

Raysa França

NATURE IN NATURE-BASED SOLUTIONS:
Understanding the discourses of nature in the UNaLab
project in Tampere, Finland

Abstract

Raysa França: Nature in nature-based solutions: understanding the discourses of nature in the UNaLab project in Tampere, Finland

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Discourses, actions, narratives, and solutions that deal with challenges in cities posed by the climate crisis have been increasingly integrated into the governance of the urban space, such as the case of nature-based solutions (NbS). This thesis focuses on nature-based solutions through one specific project, the UNaLab (Urban nature lab), an urban living lab that implemented NbS in the city of Tampere, Finland. The present thesis is an exploratory case study that investigates the meanings of nature expressed by the discourses of implementation of the UNaLab project through discourse analysis.

Data were generated from five (5) semi-structured interviews, one (1) focus group, one (1) participant-observation visit in one of UNaLab's events (invasive species workshop), and six (6) blog posts. This research identified five (5) dimensions in the literature review as relevant for the data analysis. The dimensions were knowledge, stakeholder engagement, co-creation, biodiversity, and sustainability. The study addresses multiple gaps in the scientific literature of NbS. First, it brings social and community perspectives to the NbS literature by focusing on discourses and social understandings around nature. Secondly, it contributes to building a body of knowledge on what is understood as nature in NbS, which so far has been a weakness in the definition of NbS, despite being a core category of the concept. Third, studies like this one that investigate discourses of implementation are rare. Finally, this thesis fills a gap in policy studies that analyse mainly written text by integrating data from interviews, a focus group, and a participant-observation visit.

The findings indicate that there is no clear and unified understanding of nature across the UNaLab implementation discourses. Whereas some discourses expressed cartesian meanings of an objectified reality, other discourses highlighted nature's imaginaries as kinship and ancestry. Some discourses echoed a technocratic discourse over the management of nature, which prescribes a technical treatment over the definition of problems around NbS. The findings indicate that meanings and views of nature go through a process of projectification, which filters the worldviews and meanings of nature.

This study makes significant theoretical contributions by supporting ideas that are explored in existing literature, such as the challenges of implementing solutions derived from a "boundary concept". This study also contests some points made in the literature, for example, that replicate conceptualisations of NbS from global organisations without reflecting critically on their meanings. New perspectives were also contributed through this study by exploring how discourse analysis could consider the agency of nature beyond humanity and by offering some pathways for governance with concrete recommendations. Finally, this study highlights an unexplored area in the literature, more specifically, the significance of bringing social sciences into exploring governance aspects that relate not only to traditionally "social" factors, such as communities and societies but also to contribute to the knowledge of nature.

Keywords: urban living labs, nature-based solutions, discourse analysis, urban governance, meanings of nature, urban nature, implementation discourses

The originality of this thesis has been checked using the Turnitin OriginalityCheck service.

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List of abbreviations

CDA: Critical discourse analysis

DA: Discourse analysis

EC: European Commission

EU: European Union

ES: Ecosystem Services

IUCN: International Union for Conservation of Nature

NbS: Nature-based solutions

UNaLab: Urban nature lab

VTT: Technical Research Centre of Finland Ltd.

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It takes a village to write a master's thesis.

1. INTRODUCTION

As soon as the weather got warmer in the spring of 2021 in Vuores, Tampere, edible gardens flourished with the flowers and the green leaves. Besides feeding humans and city rabbits, these gardens, financed by public money, also had an essential role in the urban landscape (UNaLab, 2019). Berries, apples, gardeners, soil microorganisms, bees, and tomatoes were more than agents; they were partners, or even kin (Haraway, 2015), helping the soil become more resilient to unusual periods of rain and drought, and, most of all, allowing citizens and city planners understand, design, and think on what type of cities we want to live at.

The edible gardens of Vuores are contrasting to the modern grey infrastructure and the homogeneity of residential constructions in the area. Contrasting to these engineered manifestations of urban development, the urban gardens shaped the urban landscape with sites for citizens to rest, play, and eat. Through nature, residents and communities were able to fabricate their surroundings, co-create the urban space, and influence the composition of a city (Winkler et al., 2019).

This short chronicle introduces the complexities of sustainable solutions to urban development. Cities are sites for global environmental and social crises and, simultaneously, as spaces with resources to advance the sustainability agenda. (Gadda et al., 2019; Kaur & Garg, 2019). With climate extreme weather events posing challenges to cities (IPCC, 2014), discourses, actions, narratives, and solutions to the mentioned crises have been increasingly integrated into the governance of the urban space, such as the case of urban edible gardens.

Examples of concepts that aim to offer tools and solutions to these challenges, as well as that elaborate on the links between city and nature, are resilience, circular economy (CE), ecosystem-based adaptation (EbA), urban forests (UF), ecosystems services (ES), smart cities, green infrastructure (GI), nature-based solutions (NbS) and many more (Dorst et al., 2019; Scott et al., 2016; Angedeliou et al., 2019; Pandit et al., 2017). These concepts share a vital premise: all of them, to some degree, are associated with governance visions for urban sustainability, and in many cases, they also appear combined in policy papers and strategies for sustainable urban development (Dorst et al., 2019; Scott et al., 2016; Karvonen, 2010; Galeeva et al., 2014; Laforteza et al., 2018; Chowdhury et al., 2020).

This thesis focuses on one of these concepts: nature-based solutions (NbS). NbS are conceptualised as solutions that work with nature and mimic nature or natural processes to benefit people, the economy, and the environment (Seddon et al., 2020). According to the Union of Conservation of

Nature (IUCN), NbS are “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” (Cohen-Shacham et al., 2016, p. xii).



Figure 1 - Natural paths implemented in Berlin, Germany (20 Green Walks in Berlin, n.d.)



Figure 2 - Refurbishment of the Clausplein square, in Eindhoven, Netherlands (Green square Clausplein, n.d.).



Figure 3 - Tree corridors in Medellin, Colombia (Magdelenat, C. 2021)



Figure 4 - Rainforest recovery in an urban area in Salvador, Brazil. (Magdelenat, 2021)



Figure 5 - Biofilter to manage stormwater in Tampere, Finland (City of Tampere, 2019)

Examples of nature-based solutions in the urban landscape include the restoration of ecosystems, urban socio-ecological corridors, green roofs, improvement of recreational areas, the transformation of grey surfaces into green surfaces, urban gardening, urban forests, river restoration, and rainwater

management (City of Tampere, 2019; 20 Green Walks in Berlin, n.d; Magdelenat, 2021). The images (figures 1-5) below are photos of NbS implemented in cities around the world, and they illustrate how NbS can look in practice in the urban environment:

NbS are considered reasonable solutions for sustainable urban development due to their promise to address mitigation and adaptation of climate challenges while ensuring the well-being and participation of local communities (Eggermont et al., 2015; Albert et al., 2019; IUCN, 2020; Seddon et al., 2020). Furthermore, from an academic perspective, NbS have considerable relevance in literature due to its ‘umbrella’ attributes. The concept integrates and encompasses previous ‘urban greens’ ideas, such as urban forest, ecosystem services, and green infrastructure (Dorst et al., 2019). Furthermore, NbS are increasingly gaining attention at the international level as suitable solutions for sustainable urban development.

In this context, even though “nature” is the very basis of the conceptualisation of NbS, and despite the concept being significantly researched (Nesshöver et al., 2017) and engaged by a myriad of actors from different sectors (Welden et al., 2021), little is discussed on what ‘nature’ means in nature-based solutions (Fernandes & Guiomar, 2018; Nesshöver et al., 2017).

Considering this, I investigated the discourses of the implementation of NbS in one urban territory, Tampere, to analyse how implementation discourses express different meanings and views of nature. In Tampere, nature-based solutions have been implemented through UNaLab, an acronym for “Urban nature labs”. Urban living labs, such as the object of this study, are experimentations in real-life city environments characterised by citizen participation and public-private partnerships (Collins et al., 2021). According to the European Network of Living Labs, living labs are defined 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, 2018, What are living labs section, para. 1).

The introduction chapter is structured as follows. First, I introduce the reader to the research aims and questions of this master’s thesis. After that, I offer a brief description of the UNaLab case, the case study analysed for this thesis, together with a contextualisation of Tampere, where the case takes place. Finally, I present the significance of the study, together with the research structure.

1.1. Research Aims and Research Question

The very idea of a “nature-based” solution indicates contraposition to “artificial”, “non-natural”, “engineered”, “societal”, or even “technological” types of solutions, contexts, and situations (Fernandes & Guiomar, 2018). To this effect, for Nesshöver et al. (2017), one of the central challenges of a concept such as NbS is to understand what is considered as “natural” or “nature”.

It is remarkable that even though “nature” is a central concept to nature-based solutions, global institutions and reports that push NbS as a framework for global sustainability do not clarify or express what is understood as nature and how these understandings are constructed collectively through language. This is visible, for example, in the IUCN Global Standard for NbS (2020) or the “Evaluating the impact of nature-based solutions” report by the European Commission (2021a). Neither of them addresses the meanings, conceptualisations, and shared understandings of nature in nature-based solutions. In both documents, nature is illustrated as a given and universal reality. Potschin et al. (2014) briefly explain what nature stands for in NbS, and for them, it is an aggregate of both individual elements of biodiversity and ecosystem services. They do not discuss how they came to this definition in the report or how this definition is collectively constructed.

When international reports of NbS address the diverse meanings of nature, their discourses usually lack clarifications on the link between meanings of nature and the implementation of NbS. The European Commission’s information on biodiversity and nature-based solutions (2020), for example, takes a positive step in discussing what nature means by introducing the concept of biocultural diversity to describe the different possibilities of the relations between humans and their natural environment. However, the reports’ descriptions of cultural biodiversity are presented in silos and are not connected further to the implementation of NbS.

Similarly, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) produced a global assessment report on biodiversity and ecosystem services (IPBES, 2019), which addressed NbS in centrality. In the first chapter, the report describes the different possibilities of meanings of nature for other peoples and cultures worldwide. Despite these efforts, the chapter’s content is not further connected to the implementation of nature-based solutions. The implications of these meanings for governance are not clearly linked or established.

In academic research of NbS implementation in urban contexts, the construction of nature through discourses has not been a priority for scholarly investigation. Krauze & Wagner (2019), for example,

highlight the importance of establishing ecological context to the implementation of water management nature-based systems without exploring how language is used to describe nature in NbS. Krauze & Wagner (2019), on the other hand, affirm that NbS will only succeed in the urban landscape if the ecological contexts are fundamentally defined. The authors, however, do not explore how language discursively constructs the ecological contexts that support the implementation of NbS.

Taking this into consideration, this research is a step forward into discovering how discourses of implementation construct the meanings and ideas of nature in a specific case, by which experimentations of NbS were implemented in an urban environment in the city of Tampere, Finland. Therefore, the research question of this master's thesis is: **How do the implementation discourses of the UNaLab project, realised in Tampere, Finland, express and construct different meanings and views of nature?**

To answer this research question, this study intends to examine, through discourse analysis, how the implementation discourses of the UNaLab project express and construct different views and meanings of nature. An exploratory design for a case study (Creswell & Poth, 2016) was chosen to set grounds for future research. As for how nature is understood in the governance of nature-based solutions have been little explored in the study; together with the fact that nature-based solutions are an emerging concept (Dorst et al., 2019) in policymaking, it was believed that novel themes might emerge that could require further exploration, hence, why an exploratory approach. In this, a social constructionism approach is coupled to an exploratory case study design.

The generation of data and the research design are further described in the Methodology chapter.

1.2. Case Contextualization

This thesis aims to provide a social constructionist approach to the discourses of implementation of nature-based solutions in one specific project, the UNaLab project in Tampere. In this section, I describe the objectives and aims of the UNaLab project delineate the city context by which the experimentation occurs.

1.2.1. The UNaLab Project: Experimenting with NbS in Tampere, Finland

From 2017-2019, in partnership with the VTT Technical Research Centre of Finland and funded by the European Commission (EC), the municipality of Tampere, Finland, has implemented NbS experiments in two neighbourhoods - Vuores and Hiedanranta. The UNaLab project had the goals of adopting and developing nature-based stormwater management for floods and pollution, monitoring the performance of NbS, developing administrative processes, and finding nature-based business models. The project is still active, but most of the UNaLab demonstrations in Tampere have already been implemented (Ril, n.d.).

The two sites for the UNaLab experimentations are neighbourhoods where intense growth and development take place. Vuores, for instance, is located 7 kilometres from the city centre, accommodating approximately 5000 residents. Its construction process started at the beginning of the 2000s. The city plans on growing the area to grow by 115 000 residents by 2025 (Tamminen, nd). Vuores is the main location where the experimentations took place, especially around Vuores Central Park.

Hiedanranta, on the other hand, is a “ghost” from Tampere’s industrial past. It is an area owned by the municipality, which served as a space for pulp mill industries and paper processing. Hiedanranta is closer to the city centre than Vuores. Its territory offers a different site for experimentation, as by the time the experiments began, no residents were living there. In the next 30 years, ambitious city plans include building housing for 25 000 people. (Särkilahti et al., 2019). Currently, Hiedanranta is characterised by rising spontaneous citizen engagement, focusing on artists and business innovation. However, citizen activities are at risk of being only temporary due to the developmental nature of the neighbourhood (França et al., 2021).

Three co-creation workshops were organised by the City of Tampere in spring 2018 in both areas where citizens could suggest and brainstorm on nature-based solutions ideas to be implemented at Vuores and Hiedanranta through UNaLab. In total, there were six workshops, with a total of 258 participants. Besides the co-creation workshops and community events, an online survey, biofilters, presentations, events, and trainings were executed. Besides these actions, signs with explanations on the NbS were also installed on the experimentation sites. Finally, innovation vouchers, which provided funding for citizen-led initiatives, were implemented by which urban gardening and a horse paddock were developed. The project’s aim is described as the goal “to develop smarter, more

inclusive, more resilient and increasingly sustainable societies through innovative nature-based solutions”. (UNaLab, n.d., section about UNaLab, para. 1).

The figures (6 & 7) below demonstrate two solutions that were implemented in the scope of UNaLab: an information sign with explanations on invasive plant species and how to remove them, as well as alluvial meadows, both in Vuores Central Park.



Figure 6 - Explanatory UNaLab sign, nearby Vuores Central Park



Figure 7 - Water management area / Flood field at Vuores Central Park

1.2.2. The City of Tampere

Powered by the powerful waters of the rapids, the city of Tampere, in Finland, grew in the XVIII century to become one of the industrial centres, receiving the nickname “Manse” in reference to Manchester. Since the 1990s, Tampere has gone through a deindustrialisation process, by which most of the old factories have moved to other areas. From that, Tampere rearranged its economic identity around services provision, the ICT sector, and knowledge. (Kankaala et al., 2018).

The growing population of around 300 thousand people is distributed across different areas in the city, divided between streets, parks, local vegetation, lakes, and buildings. Tampere is a city with considerable rainfall; it has cold winters, with average temperatures ranging below 0 °C, and snow coverage lasting between 4 and 5 months on average (Climate-data, n.d.). Tampere is the second biggest urban centre in Finland, and its urban development is characterised by imaginaries and visions

of economic growth and competitiveness (Davoudi et al., 2020). The figures (8-13) below illustrate the diversity of landscapes in Tampere, intending to offer a visual contextualisation to a reader who is not familiar with the urban landscape of the city and the balance of nature and city.

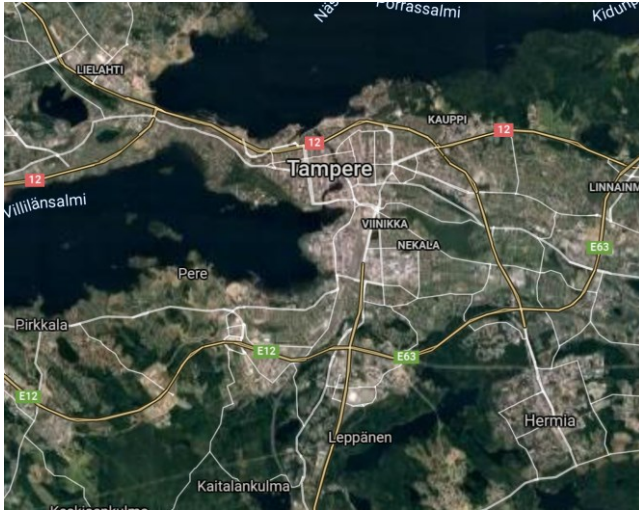


Figure 8 – Map of Tampere (Google, n.d.)

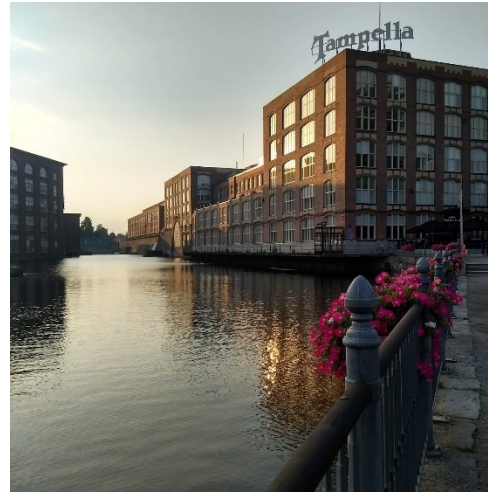


Figure 9 – Tampere rapids in the city centre (Tammerkoski) in Autumn 2019



Figure 10 - Lake Näsijärvi in winter 2020



Figure 11 - Petsamo residential area, near the city centre, in Autumn 2021



Figure 12 - Niemenranta residential area, further from the city centre, in Winter (Langel, 2021)



Figure 13 - City centre and train station, in summer 2021

In Tampere, the natural weather conditions are changing, and there are expectations for fast changes in the following decades due to the climate crisis. In that, hot periods will be more common, freezing temperatures will become less frequent, and maximum temperatures will increase. It means, in practice, that snow days will be shorter, snow cover thinner, and higher precipitation are expected to occur. (Ministry of Agriculture and Forestry, 2014).

These changes, such as the deindustrialisation experience in the 1990s, pose challenges to the public administration on expanding housing in a “sustainable” manner while creating and maintaining infrastructure that mitigates climate change adapted to climate-induced extreme weather events. The UNaLab project aims to experiment on solutions to some of these challenges through NbS (UNaLab, n.d.).

Taking these contextual aspects into consideration, table 1, which is presented below, summarises the case description:

Table 1 - Case description

Aspects	
Case	UNaLab (Urban Nature Lab), an urban living lab implemented in Tampere
Location	Tampere, Finland, Europe
Characteristics of the city	Growing urban population, weather changes due to the climate crisis

Scale	City districts: Vuores and Hiedanranta
Implementation	An urban living lab for multi-actor creation of nature-based solutions
Experiments	Co-creation workshops, stormwater management, events, communication activities, innovation vouchers, education, research
Problems to be solved	Extreme climate weather events (climate adaptation), citizen engagement, preservation of local biodiversity

1.3. Significance of the Study

According to Maxwell (2008), three goals can help define the significance of a study: personal goals, practical goals, and intellectual goals. Considering this, the significance of the study will be described considering these three dimensions: personal, practical, and intellectual.

First, from a personal perspective, one of my goals is to contribute to more sustainable cities, and ultimately, to a more sustainable world. The topic has direct connections to sustainability. The insights provided by the data generated and analysed can help practitioners, such as myself, implement more sustainable NbS projects in the future. In a more professional vein, as I work on an international NGO with topics around both climate and nature, the thesis is a learning building process that will contribute to my professional development in the field. How I connect the research findings to my work and activism can be seen more in detail in the Afterword chapter, on “How did I connect this master’s thesis to my activism”.

