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Master´s thesis

Urban Studies and Planning

Value of urban forest fragments: a Q analysis on value patterns among city officials

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Abstract

The Master´s thesis examines the conceived value patterns the city officials use in the context of land-use regulation of small forest fragments. As a theoretical framework, the study utilises Boltanski and Thévenot´s theory on the common worlds with complementary literature, such as Thévenot's cognitive formats and engagements.

In light of extensive scientific research, urban greenspaces have multiple positive impacts to both urban structure and wellbeing of the residents. Small greenspaces, so-called forest fragments with no appointed recreational activities are, nevertheless, often presented as potential sites for infill construction. This appears especially in cities where strong population growth causes pressure for urban development. This Master´s thesis complements existing research in this regard by revealing the diversity of valuation that form the basis to differing interests, perspectives and decisions that direct urban land-use policy in these forest fragments.

The empirical phase has been conducted among city officials in the City of Espoo (FI), who represent different operative units and positions. The analysis was conducted through an exploratory and semiquantitative Q methodology. In the study, the respondents (N=27) validated statements (Q=35) related to planning decisions on small forest fragments. The factor extraction was conducted by principal component analysis.

The seven analysed factors form consistent value patterns, which may be used when describing and interpreting the justification of urban planning regulation in forest fragments. In each individual value pattern, either valuation of the local landscape, public good or personal advantage is emphasised. From the common worlds, argumentation based on the industrial or the market worlds highlight personal affinity, whereas, for instance, the civic or the domestic world form a basis for argumentation on social values and the common good.

Human-centred biophilia is the most explanatory of the value patterns. Based on the valuation, forest fragments are seen as an integral part of the urban structure especially due to their cultural ecosystem services, such as recreational possibilities, effect on residents´ environmental consciousness and stability of the local landscape.

Keywords
Value; valuation; value pattern; argumentation; Q methodology; urban planning; land-use regulation; forest fragment; greenspaces; urban nature

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Tiivistelmä

Käsillä oleva pro gradu –tutkielma tarkastelee arvopohjaisten järjestelmien kautta argumentaatiota, jota virkamiehet hyödyntävät perustellakseen pienten viheralueiden maankäyttöön liittyviä näkemyksiään. Lähtökohtana arvopohjaiselle keskustelulle toimii Boltanskin ja Thévenot´n oikeuttamisen maailmojen teoria (*the common worlds*) sekä teorian laajennukset.

Kaupungin viher- ja virkistysalueilla on runsaan tutkimustiedon valossa paljon positiivisia vaikutuksia sekä kaupunkirakenteeseen että kaupunkilaisten hyvinvointiin ja terveyteen. Pienet suojaviheralueet, joille ei ole osoitettu virkistyskäyttöä, esitetään kuitenkin usein potentiaalisina täydennysrakentamisen paikkoina erityisesti kaupungeissa, joissa voimakas väestökasvu aiheuttaa paineita nopeatempoiselle kaupunkikehitykselle. Pro gradu –tutkielma täydentää näiden pienten viheralueiden suunnittelukontekstin kautta kaupunkisuunnittelun toimijoiden välistä keskustelua koskevaa tutkimusta arvojärjestelmillä, jotka valottavat maankäyttöä ohjaavien päätösten, intressien ja näkemyksen kautta näiden taustalla vaikuttavaa arvomaailmaa.

Tutkimuksen aineisto (N=27) on kerätty Espoon kaupungin virkamiehiltä useilta eri toimialoilta. Semikvantitatiivisen Q-metodologian avulla toteutetun tutkimuksen empiirisessä osassa vastaajien arvottamat pienien viheralueiden suunnittelua koskevat väittämät (Q=35) analysoitiin pääkomponenttianalyysillä.

Aineistosta analysoidut 7 faktoria muodostavat selkeitä arvojärjestelmiä, joiden avulla pienten viheralueiden suunnittelua koskevia näkemyksiä on mahdollista selittää ja tulkita Yksittäisissä arvojärjestelmissä korostuu joko paikallisen ympäristön ominaispiirteisiin kohdistuva arvostus, yhteisen hyvän tavoittelu tai yksilön oma etu. Oikeuttamisen maailmoista teollinen (*industrial world*) ja markkinoiden (*market world)* maailmat luovat pohjan pääasiassa omaa etua tavoittelevalle argumentaatiolle, kun taas yhteiskunnalliseen (*civic world*) ja lähipiirien (*domestic world*) maailmoihin nojaavissa arvojärjestelmissä painottuvat sosiaaliset arvot ja yhteinen hyvä.

