articles. The strength or weakness of leadership is examined throughout different policy areas with the general consensus that strong leadership enables experimentation. The strength of governance and leadership offers a layer of complexity because they have opposing effects. Weak or separated governance (Karapin, 2016a; Pidgeon, 2012; Rafaty, 2018) can reduce policy innovation because its encounters structural obstacles (Karapin, 2016a; Mormann, 2017; Sørensen and Waldorff, 2014), such as multiple veto points as is the case with the U.S Federal structure of government (Karapin, 2016b). However, weak governance can also encourage politicians and entrepreneurial policy makers to introduce new policies because they have felt side-lined in the political process (Torfing and Ansell, 2017), and different aspects of governance can help find avenues for climate policy (Karapin, 2016a). While the literature has identified the adverse effects which both of these components can impose, it has not determined in what context they either influence or bar experimentation.

Policy failure is featured as trigger for experimentation, but mainly in the articles focusing on general policy (Craft, 2017; Dunlop and Radaelli, 2018; Feindt, 2010; Mintrom and Norman, 2009; Strother, 2018) and on health policy (Sherraden, 2002). Here, the logic is that failure leads to policy learning, which in turn leads to the development of more innovative policy.

Administrative and governance structure is the most cited factor in relation to policy experimentation, being highlighted in 33 out of the 52 articles. Government structure is more often referred to as a barrier to policy innovation, with the majority of these focusing on the United States. Whereas, when framed as an enabler to policy innovation, the literature has much more of an even geographical coverage. More specifically, in relation to the governance structure, centralisation or de-centralisation of governance is cited as either an enabler or barrier to innovation, with no clear pattern in relation to whether more centralised or decentralised structures foster innovation. Broadly those studies highlighting the importance of decentralisation suggest that the flexibility that decentralised decision making settings offer allows more scope for policy innovation. By contrast, those advocating more centralised settings suggest that the authority and accountability of the central state allow for conditions of policy innovation. However, context may matter. For example, when we take centralisation in conjunction with location, a clear pattern emerges. Five out of the six articles which favoured a centralisation focus on the United States (Karapin, 2016a; Karapin, 2016b; Mormann, 2017; Newton, 2012; Strumpf, 2002). On the other hand, the literature which viewed de-centralisation to be favourable to innovation were drawn from a greater array of country case studies. Moreover, in China, where de-centralisation is referred to as being a facilitator, it occurs under the shadow of hierarchy (Shin, 2018; Zhu, 2013). However, it is unclear from the literature why this is, or exactly which factors are significant. Therefore, we need to contextualise centralisation to understand why it can either hinder or promote innovation

3.2.5 Collaborative Governance

Collaborative governance through the involvement of multiple actors, from both the private and public sector, in the policy making process is a relatively new concept, with over half 14 pieces of literature mentioning it of the literature having been published since 2016 (Baglioni and Sinclair, 2018; Carstensen and Bason, 2012; Dunlop, 2017a; Dunlop, 2017b; Giest, 2017; Graefe and Levesque, 2010; Higdem, 2017; Hinterleitner, 2018; McGreavy et al., 2016; McKeown, 2016; Mintrom and Norman, 2009; Nair and Howlett, 2017; Sørensen and Waldorff, 2014; Torfing and Ansell, 2017). It is exclusively seen as an enabler to policy experimentation because it promotes new understanding, with innovation labs (Carstensen and Bason, 2012), and helps overcome institutional boundaries, which itself inhibits experimentation (Sørensen and Waldorff, 2014). However, it is unclear from the literature to what extent collaboration should be incorporated into governing institutions to encourage innovation. There is a branch of literature which also incorporates co-creation through direct academic intervention to work with stakeholders to co-create, conduct policy experiments to explore and evaluate and policy learning among the public, stakeholders and authorities to nurture innovative and novel governance and policy approaches (James et al, 2017). Such approaches employ methods such as field trails in which workshops, qualitative interviews and surveys to explore how different policy interventions or treatments (James et al, 2017) can lead to lead to policy learning around different policy outcomes (relative success or failure). This aspect will be further explored during the research in the ULLs.

> **Collaborative governance**
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> Collaborative governance denotes governing through the involvement of multiple public and private actors in the policy-making process, i.e. the different stages of the policy circle. It integrates a core element of mutual learning, deliberation and links to co-creation.