Secondly, from a practical point of view, the NbS term is used by a broader range of stakeholders across different sectors and non-specialist audiences (Seddon et al., 2021), functioning as a boundary object (Welden et al., 2021). To this effect, meanings of nature can have implications for the governance, implementation, and design of NbS, going beyond being merely a communication issue. Clarifying the meanings and understandings of “nature”, “naturalness”, and “wildness” can help practitioners understand better what is meant by NbS, as well as it can sensibilise practitioners to the importance of language by denoting the links between language and governance.

Furthermore, according to CohenSchacham et al. (2016), despite narratives that praise the benefits of NbS, their implementation has been limited and contrasting to the benefits. One reason for that is the vagueness of the scope and definition of NbS. In this sense, by clarifying one of the main dimensions

of the concept, nature, the research can influence a better connection between the potential benefits and the actual outcomes of implemented NbS. In addition to that, it should be noticed that the “natural/unnatural” framing has the power to shape policies towards specific outcomes. For example, Osaka et al. (2021) analysed how the “natural/unnatural” framing had the power to shape climate policies towards adopting inefficient, expensive, and technocratic models of solutions. It can be inferred that this framing, on a concept that is based on nature, can have even more power to shape policies in specific directions. It is of most practical significance, then, to clarify the possible meanings.

When it comes to the practical significance of investigating the specific UNaLab project, until the publication of this thesis, to the best knowledge of the thesis author, it was the first initiative that dealt with infrastructure adaptation to climate challenges in Tampere. Its results, evaluation, and implementation discourses are likely to influence future adaptation strategies in the city. Furthermore, Tampere is a frontrunner city in the experiment (UNaLab, n.d.), so lessons of implementation also influence the governance of NbS in other localities. When it comes to financing, UNaLab was funded by the Horizon 2020 grant from the European Union (EU), one of the first NbS to receive funding from the EU under this scheme. It is also likely that its results and learnings will influence other NbS projects in the future financed by the EC.

Finally, from an intellectual point of view, a qualitative and social constructionist perspective to a NbS project implementation can bring a novel angle to the academic NbS discussion, which has been dominated so far by natural science approaches or by approaches that are not rooted in constructionism, as it can be noted more in detail in the literature review, in chapter 2. Furthermore, concepts frame the form and content of the “green” governance space (Hanson et al., 2020). In the specific case of NbS, it is a concept with the potential of uniting science fields that operate in silos, such as urban planning, climate adaptation and biodiversity policy (Hanson et al., 2020). By researching NbS, my research can also contribute to these other fields.

This is also a multidisciplinary study by choice. Multidisciplinarity shall not be confused with interdisciplinarity or transdisciplinarity. Multidisciplinarity draws from the knowledge of multiple disciplines and aggregates the knowledge of different fields of science while staying within the boundaries of the disciplines (Alvargonzález, 2011; Fawcett, 2013). NbS itself is a concept working at the boundaries of scientific disciplines (Hanson et al., 2020). This research is a novel effort as it draws from social constructionism, linguistics, and urban and governance studies for the literature review. Furthermore, cultural anthropology authors are used to analysing some of the insights.

In conclusion, this study is significant in all dimensions: personally, it connects to the researcher work and activism; from a practical point of view, it can bring insights to close the gap between benefits and implementation, as well as it can inform future adaptation policies in Tampere area. Finally, from a theoretical point of view, the study is an important step towards a social constructionist analysis of NbS, creating value due to its multidisciplinary character. Next, I explore the research structure of this thesis.

1.4. Research Structure

This study is systematically arranged into seven (7) chapters, as described below:

Chapter one: the objective of the first chapter is to introduce the master's thesis by providing an outline of the object of the study, aims, research question, scope, and the context of the UNaLab case. Besides this, the significance of the study is also outlined, based on three dimensions: personal, practical, and intellectual.

Chapter two: the second chapter focuses on the literature review on the governance of NbS in the urban landscape. It provides a comprehensive and analytical review on five dimensions: knowledge, stakeholder engagement, co-creation, biodiversity, and sustainability. The gaps observed in the literature are also explored in this chapter and how they connect to the master's thesis.

Chapter three: the third chapter explores the theoretical framework that supports the investigation, which is social constructionism and discourse analysis. The premises of discourse analysis are explored, together with Gee's approach to discourse analysis, and a brief overview of how discourse analysis and critical discourse analysis have been applied to the fields of governance and policy.

Chapter four: in this chapter, the methodological choices are described. It consists of an exploratory exercise of my personal background for this study, the research philosophy, the advantages and disadvantages of the method, and the criteria for selecting interviews and supporting data. After that, I describe how data were generated and analysed. I conclude by describing how validity was ensured and the ethics and a summary of the methodology.

Chapter five: in this chapter, I discuss the research results (meanings and views of nature expressed in the implementation discourses of UNaLab) concerning five dimensions: knowledge, stakeholder engagement, co-creation, biodiversity, and sustainability, concluded by a summary of the findings.

Chapter six: this chapter mobilises a discussion on the implications of the findings for the governance of NbS in the urban landscape, the implications for theory and the implications for philosophy. Furthermore, the chapter also outlines the contributions of the research both for practice and theory alike, concluding with the limitations of the thesis and steps for future research.

Chapter seven: this chapter concludes the master's thesis by outlining the object of the study, the research approach, the main findings, the implications, and the study's limitations.

Afterword: the afterword is not part of the thesis structure per se but discusses two themes related to the theme of this study. One of them is the "Can nature produce discourse?" section, for which I reflect on the limits of discourse analysis to recognising agency beyond the human. In the second section, "How did I connect this master's thesis to my activism?", I describe my personal efforts into connecting findings to activism.

2. THE GOVERNANCE OF NATURE-BASED SOLUTIONS IN THE URBAN LANDSCAPE

Nature-based solutions (NbS) have risen in the early 2000s to become a prominent concept in policymaking in Europe (Frantzeskaki, 2019; Gadda et al., 2019). The concept was introduced in the discursive space of environmental management due to its alleged capacity to promote solutions to climate change mitigation and adaptation challenges (Nesshöver et al., 2017). The EU strategy for adaptation to the climate crisis is one example of its prominence. Adopted by the European Commission in February 2021, nature-based solutions are shown as one of its priorities for investment (European Commission, 2021b).

NbS has also gained global momentum in 2021. During the UN Conference of the Parties in Glasgow 26 (COP26), for example, the government of Canada pledged 20% of its climate finance to nature-based solutions (The Canadian Press, 2021). Also, at the same international event, the Global Youth Position Statement on Nature-Based Solutions was released, by which a coalition of youth organisations shared the results of their global survey created to fill a gap of a “united youth voice (...) that clearly outlines how the global youth community understands NbS, and what is acceptable, and not acceptable within NbS approaches.” (NbS Youth Statement, 2021).

Although these examples are of a regional, national, or global level, NbS are strongly connected to the urban landscape and cities, especially in a European context (e.g., Frantzeskaki, 2019; Emilsson & Sang, 2017; Laforteza et al., 2018; Xie & Bulkeley, 2020; O'Sullivan et al., 2020). NbS are considered advantageous, for example, for their ability to offer sustainability solutions around the development and re-development of infrastructure (Frantzeskaki, 2019), as well as for helping cities rebalance their relationship with their surrounding areas, adapt to climate challenges, and bring back ecosystem services to cities (UNEP, 2021). Similarly, for Langergraber et al. (2020), NbS are suitable solutions to deal with environmental challenges specific to cities, such as urban heat islands, waste treatment, food provision and flooding events.

The chapter is structured as follows. In the first part, I describe the concept of NbS. Secondly, I examine different dimensions of the governance of NbS in urban contexts: knowledge, stakeholder engagement, co-creation, biodiversity, and sustainability. The relevance of each dimension is justified under each section. Finally, I examine the gaps in the literature of the governance of NbS in the urban landscape and how they relate to this thesis.

2.1. Conceptualization of Nature-Based Solutions

The conceptualisation of nature-based solutions appears vague and flexible, varying significantly across disciplines and fields of action (Nesshöver et al., 2017). For example, Hanson et al. (2020) describe nature-based solutions as a “boundary concept”. For them, NbS launched in a policy context, work at the borders of scientific disciplines, with the power to be both cohesive and cause fragmentation across different fields. This means, in practice, that while it gives power for multiple stakeholders to engage with the concept, it can also sustain significant variation on what it means.

More often and more broadly, NbS are solutions that aim to restore ecosystem services and biodiversity while providing benefits for humans simultaneously. It can be defined as “actions inspired by, supported by or copied from nature” (Sarabi et al., 2019, p.1). On the other hand, Fernandes & Guiomar (2018) highlight that NbS are the ones that use living organisms for infrastructure projects. In that sense, the same authors stress that NbS are artificial systems, but they are more “compatible” or “friendly” to nature.

One common aspect of the conceptualisation of nature-based solutions is the allusion to sustainability and sustainable development goals. One example is the European Commission (EC) conceptualisation, which echoes the triple-bottom-line definition of sustainability (Elkington, 1998), further explained in section 2.2.5. EC’s conceptualisation describes nature-based solutions as infrastructure projects that benefit society, economy, and environment while dealing with environmental challenges. Besides that, NbS are solutions that benefit biodiversity and support delivering ecosystem services. (European Commission, n.d.).

For the IUCN, on the other hand, NbS are the ones that use ecosystem services to deliver on solutions to societal problems, such as climate change and food security (IUCN, 2016). According to the IUCN “Nature-based solutions to address global societal challenges” report (2016), the difference between NbS and other green concepts is that in NbS, humans are not only passive receivers of nature’s benefits but can also proactively protect, conserve, and restore ecosystems to solve societal challenges. Besides that, the same report states that NbS should embrace nature conservation norms, promote fair and equitable participation, and maintain biological and cultural diversity.

Besides NbS conceptualisations advocated by global organisations, such as the EC and the IUCN, there are many other definitions and descriptions of NbS specific to an urban context. Langergraber et al. (2020), for example, state that to scale the benefits of NbS to urban environments, elements of

circularity should be integrated into the conceptualisation that predicts resources and energy to loop, to be recycled, to be returned, and reused in a city. Scott et al. (2016) define NbS as a term that emerges from imagining relations between nature and city, encompassing urban planning tools to enhance, create, preserve, and ecological design networks.

Dushkova & Haase (2020), contrary to Scott et al. (2016), focusing less on the linguistic aspects and more on the practical dimension of NbS, promote NbS as a tool for sustainable and ecologically sound urban planning and development. Following a narrower definition, Ferreira et al. (2020) describe NbS as green infrastructure projects created to improve the well-being and health of the city's population. In a more prescriptive vein, Dumitru et al. (2020) conclude that NbS in the urban space should consider the non-linear relations between social and ecological systems to be truly sustainable.

Lastly, De Weser & Loureiro (2020) create a definition of "urban NbS". According to them, urban NbS would be flexible and cost-effective interventions in urban areas that use nature and ecosystem services to deal with societal challenges, such as climate change, urbanisation, heat waves, water floods and heat island. The difference of their approach to others is that they consider the benefits of NbS to health and recognise that NbS may engage with fully natural processes and use only natural resources but can also be supported by a hybrid combination of green and grey infrastructure.

Thus, in general terms, NbS are widely agreed as (Sarabi et al., 2019; European Commission, n.d.; IUCN, 2016):

- Solutions that are sustainable or that promote sustainable development.
- Solutions that utilise processes, systems, and elements of nature to deliver services.
- Solutions that may consist of infrastructure projects.
- Solutions that promote participation.

Possibly also including

- Solutions that use living organisms (Fernandes & Guiomar, 2018).
- Solutions that embrace conservation norms (IUCN, 2016).

And, in the specific urban context, NbS are

- Solutions that ideally integrate circularity and principles of the circular economy (Langergraber et al., 2020).

- Solutions that include tools to reimagine the relations between humans and nature (Scott et al., 2016).
- Tools to promote sustainable urban planning and development (Dushkova & Haase, 2020).
- Green infrastructure projects (Dumitru et al., 2020).
- Solutions that address specific urban challenges, such as climate change, heat islands, floods, etc. (De Weser & Loureiro, 2020).

The following section explores the five dimensions of the governance NbS in urban landscapes.

2.2. Dimensions of NbS in Urban Governance

Five (5) dimensions of NbS in urban governance were identified in scholarly literature as relevant and will be explored below: these dimensions are knowledge, stakeholder engagement, co-creation, biodiversity, and sustainability. These dimensions are not exhaustive but rather were deemed relevant for the research problem explored in this thesis. The reason why these dimensions were chosen is explained briefly in each of their specific sections.

2.2.1. Knowledge

The concept of NbS brings an important novel approach to solving environmental challenges: rather than focusing on engineered solutions, NbS rely on natural systems to provide solutions, which indicates a shift in what type of knowledge is required for its design and implementation. Furthermore, the increased focus on the participation of multiple stakeholders indicates that multiple perspectives of knowledge are likely to interfere with design and implementation. Thus, this makes knowledge an important dimension to be considered for the implementation of NbS in the urban landscape. Knowledge is understood in this literature review through a social constructionist lens, by which knowledge is developed as a result of language use and social interaction, being a shared experience rather than an individual one (Bruffee, 1986; Galbin, 2015). Thus, knowledge claims are not an objective truth but rather socially constituted (Bedeian, 2017).

In this context, according to Frantzeskaki (2019), knowledge is a key element capable of advancing the mainstreaming of NbS in urban contexts. They found that NbS need to be aesthetically appealing to receive appreciation and protection from citizens, which reveals the importance of art, design & architecture professionals when designing NbS. Like Frantzeskaki (2019), Rice (2019) talks about

how in touristic locations, NbS are applied to increase the attractiveness to tourists, receiving interventions that ought to transform the place into more ‘photogenic’ scenery.

Although both Frantzeskaki (2019) and Rice (2019) acknowledge the role of aesthetics and attractiveness in driving appreciation of NbS by citizens, little attention is given to what is understood as appealing and how appreciation is built. In that sense, how different discourses of nature might influence, and construct appreciation are not discussed by the author and the role of municipalities in re-enforcing different aesthetics of nature when implementing NbS. These remarks illustrate how discourses of nature can have practical outcomes on the implementation of NbS, such as in aesthetics.

On the other hand, Fernandes & Guiomar (2016) have a different focus on knowledge, as they discuss the importance of ecological and cultural knowledge to reintroduce nature in the human habitat to prevent land degradation processes. For Escobedo et al. (2019), for example, social science research would analyse the context by which NbS are developed and how knowledge can be disseminated to diverse audiences. Frantzeskaki et al. (2019) highlight the role of social sciences in producing relevant knowledge on topics such as the hidden role of politics in driving implementation. Nesshöver et al. (2017), on the other hand, trust the social sciences to apprehend the non-monetary benefits of nature.

However, the scholars mentioned above only consider social sciences as “responsible” for investigating the human aspects of NbS, such as communities, stakeholder engagement, perspectives, values, communication, politics, cultural values, and symbolism. It is ignored from the literature that social sciences can bring insights on knowledge and generate knowledge around nature and natural processes.

When it comes to the role of multidisciplinary and engaging with the knowledge of social and biological sciences to produce NbS, little is discussed by these authors on how the distinct ontological and epistemological views of different sciences regarding nature could drive conflicts in implementation, or, even how they would influence the design of NbS towards certain outcomes. The challenges, not only epistemological and ontological, but that also come with interdisciplinarity and multidisciplinary research, are shared by Viseu (2015) in her article for Nature. Although she does not talk about NbS specifically, she points out the asymmetry between resources and the independence that social scientists face compared to scientists outside of the humanities. Usually, Viseu (2015) argues, the disparity is unfavourable to the knowledge produced by social sciences.

Ultimately, this overview of meanings and views of nature that are associated with knowledge in the literature describes, especially, the following aspects: the role of aesthetics and appreciation, the differences between ecological and cultural knowledge, the importance of multidisciplinary, with a special focus on the role of social sciences and the asymmetry between fields of knowledge. Next, the dimension of stakeholder engagement will be further explored in the literature.

2.2.2. Stakeholder Engagement

When compared to previous green urban concepts, one of the most praised conceptual innovations of NbS concerns the participation of stakeholders in the design and implementation of NbS (IUCN, 2016; Ferreira et al., 2020; Mok et al., 2021). In this, despite stakeholder participation and engagement being considered a condition for the success of the implementation of NbS in cities, studies that consider stakeholder engagement in NbS projects are still few (Ferreira et al., 2020).

Stakeholder engagement defines how stakeholders interact and dialogue with the public sector (Manetti et al., 2017). In the public administration literature, stakeholder engagement is often associated with participation, project legitimacy and accountability. For Rixon (2010), for example, accountability benefits from stakeholder engagement if stakeholders get a real chance to influence the strategic management of public organisations. Schafer & Zhang (2019) believe that stakeholder engagement provides public administrators with the opportunities to overcome administrative limitations, such as a lack of administrative staffing capacity.

One common view of the specific literature on stakeholder engagement in NbS is that multiple engaging actors can improve the quality of NbS projects in cities. Kabisch et al. (2016), for example, argue that the participation and involvement of citizens facilitate the communication and diffusion of NbS across communities. Similarly, Ferreira et al. (2020) notice that policymakers and urban planners increasingly acknowledge the importance of considering perspectives and inputs from communities when designing and implementing NbS in cities. For Katsou et al. (2020), the cooperation between various actors with competing objectives is not only beneficial for NbS but is a requirement for its implementation. Although these arguments emphasise the benefits that stakeholders bring to the table when engaging with NbS, they seem to lack a connection between the views and meanings of nature brought by stakeholders and the benefits generated by their participation. Furthermore, it is not clarified if these perspectives on nature would be equally balanced in the implementation of NbS.

Regarding tools and perspectives on how to engage with stakeholders in NbS projects, Nesshöver et al. (2017) argue that participatory evaluation, which involves stakeholders in evaluating a program or project, can help multiple views to be respected and applied. For Katsou et al. (2020), because there is a competition between the interests of different actors, there is a need that participatory processes to include an agreement on societal values and on models of urban development to be adopted. On the other hand, Mok et al. (2021) argue the importance of communicating the immaterial benefits generated by NbS. For Nelson et al. (2020), the problems that NbS deal with should be agreed upon collectively before the project, as well as NbS, must work to address structural and social inequalities.

On the results of stakeholder engagement in NbS in the urban landscape, Frantzeskaki (2019), for example, found that NbS created a space for new possibilities of relations between people, nature, and their communities through green commons. The experiments executed by different cities instigated a sense of belonging and encouraged residents to reclaim self-governance and the public space (Frantzeskaki, 2019). Little concern, however, seems to be given to how a sense of belonging can vary depending on the understandings and discourses of nature. Furthermore, the authors do not explain how these relationships are different from a ‘mainstream’ relation to nature. In a similar tone, Rice (2019) argues that NbS benefits humans’ well-being while ‘harmonising’ their relation to nature.

Common themes that cross the dimension of stakeholder engagement in NbS are the benefits generated by stakeholder engagement, the legitimacy of the implemented projects, the possibilities of relations between human communities and nature, the competition between interests. Still missing from the literature is the connection of these factors to meanings and views of nature. In the next section, the co-creation dimension in literature will be further developed.

2.2.3. Co-creation

Having recognised that NbS requires the collaboration of multiple actors to be designed and implemented, from municipal staff to urban actors such as NGOs, citizens, scientists, etc., a real challenge concerns understanding how participation can be executed. While stakeholder engagement may describe how different actors (such as citizens, project workers, planners, industries, organisations, public sector, etc.) interact on a project, co-creation is what could allow for a myriad of perspectives to be fully included in the design and implementation of NbS (Frantzeskaki, 2019). Co-creation was chosen as a dimension due to its ability to offer an explicit connection between NbS

and public administration studies, as co-creation is a traditional concept from the field (Capolupo et al., 2019).