Vahvin selitysvoima on ihmiskeskeisen biofiilian (*human-centred biophilia*) arvostuksella, jonka perusteella pienet viheralueet nähdään tärkeänä osana kaupunkia erityisesti niiden kaupunkilaisille tarjoamien kulttuuristen ekosysteemipalveluiden, kuten elpymisen, ympäristövastuullisuuden kehittymisen sekä lähiympäristön muuttumattomuuden kautta.

Avainsanat
Arvostus; arvojärjestelmä; argumentaatio; Q-metodi; kaupunkisuunnittelu; maankäyttö; jäännösvihreä; viheralue; kaupunkiluonto

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This thesis was written while working at the Environment Department at the City of Espoo. Thank you to all colleagues and coworkers who gave their time to justify their perspectives in the planning of urban greenspaces.

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1. Introduction

Urban nature is a place for various outdoor activities to a large number of residents in the local environment (Centers & Gómez 2019) but, even without any recreational facilities, it still has regenerative qualities (Kaplan 2001), enables children´s play in nature (Florgård & Forsberg 2006) and offers an islet to flora and fauna also in an urban environment (Malmivaara-Lämsä 2008). Small and vegetated forest patches do occur in cities (Ranta et al. 2013), often in suburban settings, where less-intense land-use planning enables vegetated patterns in additions to larger recreational sites. These patterns may occur intentionally or act as a land-use reserve (Kuusisto-Arponen et al. 2014) for future use, when population growth in a city arises the need for infill construction and maximised land-use.

My interest in the focus of this study has arisen from curiosity to investigate, if this type of land use is important to the people and based on which characteristics and, if this importance is, then, acknowledged and valued. Based on this starting point, I aim to combine the aspects of disregarded small forest fragments to the ongoing discussion and argumentation over land-use decisions. Especially in times when public participation has become an evident part of urban planning processes, the discussion over land use has become highly polarised and culminated in argumentation based on critical and strong opinions (Kuusisto-Arponen et al. 2014). In this discussion, the citizens are often compared to the city officers and stakeholders in a polarised way, which lacks the notion of individuality of the people dealing with the matter, even if no person grows up without external outputs that lead to certain personality formed on personal interests and experiences. As, for instance, Eranti (2016) and Bäcklund and Mäntysalo (2010) argue, zoning of urban (green) areas requires reconciliation of many differing interests. To prevent irreversible mistakes, it is important to acknowledge how different spaces are used and by whom, and with what kind of value, meaning and importance they are loaded.

A human-nature connection has been contested for so long urbanism has intertwined with the delicate system of our world – the people have shaped and transformed urban nature through planning and development in countless different ways in the name of intellectual progress of our societies. Urbanisation of nature may be

considered from several perspectives (Soens et al. 2019) – a city *as* an environment or a city *in* the environment. The first addresses human-nature connections as a process where, during urbanisation, the so-called "urban" penetrated into something called "nature". The latter makes no difference between these terms but recognises a city as a complex system where nature is part of the urban metabolism and an urban environment is a location in a biosphere.

These trajectories are discussed in this study as interconnected perspectives, where it is commonly acknowledged how urbanisation influences nearby nature (Hamberg 2009), but also how nature has an influence on the city as a system, as a landscape and as a construct (Nassauer 1995). The biophilia hypothesis suggests the humans – also the urbanised ones – have a psychological preference for natural environment and all living things (Twedt et al. 2016), which is taken as one of the standing points of this study regarding the qualities of nature to the people of the city. When our moral relations with the natural world are too diverse to be captured into a simple idiom of values-thinking, nature must be investigated both through its self-value and role as a descriptive instrument to achieve other favours, so be it nature´s intangible value, aesthetics, spirituality, functionality or indirect effect to human society.

1.1. Research design

This study aims to reveal the latent value patterns through arguments for and against land-use planning in the context of small forest fragments among the city officials at the City of Espoo in Finland. The research subjects of this study are naturally managed public green spaces, named forest fragments, which are small in size and surrounded by urban elements, such as housing, streets or other paved surfaces. Also, they are maintained extensively and can´t then be comprehended as public parks. The definite analysis of the forest fragments is discussed further in Chapter 2.2.