3.2.6 Implications for the analysis in WP6

This section has explored the current literature on experimental policy and in so doing has explored a number of potential barrier and facilitators to policy experimentation. Crucially for WP 6 in REGREEN it has provided a baseline from which to begin our analysis of experimental governance for NBS in the ULLs by highlighting the key units of focus for exploring the success of experimental policy, namely external factors, social factors and governance arrangements. From this basis, we can design our research to explore how these factors influence policy experimentation in the ULLs and also to explore whether NBS present challenges that are unique and are therefore not covered in the existing

> **Experimental governance**
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> Experimental governance denotes innovative approaches to governance and to policy making, which seek to develop novel and at times radically new approaches, strategies, polices aimed at managing a challenging policy area in the perspective of the a common good. Experimental governance relies on high learning capacity in policy institutions and take place in co-creation with other policy makers from other policy areas, citizens and stakeholders, most often at local level, whose roles are dependent of the issue and the issue in focus. Moreover, to integrate the real-life.

literature. Moreover, it provides the foundation for thinking about the co-design and evaluation of experimental policy approaches (T6.2) within the ULLs to help avoid some of the pitfalls that experimental policy making has faced in other contexts.

3.3 Summary

We use a literature study of theoretical approaches and studies of governing architectures and of experimental or innovative governance as point of departure for developing conceptual frameworks in the context of the REGREEN WP6 objectives and of NBS as an emerging, multi-sectoral and MLG phenomenon in public urban governance. The key concepts and relations will be summarized in workable analytical frameworks which systematically structure the collection of data in the ULLs and guide the analysis towards responding to the WP6 objectives. Participation and collaborative governance have been left with open questions. This is due to that the research on especially Task 6.1 will offer help to navigate in the central debates in the participatory governance literature; the intriguing aspects of participatory engagement with citizens and stakeholders are narrowed down when we link to specific city context.

Jointly with REGREEN objectives and the theoretical framework, this is reflected in the criteria that are applied to select the NBS measures for each ULL, which WP6 focusses on. Thus, the NBS measure should represent:

- A specific measure (measure, initiative or project maybe embedded in a wider policy or strategy)
- Provide more than one benefit (solution) for the city which links to urban nature
- Entail participation of stakeholders/citizens (varying types and extent)
- Alignment with the measures that are included in other WPs
- Include parallel solutions, e.g. climate adaptation, across the European and or Chinese ULLs
- Represent different phases of policy cycle: policy agenda → design – etc. → implementation of project
- Be a good example, or a measure that has run into obstacles

Table 1: Criteria for selection of NBS governing focus, example European ULLs

CRITERIA	PARIS	AARHUS	VELIKA GORICA
A specific measure (project)	Greening of schools (Cours Oasis)	Green climate adaptation and regeneration of housing areas	To be determined
Provide more than one benefit (solution) for the city which links to urban nature	√ Engagement of local children, urban gardening, climate adaptation, liveability, citizen access to green spaces	√ Regeneration, climate mitigation, sustainable mobility, biodiversity, recreational green spaces	
Entail participation of stakeholders/citizens	√ Schools, children, pot. local communities	√ Local communities	
Alignment with the measures included in other WPs	√ WP5	(√)	
Include parallel solutions across the ULLs	√ Climate adaptation, biodiversity, liveability	√ Climate adaptation, biodiversity, liveability	
Different phases of the policy cycle: Be a good example, or a measure that has run into obstacles	√ Formulation, adoption, implementation	√ Implementation, adjustment	

This implies that a) being situated in local (urban) governance; b) entailing multiple NBS based benefits; c) entailing participatory engagement; and d) the nature aspects of the measure, are constant across the ULLs, while a) size of the urban context (small, medium, large), and b) stage of the policy circle vary.

4   METHODS APPLIED

In this section, we outline the methods that are applied for data generation in our field studies in the REGREEN ULLs. Moreover, we reflect on how to obtain parallel data from the Chinese ULLs, including the use of existing studies.

Data will be shared among partners, to enable joint analysis for the tasks in WP6, while also respecting the REGREEN ethical guidelines.

4.1   ULLs as case studies

In REGREEN we include cities as Urban Living Labs (ULLs) in order to co-create research results in real contexts, and to disseminate knowledge to public and private actors, for the development of equitable, green and healthy cities. In order to provide data on governance architectures, experimental and adaptive governance of NBS, and institutional learning, our three European ULLs are selected to represent local level NBS-based governance, cities that work with NBS whether in the very early stages or in implementation, and (to varying extend) include citizens and stakeholders in the NBS governance processes. Furthermore, to ensure representation of the major city types in Europe, the ULLs are selected to represent small-medium-large cities.