Co-creation is a concept which describes how a group of stakeholders, with special emphasis on citizens, co-design a project, service, or initiative with the public sector (Agger & Lund, 2017). Importance to notice that the concept of co-creation should not be used interchangeably with co-production. Co-creation, on the contrary of co-production, puts greater emphasis on value creation (Agger & Lund, 2017) . It predicts a greater emphasis on citizen participation and more constructive exchange of different views, perspectives, and knowledge skills (Voorberg et al., 2017).

When it comes to co-creation in the literature of governance of NbS in cities, many authors believe that co-creation could allow a myriad of actors and their perspectives to be included. (e.g., Frantzeskaki, 2019; Mahmoud & Morello, 2021; DeLosRíos-White et al., 2020). For Frantzeskaki (2019), for example, social innovation was found to support inclusive designs of NbS, by which citizens' perspectives would be included more deeply in NbS design. Mahdmou & Morello (2021) argue that co-creation can enhance the knowledge of citizens on NbS, as well as improve the inclusivity of the decision-making for urban greening and transformation.

Simplifying narratives also proved to be helpful when engaging with citizens, according to Frantzeskaki (2019). The same author defends those general questions such as 'what can NbS mean for our life and our area' are useful in co-creation activities. To that end, narratives can even have the power to bridge different agendas and knowledge across different municipality departments. However, the literature mentioned does not seem to connect these narratives to worldviews and meanings of nature – for example, which framings of nature could favour a citizen-centred co-creation? Although this thesis does not directly address this question, it is illustrative of the possible connections of meanings of nature and the co-creation of NbS in the urban landscape.

Cousins' (2021) work is in big contrast to the previous authors. For them, the concept of co-creation in NbS is promoted apolitically, failing to address structural and spatial inequality. In that regard, when designing NbS, distributing key benefits and harms shall be a key component of project design (Cousins, 2021). For that, the author recommends that approaches of NbS based on justice take into consideration race, class, transformative co-production, and value articulations. The latter one considers the language and criteria used to measure and report performance. Despite Cousins' (2021) novel approach to understanding co-creation in NbS, the author does not address how discourses on nature could impact the distribution of risks and harms in a project. Although this is not a central topic

in this master's thesis, certain aspects related to the politicisation of nature will be further discussed in the findings section.

When it comes to value creation, which is argued in literature as an essential component of co-creation (Voorberg et al., 2017), to generate social inclusion value, Stijnen (2021) noticed that co-creation should consider the inputs from citizens already at the problem-setting stage, as well as that the process should be accessible for diverse audiences, and finally, for the author, co-creation should also consider the implications of social trade-offs. The author does not seem to reflect what types of natural value are created when multiple perspectives of nature are integrated into the co-creation process.

In summary, the co-creation of NbS in the urban landscape is described in the selected literature in terms of generating benefits to NbS projects, social innovation, inclusivity, simplifying narratives, justice, and equity. In the following section, the dimension of biodiversity will be explored in terms of the literature of NbS in the urban landscape.

2.2.4. Biodiversity

Biodiversity was chosen as an important dimension for the literature review for two reasons: first, according to the IUCN definition (2016), one of the main objectives of NbS is to preserve and enact biodiversity. Secondly, the concept is praised by practitioners and scholars of different fields for its ability to offer solutions both around biodiversity and the climate crisis (Seddon et al., 2021; Enzi et al., 2017; Mori, 2020).

According to Swingland (2001), from the Durrell Institute of Conservation and Ecology, biodiversity refers to the variability among living organisms, corresponding to genetic, ecosystem, habitat, and ecological diversity. Norton (2008), on the other hand, discusses if a definition of biodiversity, which is policy-relevant, to bridge the silos between science and policy, should be developed. Meinard et al. (2014) argue, from a constructivist perspective, that the main goal of biodiversity conceptualisations should not be to grasp quantitative organisms or processes but rather as a term used to claim relevance and legitimacy over projects. Their position is that the concept of biodiversity possesses social and philosophical relevance. Finally, Meinard & Quétier (2014) propose a way to communicate about biodiversity that aims to connect science to policy focused on biodiversity as learning.

When it comes to the notion of biodiversity applied to NbS, scholars in governance-related fields of science indicate that the lack of a shared understanding of biodiversity, a lack of institutional capacity to govern biodiversity, and a lack of access to knowledge regarding obstacles are barriers to the implementation of NbS (Enzi et al., 2017; Seddon et al., 2019; Xie & Bulkeley, 2020). For example, Xie & Bulkeley (2020) found that European cities had explicit links to biodiversity goals in their NbS, often with quantifiable targets. Nevertheless, there was a great variation in how interventions were pursued. Whereas biodiversity interventions were usually focused on the ecosystems, few initiatives seem to protect specific species or protect genetic biodiversity.

On the other hand, Seddon et al. (2020) indicated the danger of supporting NbS projects with low biodiversity value, such as monocultures of “non-native” plants. Clarifying the meanings of nature, in that sense, could be helpful to prevent those solutions that deliver low value for biodiversity are not passed on as NbS. Bush & Doyon (2019) focus on trade-offs – for them, the planning of NbS in cities should consider which species are excluded from the design and land planning. A follow-up question to their angle could be to ask how meanings and views of nature could influence which species are favoured and picked to compose the urban landscape.

On a more practical approach, when it comes to communication of science, Szabó & Macalik (2020) defend that to educate non-scientists and decision-makers on the concept of biodiversity and the relations between biodiversity and human communities, distinct techniques can be used, such as storytelling, emotions, framing and narratives through metaphor. The authors mentioned in this section recognise the explicit links between human well-being and biodiversity. However, few address how discourses of nature-based solutions may occult or transmit certain ideas of what biodiversity entails. In the next section, I discuss the relations between sustainability and the meanings of nature in NbS governance.

2.2.5. Sustainability

Sustainability was chosen as a dimension for the literature review due to several reasons. First, NbS are often coupled with ideas around the concept of sustainability, usually as a tool to promote sustainability (Nesshöver et al., 2017; Maes & Jacobs, 2017; Martin et al., 2020). Secondly, the way NbS is conceptualised has an explicit link to the pillars of sustainability, assigning the social, environmental, and economic dimensions the same conceptual importance (Nesshöver et al., 2017). Finally, sustainability has prescriptive and normative value, which means that besides aggregating different bodies of knowledge, usually, it aggregates reflections on what the world or future should

be (Martin, 2015; Alexander, 2007). Therefore, one cannot prevent engaging with discussions around sustainability in the literature, as these are likely to have a practical impact.

The concept of sustainability has become increasingly popular since the 1970s, and it has been subject to many different definitions, usually followed by the idea of development. Likewise, to sustainability, development is a concept with many associated meanings. For example, Latouche (Brightman & Lewis, 2017) note 60 different interpretations, mostly with a European heritage. Another popular concept is the triple bottom line, already briefly mentioned, which accounts for sustainable development as the development that considers the following three dimensions: society, economy, and environment (Elkington, 1998).

Elkington's approach was proposed to measure performance regarding sustainability. The Triple Bottom Line is an accounting framework that, instead of focusing on shareholder value for reporting purposes, aims at incorporating three dimensions of performance: social, environmental, and financial. Although it was developed with the business world in mind, the concept was adopted by NGOs, public bodies, government, and third sector to describe their sustainability goals and performance: social, environmental, and financial. (Norman & MacDonald, 2004). The scheme below (figure 14) illustrates the triple bottom line of sustainable development:

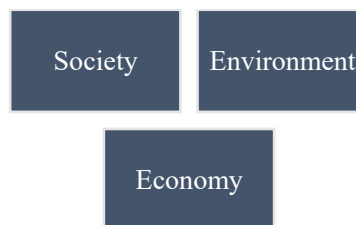


Figure 14 - The triple bottom line of sustainable development as established by Elkington (1998)

In Nesshöver et al.'s (2017) scheme, sustainability appears as the mechanism that ensures legitimacy and the overall quality of nature-based solutions. In this, challenges regarding the implementation of NbS to achieve sustainability include a good understanding of ecosystem processes, engagement of a diversity of actors, and the integration of broad societal issues. (Nesshöver et al., 2017).

When it comes to urban sustainability, for Fink (2016), cities are a crucial asset for the sustainability agenda due to municipalities' responsibilities regarding infrastructure, transportation, and societal behaviour. On the other hand, Dorst et al. (2019) denote the links between NbS and urban

sustainability even more. For them, NbS are conceptualised as sustainability instruments that address problems caused by urbanisation and climate change.

Although the concept of sustainability is an opportunity for sustainability science and practice, it should also be viewed carefully. As seen from this literature review, the common approaches of sustainability related to NbS fail to recognise, for example, the diversity of narratives and meanings associated with each of these dimensions. Taking the economic dimension as an example, it is essential to consider that different types of economies associated with sustainable development exist, such as circular economy, solidarity economy, frugal economy, sharing economy, etc., some aiming at green growth and others at degrowth (e.g. Schroeder et al., 2019; Esteves et al., 2021; Manta et al., 2021; Boar et al., 2020) Thus, a question is how we collectively define which economy (or economies) are the most legitimate and suitable for a sustainability framework. It is possible to ask infinite questions regarding its meanings for each of these dimensions (social, environmental, and economic). Practitioners and scholars alike may assign distinct conceptual frameworks to each of them, which may harm a common assessment of sustainability or sustainable NbS.

As the economic example illustrates, the issue with a broad sustainability definition is that it might jeopardise the potential of executing deep social change as it lacks a clear orientation. Likewise, if NbS aims to support sustainability, it also needs a clear definition of what is understood as nature. Although the economic example is merely illustrative of conceptual confusion, by addressing the meanings, imaginaries, and knowledge of nature associated with discourses in the implementation of NbS, the thesis may help advance sustainable solutions “in the real world”.

2.3. Gaps in the Literature

Through this literature review, I demonstrate that investigating the meanings of nature through discourse is not a purely abstract or philosophical exercise - these meanings have implications for the governance, implementation, and design of NbS in dimensions related to knowledge, stakeholder engagement, co-creation, and sustainability. The most relevant gaps and questions of the literature analysed that were written throughout this literature chapter are summarized in the following list and how this thesis contributes to bridge these gaps.

- Many published cases have a focus on the environmental benefits of NbS, whereas social and community perspectives are neglected. By focusing on discourses, this thesis apprehends social understandings around nature-based solutions that are missing from scholar literature.

- Little attention is given to how implementation discourses of NbS co-creates and build certain visions and/or understandings of nature. Meanings of nature are either assumed in literature or discussed in the background and not as the focus of the research. This aspect is directly addressed by the research question of this master's thesis, for which meanings of nature are the main object of research.
- There is a neglect of studies that investigate the discourses around the implementation of policies. Most of them analyse agenda setting, strategizing, and policy planning. (Ciccia & Lombardo, 2019). The present study addresses this gap by investigating the discourses of implementation in one specific NbS project.
- Finally, most research designs of discourses in governance or policy studies analyse written data such as policy texts, and rarely data from interviews, observation fields, multimedia, etc. Written data is not the focus of data analysis and generation in this study. Semi-structured qualitative interviews as well as a focus group were also executed with the goal of providing diversified data on speech and discourse.

In the next chapter, I will discuss the theoretical framework of this master's thesis, which is social constructionism and discourse analysis.

3. THEORETICAL FRAMEWORK: SOCIAL CONSTRUCTIONISM AND DISCOURSE ANALYSIS

When I decided to investigate the meanings of nature around the implementation of the UNaLab project, it was clear that the research would follow an interpretative paradigm of research. In a simplified manner, a researcher following an interpretative philosophy usually understands reality as subjective and collectively constructed, and rather than investigating causal relations between elements, subjectivism, and interpretation-based methods are preferred (Creswell et al., 2007; Creswell & Poth, 2015).

The research design gained some maturity, and ‘discourse’ became the main object of analysis. To conceptualize ‘discourse’ is not an easy task. Discourse, like many concepts described in this thesis, is a word used with a variety of meanings. While in linguistic research, discourse can refer to words and phrases, in social science it can allude to broader social and cultural contexts (Gee, 2011). In this thesis, the idea of ‘discourse’ will follow a social constructionist approach to science.

Thus, the current research utilizes social constructionism and discourse analysis as the theoretical framework. In this chapter, I start by analysing the basic premises of social constructionism, followed by a deeper analysis of discourse analysis, where discourse will be conceptualized. I will conclude with examples of the governance literature that has used discourse analysis.

3.1. A Journey through Social Constructionism

In this thesis, social constructionism is understood as an umbrella for theories and scholars that investigate culture and society through lenses of interpretation, rather than on relations of causality (Jørgensen & Phillips, 2002; Galbin, 2015). According to Heikkinen (2014), there are many versions of social constructionism, all of them sharing some common aspects. Social constructionism as an epistemology focuses on the social construction of knowledge (Andrews, 2012). However, the influences that constituted social constructionism are the object of intense debate in academia.

Although some scholars position constructionism as part of symbolic interactionism school (Walker, 2019; Fairhurst & Grant, 2010), for Andrews (2012), constructionism is distinct from interpretivism, as interpretivism would aim to develop an objective science to capture human subjectivity.

Social constructionism is one of the most influential social theories of the XX century (Walker, 2019). The beginning of Social Constructionism is usually attributed to Berger & Luckmann's (1966) work. In this panorama, Berger & Luckmann (1966) aim at understanding how knowledge, created by the interactions between members of society, emerges and acquires significance. For the authors, through shared meanings and understandings people assume a take-for-granted reality. Thus, more or less crystallized concepts allow for the creation of a subjective reality. Furthermore, the authors investigate the relations that sustain individuals' roles in the social construction of realities (Galbin, 2015).

Social constructionism has faced criticism in academia (Stam, 2001). One common critique is to the relative nature of reality - if everything is relative, and if there is no 'definitive truth' there are questions on what the actual object of academic inquiry is. In this, some authors claim social constructionism to be 'anti-realist' (Galbin, 2015). Nevertheless, for social constructionists, all objects have definite properties. The difference in the approach, however, are the properties that are assumed to have importance, and why they are the basis for social and scientific evaluation (Burr & Dick, 2017).

Social constructionism, despite the critiques in scholarly literature, is the approach of choice due to the possibility of apprehending meanings behind concepts that are not yet crystallized in policymaking, and where knowledge is still disputed, such as the case of nature-based solutions. As the main objective of the thesis is to grasp meanings and views of nature embedded in discourse, social constructionism is the approach best suited to deliver on a more interpretative framework for analysis. All in all, the social constructionism approach helps me explore how certain categories (nature, nature-based solutions) become central to the construction of a social world (governance of the urban space) realities (Burr & Dick, 2017). Finally, social constructionism claims that understandings of social reality (nature) have consequences and implications to social action (governance of nature-based solutions), which is helpful for the aims of this thesis.

3.2. Discourse Analysis

Language has a central role in social constructionism, as it is through language that we understand, represent, and perceive the world (Burr & Dick, 2017). In that sense, discourse analysis is one of the many social constructionist approaches (Jørgensen & Phillips, 2002). Discourse analysis (DA) is applied in the thesis both as a method and as a theory (Jørgensen & Phillips, 2002). In the following

section, the theoretical basis of discourse analysis will be described, as well as its history and premises.

Discourse analysis can be applied to different fields (e.g., Prentice, 2010; Harper, 1995; Savaria et al., 2017; Le Roux, 2008; Proops, 2001), however, it should not be applied as a method detached from theoretical foundations. The theoretical foundations will be explained further in this section, as well as the theoretical choices of this thesis. According to Snape & Spencer (2013), discourse analysis aims at understanding how knowledge is produced within different discourses, the rhetorical devices used for particular reasons, linguistic styles, and action enacted by language.

3.2.1. Premises of Discourse Analysis

Scholar approaches to discourse analysis share both premises and differences (Jørgensen & Phillips, 2002). Discourse analysts tend to analyse talk and speech in large societal and cultural contexts (Marshall & Rossman, 2014). There are varied and multiple approaches to discourse analysis, however, according to Jørgensen & Phillips (2002), there are some shared premises, explained as follows:

First, in discourse analysis, there is a critique of objective truth or taken-for-granted knowledge. In this sense, this means that products of knowledge are products of discourse, thus, products of how we categorize the world. Secondly, knowledge is also a product of history and culture, which means that worldviews, identities, and categories could be different and could change over time. Consequently, discourse analysis stands in opposition to a view of knowledge that is grounded on solid and objective human action. Thirdly, scholars of discourse analysis see discourse as social action that produces the social world. This is a non-essentialist view, and rather than the social world being determined by fixed characteristics, the social world is built discursively. (Jørgensen & Phillips, 2002).

In fourth place, knowledge is not given but rather built through social interaction, which denotes links between knowledge and social processes. When it comes to the role of language, it should not be seen as a mere reflection of a pre-existing reality. For a discourse analyst, there would not be one single system of meanings, but rather multiple systems or discourses, with changing meanings. In this, the meaning attached to words are no inherent to words, but a result of social conventions. Discursive patterns would then, be transformed and maintained through discursive practices. Finally, in discourse

analysis, the social construction of knowledge does not happen in silos with praxis, as it produces consequences in the social world. (Jørgensen & Phillips, 2002).

Despite these shared premises, there are differences among approaches. Critical discourse analysis (CDA), for example, is usually characterized by an orientation to the problem, to linguistic, and to pragmatism (Nokkala & Saarinen, 2018). In CDA, texts reproduce, build, and construct structures and relations of power, so by analysing texts, we can access how social control and domination are negotiated and resisted in a society (Wodak, 2001; van Dijk, 2002; Fairclough, 2001). Some scholars criticize CDA for its limitations in interpreting broader social change through texts that are restricted in size, scope and time (Cheng, 2009). The main difference between CDA and other approaches to discourse analysis is that CDA has a major focus on power or inequality, and how discourses maintain and reinforce certain positions of power (Wooffitt, 2005).

This thesis utilizes a specific stream of thought within discourse analysis, based especially on Gee's apprehension of discourse analysis (2002; 2011). The author proposes his own unique integrated approach to discourse analysis. The main aspects of his approach are the following: first, discourse analysis is not only about language, but about human interactions with the world (Gee, 2014b). Secondly, for him, language is always political, since social goods are always at stake with the use of language (Gee, 2011). In third place, language only acquires meaning through social practices. Finally, discourse is situated and co-constructed (Gee, 2011). Gee's approach will be discussed more in detail below, together with the reasons why it was chosen.

3.2.2. Gee's Approach to Discourse Analysis

This thesis focuses on one of the many approaches to discourse analysis, the one made popular by Gee (2002; 2011). Language, in his approach, is what humans use to build the world and to keep the social world going. He argues for a situated and co-constructed view of the discourse. His theory and method for discourse analysis also include multimodal formats, such as music, video, art, and pictures. (Gee, 2002; 2011).

The reasons why Gee's (2002; 2011) approach was chosen are twofold: first, his approach can offer tools for the analysis of both contextually significant meanings of language and of the texts, which allows the research to examine both social context and linguistic devices. Secondly, his books and theories have an accessible, straightforward, clear and didact language. To this effect, his methods

can be easily applied and replicated by students and more experienced researchers alike, which contributes to validity of the analysis.

Gee's (2002; 2011) theory of language is that language is intrinsically attached to the practice, so the only way language acquires meaning is through practice. Following the basic premises of social constructionism, he believes communication and meaning are co-constructed by people via the social context of an interaction. In this sense, he advocates for a bottom-up approach to the analysis of language. To this effect, meaning, rather than originating from an abstract system, relies on the experience and everyday situations of both producers and receivers of language.

Gee's assumptions recognize that speech, talks, words, and images may be used in predictable ways, but they also may be objects of innovation, stretching the boundaries of their associated meanings. For Gee, meaning arises when symbols are associated with something beyond itself, a denotation or reference. In this, people use conventions and information to identify and interpret the symbols. The conventions, or information, are the symbols' connotation, or sense. And the connotations or senses are found and created in social practices. (Gee, 2002; 2011).