Following perspectives drawn from pragmatic sociology through valuation framework by Boltanski and Thévenot (2006), I aim to draw general contingent valuation (Beckerman & Pasek 1997) that lead urban planning and policy directives in the context of small forest fragments. By choosing one theme on a "wasteland" in a city, the analysis is drawn further and to a more concrete level than merely as a discussion of general, macro-level guidelines for possible valuation.

The aim of this study is to investigate latent value patterns lying under argumentation for and against land-use regulation of these forest fragments. Therefore, the main research question of this study indicates, **what kind of value patterns are associated with small forest fragments**. By answering the main question, I aim to find out, how these theoretical value patterns could be utilised to better understand differing perspectives on land-use decisions in this regard. Also, the results shed some light on justification in possible decisions and argumentation, when the future of forest fragments is discussed.

The main themes covered in this study are related to human-nature relations: how the city officials experience and value these natural areas, taking into account their role in the administrative and political sphere. Within the scope of this study, the city officials are seen as mediators in between different political and individual opinions, desires and aspirations with both political pressure and demands on public participation processes (Kuusisto-Arponen et al. 2014). They combine their professional expertise with abilities to hear and participate in the dialogue between different stakeholders and therefore hold the key to conciliate discussion between different ideologies that emerge in land use and policies. The preliminary hypotheses of the study suggest, that from the data several value patterns emerge, aiming to value, and then to justify, preservation or infill construction of forest fragments in different ways. It may also be assumed that several statements stand out and therefore lead the discussion in this regard.

The main data in the study is collected through a principal component analysis by Q methodology, often used in social sciences to measure a range of opinions about a topic within a sample population, and how these opinions differ and converge (Bredin et al. 2015). Q methodology is a useful tool for combining semiquantitative statistical analysis to the interpretation of results through a qualitative dimension (Vaas et al. 2019). Both the method and data aim to confirm the fact that actors who discuss over land-use decisions are not monoliths or defined by their role in the urban planning system, but as individuals acting for and against certain principles over land-use decisions and act based on a complex system of valuation and principles. This is a prerequisite for research made about these decisions in a more analytical fashion.

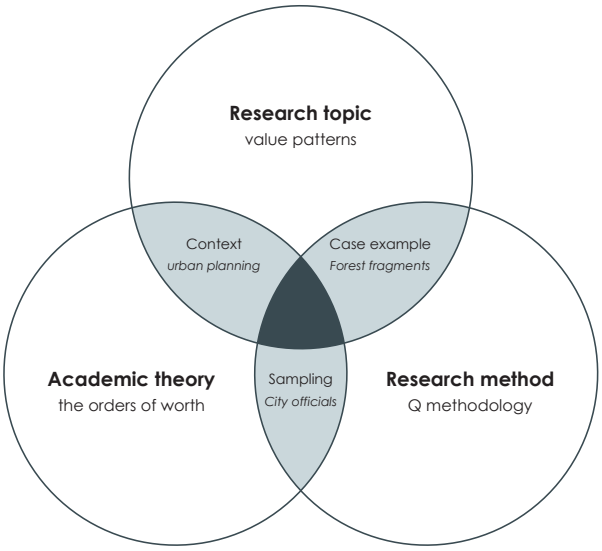


Figure 1. Overview on the research design of the study formulated on a combination of the research topic, theoretical framework and methodology.

1.2. Academic contribution of the study

This thesis complements existing research by revealing the diversity of latent value patterns that form the basis to differing interests, perspectives and decisions that direct urban land-use regulation in these forest fragments. So far, former studies have concentrated mainly on both ecological connectivity and urban nature in general (e.g., Lieberg 1994), together with the design of small but in-detail planned pocket parks (e.g., Nordh & Østby 2013; Peschardt et al. 2014) within densely built areas. Apart from Florgård and Forsberg (2006), whose study concentrates on the use of green remnant patches in Järvafältet, Sweden, only a few studies have been conducted on the use of patches with original vegetation. Nevertheless, remnants of natural vegetation in cities have been found to be threatened in many ways (Nyhuus & Halvorsen Thorén 1996), so more information is needed in both their value and use to support the discussion over their restoring or using them for infill development.