Compared to case studies, where cities would be examined up-close and in-depth but with no further intervention, the aim of the ULLs is to co-create and experiment and test innovative NBS policy approaches and processes. The objective of the ULL research is to obtain data, develop approaches and test results. A parallel aim in all ULLs, no matter if situated in Europe or China, is to make the research useful for the local (and other level) policy makers, the citizens and other stakeholders living and working in the ULLs.

The term "Living Lab" has emerged in parallel from computer sciences, more exactly from ambient intelligence and on the other side from the discussion on experience and application research (EC, 2004). William J. Mitchell, Kent Larson, both architects and Alex Paul "Sandy" Pentland, a computer scientist, all working at MIT, are accredited the exploratory concept of a Living Laboratory. Living labs denotes a user-centric research methodology for sensing, prototyping, validating and refining complex solutions in multiple and evolving real-life contexts.

Also the European Network of Living Labs (ENoLL) defines Living Labs (LLs) as "user-centred, open innovation ecosystems based on systematic user co-creation approach, integrating research and innovation processes in real life communities and settings" (ENoLL, 2020). Others stress how the aim is not only to learn from the experiences in the particular lab environment, but also to replicate specific innovation in real life (Franz et al., 2015; Juujärvi and Lund, 2016), for example policy innovations. This emphasis on a formalization of knowhow to be disseminated and applied in another context is the key point which distinguishes living labs from other policy experiments. (Evans and Karvonen, 2014, cited in Steen and van Bueren, 2017).

Contrary to Living Labs, "Urban Living Labs" have, according to Steen and van Bueren, 2017 an "explicit territorial focus on finding local sustainable solutions addressing wicked problems that tend to be

global, such as climate change and energy transition". This reflects the aim of REGREEN as seeing cities as an important governance level, also for sustainable development.

In Europe, in order to provide data on governance architectures, experimental and adaptive governance of NBS and the governance of institutional learning, the three ULLs were selected to represent local level NBS-based governance as well as to represent small, medium and large cities, to ensure the representation of the major city types in Europe. They all work with NBS but in different stages.

In the early stages of REGREEN, the six different ULLs in Europe and China are established and procedures for interaction on research activities are planned, including the identification and definition of concrete NBS activities. For WP6, this means that in this phase, the different systems of governance work at the city level in each of the ULLs and the impact this has on the capacity of cities to include NBS-based approaches, tools and measures that are being examined.

4.2 Policy document analysis

Policy document analysis is a main method for data collection in Task 6.1 and Task 6.2. Policy documents are in principle part of the policy making process; they are thus to be seen as political statements (Birkland, 2001; Knill and Tosun, 2008). Thereby, the rationale, or logic, of the how cities govern, work with and increasingly integrate NBS in urban policy and planning will be reflected and is represented in a way that is political. Thus, through examining key aspects of the text, we can specify the rationale, framing, actors and measures of the policy (Bowen, 2009), and thus gain access to the governing architecture and experimental governance.

We use a common matrix across the ULLs for examining the policy documents, which ensures a systematic approach to specify data in the policy documents. The matrix is structured according to theoretical framework for the two tasks. The matrix focusses at a generic level on the key dimensions of policy integration, including i.e. identifying the (proxies for) framing the issue, objective and rationale of the policy, included sectors, and implementation, while also being sensitive to specific features of the national governing systems. The key aspects follow those that are discussed and specified in the concepts note. Thereby the screening matrix mirrors the interview guide and the matrix for analysing the interview data (please see section 4.3). Through developing the screening matrix for analysing the policy documents in parallel to the screening matrix used for the interview texts, we produce data with similar focus, however covering two different aspects of the policies that we analyse; the policies as political statements and part of the policy making process (through the policy document analysis), and the perceptions, processes and experiences of and with policies as process and based on a specific logic of governance (in the interviews).

4.2.1 Selection of policy documents

Based on the conceptual frameworks outlined above, the policy documents are selected according to the ULL methodology and the multi-level perspective, i.e.:
- Strategies/policies/measurers published in the ULLs that address governing structure, culture and selected NBS-based strategies/polices/measures (please see section 4.1)

- On a supplementary basis, policies published at EU level and national level that are significant and linked to the urban policy/strategy/measure investigated
- Snowballing

The number of included policy documents vary among ULLs and there is a need to balance the need for sufficient detailed knowledge against identifying the most significant documents.