Context has an important role in discourse analysis; however, it is indefinite and large. The dependence of discourse analysis on an infinite context has been named 'framing problem', by Gee (2002). When speeches or texts are produced, listeners, readers, and analysts alike need to judge which parts, and how much of a context, is relevant for interpreting the meanings. This means that there is always a possibility that with more information on a context, the judgment or interpretation would have been different. To discourse analysts, framing can be a concerning problem: it can be unclear, or difficult, to determine the point by which context information is deemed as enough. (Gee, 2002; 2011).

When it comes to validity, according to Gee (2002; 2011) what makes discourse analysis scientific is based on shared principles of science across different disciplines. In this, discourse analysis shares the following principles that ensure validity. First, respect for evidence should be ensured, not to 'prove' things, but as data that is always open for revision. Secondly, the possibility for peers to check or falsify the claims, and third, by the constant attempt of the researcher to falsify their own views (Gee, 2002).

The conceptualization of discourse by which this thesis is based upon shares the following properties:

- Discourses describe frameworks of ideas or ways of understanding the world (White, 2004).
- However, discourses are defined not only by their descriptive aspects but by their productive power to influence how societies act and shape reality (Knights & Morgan, 1991).
- Discourse is a social and situational resource (Gee, 2002).
- Discourse is the way members of a group use a language to identify themselves and to identify others (Gee, 2002).

3.2.3. Discourse Analysis in Governance and Policy

Discourse analysis, as mentioned before, can be used as a theory to support research across different fields of science. In governance and policy, distinct approaches to discourse analysis have been employed by researchers with different aims.

Cheng (2009) investigated policy development in the educational voucher implementation in Hong Kong through critical discourse analysis (CDA), specifically addressing how one policy paper shaped and framed the subsequent development of the voucher policy. Throughout the article, the author investigated how the policy text revealed the power dynamics between the government and stakeholders, as well as the role of marginalized groups in shaping the policy. On the contrary to this master's thesis, which is focused on discourses of implementation, Cheng's studies focused on the analysis of a single policy paper. Like Cheng, Fischer (2003) studied the effect of discourses on policy formulation, in addition to agenda-setting. Engebretsen et al. (2011) also focused on issues of power and legitimacy of types of knowledge, however, by investigating accreditation policies of Norwegian higher education.

Ciccia & Lombardo (2019), on the other hand, focused their study on analysing the literature on gender, politics, and on the implementation of care policies, which are designed to provide care for children and adults that cannot provide for themselves. In this, the authors highlighted the role of discourses producing gendered outcomes, as well as the implementation of care policies in practice. When it comes to urban sustainable development, Bradley (2009), in their doctoral thesis, explored how dominant discourses in a neighbourhood in Sweden associated 'swedishness' and national belonging to a certain type of responsibility, focused on eco-consumption, recycling, and tidiness. Thus, research such as Bradley's is important to demonstrate political and moral aspects related to discourses of conservation, which underlines those meanings of nature do not happen in a space of political neutrality.

Concerning discourses related to nature-based solutions, Mendes et al. (2020) discussed the discourses of scholarly research on the institutionalization of NbS. The authors found a lack of planning and policy recommendations in scholarly research, as well as the institutional arrangements that promote NbS. The study, which was focused also on quantifiable aspects of the DA, however, does not address the actual policies or implementations of NbS and does not analyse as well the meanings of nature mobilized by these discourses. Kotsila et al. (2021), on a more critical vein, through means of discourse analysis, discuss how in two NbS projects a positivist view of urban sustainability was used to promote neoliberal actions that served the interests of an economic elite.

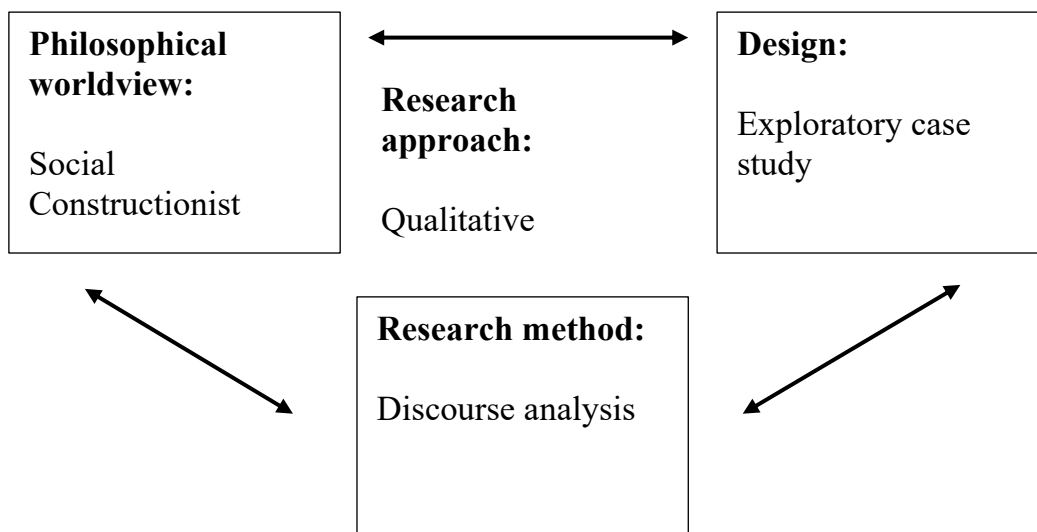
The studies demonstrate that DA can also be applied to fields of governance, policy, and administrative sciences, however, important gaps remain, such as a needed focus on implementation discourses. In the next chapter, the methodology of this research will be explored and presented.

4. METHODOLOGY

Any scientific research requires making several decisions regarding a research philosophy, aims, data generation, analysis, and how to report the results. In this chapter, the choices made during the thesis process will be presented. This research uses an exploratory case study design. Discourse analysis is used as both method and theory that support the generation and analysis of data, oriented by the social constructionist school of thought.

According to Creswell & Creswell (2017), a research approach consists of a research design, a philosophy, a method for generating and analysing data. The scheme below (figure 15) summarizes the research approach used in this study and illustrates the interactions between these components of a research approach. The scheme is inspired by Creswell & Creswell (2017) framework on the interconnection of worldviews, design, and research methods (pp. 43):

Figure 15 - Research approach, scheme inspired by Creswell & Creswell (2017, pp. 43)



This chapter summarizes my personal background, my choices regarding a research philosophy, the advantages, and disadvantages of the research method, the selection of data, the data generation and analysis process, the ethics of the research, and finally, I conclude by presenting a summary of the methodology chapter.

4.1. My Personal Background for this Study

The social constructionism approach, which is the theoretical foundation of this master's thesis, as mentioned before in the theoretical section, does not aim at providing a positivist overview of knowledge (Galbin, 2015; Dawson, 1981). For social constructionists, all knowledge is relative to one's location within a set of discourses and social norms, which includes the researcher (Galbin, 2015). Therefore, my personal background will be shared as follows, with the goal of describing the role of my personal background in this research.

I am from Belo Horizonte, Brazil, a highly urbanized city with a population of approximately two million people. I grew up in a city made of concrete and asphalt - so traffic jams, grey, and big-sized infrastructure, as well as life in a small apartment, were natural to me. Contrasting to the city infrastructure, I lived in a neighbourhood with a jogging path through different grass and fruit trees, and access to green parks and areas. There was even a preserved natural area nearby, where visitors were allowed to enter within the limits of visiting times, after paying an entrance fee. I consider that my access to these natural areas was a privilege, as Brazilian cities provide unequal access to environmental goods and risks (Paes, 2017; Baumgartner, 2021; Torres et al., 2019).

In 2018, I was studying for the Bachelor of Social Sciences at the Federal University of Minas Gerais (UFMG) when a Finnish exchange student from the University of Jyväskylä asked me to be interviewed for his course assignment on urban anthropology. In this interview, he asked me questions that motivated me to think how I felt about green areas, and how I perceived Brazilian urban nature.

Intellectually, that interview was an important milestone in reflecting on meanings of nature from a social sciences approach. I had already worked with environmental corporate sustainability before, but until that moment I had not reflected yet on how my fears, anxieties, and discomforts around urban nature were related to broad social contexts. It was also an important 'eureka' moment, for which I realized that there was not only one single way of imagining, perceiving, and talking about urban nature, and most importantly, it made me question how governance of urban nature can express distinct views and meanings of nature. University courses on socio-environmentalism, and decolonial thought pushed me to reflect even more deeply on the connections between what we say about nature and how we govern the urban natural space, also training me more on qualitative approaches to science.

These reflections materialized in my bachelor's thesis. I investigated the associated meanings and the cultural and social process by which domestic dogs were categorized and treated as invasive dogs in a national urban park in Rio de Janeiro. Once my bachelor's was concluded, and after moving to Finland to study a master's in Administrative Sciences, for which I write this master's thesis, I noticed different governance patterns of natural areas. In Finland, parks are always open and available for visitors, for example, and on the contrary of preserved areas in Brazil, there are no fences. I also noticed that the relationship between human communities and nature was one of the pillars of Finnish national identity. These were aspects that drove an intellectual interest further into investigating the meanings of nature in the urban governance space in Finland.

Although this personal background is described in a much more linear manner than it occurred in "reality", they show how these life happenings have influenced my research design, including the method of choice, the topic, and how I approach it from an intellectual point of view. Besides this, the relationships I built in Finland and in Brazil, my work in the third sector, as well as my personality traits and interests play a major role in recruiting collaborators for interviews for the research, the data analysis, and reporting the results. Finally, this research was conducted during the COVID-19 pandemic. The barriers imposed by the COVID-19 pandemic, such as social distancing, also prevented a deeper engagement with the UNaLab project and with its participants.

Creswell & Poth (2016) suggest that a researcher's specific worldview, and a set of beliefs and assumptions guide their research. Hopefully, this personal background clarifies and illustrates on how my personal background guided this research inquiries. In the next section, I describe and explain the research design.

4.2. Research Design

This research uses a qualitative approach, which, according to Creswell & Creswell (2017), in general lines, is an approach employed by researchers to explore and understand meanings, perspectives and values that are ascribed to human or social groups/phenomenon. Furthermore, the thesis utilizes an exploratory case study design, which will be further explained below.

A case study is as a method that investigates, in depth, a contemporary phenomenon within a real context, also benefitting from a prior theoretical framework to guide the data generation, analysis and discussion (Yin, 2009). According to Yin (2009), a case study strategy is recommended when the researcher has no control over the experiment or the situation, which means that the context is most

relevant. Furthermore, the same author argues that a case study is a relevant method for cases that are focused on contemporary events. This means that, typically, a researcher counts on the observation of events that are still happening in the present, as well as on the insights of participants who still may be involved in these events that are being studied.

The theoretical framework is social constructionism, operationalized by discourse analysis as developed by Gee (2002; 2011). The case study is exploratory since the research question points to directions that are under-researched and explored in academic literature, as mentioned previously on the research gaps in the section 2.3.

4.3. Research Philosophy

More than a method of data analysis, distinct discourse analysis schools entail philosophical premises regarding the role of language (Jørgensen & Phillips, 2002). I will describe these philosophical foundations below:

By choosing a discourse analysis/social constructionist approach to my master's thesis, in terms of ontology (nature of reality), the reality is not abstract and objective, and that is because, for social constructionists, access to reality is always granted through language. In this, language does not work as a reflective tool of reality, but rather it constructs and builds reality. It is important to mention that social constructionism does not deny the property of physical objects, but rather states that their meaning is only acquired through discourse. Nevertheless, it is considered that despite the physical world existing, humans have no direct access to it. (White, 2004). When it comes to epistemology (theory of knowledge and role of the researcher), the analyst is always having a position in relation to what is being studied. This position influences what the researcher can see, find, or present, which does not mean that any research would have had equally good results. (Jørgensen & Phillips, 2002).

When it comes to the rhetorical dimension (the language of the research), the language reflects the entanglements of the researcher to the object of study, so, it means that I use the first-person voice more often. If my philosophical assumptions are far from a positivist approach that locates the researcher as an external observant there is no reason that justifies a writing approach that would follow positivist principles.

There are critiques to the philosophy of a social constructionist approach. For Crist (2004), for example, seeing nature as a social construct is politically questionable activity, which privileges a humanist vision of knowledge that believes human cognition to be above nature.

Every choice for a method of research comes with disadvantages and advantages. In the following sections, I will discuss both limitations and benefits of the chosen research method.

4.4. Disadvantages of the Research Method

Qualitative methods aim at providing rich data that answers to research questions rooted in finding “how” rather than “why” (Creswell & Miller, 2000; Creswell & Poth, 2016). Generally, qualitative research, despite providing interpretative, and subjective insights, have considerable limitations when it comes to scientific research. One of the most noted limitations concerns the lack of universalization that is present in quantitative methods – it means that specific findings of the study cannot be universalized for an entire population and general laws cannot be sourced from the particularized analysis that are typical to qualitative research (Creswell & Miller, 2000; Creswell & Poth, 2016; Wetherell & Potter, 1988).

Furthermore, discourse analysis is pointed out by scholars as a difficult, lengthy, and laborious work. Transcribing interviews and analysing their discursive aspects can be slow to conduct and can take a lot of time (Wetherell & Potter, 1988), which, many times, is not compatible with bureaucratic deadlines, the reality of funding, and with academic and/or personal life pressures and challenges.

In that regard, although being sensitive to these barriers and challenges, the benefits of discourse analysis surpass the limitations, and they will be further explored below.

4.5. Advantages of the Research Method

One of the greatest advantages of discourse analysis is that it challenges a taken-for-granted nature of language (Snape & Spencer, 2013) around the implementation of a policy concept. Thus, it can show in which ways the implementation of a novel concept (nature-based solutions) can display subtle shifts in values, priorities, and meanings of nature, also encouraging an interpretative approach to areas that usually have quantitative lenses of analysis, such as biodiversity (Xie & Bulkeley, 2020).

Furthermore, the choice of method may also have practical value. By understanding the discourses of nature-based solutions and their implications regarding the meanings of nature, practitioners and policy makers can shape their own narratives of NbS towards achieving certain outcomes, for example, increased co-creation and collaboration between municipalities and citizens. In that sense, the discursive framing of NbS does not happen in silos to implementation of NbS, as the framings of discourses can shape how problems and solutions will be defined, and addressed, with critical implications for policy, research, and practice around NbS (Welden et al., 2021). Consequently, it is of foremost importance, in this case, to understand and investigate how discourses carry implicit and explicit meanings of nature that ultimately implicate on policy and research.

Taking these factors into consideration, discourse analysis results can be potentially useful by helping us identify the interpretative repertoires that are used to describe urban greening and nature-based solutions in cities, which can help us define and determine how these interpretations can be transformed and changed to influence more sustainable patterns of governance.

4.6. Selection of Interviews and Supporting Data

A research strategy that is based on case study usually counts on diverse tools and techniques to generate data (Creswell & Poth, 2016; Yin, 2009) My thesis is not an exception from this tradition. By utilizing multiple sources of data, Yin (2009) argues, the researcher can ensure reliability, quality control and triangulation, relevant especially for qualitative research. Furthermore, by relying on diverse sources of data, there is an increased potential to deepen the understanding of the case study, and to offer richer information for the analysis (Eriksson & Kovalainen, 2015). Finally, from a personal perspective, analysing a diverse set of data allows me to exchange between activities which can be a positive aspect in a laborious, highly intensive work of analysing qualitative data through discourse analysis.

Interviews and a focus group were chosen as the primary method for data generation due to their ability to offer insights on values, perspectives and meanings attributed to nature by individuals through their speeches and discourses. Furthermore, interviews allow participants to express themselves in their own language and voices (Byrne, 2004), which would not be possible in a quantitative survey, for example. The focus group, on the other hand, allowed me to grasp the interaction between two stakeholders behind project planning and management, rather than their own singular voices, while still allowing for flexibility present in semi-structured interview questionnaires, which was also a convenient solution considering time constraints.

Altogether, data was generated in a participant-observation visit at one of UNaLab's events (an invasive species workshop carried out in Vuores central park), five (5) semi-structured qualitative interviews with five (5) UNaLab stakeholders, and one small focus group with two (2) UNaLab stakeholders, totalling 7 research participants. Participants were the stakeholders involved in UNaLab. Documents, such as blog posts were also collected as supporting data. In total, 6 documents were analysed as supporting data. All the analysed data was in English. The interviews and the focus group were carried out between August 26th, 2021, and October 14th, 2021.

The method for selection of interviewees will be further described below.

4.6.1. Selection of Participants

As mentioned above, when selecting participants for interviews and for the focal group, the main objective was to engage with a diverse range of stakeholders to grasp as many perspectives as possible, following a social constructionist design: city employees, experts, project participants, innovation voucher winners, etc. Since in social constructionism, the construction of knowledge and of reality varies depending on how socially positioned individuals are (Galbin, 2015), it was important in this research to recruit participants with the biggest variety of societal positions and roles possible in the experimentation.

The criterion for the interviewees was that they had to have had participated in the UNaLab project in Tampere, in any capacity, for example, either as a consultant, visitor, community participant, citizen, planner, or manager, etc. The method of recruitment followed a snowball approach, which means that the researcher contacts a focal point that recommends other interviewees. In this case, one participant leads to another (Edmonds, 2019). The limitations of this type of selection method include the reliance on the subjective judgement of contact points and the non-randomicity (Johnson, 2014; Creswell & Poth, 2016). However, the advantages surpassed the limitations. Snowballing can be relevant especially for cases where recruiting participants is rare or hard to locate (Johnson, 2014). Due to the narrow nature of the case study design, which consisted of a single experiment of which many activities had already happened at least two years before the research took place, snowballing was the most appropriate choice.

The initial contact was made through the project managers and planners of the UNaLab, who recommended relevant stakeholders to be interviewed. Due to the Covid-19 situation, participants

were given the option of meeting face to face in Tampere or having the interviews written, via an online video chat or a phone call. The goal was to be as inclusive as possible to participants' availabilities and preferences regarding communication. The number of interviews was determined both by the availability of stakeholders as well as by data saturation (Creswell & Poth, 2016). Saturation is understood here as the point by which new data repeats what was already present in previously generated data (Saunders et al., 2018).

The table 2 below shows the process of recruitment and selection of interviews in detail:

Table 2 - Selection of participants, nature of participation and interview duration

Participants	Nature of participation	Motivation for selection	Interview duration (minutes)
VTT Expert, coordination with the European Commission	Interviewed through video chat. Recorded and transcribed.	Key role in planning and mediating the relationship across different municipalities and the EU.	60:02
Innovation voucher winner (Horse paddock)	Interviewed through video chat. Recorded and transcribed.	Local community perspective	49:41
Project managers, municipality employees	Mini focus group realized - video chat Recorded and transcribed.	Project management and planning perspective on the municipality's side	50:26
External consultant, project communications	Interviewed through video chat. Recorded and transcribed.	Key role in communicating to UNaLab's stakeholders	23:10
Participant at invasive species workshop	Interviewed through video chat. Recorded and transcribed.	Citizen perspective	31:24
External consultant, project ecology	Interviewed through video chat.	Perspective from the point of view of ecology	44:03

4.6.2. Selection of Supporting Data

Besides interviews, it was considered necessary to analyse complementary data that could reveal other sources discourses on implementation, due to the nature of a case study design, as mentioned previously. It is important to notice that documents and complementary data were selected after a preliminary analysis of the data coming from the interviews and from the mini focus group, as well as the field notes from the field participant-observation visit of one of the UNaLab events (Invasive species workshop in Vuores Central Park).