When considering perspectives of valuation in public debate, discussion on this, especially in the context of urban planning, is scarce. Boltanski & Thévenot´s pragmatic sociology, which forms the theoretical framework in this study, has been earlier applied to environmental conflicts in multiple studies (e.g., Centemeri 2014; Thévenot et al. 2000) Also, a lot of research has been conducted about public

Figure 2. Four phases of analysis in this study. The study proceeds analytically from theoretical framework to the empirical phase of analysis.

participation and critical debate on, for instance, NIMBY (*not in my backyard*) phenomenon (e.g., Eranti 2016; Devine-Wright 2009; Neveu 2002) that aims to prevent unwanted land use close to one's own neighbourhood. This resistance is connotative to active participation and critical attitudes against the bureaucratic urban planning processes. In this study, I aim to acknowledge the individuality of the people taking part in this discussion and reveal what kind of categorisation on the value assets could be formed.

The study contributes to the existing literature in a unique way by combining the academic theory by Boltanski and Thevenot (2006) to the method used the most often within environmental studies and through the context of urban planning and the topic of forest fragments in cities (Figure 1). In former literature, Q methodology has not been connected to the common worlds, and both the theory and method are still relatively unknown in urban studies (for some, see Eranti 2016; Blok & Meilvang 2014).

The paper is structured on four phases of research, which are i) definition, ii) theory, iii) analysis, and iv) implementation (Figure 2). The first phase forms an introduction to the main theories and theoretical framework together with complementary information about forest fragments and Espoo as a context to the study. The theoretical phase dives deeper into Boltanski and Thévenot's common worlds by describing the content of the unique worlds through discussion on specific aspects related to the themes. The analysis phase forms the empirical content of the study, where both the methods, implementation and results of the empirical study will be described. Finally, the implementation phase includes the discussion and conclusions of the study as a whole, together with some suggestions for real-life implications of the study´s results.

I Definition

"values... arise out of human experience"

Williams & Albert (1990: 286)

2. Forest fragments in urban planning

Urban environments are socio-environmental systems, where the setting is defined by a complex union of natural and social drivers, unique to each configuration of a city and context (Soens et al. 2019). Therefore, both the grounds and definition of forest fragments must be discussed throughout the lenses of urban planning history in Finland. Based on this discussion, I define a general definition of forest fragments in cities.

2.1. Urban planning history and greenspaces

Green area planning ideas and guidelines have changed multiple times throughout urban history when preferences for the outfit and characteristics of urban nature have been motivated by the philosophy of their creation and land development processes (Byrne & Sipe 2010). When building efficiency is often the first planning guideline for setting a housing district before nature inventories have been accomplished (Vilkuna 1992). This means the main criterion for allocating land for green areas is often their low suitability for construction (Vilkuna 1992), which doesn´t necessarily make them ideal for recreation either (Tyrväinen 1999).

Along with recreational urban parks, at the fringes of industrialising cities in the late 19th century did emerge “temporary” green and open spaces, which were not officially acknowledged as nature, but places where the common folk did socialise and spend time (Niemi 2019). These fringe areas of vacant lots, fields and forests were taken into use when needed.

The major flow of urbanization occurred in Finland not until the 1950s (Niemi 2019) when garden city ideologies were for the first time applied comprehensively into the modern Nordic cities (Jalkanen et al. 2017). In these decentralised but green satellite cities, the settlement of the housing units was conducted carefully based on the terrain, vegetation and topography of the area, which made it possible to restore also indigenous vegetation and even trees on the site. One of the most representative examples of these cities surrounded by forest was Tapiola in Espoo, built mainly in the 1950s and early 1960s (Jalkanen et al. 2017).

Housing districts built in the 1960s and 1970s are characterised by rapid urbanisation and high demand for new construction, which led to major alterations of terrain, use of precast elements and poor environmental quality (Jalkanen et al. 2017). As criticism to this planning based on functionalist ideologies, construction in the 1980s made, again, an effort for conserving existing vegetation in construction sites, even if infill development of existing, low-density neighbourhoods somewhat hit to the existing greenspaces.

When in the 1990s ecological materials and energy-saving solutions reared their heads in the construction sector in the name of sustainable development and lowering of carbon emissions (Tyrväinen 1999), in the 2000s and 2010s ecological reconstruction has been raised beside climate change mitigation and adaptation. In recent decades, infill development and transit-oriented development have increasingly been set as solutions for gaining objectives of carbon neutrality by lowering carbon emissions caused by transportation.