The included policy documents are listed with full references in a table, which can later be used for references and which serves to document the policy document analysis. This implies that also policy documents, which were initially included but which on closer reading are not deemed to be relevant, are listed in the table and marked as 'not relevant'.

4.2.2 Screening matrix

The document texts are coded in a screening matrix that singles out the key areas of the analysis, according to the objectives and the analytical framework. Through developing the screening matrix for analysing the policy documents in parallel to the screening matrix used for the interview texts, we produce data with similar focus, however covering two different aspects of the policies we analyse. To enable comparison, all ULL studies will use the same screening matrix. This will however be adapted to the Chinese context for the Chinese ULL studies. Moreover, to entrust the data with its own voice, it is significant to also be attentive to topics, dynamics, etc. emerging in the documents, which was not anticipated beforehand.

4.3 Qualitative face-to-face interviews

Qualitative semi-structured interviews are the second major method for data collection in task 6.1 and task 6.2. For each ULL we will conduct interviews with policy makers and stakeholders. In accordance with objectives 1 and 2 of our WP 6, the aim will be to assess how the governance system works in urban areas and whether or not it allows the advent and implementation of NBS. These interviews will enable us to identify the characteristics of governance that influence governance architectures and processes, including participatory and experimental NBS based policy development and implementation of NBS, taking advantage of the fact that *"[t]he aim semi-structured [interview] is to construct a flexible framework of questions, which reflects the questionings of the problematic and hypotheses in concretes questions, formulated simply, to be put to the interviewer."* (Alami, et al, nd:84).

4.3.1 Interview methodology

We use open-ended, semi-structured and dialogue oriented interview approach (Kvale and Brinkmann, 2008; Knox and Burkard, 2009; Seidman 2013, Alami et al, n.d.) for collecting data. These interviews are qualitative, in-depth, face-to-face, semi-structured empathic interviews that focus on meanings, perceptions, events, experiences of the interviewee. Additionally, factual information on tacit or local knowledge can be gained during the dialogue.

Initially, policy documents in the relevant areas will inform the preparation of the interviews, while the interviewee may be encouraged to recount aspects of the policy documents in order to gain insight into how the topic evolved or was managed by actual policy makers. The policy documents are subject of a parallel analysis that focuses on the same topics as the interviews.

A thematic interview guide rather than a set of predefined questions structures the interviews and ensure that the interviews produce the data (Kvale and Brinkman, 2008). The interview guide is based on the theoretical framework for task 6.1 and tasks 6.2, i.e. governing architectures and experimental governance and policy development form the basis of the interview guide. However, "[t]he interview guide remains a flexible framework" (Alami et al. n.d.:86). All ULL studies use a joint and similar interview guide in which specific details may be added in order to adapt the screening matrix to the national context and the interviewee.

Interviews may be conducted by one to two researchers. Interviews have the form of dialogue which the starts with the interviewee introducing her/himself professionally, and the first topics to engage with should concern the daily work of the interviewee in order for her/him to enter a relaxed and open mindset. All ULL studies will use the same basic interview guide, which is subsequently adapted in a limited sense to national and/or local contexts, and the interviewee. Using the joint interview guide is instrumental for producing data, which can feed into the comparative analysis.

4.3.2 Selection of interviewees

Interviewees comprise policy makers who work with nature and the challenges to which urban nature may provide a solution and/or qualify policy interventions, including social challenges, and related public policy issues on a regular (daily, weekly or similar) basis. Moreover, interviewees include NBS stakeholders selected in each ULL (public and private actors), to better understand their role and position; and identify to what extent they are direct or indirect actors in the governance of the territory in which their project is located.

Interviewees are selected in the policy sectors in which NBS of the particular measure is considered and/or beneficial and/or meet resistance or negligence in the ULLs and are due to the multi-level governance character of NBS policy supplemented with interviewees at national and regional levels of governing when relevant.

4.3.3 Analysis of interview data/transcripts

All interviews are recorded, after explicit agreement with the interviewee, and are transcribed. If transcription is impossible, key sections of the interview are identified and transcribed, noting the time in the recorded interview file. After each interview, a very short note (app 5-15 lines) is written on the key issues that implicitly or explicitly were discussed or mentioned during the interview, or prominent issues or events not anticipated, or the impressions of the interviewer of the interview dialogue/the interviewee.