The following criteria were determined to select documents for the analysis:

- The documents necessarily had to contain narrations of the implementation or implemented activities of the UNaLab project in Tampere, Finland
- The documents had to be cited or mentioned by participants of the research or had to be related to the participant-observation field visit (An exception to this selection rule was made in order to accommodate documents that mentioned the urban gardening innovation vouchers, as participants in this category were not available for an interview).
- The documents had to be written in English language

Table 3 - List of supporting data

Type of data	Description of data
Participant-observation / field visit	I was a participant at the invasive species workshop carried out in Vuores Central Park, in 15.06.2021, where we removed invasive plant species from the areas nearby the park
Blog post	“How do people use and perceive green spaces and how has Covid-19 changed the situation?” which narrates the results of a survey conducted in the scope of the UNaLab project.
Blog post	“Pollinator friendly nature-based solutions in Tampere”, which narrates the benefits to biodiversity of the solutions implemented in Tampere.
Blog post	“Natural areas increase attractiveness in Vuores”, which narrates Natural areas increase attractiveness in Vuores.
Blog post	“Children urban lab in Vuores”, narrating a co-creation workshop carried out with children.
Blog post	“First results of co-creating nature-based solutions in Tampere”, narrating results of co-creation workshop.
Blog post	“NbS innovation vouchers in Tampere”, which narrates the implementation of urban gardening vouchers, as stakeholders of this category were not recruited.

4.7. Data Generation and Analysis

In this section, I describe how data was generated, and how it was analysed.

4.7.1. Data generation

Interviews were generated, recorded, and transcribed through semi-structured questionnaires. Interviews were first transcribed by Google's Artificial Intelligence software, reviewed, and discourse marks were introduced. Some of the interviews were transcribed by contracted third parties that signed a confidentiality agreement. The confidentiality agreement is attached to the Appendices section of this master's thesis.

Semi-structured interviews (Creswell & Poth, 2016) were used, which means that planned questions guided the interviewing, however, follow-up comments and additional questions were also carried out during the interaction with interviewees, depending on the issues they wanted to share or highlight.

Semi-structured interviews were chosen mainly due to flexibility, as they allow participants the freedom to explain their thoughts and highlight areas that they would feel to be important (Horton et al., 2004), while also allowing for myself to explore the dimensions that were deemed important from the literature review.

Each questionnaire had between 15 and 25 questions, that were adapted depending on the interaction with the participants during the interview, in order to allow them to highlight themes or concerns that they thought were important. In that sense, not all the planned questions were answered by all participants. This is an aligned choice to the social constructionist school, which relies as much as possible on the views of participants for generating data (Creswell & Creswell, 2016). Five dimensions, derived from the literature review on the governance of NbS in the urban landscape (knowledge, stakeholder engagement, co-creation, biodiversity, and sustainability), guided the development of questions for the semi-structured questionnaire. Besides utilizing inputs from the literature to develop the questionnaire, field notes from the participant-observation visit in one of the UNaLab's events were used to verify or elaborate the interview data.

All stakeholders had a common set of questions, with slight variability among them depending on the group they were part of. The focus group had an additional number of questions in addition to the common set, with the aim of encouraging interaction and dialogue between the participants. The complete questionnaires plan can be consulted in the Appendices section. In this study, I also had to

consider the influence of cultural backgrounds when interviewing participants of the UNaLab project. Two (2) participants were of a different nationality than Finnish, and all the other five (5) participants were of Finnish nationality. In generalized and simplified terms, Finnish communication enforces silence as a natural and as a respected practice, as well as worthy of value (Berry et al., 2004).

Brazilians, like myself, on the other hand, tend to communicate in a way that forges intimacy and personal ties to the listeners/readers (Fonseca, 2011). I noticed these differences when conducting interviews. While in Brazil, my experience with semi-structured interviews was that participants usually were active in the conversation, producing more content without needing much facilitation from the interviewer. While interviewing in Finland I noticed I needed to have a bigger role in creating room for conversation and asking more questions that would allow a dialogue to emerge. Another aspect that is relevant for data generation concerns the language of choice. The interviews were conducted in English, for which only one participant was a native speaker of the language. To this effect, I noticed that sometimes interviewees struggled to find the words and express themselves, so the language had an impact in a sense to limit how they would phrase or express their thoughts if they were being interviewed in their native languages.

Besides the interviews and the focus group, supporting data was generated through a participant-observation visit in one of UNaLab's events (invasive species workshop in Vuores Central Park, that happened on the 15.06.2021) and documents (blog posts). Generally, participant-observation describes the method by which the researcher is immersed in the fieldwork, in the everyday lives and the practices of the participants (Moeran, 2009). Despite not being immersed on a continuous manner, as the method usually prescribes, I was not only observing the event as an outsider, but I was also being a participant in the event, removing the invasive species and observing the practices "from the inside", hence, why it is named "participant-observation visit". Participant observation was chosen due to its ability to offer insights not only from the perspective of an external researcher, but also from a perspective of a participant (Becker & Geer, 1957), which allowed me to generate deeper and richer data insights.

4.7.2. Data analysis

There is no consensus on what the best way is to analyse data following a discourse approach (Phillips & Jørgensen 2002; Gee, 2014a). As discourse analysis is multidisciplinary by nature, and as it entails a diversity of analytical techniques, different tools and perspectives can be employed depending on the objective of the study (Bardici, 2014). Given the focus and objectives of the current master's

thesis, and based on the research questions and literature, I identified a set of tools that were used to code the data, sourced from the perspective approached by Gee (2011).

These tools are described as follows on table 4, all based on Gee’s (2011) book: How to do discourse analysis: A toolkit.

Table 4 – Tools for coding the data, derived from Gee (2011).

<p>Looking for ‘hidden’ meanings</p> <p>This tool allows the analyst to look for the context that is embedded in phrases, words, and speech. In this sense, coding is performed by identifying the meanings that readers/listeners have to attribute to the words and phrases in order to understand what they mean. This tool aims to unveil the assumed and constructed meanings associated with the speech context.</p>	<p>Social languages</p> <p>The social languages tool has the goal of understanding how the producer of a text engages with grammatical structures, words, and phrases to enact specific identities, practices, social languages, or values. This tool identifies and codes discourses into social languages.</p>
<p>Intertextuality</p> <p>The goal of the intertextuality tool is to identify intertextual references, and intertextuality in a discourse, and analyze the role of quotations, allusions, and references to other texts, speeches, talks, or even other discourses.</p>	<p>Figured words</p> <p>Through this tool, the following is identified in the data: the figured stories, words, and worlds that are assumed in the communication, as well as, investigated values, ways of interacting, institutions, and objects that are embedded in these figurations.</p>
<p>Discourse with a capital D</p> <p>The big D tool has the aim of investigating the role of actions, beliefs, objects, tools, technologies, and values in relation to communication or discourse. In essence, it is a tool of the context. This tool invites the analyst to focus on how language is being used to enact certain social identities or to engage in recognizable social activities.</p>	<p>Filling in the context</p> <p>This tool is similar to the “look for hidden meanings”. In both cases, the researcher aims to understand the hidden assumptions of a discourse. However, while the first tool focuses on hidden meanings, the ‘filling in the context’ focuses on the broader assumptions regarding the context, as well as which parts of a context are relevant to achieve clarity on the communication.</p>
<p>Action</p> <p>Through this tool, the analyst seeks to identify not only what the text is saying, but what type of action is being executed by the discourse producer, or what type of action it enacts in the real world.</p>	<p>Politics</p> <p>This tool helps the analyst identify the elements how discourse, phrases, and words are built to assume and define social and environmental goods, and how they should be distributed in a society.</p>
<p>Intonation</p>	

The intonation tool has the goal confronting the material to specific patterns of intonation, in order to understand how the speakers, produce meanings and emphasis through intonation. The intonation tool was used solely for the recorded interviews and for the focus group, and not for the documents that were analysed.

Besides the tools offered by Gee's method, I also aimed at integrating elements to my analysis that to identify the role of nature and natural elements as agents in the speech. This integration was only marginal, however, the ideas around agency of nature and discourse will be further discussed on both chapter 6 and on the Afterword.

Each of the interviews and supporting data were analysed following all these tools (Gee, 2002) and steps. Data analysis was executed on a Google spreadsheet, based on the transcript material. Transcriptions included discourse marks (such as intonation, pauses, breathing patterns, etc.). When analysing the data, besides analysing the written material, I also listened to the recordings to make sure that the discourse marks, such as intonation, would be included in the coding process.

4.7.3. Connecting discourses to five dimensions of NbS

After coding the material through Gee's (2002) tools mentioned above, codes were systematically organized and categorized into five dimensions: knowledge, stakeholder engagement, co-creation, biodiversity and sustainability. These are the same dimensions that were explored in the literature review on chapter 2. Once these summaries were categorized, and reviewed thoroughly, the analysis was executed taking into consideration relevant aspects that were brought up by the literature review. The literature framework of dimensions of the governance of NbS in the urban landscape (section 2.2) thus forms the foundation for the discourse analysis and enabled the identification of words and themes that are relevant for the analysis. The diagram below (figure 16) illustrates the steps of analysing the data:

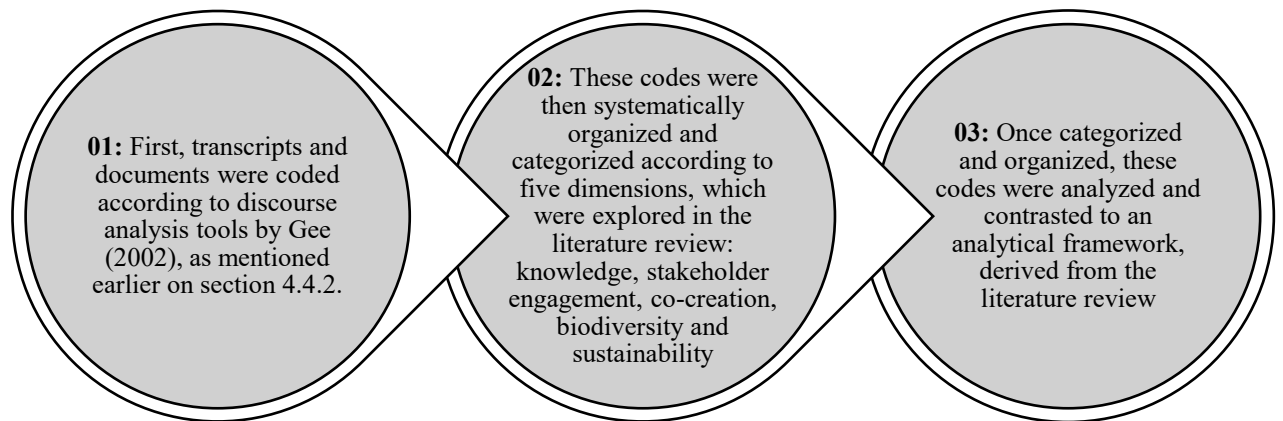


Figure 16 - Process of data analysis

The table 5, which is presented below, describes the aspects that emerged from the literature review and that were used to guide the analysis of the coded material.

Table 5 – Analytical framework for data analysis

Dimension	Main aspects identified in the literature
Knowledge	<ul style="list-style-type: none"> • Role of aesthetics and appreciation • Ecological and cultural knowledge • Multidisciplinarity • Role of social sciences • Asymmetry of knowledge
Stakeholder engagement	<ul style="list-style-type: none"> • Trade-offs and competing interests • Accountability • Communication • Relations between human communities and nature • Belonging
Co-creation	<ul style="list-style-type: none"> • Inclusivity • Value creation • Communication and narratives • Distribution of risks and harm • Justice

Biodiversity	<ul style="list-style-type: none"> • Shared understandings • Evaluation of biodiversity • “Nativeness” vs invasiveness • Education and communication
Sustainability	<ul style="list-style-type: none"> • Performance measuring • Legitimacy and quality • Sustainable urban development • Urban & population growth

4.8. Validity of the Research

Validity is a crucial aspect of qualitative inquiry. It is validity that ensures a sound scientific process (Creswell & Miller, 2000). In that sense, the limited and inadequate time availability for the study to be conducted due to tuition fee rules¹ prevented that stricter validity instruments were carried out, such as continuous external evaluation and peer reviewing and prolonged immersion in a field.

Nevertheless, certain validity instruments were executed in order to diminish or overcome validity barriers imposed by the lack of sufficient time to conduct this thesis. One validity tool, for example, was the action of “Disconfirming evidence”. It is a procedure by which the researcher searches for evidence in the literature that contradicts or disconfirms the themes and findings. Since this process faces limitation in literature review, additional validity processes were also adopted, such as describing openly throughout the thesis my personal background and personal beliefs that could compromise the research results (Creswell & Miller, 2000). Another step that was taken in order to ensure validity was to describe clearly and in a straightforward language the methods and research approach. According to Creswell & Creswell (2017), describing thoroughly the methodology is an important action towards ensuring validity. Finally, as suggested by Gee (2002), once the analysis was concluded, the material was thoroughly reviewed again in order to verify if context gaps were noticed.

¹ As of 2016, Finnish universities were required to charge tuition fees for students incoming from outside the European Union or the European Economic area (Yle news, 2019). Annual tuition fees in Finland range from 8,000-18,000 euros, which creates a gap between students that can take their studies lightly, slowly and dedicate to studies and other extra-curricular activities, and the students that need to compromise the quality in order to afford living and be able to graduate.

4.9. Ethics of the Research

Research is developed in a relationship of mutual trust between researchers and participants. In this sense, it is the duty of participants to talk honestly, and my duty is to act respectfully and take care of participants' time, stories, perceptions, well-being, discomforts, and negative or positive feelings that may arise during the research process. Ethics is a core component of this master's thesis, and the following aspects have been fully addressed throughout the entire process of the production of the master's thesis.

A first aspect related to thesis that was considered for this research concerns the relevance of the topic and the findings to the participants of the study. Whereas my research question may be relevant for academia and for me, it may not bring value to the participants in the study or may not be considered relevant by the participants. In order to mitigate this aspect, participants were informed that research results may not have the desired impact on them. At the same time, I communicated about other possible benefits and generated value that may not have been their priority at first, e.g., that the thesis could have value for my educational learning as well as for science.

Interviewees were asked regarding their expectations for the study - and what they thought it could bring to the project. I also registered the expectations of participants and pondered whether they could be integrated into my master's thesis. One of the participants, for example, manifested interest in learning more about the results from a practical point of view, and because of that, I committed to communicating about the research through different ways (a detailed explanation on how I connected the thesis to activism and communication can be seen in the Afterword).

A second aspect regarding ethics concerns consent. According to the American Sociological Association Code of Ethics (Asanet, 2018), an informed consent is the ethical basis of all social research that involves humans, being the responsibility of the researcher the communication regarding the research requirements. For this thesis, participants were informed of possible expectations, risks, and outcomes of the research, and to participate in the study, they had to be fully aware of this information, and consent to all the risks and possible outcomes of the research. This included, for example, consenting to the recording, the possible transcription by third parties, and the aims of the data, which are to be used solely for academic purposes. Since in the context of Finnish culture verbal agreements have a strong value, a written consent form was not produced.

Finally, potential risks were considered and analysed in order to diminish the possibilities of harming the participants and ensure that proper mitigation measures would be taken. The risk assessment table can be consulted in the Appendices section. All participants were anonymized in the study in order to maintain confidentiality and ensure their safety.

4.10. Summary of the methodology

The table 6 summarizes the content of this chapter.

Table 6 – Methodology description – summary of the chapter

Aspects	Description
Research approach	Qualitative
Theoretical framework	Social constructionism / Discourse analysis
Research design	Exploratory case study
Unit of analysis	Discourse
Data	Five (5) semi-structured interviews, one (1) focus group, one field event visit, documents (6 blog posts)
Method for data generation	Snowballing and criteria-setting for selecting documents
Method for data analysis	Discourse analysis
Validity	Disconfirming evidence, describing personal influences, reviewing and writing clarity
Ethics	Expectation management, informed consent, risk assessment

5. FINDINGS

This chapter will present the findings that emerged throughout the data analysis. As stated earlier, the analysis derives from five (5) interviews with five (5) participants, a focus group with two (2) participants, data from a participant-observation in an event organized by UNaLab, which was the invasive species workshop and 6 documents, which are blog posts from UNaLab webpage (unalab.eu).

The findings respond to the following research question: **How do the implementation discourses of the UNaLab project express different meanings and views of nature?**

The findings are structured according to five dimensions: knowledge, stakeholder engagement, co-creation, biodiversity, and sustainability. These dimensions were selected through an extensive literature review, as described in detail in the methodology chapter. In case of direct citations to interviews, participants of the study will be referred to as P1, P2, P3, P4, P5, P6 & P7. Participants are always referred to as a “they”. “They” is a plural pronoun that is used throughout the findings to refer to singular subjects in a gender-neutral manner².

The table 7 describes the participants’ roles in the experimentations as well how they are referred to (participant code) throughout the findings chapter.

Table 7 – Participants and their code

Participants	Participant code in the findings chapter
VTT Expert, coordination with the European Commission	P1
Innovation voucher winner II (Horse paddock)	P2
Project manager, municipality employee	P3
Project planner, municipality employee	P4
External consultant, project communications	P5
Participant at invasive species workshop	P6

² Bradley’s (2020) study demonstrate that the usage of the singular “they” pronoun is more commonly understood within a community of speakers that are more used to non-binarism in gender. This choice for using singular “they” could then compromise the clarity of the findings for an audience more used to gender binarism. However, according to Foertsch & Gernsbacher (1997), “they” is an efficient gender-neutral replacement for “he” or “she”, from a cognitive point of view. Bradley et al. (2019) also found through an empirical study that participants matched a singular “they” to gender-neutral expressions, hence, the decision on using “singular they” on this study as a more inclusive way of talking about individuals without indicating their gender.

External consultant, project ecology	P7
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The supporting data that was analysed will be referred to as S1, S2, S3, S4 and S5. The table below (table 8) describes the correspondence between the piece of the data and which code refers to it throughout the thesis.

Table 8 – Codes for supporting data in the Findings chapter

Piece of supporting data	Code in the findings chapter
Participant-observation field visit at an UNaLab organized event, “Invasive species workshop”, that happened in Vuores Central Park	S1
Blog post: “Children’s urban nature lab in Vuores”	S2
Blog post: “Pollinator friendly nature-based solutions in Tampere”	S3
Blog post: “How do people use and perceive green spaces and how has Covid-19 changed the situation?”	S4
Blog post: “Natural areas increase attractiveness in Vuores”	S5
Blog post: “NbS innovation vouchers in Tampere”	S6
Blog post: “First results of co-creating nature-based solutions in Tampere”	S7

The findings are systematically organized under the dimensions of knowledge, stakeholder engagement, co-creation, biodiversity, and sustainability. The meanings of nature narrated here are not necessarily in opposition to each other, and many times, they appear connected to one another. Sometimes meanings repeat across different dimensions, however, since they connect to the dimensions in different ways, they may be mentioned more than once across the findings chapter.

Next, I explore how the discourses of implementation of the UNaLab express different meanings of nature regarding knowledge.

5.1. Knowledge

The implementation discourses of UNaLab that relate to knowledge express meanings of nature through different discursive mechanisms.

It was a consensus among participants, for example, that their knowledge of nature and natural processes, either as an expert or as a community participant, is always limited (P1, P2, P3, P6, P7). Limitation in that sense, does not mean that nature itself is limited, but that humans could only access

knowledge about nature and natural phenomena through limited scientific or cultural resources, lenses, and tools. P7, for example, describes how Indigenous knowledge can fill gaps around the scientific knowledge of nature:

“I try to get in the Indigenous knowledge about the nature [insecure tone of voice] (...) because I can't get enough scientific, [smiles] cultural information, that I could understand in a very short time and they have time span of thousands of years, even though I don't understand the kind of a mechanism or the scientific background beneath it.” P7

P7 also demonstrates the limitations of conceptualization of nature-based solutions (“processes by which nature is mimicked”) due to the limitation of knowledge. They say: *“we cannot mimic nature completely because we still don't know all the processes that are going on in there”* (P7).