Even if not necessarily threatening the overall existence of green elements in a city, the demand for land within the existing urban fabric and existing transport infrastructure results in incentives for use of land that has been formerly allocated to greenspaces. This concerns especially forest fragments as informal spaces with natural vegetation, which are more threatened than places with planted vegetation (Nyhuus & Halvorsen Thorén 1996). In addition to decreasing the amount of greenspaces within the neighbourhoods, also the remaining recreational areas face congestion and increased erosion of the terrain. Especially in the Helsinki Metropolitan Region, the challenge of urbanisation and infill development is very topical since the Uusimaa region is expected to have over 290 000 new residents between 2017 and 2040 (MDI 2019).

2.2. Forest fragments: a definition

When the pace and direction of urban growth have always been difficult to predict, some land has always been left as a land reserve for future development. These semi-wild natural reserves might be located either at the fringe of a city (Niemi 2019) or as part of the existing urban setting (Nyhuus & Halvorsen Thorén 1996). In this study, I concentrate on naturally vegetated areas – so-called **forest fragments** – in a

built (suburban) environment, where human activities and needs have highly affected land use and coverage. In addition to their function as a land-use reserve, the reasoning for having small, vegetated green areas in a city act often as protective shelterwood in between buildings or roads. Respectively, the existence of these forest fragments may also be to act as pleasant green elements near housing or pedestrian walkways.

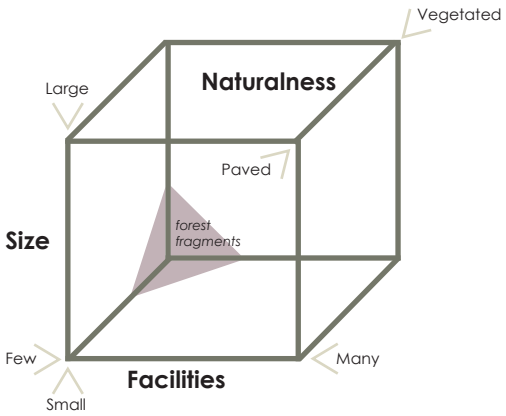


Figure 3. Forest fragments in park classification adapted from Byrne and Sipe (2010). Forest fragments can be seen as greenery without any formal park facilities. Hence, they are located in the far end corner of the classification with small size, few facilities and with indigenous vegetation.

Even if the Nordic cities have relatively lot of green elements, the parks and forests vary in their level of maintenance, age, facilities and size. In urban environments, the parks are managed and used mainly for recreational functions, when scenic values, protective abilities and biodiversity are considered as well (Gundersen et al. 2005). Based on the park typology created by Byrne and Sipe (2010), a greenspace has three significant attributes to be considered: size, facilities and naturalness of the vegetation (Figure 3) – in this categorisation, the greenspaces in the interests of this study are located in the far-right end of the attributes: they are small in size, covered with natural vegetation and have no recreational facilities. With an academic foundation, I have defined the forest fragments as places of urban greenery with the following characteristics, introduced in Table 1.

By the definition of forest fragments described above, I argue that as places that devoid of any determining identity or role, forest fragments can be defined as *non-places*, following the work of Marc Augé (1995), respectively. Based on Augé's definition, when a place cannot be defined based on relational, historical or identity-related considerations typical to a place with meaning, it cannot be considered as a place and is, therefore, a non-place. One of the soft characteristics of the forest fragments is, to some extent, their evasion of identity and meaning – they may be considerable to some local residents from a personal perspective and their history

Location		
	in suburban areas with population density < 50 persons per ha	*Soens et al. 2019; Malmivaara et al. 2002*
Locale		
	separated from the ecological network	*Väre & Rekola 2007; Hirvensalo 2014; Knez et al. 2018 Jalkanen et al. 2017*
	surrounded by buildings, private gardens, public spaces and/or transport facilities	
Size		
	less than 1 hectare in size	*Söderman & Saarela 2011; Saukkonen 2007*
Visit length		
	from passing by to less than 1 hour	*Byrne and Sipe 2010; Kaplan 2001*
Visit purpose		
	a shortcut; educational purposes; games and play; observing nature; short-time settling down	*Lehikoinen et al. 2014; Florgård & Forsberg 2006; Gilliland et al. 2006; Kaplan 1995; Tyrväinen et al. 2007*
Recreational facilities		
	none	*Byrne & Sipe 2010; Niemelä et al. 2010*
Economic worth		
	low market-priced benefits; property value	*Saukkonen 2007; Florgård 2000; Tyrväinen 1999*
Naturalness		
	indigenous forest vegetation by land coverage	*Hamberg 2009; Malmivaara et al. 2002; Saukkonen 2007; Twedt et al. 2016*
Maintenance		
	low maintenance intensity with Green Area Maintenance Classification of C - Local forests.	*Espoon metsien ja ... 2017; Viherympäristöliitto 2020;*