The interview texts are coded in a screening matrix that singles out the key areas of the Task 6.1 and Task 6.2 analyses, according to the objectives and the analytical framework (Kvale and Brinkman, 2008; Fereday and Muir-Cochrane, 2006). Moreover, to entrust the data with its own voice, it is

important to also be attentive to topics, dynamics, etc. emerging in the interview, which was not anticipated beforehand. The team uses a similar screening matrix for analysing the policy documents. To enable comparison, all ULL studies uses the same screening matrix.

4.4 Workshops

In the European ULLs, workshops (see James et al 2017) with relevant stakeholders will be conducted to co-create research approaches aimed at investigating experimental and innovative governance in Task 6.2. The objective of conducting the workshops are to:

- Understand the factors that have helped and hindered them pursuing experimental policy approaches for NBS in their cities, through facilitated focus group interactions
- Develop criteria and processes for evaluating existing experimental NBS policy approaches in a workshop format
- Design and evaluate experimental NBS governance approaches in a series of co-production workshops

In the Chinese ULLs, it is difficult to establish how the workshops might operate given the scaled down focus on China. It is clear that at a minimum, workshops could be used to explore the baseline factors that hinder or help the development of experimental policy approaches in the Chinese ULLs as well as China more widely.

A final workshop involving stakeholders from both Chinese and European ULLs would allow for dissemination of the findings on experimental learning in the ULLs and in so doing would allow for a co-productive approach for drawing policy relevant lessons for the transferability of the research findings to other contexts (countries, scales, cities, governance structure) as we investigate in Task 6.3.

4.5 Survey among cities

A survey among European cities is conducted in order to identify the scope for urban NBS which cities can integrate in urban governance and adapt to city-specific circumstance. The aim is to identify which NBS are presently used or are planned across cities in Europe and will involve approximately 200 cities, representing small, medium and large cities. The survey is potentially extended and adapted to also include a sample of Chinese cities, while this is dependent on availability of data and respondents.

The survey is developed on the basis of the analytical framework presented here, in particular NBS, governing architectures and adaptive governance, and on the ongoing findings from Task 6.1 on Urban NBS-based governing architectures, and Task 6.2 on Experimental and adaptive NBS-based governance. WP6 will collaborate with WP2 in selection and engagement of the cities. Results are integrated in Task 6.3 that aims to investigate policy learning across and also inform Task 6.2.

4.6 Status and position of Chinese ULLs

Baseline data from the Chinese ULLs will mainly cover document analysis and supplementary interviews. In China, due to the difficulties with funding and the situation with the Corona virus, the extent of work with and accessibility of data in the ULLs is still uncertain. ULLs in China are placed in Beijing, Shanghai and Ningbo.

The tentative focus of the governance study follows broadly the selection criteria outlined in section 3.1. In Beijing, the focus of NBS will tentatively be on locating trees near pollution sources and increasing the storm water retention capacity of existing and planned tree planting sites. In Shanghai, the turning the city into an "Ecological City" by constructing and protecting the green land, forestland, and wetland across Shanghai may provide a suitable focus. In Ningbo, the monitoring of ecological, social and economic impacts of dams and the artificial beach and the establishment of new green-blue infrastructure on Meishan Island offer tentatively a useful measure for the WP6 study.

4.7 Summary

Through engagement with the REGREEN ULLs and academic literature, we examine the governance systems and cultures (architectures), adaptive and experimental governance, and policy learning of cities that include, or plans to include, NBS in their management of major urban challenges. The latter include environmental, social and economic challenges, and links NBS directly or indirectly to sustainable transitions, thus also considering issues such as social equality, business innovation, etc. The ULLs are at situated at local/urban level of governance while the NBS based policies, measures and initiatives targeted in the study is situated in a multi-level governance context, i.e. interact with policy making and governance at regional, national, European and international level of governance. Policy and governance at other levels will thus be included in examination of urban NBS policies, measures and strategies when relevant.

Research is based on jointly developed conceptual and analytical frameworks for each task. The frameworks are developed on the basis of review of relevant literature and applied across the ULL studies to ensure common findings and comparable data. Data is produced and collected using mixed methods. Focus is on perceptions, experiences, behaviour, processes and systems of governance at urban level and how NBS is included in this and change processes, practices and framings of policy making and planning. Thus, data collection has emphasis on qualitative methods: qualitative semi-structures in-depth, face-to-face interviews, qualitative structured and coded policy document analysis, and co-creative development and design workshops. These methods are combined with a quantitative survey among European (app 200) and Chinese (as far as possible) cities and statistical analysis of results.