For some of the participants of the study, the climate crisis seems to exacerbate this limitation regarding human knowledge gaps on nature. For P1, P2 and P3, for example, due to unprecedented changes caused by the climate crisis, experts and communities alike have less previous experience to understand and to deal with novel natural processes. Similarly, climate change is discursively constructed as a reality, and the need to adapt to is not questioned. Like the discourses of novelty and the inevitability regarding the climate crisis, often, nature was spoken as collapsing ecosystem, which was constructed in the speech through visual imagery, intonation, figurations, and intertext. (P1, P2, P3, P4, P5, P6, and P7).

“You know, without the services provided by healthy ecosystems our whole system collapses, we have no goods or services. We don't have clean air or clean water.” P1

“It's very ironic that [ah] humanity has, like, or certain key players [chuckles] in humanity or certain ways of life or ideologies or whatever have led to nature being impacted so badly by human activity” P6

The perceived limitation of knowledge, for example, did not prevent citizens, communities, and project experts to engage with NbS. During the invasive species workshop, for example, some participants revealed that despite not knowing why the invasive species were being removed, they trusted the organizers knew the reasons to remove them (S1). Furthermore, some project workers did not always understand technically how some of the solutions worked, but still described their work as a contribution to more healthy environments (P3, P4). Phrases such as “To make the world a better

place” and “to work for nature” were used often by them to describe how they expressed the impact of their jobs.

“I work for the nature. I also work to save this planet [happy/excited tone of voice].” P2

“My job is to be the voice of nature in projects.”. P7

The implementation discourses of UNaLab also echoed broader social technocratic environmentalist discourses on nature. Technocratic environmentalism is a movement that emerges in the XIX century, and that advocates for science and expertise to plan, explain, organize, and legitimize solutions to environmental problems (Wolsink, 2010; Chakravarty, 2017). P1, for example, described NbS as solutions that always solve “technical” problems. In that sense, according to P1, bringing community knowledge to the table does not erase the fact that solutions to environmental problems are always engineered and technical.

5.2. Stakeholder Engagement

In this section, I look at meanings and views of nature regarding stakeholder engagement, derived from the discourses of implementation of the UNaLab project.

Participants’ discourses on nature indicate that nature does not possess a stationary and permanent meaning. One example concerns the relations established by the project experts and the funding agency (the European Commission, EC). P1 found the interaction with the EC ‘reasonable’, which is further emphasized by their expression that, when it comes to funding reporting, the EC does not seek “to punish people”. P1 shares that, when reporting project results to the EC, actions that were not categorized strictly as NbS, such as information signs and pavements, were justified in terms of funding because their implementation supports the NbS.

Fundamentally, the flexibility preached by P1 demonstrates that even the meanings of nature can be negotiated in the discourse when reporting implemented actions to funding agencies - this example demonstrates that “nature” is shaped and transformed in the discourse to serve the purposes of justifying financially the implementation of NbS. P2 and P3, on the other hand, felt that project funding schemes were not as flexible, which limited the creativity and possibilities of NbS that could be implemented through the UNaLab project. P5, one of the innovation voucher winners, mention

that projectization limit the creativity of the solutions that are implemented, but at the same time, project workers showed flexibility when it comes to financing their solution. They say: *“I also felt that the idea was so outstanding that they really tried to find a way how to finance us the idea.”* P5

In this, the discourses illustrate that meanings and imaginaries of nature go through a selection and refining process through “projectification” even before the project is implemented. Projectification is a phenomenon by which sustainability goals are engaged with through interventions with schedules, determined actors, plans and funding (Munck af Rosenschöld, 2017).

When it comes to the reimagination of different relations between human communities and nature, speech and discourse mechanisms were promoted specific visions and meanings of urban nature. One of these visions, for example, relates to the benefits of nature to human well-being and mental health. The invasive species workshop in Vuores, for example was advertised and promoted as an opportunity for residents to engage with a physical exercise outside. When discussing the event with one of the participants onsite, he shared that he enjoyed participating in workshop as he felt he was part of a community (S1).

Another vision of nature that was enacted by discursive practices concerns “nature as a continuum”. It refers to a scale that characterizes certain phenomenon, projects, ideas, or objects as “natural” or “artificial”. P6, for example, mentioned that the communication around invasive species is too harsh. One example concerns invasive species. Invasive plants species, such as the Lupine, are also attributed the status of artificial and non-natural, as noticed in one of UNaLab’s events on invasive species removal. The figure 17 offers a visual explanation of the principle of nature as a continuum:

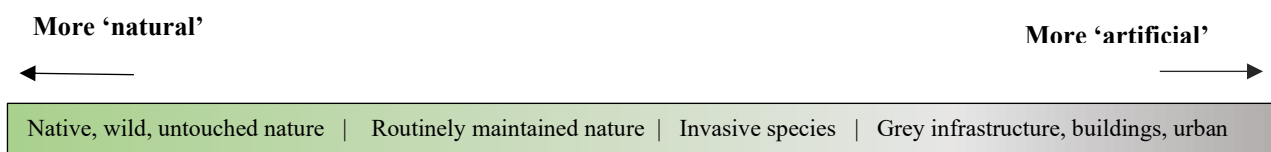


Figure 17 - Nature as a continuum

In that sense, nature as a continuum can also relate to a vision by which nature is a property or essence of objects. For P4, for example, when urban parks are too managed, they are not so ‘nature’ to them anymore. In this sense, “nature” is a property that is shaped through practices of discourse.

“If parks are very tidy and planned, maybe they are not so much nature for me.” P4

The vision of “nature as a continuum” can jeopardize or limit the reimagination of relations between humans and nature. If we reject “artificial” solutions, inevitably the stakeholder engagement will be compromised. Rather than seeing nature as a continuum, in that sense, a focus on the “how” artificial relations could promote biodiversity, would be beneficial for stakeholder engagement.

Wording and speech also brought a view by which nature is associated to kinship and ancestry. P1, for example, when narrating the value brought by the community when engaging with NbS, used the wording ‘grandfather’. This denotes a relationship between human communities and nature based on kinship, history, past, and ancestry.

*“Maybe we don't have all the best data about the extent or duration of flooding, but some of them [community] can say [change of voice towards a deeper tone]: ‘**my grandfather** lived here, and he talked about when it flooded to this height’. [shows the height with hands]” P1*

Nature as kinship was also an aspect brought up by the innovation voucher winner (P5). They describe having horses as an ‘old school’ habit, as well as they talk about how their farm was inherited from family. P5 states multispecies collaboration as the vision for a future of kinship with nature. In that sense, the interviewee actively contrasted their solution to modernized views of urban development.

Some project workers mentioned that nature brought discomforts and fears to the residents (P4 and P7). In this panorama, some residents were scared that their kids would drown, while others feared wild insects that NbS could bring to the area. When faced with conflicting views and meanings of nature brought by multiple stakeholders, a suggested solution by project workers usually involved educating the receivers of the project, or the affected communities (P1, P2, P3 & P4). When communities and residents shared similar understandings of nature with the UNaLab project workers, there was a perceived potential for collaboration. When these visions conflicted, however, experts stated the need of educating and teaching the community regarding “ecosystem services” (P2, P3), “the importance of biodiversity” (P1), etc. Education is seen here not to dialogue on different worldviews, but rather to share and teach an ‘objective’ knowledge of nature.

5.3. Co-creation

In this section, I explore the findings related to co-creation. It should be noticed that the view of the ‘limitation of knowledge’, that was first explored in 5.1., was used to justify why communities should participate in the co-creation of NbS. According to P1, for example, they could bring a different possibility of knowledge on the past and historical entanglements that technical experts do not possess.

Many experts (P1, P2, P3, P7) made sure to emphasize the role of communities, as well as blog posts (S2, S4, S5, S6 and S7). It was noted an attribution of moral value to the inclusion of communities in the discourse and to the inclusion of citizens to co-creation, with P7 even emphasizing the role of Indigenous engagement. In this, it indicates the relations between NbS and conservation narratives: by highlighting how important community engagement is for the definition of nature, experts want to demark the differences between NbS and the conservation discourses that were criticized for not publicly acknowledging communities and societies in their approach (Büscher et al, 2012; Diegues, 2019),

Co-creation was seen as a tool to generate “mediation value” between stakeholders and discourses that are usually contradicting to each other. Participants, with special emphasis on the experts, emphasized their role as mediators through discourse. This means that through language, they enacted a social role by which they would bring conciliation between conflicting views on nature and urban development. Their speeches frequently alluded to societal discourses and debates on what types of cities we should have, as well as referring to existing “polarization”. For them, in a simplified manner, there would be two sides: while there would be some voices preaching for engineering solutions, other voices would praise for solely “environmentalist” interventions.

“But I don't know how to grasp this in the design processes, and it gets very polarized somehow that... those are just the “nature people” and then there are just, you know, “joggers”. But they can be joggers that go to see nature [laughs]” P7

In this scenario, both nature, as well as humans, would have the role of allowing for solutions to emerge that would mediate and put in harmony these two worlds. Politically, this meditation treats both sides as equals, as well as highlights the need for a balance as a value that should be sought for (P1, P2, P3, and P4). The moral appreciation for ‘balanced solutions’ is seen in P4’s speech:

“I think many Finnish people can appreciate that kind of wild surroundings because Vuores [pause] anyway, has so much this kind of city infrastructure and these (natural) places too, so, maybe it's about the balance” P4

This is also seen in the language used by the UNaLab professionals to report actions executed under the NbS that were not based on nature (for example, pavements and information signs). They were called “supporting actions”. The supporting word means that these actions are not in contradiction, but rather mediating the engineered solutions to the ‘nature-based ones.

In addition to these views, nature was also constructed as a limitation to co-creation. In this, NbS allows for sustaining relationships with the community, it is a dialogue, but not a satisfaction guarantee. Even though the community may express the need and wish for more recreational solutions, for example, other types of NbS maybe produced if they better deliver on 'biodiversity' and 'ecosystem' services. (P1, P2, P3 and P6)

This view is also expressed by the idea of “acceptance of nature” (P1 and S3). In a survey conducted by UNaLab of NbS around Europe, one of the relevant findings was regarding cultural differences in acceptance of nature (P1 and S3). The fact that the word ‘acceptance’ is used presumes a reality or an entity that is being accepted. This reality is not up to be questioned, negotiated, or discussed, but rather, it is up to be accepted. The role of the community, in this sense, is not discursively constructed as shaping nature’s reality, but rather on defining how much of nature it can accept.

In addition to co-creation with citizens, nature was also portrayed as a co-creator itself. Sometimes, participants would refer to themselves as ‘us’, as part of a whole community and in togetherness with nature. This was a vision which was shared by P6, who participated at the invasive species workshop in Vuores. According to them, removing invasive species is one activity with the power of bringing people together. At the same time, a change of voices in the speeches would suggest that project workers change between talking about themselves as an externality to the co-creation process, and other moments, talking about themselves as part of the togetherness co-creating NbS. This suggests that in discourse the roles of humans and nature in co-creation can change (P1, P2, P3, P4).

As reported by P7, the project itself also allowed them to be more civilly engaged in Tampere. One of the reasons for that, they say, has to do with the fact that because of UNaLab they would be able to promote the “importance of city nature” to citizens. They mention:

“I think UNaLab has been one of the projects where my sort of my personal interest has also been able to spawn in a way with the pollinator things and we engaged with the other stakeholders and the citizens, so I kind of found myself in lot, lots of times more of kind of a Tampere citizen [laughs] in this project than in any other” P7

5.4. Biodiversity

On this section, I analyse the meanings of nature that relate to biodiversity.

Biodiversity is described in discourses through visual examples, figured words, and intertext. Participants engage with these resources in order to demonstrate that there is an inherent variety within nature, as well as “messiness” and “uniqueness”. The excerpt below illustrates this principle:

“[...] So that means it floods sometimes, so it provides buffering capacity for flood, floodwaters, but it also means that it's a really [smiles] unique environment. So, there's a lot of different, you know, [excited tone of voice] unique plants and animals that will live there [...]” P1

In this, these discursive mechanisms assign to nature a value beyond human. P1, for example, also contrasts this messiness to the aesthetical public park and recreational areas. Similarly, P6 states how lupines’ beauty, which is the invasive species that were removed during the workshop in Vuores (S1), is a contradiction to messiness of biodiversity. For P1, P2, P3, and P4, there is a need that municipality’s residents understand that NbS will include messy and unique ‘natural’ aspects that will preserve biodiversity, but that will not bring necessary human recreational or aesthetic value. Nevertheless, it is not explicated by P1, P2, P3 and P4 who would get the right to be the ‘voice’ of biodiversity, and how the value of biodiversity would be defined. Biodiversity is, in this sense, is a discursive mechanism that participants use to indicate a hierarchy of priorities when it comes to preserving nature rather than prioritizing human needs and wishes.

Furthermore, biodiversity relates to the implementation discourses to what I nominate as “preservation of biodiversity as the chicken-egg paradox”. There is a common anecdote across many

cultures that states a “chicken-egg” paradox, which is, in essence, is story that discusses the paradox of origins, meaning, the impossibility of knowing who came first, the chicken, or the egg (Sorensen, 2003). The anecdote illustrates the trouble in finding and defining the origin of beings, things, and entities. Without the source (the chicken), we would not have an egg, and without an egg, we would not have a chicken. The ‘egg or chicken’ paradox is referred to here to illustrate a similar paradox regarding the relations between wild biodiversity and NbS.

For some participants, NbS are nature-based because they enact wild biodiversity (P1, P3, P4 and P6), and wild biodiversity is “nature-based” (or rather, natural”) because it occurs naturally without the management of humans. The diagram below illustrates how the “preservation of biodiversity as the chicken-egg dilemma” is expressed on the implementation discourses of the UNaLab project.

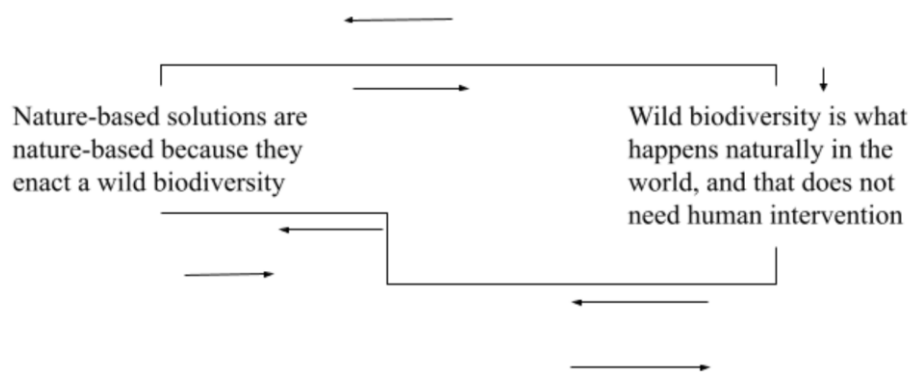


Figure 18 - Preservation of biodiversity as the chicken-egg paradox

This is a paradox that is directly addressed by P7 as a barrier to the implementation of NbS. For them, a gap in the project was the lack of direct management towards biodiversity. This is an illustration on how constructed beliefs towards discourses can have practical implications for the governance of NbS.

Besides the chicken-egg paradox, coupled with biodiversity, nature is also understood as ‘hidden worlds’, or is characterized by what is unseen (P1, P4 and P6). While for P1, the UNaLab project brought to light the biodiversity that is not visible at first sight, for example, microorganisms, P4 mentioned that “people” may think wild nature is ugly or may not value or appreciate nature that enacts biodiversity, but that is because much of the biodiversity is simply unseen. It would be the role of education and communication, in that sense, to make this biodiversity more visible.

Another common meaning associated with biodiversity concerns “nativeness”. In conservation discourses, “being native” is so strongly associated to nature that it has the power to explain and justify actions to remove invasive species on its own. In that sense, the phenomena of seeking for “native” nature happens in parallel with feelings of Finnish national identity that are enacted by participants.

Nationalist discourses and the construction of a national identity frequently engage with elements of nature in order to fabricate national identity (Schwartz, 2006; Demeritt, 2002; Duarte, 2014). P2 and P3, for example, believe that Finland is already performing well when it comes to preserving nature, NbS are not needed, but rather the focus should shift to the preservation of the “untouched” nature that already exists.

“Here in Finland, where we have a lot of natural areas, we have forests and lakes... and the population is not so, so dense. So, hm, [exhale] I think in our country it is more important to preserve existing nature [chuckles] than build nature-based solutions.” P3

The excerpt above brings common discourses of the environmentalist agenda. One example is of human population density is the cause of natural problems, as well as what matters is the abundance of natural areas, instead of the quality and characteristics of these areas, such as biodiversity, accessibility, etc.

When it came to the appreciation of an ‘ugly’ or ‘wild’ nature, P4 tells that:

“I think many Finnish people can appreciate that kind of wild [a bit of uncertain tone] kind of surroundings.” P4

5.5. Sustainability

First, nature is portrayed as having “integration” or “integrative” value by the participants of the study. By integration or integrative value, I refer to discourses that praise the ability of nature to bring together polarized perspectives, contradicting or diverse fields of science and/or different social groups towards common goals. P7, for example, argues that NbS require the collaboration of multiple fields of science precisely because it is based on nature. This “integration” or “integrative” value is constructed through broader discourses of sustainability, not only academic, but also in the public

sector (e.g., Larsson & Holmberg, 2018; Franco-torres et al., 2020; White et al., 2019; van der Bergh, 2018; Bruckmeier, 2018; Thomson et al., 2014; Enqvist et al., 2018).

All participants mention, at some degree, the integrative value of nature regarding sustainability (P1, P2, P3, P4, P5, P6 and P7), but despite this, there is a discursive imbalance on how important the role of each stakeholder and field of knowledge should be. For example, as discussed in the biodiversity section, biodiversity was expressed as more important than citizens' values of aesthetic appreciation. If this is the case, for example, the three dimensions of the triple bottom line, which was discussed more deeply in the section 2.2.5., the environmental dimension would be prioritized over the dimension of society.

Furthermore, some participants revealed power imbalance on who gets to decide how cities should look like, and how urban development would be executed. P5, for example, refers to decisions over urban growth and development as being “faceless”, which would prevent citizens from questioning or influencing on the outcomes of the decisions.

Secondly, nature is constructed through discourse as a source of “resources”, or “benefits”. This was also a common narrative not only in the interviews and in the focus group but was also noticed during the event workshop on invasive species (S1), as well as in blog posts (S2, S3 and S4). Usually, NbS are understood as capable of bringing both mitigation and adaptation benefits. However, in the implementation discourses of the UNaLab project, the focus of benefits provided by NbS relied more on adaptation rather than on mitigation (P1, P2, P3, P7). Thus, these discourses re-enforce ideas present in NbS discourses at the international level by which nature is instrumentalized and commodified for human benefits (Newell & Taylor, 2020). A similar process of critique happened to a “sister-concept” of NbS: ecosystem services. The concept was criticized both in academia and by social movements over portraying nature as instrumental, over commodifying nature, and over promoting an anthropocentric view of nature (Schröter et al, 2014).

Another important aspect regarding the use of language, concerns how urban developers and communities are categorized as being from “opposite sides” in the battlefield of urban development, which sometimes was referred by participants as a phenomenon of “polarization” (P1 and P7). Besides the duality of developers vs communities being enforced by speech, in some cases, nature was also understood in opposition to development and to urban growth. P5, for example, one of the innovation voucher winners, says:

“(Urban growth) is like a force from the sky pushing things forward and it's called development, this, like a natural development that it will happen anyway. The city will grow anyway”. P5

P5 reveals an ideology of realism and inevitability constructed in the discourses of implementation when it comes to city growth and urban development. This is expressed by P1, for example, when they say that there will always be trade-offs, and that when NbS are implemented on pieces of land, this could mean a loss of opportunity for developers.