Table 1. Defining characteristics of forest fragments.

but do lack the ability to communicate their meaning in a wider sphere and have no pivotal role in the local history of their surroundings.

2.3. Forest fragments: discussion on terminology

There are no customary terms for small, vegetated patches that are not considered as parks or other formal greenspaces in urban environments. Therefore, a single term was defined following current terminology used in similar settings.

As described in the previous chapter, the forest patches this study is focused on are *fragmented* due to certain land-use decisions and have lost their connectivity to other similar patches or wider green areas around the city. When these vegetated patches are often incapable to grow by their surface area, the areas are mainly pressed in between buildings or roads. By their vegetation, these fragments mainly contain indigenous forest vegetation, typical to Nordic conditions. Based on these two main characteristics, vegetated patches are called forest fragments, which is used by, for instance, Hamberg (2009) and Ranta et al. (2013) but otherwise as a single term does not occur in literature.

Other possible terms considered during the process were, for instance, remnants of green, leftover green, green patches, nature pockets, vegetative pockets and informal green. From these, the term “remnant” arises a connotation to a relic of something that has previously existed, including a false notion of a city as something that has intruded to the “pure” nature and natural state of a system. Also, to avoid connotations on unnecessity and redundancy, also “leftover green” and “informal green” were excluded from considerations: informality includes a notion on accidentality in the green’s existence, even if in many cases they exist due to land-use planning, not as an opposite to formality. Also, wildness refers to something unorganized and uncontrolled: even if often rich in biodiversity, the forest fragments are still in place due to human actions and land-use planning (or lack of it).

Nature/vegetative pockets, on the other hand, has a certain – but false – association with pocket parks, a relatively used term to describe small and highly designed green areas in city centres (see e.g., Nordh & Østby 2013; Peschardt et al. 2014). Different from those formal parks, forest fragments are established based on a very different development process and settings in mainly suburban neighbourhoods.

3. Urban Espoo

Espoo, in which the Q analysis was completed, is a network city of five local city centres and an extensive green area network. The city is located in the Helsinki Metropolitan Region (Figure 4) and is largely influenced by the capital. By its land use, Espoo has two differing settlements: the denser urban environment in the south and sparsely populated, almost rural settings in the north (Figure 5). Building density is high only in a few locations at Espoo, mainly at the five centres of the city.

Espoo urbanised rather rapidly in the 1940s and the 1950s in the spirit of post-war optimism and urgent need for urban residences to new population moving from the rural areas in seek for wealth and better life (Phelps et al. 2006). Unlike its neighbour, Helsinki, Espoo had a private landowner-developer model and very little detailed planning. It wasn't until the late 1970s that Espoo had its first master plan, by which time the basic structure of the city had already been dictated by several relatively uncoordinated private development and national public infrastructure decisions (Phelps et al. 2006).

As in many major cities in Finland, population growth is rapid in Espoo due to both migration and a high birth surplus and is expected to exceed 300 000 inhabitants in 2022 (Espoon väestö... 2020). Urban planning in the city is aiming towards denser, transit-oriented development wherever possible to answer to both needs of future residents and visions of a more sustainable and carbon-neutral future by 2030 (Espoo Story 2017).