5 THE REGREEN ULLS IN NBS GOVERNANCE OF CITIES

This section provides a short introduction to the ULLs from a WP6 perspective, and outline their position in the co-creative governance studies. The governance research of WP6 focuses the research in the REGREEN ULLs on the level of urban governance, as these are situated in the regional, national and European levels of governance. Therefore, the ULLs included are Paris Region where we focus on the City of Paris, the City of Aarhus and the City of Velika Gorica in Europe, and the City of Beijing, with the City of Shanghai and the City of Ningbo pending, due to the early stage of REGREEN. Also due to the early stage of REGREEN, the ULL descriptions and interactions will be elaborated and adjusted as the research and collaboration with the ULLs develop. Therefore, the descriptions presented here vary accordingly in detail and length.

5.1.1 The City of Paris

The City of Paris is located in the Paris basin, on a loop of the Seine, between the river's confluence with La Marne and l'Oise, it has 2.2 million inhabitants and it is divided into 20 arrondissements. Paris is part of Ile de France, the capital region of France, with about 12 million inhabitants or 18.2% of the population of France. In 2012, the municipality of Paris conducted a diagnostic study, which predicts the following major climate hazards for the coming years: 1) Hotter summers and more frequent heatwaves compounded by the UHI effect; 2) floods caused by Seine overflowing its banks or by rainfall runoff after heavy rains; 3) droughts that can impact water resources, and 4) the conservation of biodiversity (Mairie de Paris, 2015). Based on this, the municipality decided to enhance sustainable city planning by 'allowing a greater place for water and nature in the city' (Mairie de Paris, 2015). Since then, the City of Paris has updated and developed several environmental policy documents under the umbrella of the 'Paris Climate Action Plan' (i.e., The Adaptation Strategy, The Resilience Strategy, The Paris Rain Plan, The Biodiversity 2018-2024 plan, etc.). The 'Paris Climate Action Plan' includes 500 comprehensive climate measures and holds a 2050 vision of Paris as a carbon neutral, resilient and inclusive city based on 100% renewable energies. (City of Paris, 2018).

The climate change adaptation measures highlighted in the climate plan include a mix of engineering and NBS. The most emphasised NBS is greening the city within the mayor's current term office. This is done also through promoting green roofs and walls, and increasing the number of planted trees, parks and gardens to reduce urban heat islands and flooding events (DICOM, 2020). Moreover, Paris is creating ecological corridors to conserve and enhance biodiversity. The City also aims to increase soil permeability in the city. A key project which head in this direction is the 'Cours Oasis', whose purpose is to replace asphalt Paris school yards by vegetation to create 'fresh islets'. Furthermore, the City of Paris aims to develop blue areas for recreational purposes and natural water management, for example, through creating 'rain gardens' with ponds to mitigate runoffs. Finally, social cohesion, boosting solidarity and active participation values are mentioned in almost all Paris environmental policies, and are reflected in some projects, such as creating community gardens for social housing inhabitants (Mairie de Paris, 2015).

This suggests specifically awareness raising and education with children and adults including both the public, professionals and elected representatives as a useful ULL study focus. Focus in the REGREEN governance study is on biodiversity and ecosystem knowledge and processes that may stimulate the

switch from landscape-based design to nature-based design. With children, this may entail children's knowledge and awareness of nature as a vital resource for urban living, working with the Natural Museum National D'Histoire Naturelle (MNHN), one of the world's major natural history institutions and contributes to the knowledge and conservation of biodiversity.

5.1.2 The City of Aarhus

The City of Aarhus is a medium-sized city located on the east coast of Jutland and is Denmark's second-largest city with 340,000 inhabitants (Sekretariatet for Klima og Grøn, n.d.). The major climate hazards that Danish municipalities face in the coming years are an increase in rainfall, wind and extreme weather events, as well as higher water levels, and the City of Aarhus is working to adapt to more intense rainfall and raising sea levels, to avoid the anticipated increase in flooding events. (Ministry of the Environment and Food of Denmark, 2014). Since 2008, the City has developed several environmental policies and plans (e.g., the Wastewater Plan 2011, the Climate Adaptation Plan 2014, the Climate Strategy). Specifically, the Climate Plan 2016-2020 contains 50 initiatives to achieve the vision of making Aarhus a CO2 neutral city by 2030, through promoting active participation and social responsibility (City of Aarhus, 2017).