In addition to these views, nature is often associated with body sensations, or with forests. Forests were the main image cited by participants as a visual example of what nature means. It is not uncommon also to find many visual representations that associate nature to the colour green and to specific colours, like the autumn colours. P6, for example, says the following:

“And I really enjoy seeing the colourfulness of the trees these days. But I also engage, like, on, maybe, the deeper when I go to the forest for, just last night, I went for a run in the woods” P6

The issue of justice was marginal in the implementation discourses of UNaLab. Justice and equity were shared only once by P1, who manifested a personal interest in learning more how to avoid gentrification and unequal share of access to green spaces. P6, manifested an equality to access to decision-making, but neither of these revealed how these approaches were integrated into implementation.

5.6. Summary of findings

The table below (table 9) summarizes the findings of the chapter:

Table 9 – Summary of findings

Dimension	Meanings and views of nature expressed by the implementation discourses of UNaLab
Knowledge	Human knowledge about nature and natural phenomenon is always limited.
	The climate crisis exacerbates the limits to access and generate knowledge about nature.
	Nature is a given and objective reality, and it exists in opposition to what is “human-made” (a cartesian view).

	Nature problems are “technically” made and solved, echoing a technocratic environmentalist discourse.
Stakeholder engagement	Meanings of nature are flexible, and can be negotiated through discourses when reporting results.
	Meanings and views of nature go through a filtering process through projectification.
	Stakeholders can engage with nature as kin or partners.
	Nature can be a source of fears and discomforts for some stakeholders.
	Education has the role to teach an “objective” knowledge of nature to stakeholders.
Co-creation	Nature has the role of being a mediator, fostering dialogue and conciliation between “polarized” opinions
	Preservation of nature or biodiversity is more important than human motives.
	Funding schemes determine what nature is and what is considered nature
	Nature is an objective reality that is “accepted” by citizens.
	Nature has agency to influence on the outcomes of a project.
Biodiversity	Nature has an intrinsic value due to its ability to produce difference and uniqueness (biodiversity).
	Preservation of biodiversity as the egg-chicken dilemma: NbS are nature-based because they enact wild biodiversity, and wild biodiversity does not need human intervention to thrive.
	Nature as “hidden” worlds, what is unseen.
	Biodiversity, and nature, are interlinked with national and national identity.
Sustainability	Nature’s existence is a contradiction to urban growth and development.
	Nature is a provider of benefits for human communities, especially around well-being and mental health.
	Nature’s imaginaries are associated mostly to forests.
	Nature as body sensations and visual stimulation.

6. DISCUSSION

The purpose of this study was to complement the existing literature on cases of implementation of NbS in urban landscapes, while also addressing an existing gap that is under researched in NbS: how discourses produce meanings and views of nature. To guide my research, the central question posed was **“How do the implementation discourses of the UNaLab project, realized in Tampere, Finland, express and construct different meanings and views of nature?”** A social constructionist approach was adopted to respond to this question, which enabled the exploration of how UNaLab stakeholders describe, explain, and interpret the project implementation, and what are the meanings and views of nature embedded in these discourses.

Through discourse, the meanings of nature were analysed in terms of demarcation of social identities, intertexts, attribution of values and social roles, demarcation of appropriate practices in NbS and the shaping of social relations through language. One of the main findings of the research is that nature is a movable concept, coupled to different discourses and, many times, with unclear and contradictory meanings. The multiplicity of possibilities for the meanings of nature in a single case study show that its conceptualization of nature is far from being a consensus on the NbS space. To say that the meanings are movable mean that they also change and move, which creates, for example, the ‘chicken/egg’ paradox, as described more in the detail in the findings.

This chapter discusses the implications of the findings for the governance of NbS in the urban landscape, followed by a discussion on the theoretical implications of the findings.

6.1. Practical Contributions and Recommendations

In this section the practical contributions of this study will be elaborated, with the aim of showing the connections between the findings and the governance of NbS in the urban landscape. I also draw recommendations based on the findings, that can aid practitioners working with the implementation of NbS in urban landscapes. My recommendations should not be seen as universal or generalized for all urban contexts. The exploratory and qualitative nature of this case study poses considerable limitations with regards to the generalization of the results. Nevertheless, the context-rich data offered by this thesis may help practitioners understand how they can further integrate meanings of nature to their work, as well it can sensitize them on the importance of language in their projects and practice.

The table below (table 10) summarizes the implication of the main findings to the governance of NbS in the urban landscape. The first column of the table, which presents “Meanings and views of nature (...)” were already presented on the summary of findings. An extra column, “Implications to governance”, relates these findings to their implications to the governance of NbS in the urban landscape. A third column brings recommendations to practitioners that are based on these findings and implications. A table was chosen for its ability to improve readability and to provide a clear visualization of findings, implications, and recommendations alike.

Table 10 - Implications of findings for governance and recommendations

Dimension	Meanings and views of nature expressed by the implementation discourses of UNaLab	Implications to governance of NbS in the urban landscape	Recommendations
Knowledge	Human knowledge about nature and natural phenomenon is always limited.	Governance of NbS will always rely on incomplete knowledge and on unknown variants regarding nature and natural processes.	Stakeholders’ different knowledges around nature and NbS can be assessed, and how their different parts can be joined to form a more cohesive vision of nature
	The climate crisis exacerbates the limits to access and generate knowledge about nature.	Governance of NbS relies on unreliable technical and community knowledge as the “reality of nature” is constantly changing due to the climate crisis.	Changes caused by the climate crisis should be communicated constantly to stakeholders, so they are prepared to engage with generation of knowledge of new natural processes
	Nature is a given and objective reality, and it exists in opposition to what is “human-made”.	An “objective” view of nature can prevent cultural and symbolical elements from being integrated and perceived as “solutions”, such as “messy” or “ugly” natural elements.	Communication should portray nature not as a co-constructed reality, while focusing on what different worldviews can bring in terms of knowledge
	Nature problems are “technically” made and solved, echoing a technocratic environmentalist discourse.	A technocratic environmentalist discourse prevents citizens and non-technical stakeholders from engaging further with the definition of the problem.	By allowing participants to co-define the definition of the problems that NbS are trying to solve, nontechnical knowledge will be automatically considered when designing and implementing NbS
Stakeholder engagement	Meanings of nature are flexible, and can be negotiated through discourses when reporting results	Language of NbS in governance is not neutral and permanent. The language mobilizes action through specific meanings of nature	Recognize the non-neutrality aspects of language. Include a section on project design, and monitoring on how language mobilized certain types of action
	Meanings and views of nature go through a filtering process through projectification	Projectification limits stakeholders’ creativity and possibilities of integrating distinct views of nature when implementing NbS	Build project designs that are flexible to change due to the integration of stakeholders’ perspectives and worldviews on nature

	Stakeholders can engage with nature as kin or partners	Kinship with nature presumes a different nature of governance that does not rely only on technical and rational knowledge	Meanings of nature should not be assumed in the project: project workers should integrate mechanisms, so a shared understanding of nature is co-constructed by the stakeholders
	Nature can be a source of fears and discomforts for some stakeholders	NbS may face criticism or backlash from the community due to their fears or discomforts	A dialogue on common fears and discomforts can mitigate them; Communication should be intentional in portraying also the “negative” downsides of nature
	Education has the role to teach an “objective” knowledge of nature to stakeholders	Education is limited from its potential to foster a dialogue between different worldviews of nature.	Validate the project with the critiques to different discourses on nature, and try to ask yourself about the paths the project is following: are they representative of stakeholders’ inputs on nature? Create spaces for dialogue.
Co-creation	Nature has the role of being a mediator, fostering dialogue and conciliation between “polarized” opinions	The way nature is framed has the potential of encouraging less or more citizen participation	Trade-offs should be openly addressed through project communication
	Preservation of nature or biodiversity is more important than human motives	Co-creation in governance is limited by nature itself (e.g., biodiversity is more important than citizens’ inputs)	Openly address through communication the purposes of biodiversity and of the more-than-human world
	Funding schemes determine what nature is and what is considered nature	Co-creation and citizen participation is limited by funding schemes	Communicate to funding agencies the limits imposed to the creativity of NbS. If awarding funding, try to reflect on how limits of projects could push NbS towards more inclusive visions of nature
	Nature is an objective reality that is “accepted” by citizens	Citizens and communities have limited possibilities to co-construct the reality of nature through governance, but rather they participate in “accepting” it	Project communication can be realized by citizens. Integrate the language used by citizens to report and monitor project results.
	Nature has agency to influence on the outcomes of a project	Nature becomes an actor with agency to co-create the solutions (in this sense, solutions would not be nature-based, but made <i>with</i> nature)	In the co-creation planning stage, try to reflect how the project would look like if nature was considered an actor, and if nature was to participate as a co-creator. Try to assign a voice to nature. It may be useful to draw from artistic tools or Indigenous knowledge for that.
Biodiversity	Nature has an intrinsic value due to its ability to produce difference and uniqueness (biodiversity)	Homogenous nature, or nature not perceived as biodiverse can be excluded from frameworks of solutions	Governance should experiment with “homogenous” solutions as partners for biodiversity, such as the case of horse paddock (a homogenous species

			collaborating with humans to create a more biodiverse environment0
	Preservation of biodiversity as the egg-chicken dilemma: NbS are nature-based because they enact wild biodiversity, and wild biodiversity does not need human intervention to thrive	This dilemma is a dangerous one and it has the potential of threatening the very basis of nature-based solutions. If wild biodiversity does not need humans to thrive, NbS are not needed, and all it would take would be for humans to “leave ecosystems alone”.	Rather than justifying NbS on a “pristine” or “naturally occurring” biodiversity, communicate about the links of human communities and biodiversity to your project stakeholders. Rather than looking for “pure” forms of naturally occurring biodiversity, integrate to governance ways of managing ecosystems that are thriving for biodiversity.
	Nature as “hidden” worlds, what is unseen	NbS can have low acceptance since solutions may operate on a “hidden” level of nature	Communicate and educate stakeholders on the possibilities of biodiversity that are not visible to the human eye.
	Biodiversity, and nature, are interlinked with national and national identity	Selection of solutions that could bring national identity value rather than biodiversity value	Deconstruct nature of national value and try to reflect critically on what types of nature gets valued
Sustainability	Nature’s existence is a contradiction to urban growth and development	The assumption that the city will grow, and inevitable environmental destruction will occur restricts the potential of NbS to attain and achieve fully its benefits	It is recommended that project workers also encourage citizens to question the ‘naturalized’ assumptions on urban development and growth. It is recommended that discussions on urban growth and development be included in the design and implementation of NbS, and what is the “stand” that the NbS take
	Nature is a provider of benefits for human communities, especially around well-being and mental health	Nature is considered valuable for governance if it is providing benefits for humans	Adverse effects of integrating nature into the city landscape should also be considered, together with possible actions for its mitigation
	Nature’s imaginaries are associated mostly to forests	Implemented NbS may be reduced in scope due to limited imaginaries of nature	When promoting NbS and explaining what they consist of, be intentional to utilize images and text that highlight “ugly” and underrepresented imaginaries of nature
	Nature as body sensations and visual stimulation		

Besides the implications and recommendations shared on this table, I would like to bring special attention to a few aspects. First, regarding the preservation of biodiversity as the egg-chicken paradox, which states that NbS are nature-based because they enact wild biodiversity, and wild biodiversity does not need human intervention to thrive. One possible solution to the paradox would be to introduce the idea of “cultural biodiversity”, or “biocultural diversity” (Maffi, 2007; Santilli, 2002; Gonçalves et al., 2021; Rigonato, 2011; Agnoletti & Emanuelli, 2016). These frameworks are based

on the idea that biodiversity is co-created with humans' ways of living that generate cultural diversity. So, rather than attributing to nature the “wild” or “untouched” overviews that are typical to Western and Cartesian modernity (Dingler, 2005), one way of integrating nature in biodiversity could be of considering nature and natural elements as a stakeholder with agency to influence and collaborate for NbS.

Another important takeaway for the implementation of NbS concerns multispecies collaboration. In the UNaLab this was expressed by the funded horse paddock innovation voucher. The experiment showed that even a “homogenous” species (a horse) could contribute to increasing the biodiversity of the area through kinship and collaboration. Governance should experiment with “homogenous” solutions as partners for biodiversity, such as the case of horse paddock.

6.2. Theoretical and Methodological Contributions

The goal of the study was to gain a better understanding on how the meanings and views of nature are constructed through specific discourses – in this case, the discourses of implementation of the UNaLab project.

A key *theoretical contribution* of this thesis concerns the need for NbS conceptualizations to acknowledge the multiple possibilities for meanings of nature. It is key that future research considers the impact that conceptualizing, viewing, portraying, and talking about nature can have on the governance of NbS in the urban landscape. This study also challenges some of the scientific literature on NbS that replicates the conceptualizations of global organizations such as IUCN and the EC without critically analysing its premises, for example, the very idea of nature. Another theoretical contribution is that the study also confirms some important insights from the literature, for example, that NbS are a “boundary concept” (Hanson et al., 2020). The study also confirms that projectification (Nylén, 2021) filters meanings and possibilities for multiple worldviews to be integrated further into NbS.

Likewise, this thesis was able to demonstrate the importance of language in constructing realities, a principle of social constructionism that was not explored enough in NbS in literature yet. Still concerning theoretical contributions, this thesis results also question the limits of social constructionism and discourse analysis in recognizing the agency beyond the human. One way of developing discourse analysis could be of integrating one tool to the analysis of discourse: what are the agencies that are being enacted by the discourse? The initial attempts to recognizing agency in

nature beyond human can be further developed in NbS research. The agency aspect is further explored and experimented through visual text in the Afterword, on the section “Can nature produce discourse?”.

Another important theoretical contribution concerns the role of Multidisciplinarity for the research of NbS. This study is a unique combination of knowledge and insights from fields such as administrative sciences, urban geography, linguistics, philosophy, sociology, anthropology, and sustainability science. This is a notion that was already present in the literature, for which argues the need of considering multidisciplinary fields of science when studying NbS (Hanson et al., 2020).

When it comes to *methodological contributions*, this study contributed to an understanding of the implementation of NbS through the utilization of a unique and diverse set of data that consisted of semi-structured interviews, a focus group, a participant observation, and documents. The study is demonstration that discourse analysis can be used for analysing a diverse set of the data. While most studies of NbS concentrate on one method for data generation, this study successfully grasped on as many perspectives as possible.

6.3. Limitations and future research

Investigating the meanings of nature that are produced by discourses is an ambitious work that cannot be addressed solely by the master’s thesis. Despite the limitations imposed by a challenging and multidisciplinary research design, and by external conditions that limited the amount of time available for the research, such as tuition fees and the COVID-19 pandemic, I was able to explore the links between discourses of implementation of the UNaLab project and meanings of nature. However, despite being able to overcome those important challenges, some research gaps remain.

First, one important limitation is that the research design does not allow for a higher level of generalization and abstraction of the findings. Despite this, this single case study generates contextually rich data, and the results can therefore help identify specificities of this particular case. The insights generated in this study can be developed for future research of other NbS projects executed in urban territories. In order to overcome generalization limitations that are usually intrinsic to qualitative designs of research, it is recommended that researchers utilize this thesis findings to produce quantitative or mixed-method research that can produce insights that can be generalized. The

present research findings can be complementary both to inferences provided by larger quantitative studies or by deeper and thicker qualitative research designs, such as ethnographies.

A second limitation consists of a lack of data in Finnish language, or, even more, a lack of a multilingual literature references. Even though the research was conducted in Finland, it was carried out mainly with literature references in English, and data was generated mainly in English. This includes limitations on what type of information the research can access, as well as on the possibility of participants to join the interview in the English language. Furthermore, it misses on important literature that may be developed in countries where publishing in English is not that common.

Furthermore, almost all the references in the literature came from academic sources. In this sense, although this thesis criticizes a technocratic vision of nature, it also contains a significant gap of knowledge outside of academia. Besides this, Indigenous knowledge was not considered for the literature review and interpretation of the findings. Indigenous social movements and Indigenous knowledge have been active into criticizing narratives and projects of NbS (e.g.: Cassin & Ochoa-Tocachi, 2021), also claiming to have practiced forms of “nature-based” ways of living for millennia. In this, for future research design, it is also recommended that Indigenous frameworks of knowledge are integrated into the research.

Also, it should be considered that the study analysed discourses of implementation, and not discourses of project design or agenda setting. It is unclear, in this sense, what happens when projects consider and acknowledge the multiplicity of meanings, views and worldviews of nature from the very beginning, and it is unclear what type of value is generated by including multiplicity of nature from the beginning. This remains a gap to be explored both by research as well by practitioners.

Finally, when it comes to the limitation of the methods, the method fails in recognizing agency beyond the human. Despite some attempts into analysing and identifying an agency beyond human, for future research, discourse analysis maybe method could expand to interpret nature’s signs as discourses.

7. CONCLUSION

This study had the goal of understanding the meanings and views of nature expressed by the implementation discourses of the UNaLab (Urban nature lab) in Tampere, Finland. The UNaLab project is an urban lab that experiments on nature-based solutions (NbS) in two neighbourhoods in Tampere where intense development has happened for the past 10 years: Vuores and Hiedanranta. In order to attain to the research aims, the following research question was asked: **How do the implementation discourses of the UNaLab project, realized in Tampere, Finland, express and construct different meanings and views of nature?** Throughout the research process, I was able to respond to this question by employing qualitative research methods, which, through an exploratory case study design, consisted of a discourse analysis of interviews, a focus group, a visit to one of UNaLab's events (invasive species workshop in Vuores) and blog posts.

Based on the data analysis, it can be concluded that there are multiple views and meanings of nature, many times conflicting to each other. Furthermore, the meanings of nature have concrete implications for the implementation of NbS. These meanings were shared throughout the findings chapter divided across to five different dimensions of NbS: knowledge, stakeholder engagement, co-creation, biodiversity, and sustainability. The discourses of implementation of the UNaLab project demonstrate that nature's views and meanings have mobilized action, influencing on what solutions were picked, and how they were communicated about, and how they influenced co-creation and stakeholder engagement. Furthermore, the findings also suggest that some views of nature echo a technocratic view of environmentalist, such as the belief that NbS are solutions that solve technical problems.

The technocratic views were not the only ones expressed by the implementation discourses. Nature was also seen through lenses of "hidden worlds", as well as through lenses of kinship and ancestry. It was possible to realize that some meanings and views of nature were more encouraging of the participation of stakeholders and more encouraging of co-creation. This thesis also proved what has already been mentioned by literature: that "projectification" shaped and filtered possible meanings of nature. Considering these findings and results, implications for both theory and methodology were drawn, for example, regarding the contribution of the results into defining the social construction of nature in nature-based solutions. It is also inferred that considering multiple worldviews of nature has also the potential of improving co-creation, stakeholder engagement and the inclusivity of NbS projects.

This single case study does not allow for the generalization of the findings, or for a higher level of abstraction, due to its exploratory objective. The contextually-rich data, however, allows for practitioners to base on the conclusion and the findings to follow some recommendations for the improvement of NbS projects. It was recommended, for example, that practitioners take into consideration communication aspects and multiple worldviews of nature from the very beginning of the project.

Although this study has important limitations, such as the lack of generalization as well as a lack of consideration towards multilingual and non-academic sources of knowledge, the data generated by this study is contextually rich, it brings tangible outcomes to both practice and theory. Furthermore, the results can be further explored by future research, especially in dimensions of the governance of NbS related to knowledge, stakeholder engagement, co-creation, biodiversity, and sustainability.

AFTERWORD

Can nature produce discourse?

Through this master's thesis, I investigated the meanings of nature expressed by the discourses of implementation of the UNaLab project in Tampere, Finland. Throughout the writing of this master's thesis, I asked myself if nature could have a voice – and if not, who would have the right and legitimacy to speak on behalf of nature and how this would be defined and determined collectively. Even more, I questioned if nature could produce discourses, or if these were attributes specific to humans only.