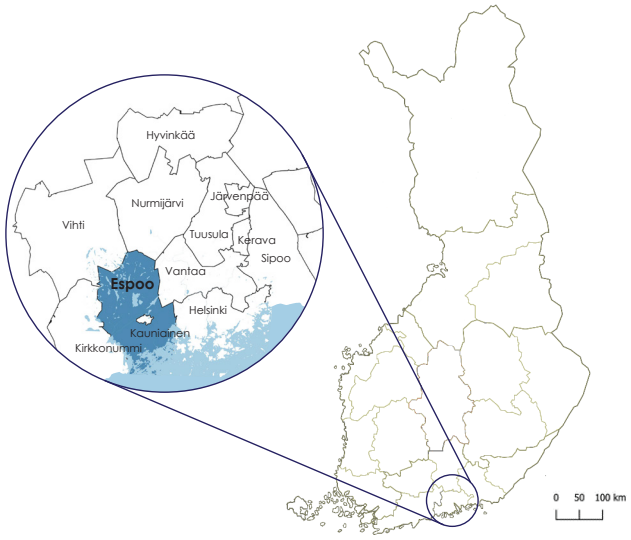
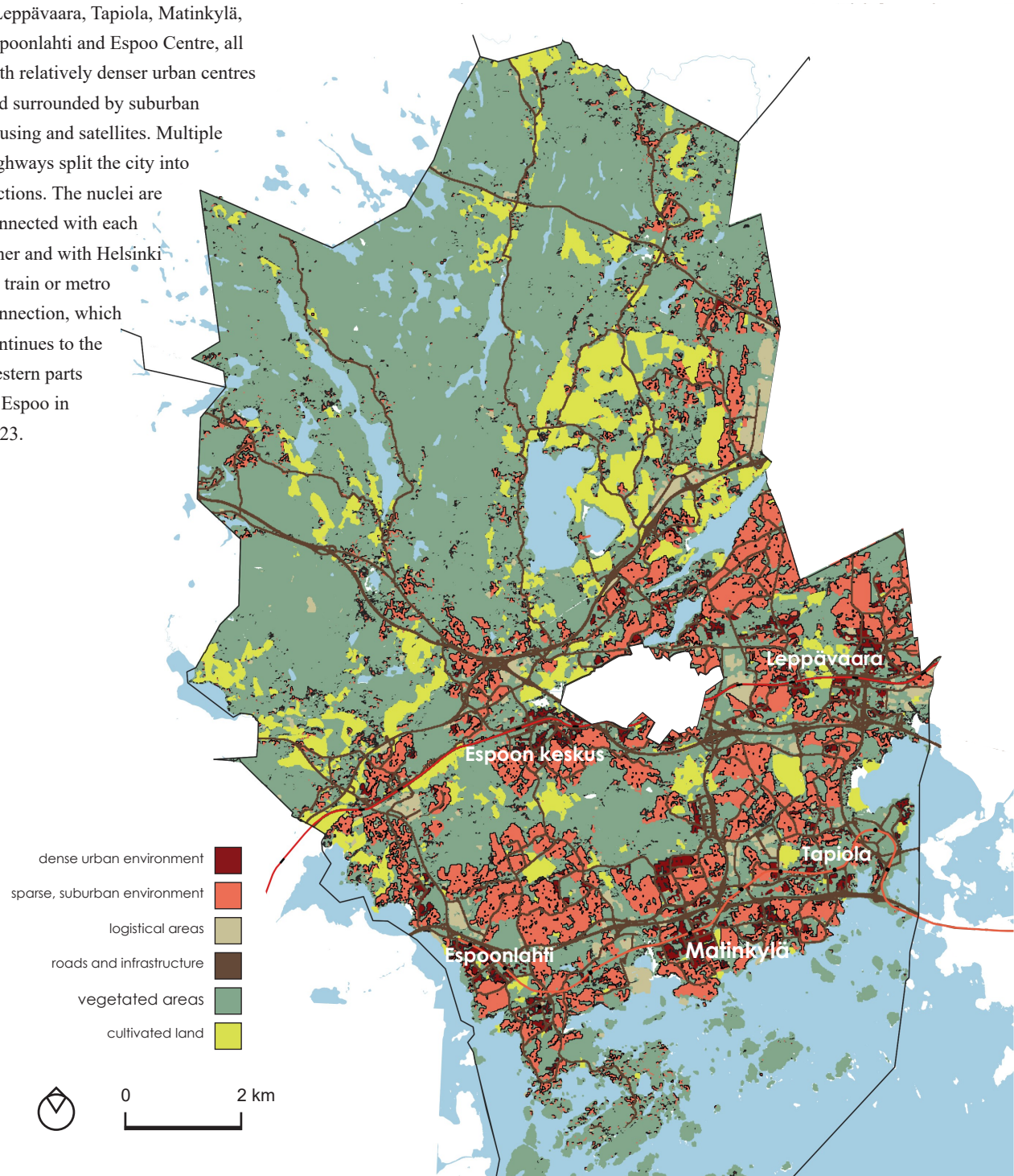


Figure 4. Espoo is located in the Helsinki Metropolitan Region in southern Finland. Therefore, it is largely influenced by the vitality of Helsinki. From surrounding municipalities, Helsinki and Vantaa are cities, surrounded by smaller urban settings with rural characteristics.