The City of Aarhus aims at enhancing sustainable urban planning and has already initiated several NBS projects. For instance, lakes, wetlands and ditches are being implemented to collect and drain water in order to slow runoff after heavy or prolonged rainfall events. Moreover, local blue spaces are expected to provide recreational areas around the city (Aarhus Kommune, 2019). The City of Aarhus is also promoting citizen-driven projects, such as creating 'garden communities' and 'green streets' to increase the amount of urban green spaces and enhance social cohesion. Furthermore, different pasture species have been introduced to preserve biodiversity and stimulate the self-regulation of natural areas. (Sustainia & Realdania, 2018). Moreover, the City aims to achieve a doubling of the areas of 'natural beauty' around the city. For instance, forestation is expected to protect the groundwater, improve carbon absorption and increase the recreational value of the area, with the additional aim of ensuring all citizens access to natural areas in the city outskirts to increase liveability and reduce the recreational impact on the woods (Aarhus Kommune, 2019). The NBS governance study in the Aarhus ULL departs from the strategic approach to placing NBS at the core of the Climate Plan (jointly with grey measures), and examine and trace the changing governing cultures, processes and structures, including innovative processes and participatory engagement with stakeholders, which NBS foster and rely on.

5.1.3 The City of Velika Gorica

Representing a small town with about 63,500 inhabitants, The City of Velika Gorica in Croatia is located in the proximity of Zagreb and hosts the metropole's airport. The work with NBS governance is in a rather early stage but could research innovative approaches to for example forestry on the rim of the city, installation of solar panels on the green roofs, incubation of "green" start-ups in Velika Gorica's new business incubator and the participation of citizens.

5.1.4 The City of Beijing, China

Beijing is the capital city of China. The city has a land area of 16,410 km^2, and a typical continental monsoon climate. Beijing has gone through a rapid urbanisation process in the past four decades. Beijing's permanent population has increased from 13.8 million in 2000 to 21.7 million in 2016 while the built-up area has increased from 488 km^2 in 2000 to 1400 km^2 in 2016. Urban green space accounts for about 821 km^2, corresponding to 21 m^2 per inhabitant. By the end of 2015, there were 339 registered municipal parks with 290 of them providing free access to the public. Beijing municipal government initiated a mega urban greening project in 2012. In the first phase of the project, 54 million trees were planted on 6,700 ha of land between 2012 and 2016. The second phase of the project started in 2018 and 600 ha of new tree plantations will be added in 2018.

High population density, rapidly expanded built-up areas, and increased private car ownership have contributed to severe environmental pollution and traffic congestion problems in Beijing, which have challenged liveability in Beijing. In 2013, only 176 days were classified as days meeting air quality standards. In addition, increase of flash flooding and heat island intensities are other negative impacts resulting from climate change and the rapid urbanisation in Beijing.

In the most recent City Master Plan (2016-2035), approved and adopted in 2017, Beijing has made "building an international, harmonious and liveable city" as its core vision of urban development in the next two decades. The Plan sets out a series of measures to incorporating nature in the urban living environment, including increasing the number of community-scale public green spaces and parks, building a city-district-community system of green corridors across the municipality, and improving the water system, forest protection, public parks and green spaces to enhance the overall liveability of the city.

5.2 Summary

The cities represent different sizes, e.g. the European ULLs from small (Velika Gorica) over medium (Aarhus) to large (Paris region) urban areas, and moreover represent different stages of working with NBS in the public policy and governance, from very early plans (Velika Gorica), over experiences with developing and designing (Paris region) to implementation and on-going development through also feedback (Aarhus). The Chinese ULLs also represent different size and maturity of NBS governance.

6   ANALYSIS

To be able to perform a joint analysis across data from the ULLs, we use similar guides for conducting the methods, i.e. criteria for selecting the policy documents to be included and matrixes for analysis of policy documents. Since the cities are different and have different governance systems and cultures, and are placed in different national contexts, these general guides are adjusted to enable the capture of significant dynamics and aspects. When following the same general joint outline in the studies in the ULLs, we produce compatible data and can draw conclusions across the ULL studies, which strengthen our findings significantly.

7   LITERATURE

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