All these questions are debatable questions. Depending on how we conceptualize and understand nature, it does not make sense to investigate if nature produces discourses, or if nature would have a voice. If we agree to a cartesian definition of nature (Dingler, 2005), for example, by which nature is opposed to culture, society, and opposed to the work of humanity, it becomes clear that discourse and voice are human-only attributes. However, if we interpret nature as socially constructed within discourses, we can investigate if and how discourses can be produced by nature.

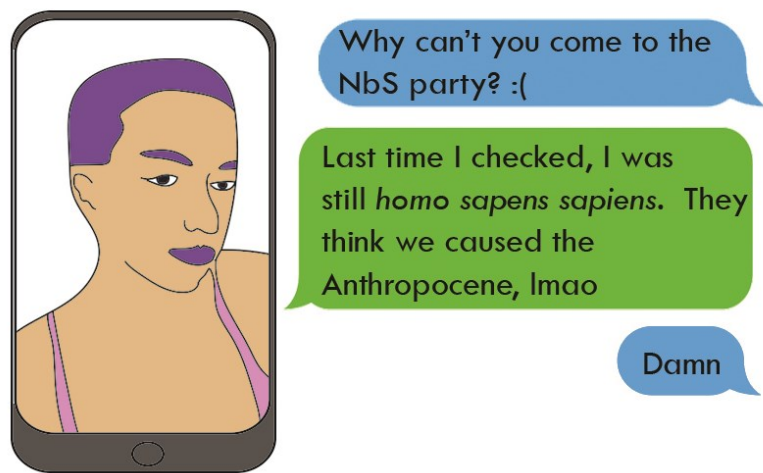
In order to understand if nature can produce discourse, one shall understand what a discourse is. In this master's thesis, a discourse was defined as:

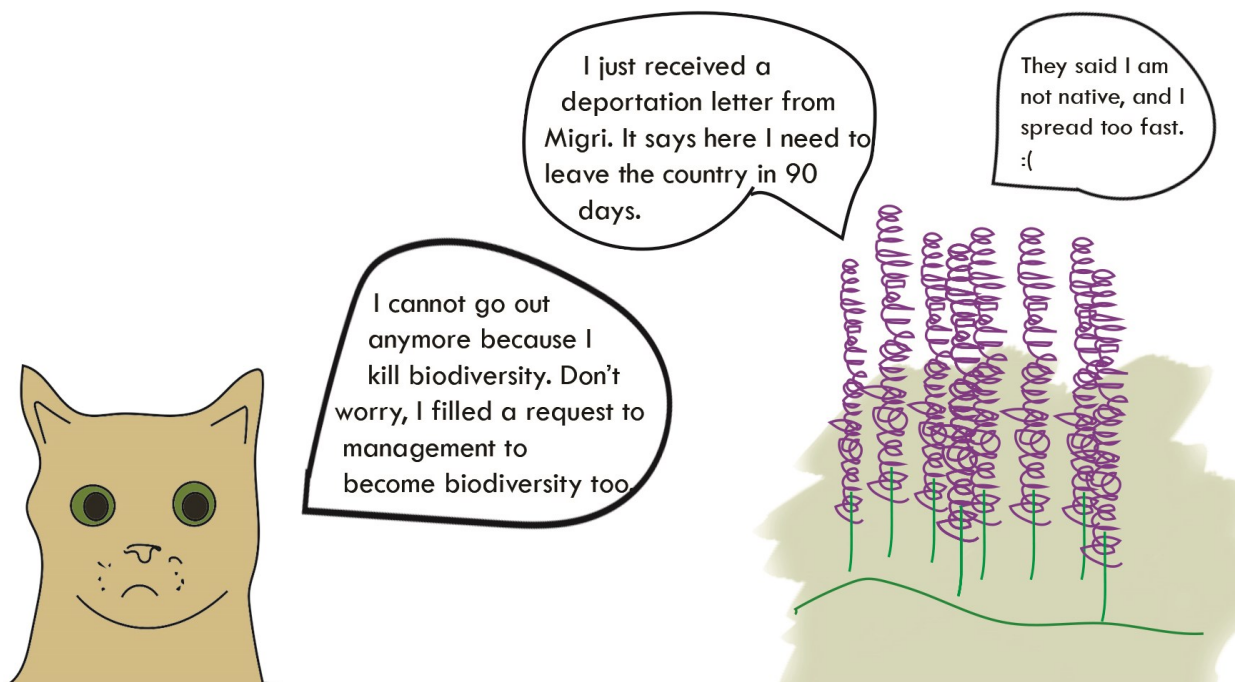
- Discourses describe frameworks of ideas or ways of understanding the world (White, 2004).
- However, discourses are defined not only by their descriptive aspects but by their productive power to influence how societies act and shape reality (Knights & Morgan, 1991).
- Discourse is a social and situational resource (Gee, 2002)
- Discourse is the way members of a group use a language to identify themselves and to identify others (Gee, 2002)

For the first criteria, discourses would presume understanding, that would presume consciousness. And despite recognizing that some animals would possess consciousness, this is an attribute that nature, as an entity, would not have. For the second criteria, we could say that nature acts and shapes reality. Nature's agency is a matter that is being consistently advocated for in academia, also common across many Indigenous cultures.

It becomes clear that by this definition nature does not produce discourses, or, at the very least, we cannot know because even if elements of nature (such as animals) produce communication, we have barriers to access and understanding these communications. The subject should not be considered as done, however. How we formulate questions, however, many times, matter more than the answers themselves. If I am asking if nature can produce discourse, this is a question that already assumes duality. A better question, in this sense, could be: “How humans and nature together produce discourse?” It comes to questioning not only if nature can produce discourse, but if humans would be able to produce discourse without nature in the first place, and vice-versa. This question is also a better one because it recognizes that agency goes beyond a consciousness; and it recognizes that both humans and nature have agencies when discourses are produced.

The illustrations below are an experimental exercise of imagination on what discourses produced by human and nature would look like.





How did I connect this master's thesis to my activism?

My first lesson on political science in the bachelor's degree of Social Sciences impacted me. Not because it was the first, or because it was special in some way, but because it was initiated by the teacher asking the students the difference between philosophy and political science. According to him, philosophy is normative, meaning, it thinks in terms of values and on what/how things should be, while political science looks at things on how they are. Since then, I was puzzled by this affirmative. While this vision is not shared and agreed by all the researchers in the social sciences field, especially the ones from feminist and postmodern traditions (Haraway, 2016; Butler, 1993), it is still a vision that encounters relatively hegemony in academia.

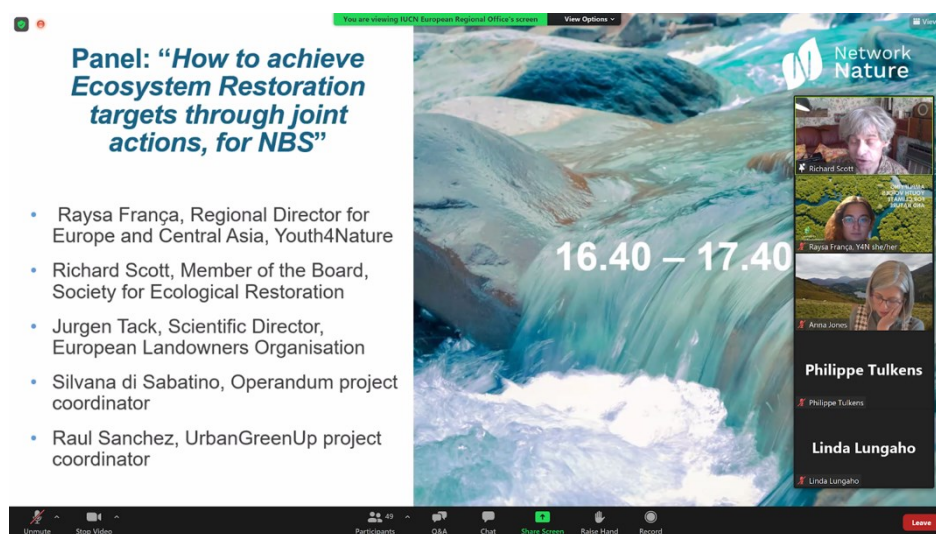
Throughout my master's degree in the Leadership for Change at Tampere University, this was a vision I encountered many times. I felt I was taught and invited to think from a perspective by which a research problem would be different from a social problem. This method for teaching was not only present in most of the content level of the courses of my master's degree, but even engrained at the academic writing class, by which, for example, I was encouraged to practice a writing that narrates findings in third person, and that occults subjectivism from the language. Conforming to these academic rules and expectations was a struggle to me - my motivation for studying in the Leadership for Change program was to learn and practice research skills that could help me engage with activism

and contribute to a normative, social change, but this wish was contaminated by a challenging environment to ideas of joining activism efforts to academic efforts.

Activism is, in essence, a normative activity. Activists aim to influence politics through civil society and civil activity. Research, on the other hand, as my previous political science teacher used to say, oversees analysing things how they are. Could be possible, then, to build synergies between these two activities, without compromising one another?

A first and important step towards this realization came through the course “Urban Activism”, which was a course co-organized between the Schools of Architecture and Environmental Policy from Tampere University. Since taking part in this course, it was my personal intentions to make sure that the findings, results and implications of this thesis would be communicated and connected to actors practicing nature-based solutions.

Panel participation: “How to achieve Ecosystem Restoration targets through joint actions, for NbS”



The panel was organized jointly by Network Nature and by the IUCN on 21 October 2021, and on the panel, I highlighted the importance of acknowledging the different views and meanings of nature that stakeholders, with a special focus on youth, may bring to project implementation. I invited audience and panel speakers alike “to stay with the trouble” and embrace conflicting views on nature and challenges that come with the multidisciplinary. In the panel, I also advocated for NbS to not become the “rebranded” discourse of conservation that resulted in land grabbing and exclusive actions in the past. In that sense, NbS could not hide the ugly past and the mistakes of conservation.

COP26 - How did I spread the findings?

NbS was one of the main action tracks for the United Nations Conference of the Parties for Climate Change (UNFCCC COP 26), which happened in the United Kingdom in November 2021.

At COP26, I had the opportunity to engage with decision-makers, with delegates, with members of high-level organizations, with protests and marches. In all of these engagements, the results and learning of the master's thesis contributed for my activism.

One of the highlights of participating in COP26 was the moderation of the panel: “Global Youth Statement on Nature-based Solutions Launch in Nature Zone at COP26”. There, I moderated the discussion with a panel of experts on what was missing from a global youth perspective in the narrative of NbS. Knowing the specific context and the literature was key to able to moderate a discussion that would advance and bring insights



Figure 19 - Global Youth Statement on Nature-based Solutions Launch in Nature Zone at COP26 (Youth4Nature, 2021)

Besides international events, and these narrated events and actions, I expect to continue spreading these findings and connecting them further into my thesis through my work at Youth4Nature, an international non-governmental organization working in the field of nature and climate. I will do that by engaging with youth and decision-makers to amplify the need for considering multiple worldviews when designing NbS, as well as highlighting the critique.

APPENDICES

Appendix A: Interview questionnaires

Basic questionnaire – same to all interviewees

a. Break the ice - conversation starter

- Can you tell me a little bit more about your studies and professional background?
- Do you feel comfortable around nature? What type of nature experiences are you most comfortable with?

b. Knowledge

- Besides the UnaLab project, how often in your daily life do you engage with nature? Can you share concrete examples?
- How is this engagement with nature at UnaLab different from the one you have in your daily life?
- Has your knowledge about nature and NbS changed due to the implementation of UNaLab?
- In your opinion, within your knowledge of NbS, how should nature be considered when designing and, most importantly, when implementing nature-based solutions?
- How do you think nature was considered in the implementation of the UNaLab project you were part of?

c. Stakeholder engagement

- Do you think you brought different perspectives or views when compared to the perspectives brought by other participants?
- What value does nature add to human interaction, in your opinion?
- Do you think nature added any value to your interaction with the UNaLab project? In which ways?

d. Co-creation

- Did the UnaLab project change the way you see or participate in your community?
- Do you feel your contributions were taken into consideration in the implementation of the UNaLab project?
- Do you feel your participation had a significant influence on the outcomes of the UNalab project? In which ways?

e. Biodiversity

- Do you know what biodiversity is? If yes, can you describe what biodiversity is? If not, do you have an approximate idea of what it could be?
- Do you think your participation in the UNaLab project had any direct link to biodiversity? In which ways?

f. Sustainability

- How did the activities of UNaLab contribute to a 'good' life in the city, in your opinion?

- In your opinion, how nature can help us achieve a "smart", "more inclusive", "more resilient", and "more sustainable" city? Was this the case of the UNaLab project, in your opinion?
- In your opinion, did the implementation of the UNaLab project contribute to a more sustainable Tampere/Vuores/Hiedanranta? In which ways?

g. Extra questions if needed

- When you hear the word nature, what images come to your mind? Could you draw or offer me visual descriptions of nature? What sounds come to your mind?
- How did you engage with nature in this specific activity?
- How would you describe what nature is to an alien that is coming to this world for the first time?
- How does your understanding of nature influence your participation in the project or activity?
- Did the project change how you feel about nature, or how you perceive nature?

Specific questions for visitors, community participants and citizens

a. Break the ice – conversation starter

- How did you hear about this activity?
- What motivated you to participate?
- What was, in your opinion, the best thing about being part of this specific activity / specific project?

Specific questions for project workers (Project planners, designers, managers & technical experts)

a. Knowledge

- Why are the solutions in the UnaLab project 'nature-based solutions'? What grants the right to these activities to receive the name 'nature-based solutions'?

b. Stakeholder engagement

- How could you describe your technical participation in the UNaLab project for a person who has no idea about your background or field of studies?
- Did you interact with the European Commission? If yes, when you communicated to the European Commission about what happened in Tampere, what words did you use to describe the solutions you were implementing?

c. Biodiversity

- How was biodiversity considered in the project design and implementation?

Specific questions for innovation voucher winner

a. Break the ice – conversation starter

- How did you hear about the innovation voucher?
- What motivated you to apply?

- Can you explain a little bit more about the process of application, and how you ended up being the winner?
 - b. Co-creation
- How the design of your solution took into consideration the inputs offered by citizens, the city and the community? How did they influence and design the implementation?
 - d. Biodiversity
- How was biodiversity considered in your project design and implementation?

Specific questions for the focus group

- I am going to read some statements for you, and you are going to tell me if you agree or not and why. After that, I am asking you if this is the case for the UNaLab implementation.
 - a. Statements:
 - Nature-based solutions need to be designed and implemented in a way that enacts a wild and unmanaged nature.
 - Nature-based solutions are merely a tool that utilizes nature and natural benefits to advance sustainable urban development and urban planning.
 - Nature-based solutions help the city grow without harming the environment.
 - Nature-based solutions have the goal to ensure a sustainable environment for current and future generations.

Appendix B: Safety and security of participants – Risk mitigation plan

Table 11 - Safety and security of participants - Risk mitigation plan

Risk	Perception of risk	Probability of occurring	Mitigation plan
Risk of contracting a serious form of COVID-19 on face to face interviews	Low	Finland has a high vaccination rate which decreases the chances of contracting serious forms of COVID-19	I should always offer remote options for participants. If interviews are done face to face, I can request participants to wear a face mask, as well as respect the safety distance. Preferably interviews should be carried out in public spaces with good ventilation.
Risk of a personal data breach	Low	There is a risk that my computer could be hacked or infected by malware, so data would be vulnerable. However, I do not engage in risky behavior online, and I also have installed two protection software on my computers, therefore, the risk is low.	I should not require any personal data that is not relevant to the object of the master's thesis.

Privacy risks on third-parties data storage (Google Drive)	Medium	There is a risk that third-party data storage providers will have access to the research data stored there. There is also a risk that their servers may be hacked or infected by malware, which I do not have any control over.	Data and thesis material will be stored on a personal google drive due to a lack of personal resources (Office package). To diminish the associated risks with this decision, I will not store audios and videos interviews on Google Drive and I will transfer the data to an external HD and delete it from online servers as soon as the research is concluded.
Data confidentiality risk due to third-party contractors (transcription)	Low	There is a risk that sensitive personal data is shared with the third-party contractors that will transcribe some interviews. And there is a risk that these transcribers will leak the data to the public.	Transcribers will be chosen among a pool of friends by which there is a relationship of trust already. Confidentiality agreements are to be signed by the researcher and by third-party contractors. Data will be reviewed for sensitive personal information in order to be sure these will not be shared.
Damage to public reputation	Low	There is a risk that published data may be personally linked to participants of the study that may damage their reputation. Since the topic is not a social taboo, and since personal sensitive issues are not discussed, this risk is low.	Participants are anonymous in the study, and personal details or any sensitive information that could arise will not be shared.
Discomforts / Emotional pain during interview	Low	The interviews may trigger uncomfortable feelings, and shame. The topic is not a social taboo, and personal sensitive issues are not discussed, thus the risk is low.	I will make sure to communicate clearly that participants do not need to answer any questions they do not want to. I will plan the questionnaire in a way to avoid asking any questions that may cause emotional pain.
Health risks (besides COVID-19)	None	The research does not offer any considerable health risks besides COVID-19.	No mitigation plan needed.

Appendix C: Data confidentiality agreement

INDEPENDENT NON-DISCLOSURE AND DATA PROTECTION AGREEMENT

BETWEEN
Raysa França Pereira do Carmo
("Client")
Hidden (sensitive information)
(Mailing Address)

AND

("Independent Contractor")

(Mailing Address)

Effective Date of Agreement: xx.xx.2021

THIS CONFIDENTIALITY AND NON-DISCLOSURE AGREEMENT (this “Agreement”) is made and entered into as of the Effective Date of Agreement set forth above by and between Client and Independent Contractor.

WHEREAS, both parties recognize the value of the Confidential Information and that it is in their mutual best interests to maintain the confidential, proprietary and secret nature of the Confidential Information.

Independent Contractor is hired to offer transcribing services for the Client's Master's thesis. Data by which Independent Contractor has access to are audios of interviews and transcriptions carried out by Google's Artificial Intelligence. The interviewees have consented to the recording, transcription and analysis for academic purposes.

The parties hereto agree as follows:

1. CONFIDENTIAL INFORMATION. Confidential Information shall include, but not be limited to, documents, records, information and data (whether verbal, electronic or written), drawings, technical, experimental results, transcribed data.

In the course of their work contemplated in this Agreement, regardless of whether such Confidential Information has been expressly designated as confidential or proprietary. Confidential Information also includes any and all analyses, compilations, work product, studies and other materials prepared by or in the possession or control of the Independent Contractor, which contain, include, refer to or otherwise reflect or are generated from any Confidential Information. Confidential Information may be provided in written, oral, electronic or other form.

2. FORM OF DISCLOSURE. Confidential Information may be oral, visual, or by demonstration, or in some other form not permanently recorded, and shall be considered Confidential Information regardless of whether such Confidential Information has been expressly designated as confidential or proprietary.

Independent Contractor shall not share any confidential information or data with third parties (including its affiliates, employees, agents and consultants).

3. NO PUBLIC COMMENT. Independent Contractor shall not directly or indirectly make any public comment, statement, or communication with respect to, or otherwise disclose or permit the disclosure to any third party of any Confidential Information or of any matter relating to the Subject Matter or purpose of the services.

4. NOTICE OF UNAUTHORIZED USE OR DISCLOSURE. Independent Contractor shall notify Client immediately upon discovery of any unauthorized use or disclosure of Confidential Information or any other breach of this Agreement by Independent Contractor or any third party and will cooperate with Client in every reasonable way to help regain possession of the Confidential Information and prevent its further unauthorized use or disclosure.

5. MANAGING THE DATA. The Independent Contractor commits to permanently delete all files, transcriptions and data from their computers after 2 weeks of the delivery of the service.

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