Even if this population growth is mainly targeted to the existing urban nucleus, the urban green network is narrowing down, and the city is threatened to lose its capacity to produce high-quality ecosystem services. As closeness to nature is one of the most valued characteristics of Espoo, dissenting voices have raised among several interest groups who argue for “too much construction” which is “out of control” (Parikka 2021: 10). Rapid infill construction and urbanisation make Espoo an interesting example of urban planning processes with a wide-ranging and occasionally passionate discussion on the future and direction of the city.

Figure 5. Urban fabric in Espoo with land use data of a 400 m^2 grid. The city is characterized by its five urban nucleus - Leppävaara, Tapiola, Matinkylä, Espoonlahti and Espoo Centre, all with relatively denser urban centres and surrounded by suburban housing and satellites. Multiple highways split the city into sections. The nuclei are connected with each other and with Helsinki by train or metro connection, which continues to the western parts of Espoo in 2023.



3.1. Urban greenspaces in Espoo

The green network of Espoo is defined by three main elements – hemiboreal forest in north-western Espoo, Espoo Central Park and the archipelago at the Gulf of Finland. The Espoo River Valley runs across the city, connecting urban greenspaces to the seashore in Southern Espoo (Hirvensalo 2014). Both natural wilderness and urban greenspaces exceed by far the European average when 60% of Espoo´s landmass is occupied by forests. There are only a few intensively maintained parks in the city.

Local forests vary in size and shape, but mainly the forests in residential areas are less than 10 hectares in size and kept in a semi-wild state (Espoon metsien ja ... 2017) (Figure 6). Management costs of such urban forests are quite low when compared to more intensively maintained greenspaces (Florgård 2000). Mainly maintenance of urban greenspaces is determined by their location, use, natural conditions and zoning status (Espoon metsien ja... 2017).

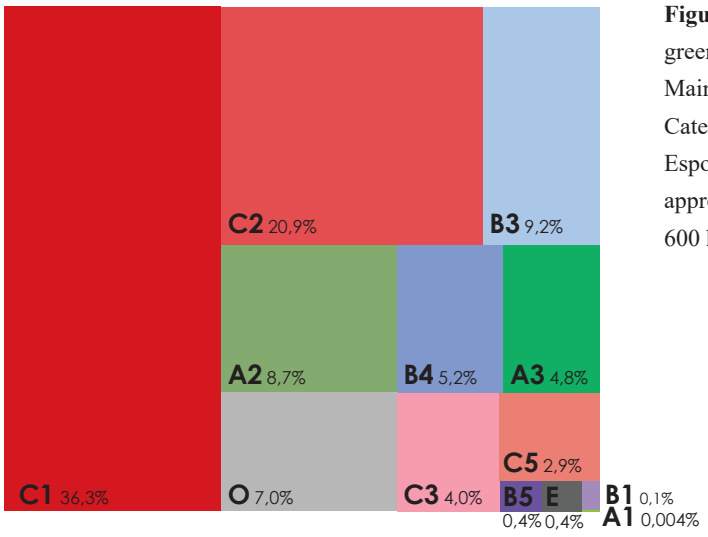


Figure 6. Maintenance intensity of greenspaces based on the Green Area Maintenance Classification in Espoo. Categories B2, C4 and S are not used in Espoo. Altogether, the City of Espoo owns approximately 5500 hectares of forests and 600 hectares of meadows.

A - Built greenspaces	
Representative greenspaces	A1
Functional greenspaces	A2
Sheltering and functional greenspaces	A3
B - Open greenspaces	
Landscape fields	B1
Functional meadows (not used in Espoo)	B2
Landscape meadows and pastures	B3
Open areas and views	B4
Valuable meadows	B5

C - Local forests	
Local neighbourhood forests	C1
Outdoor and recreational forests	C2
Shelterwoods	C3
Commercial forests (not used in Espoo)	C4
Valuable forests	C5
Supplementary classes	
Special sites	E
Unclassified sites	O
Conservation sites (not used in Espoo)	S

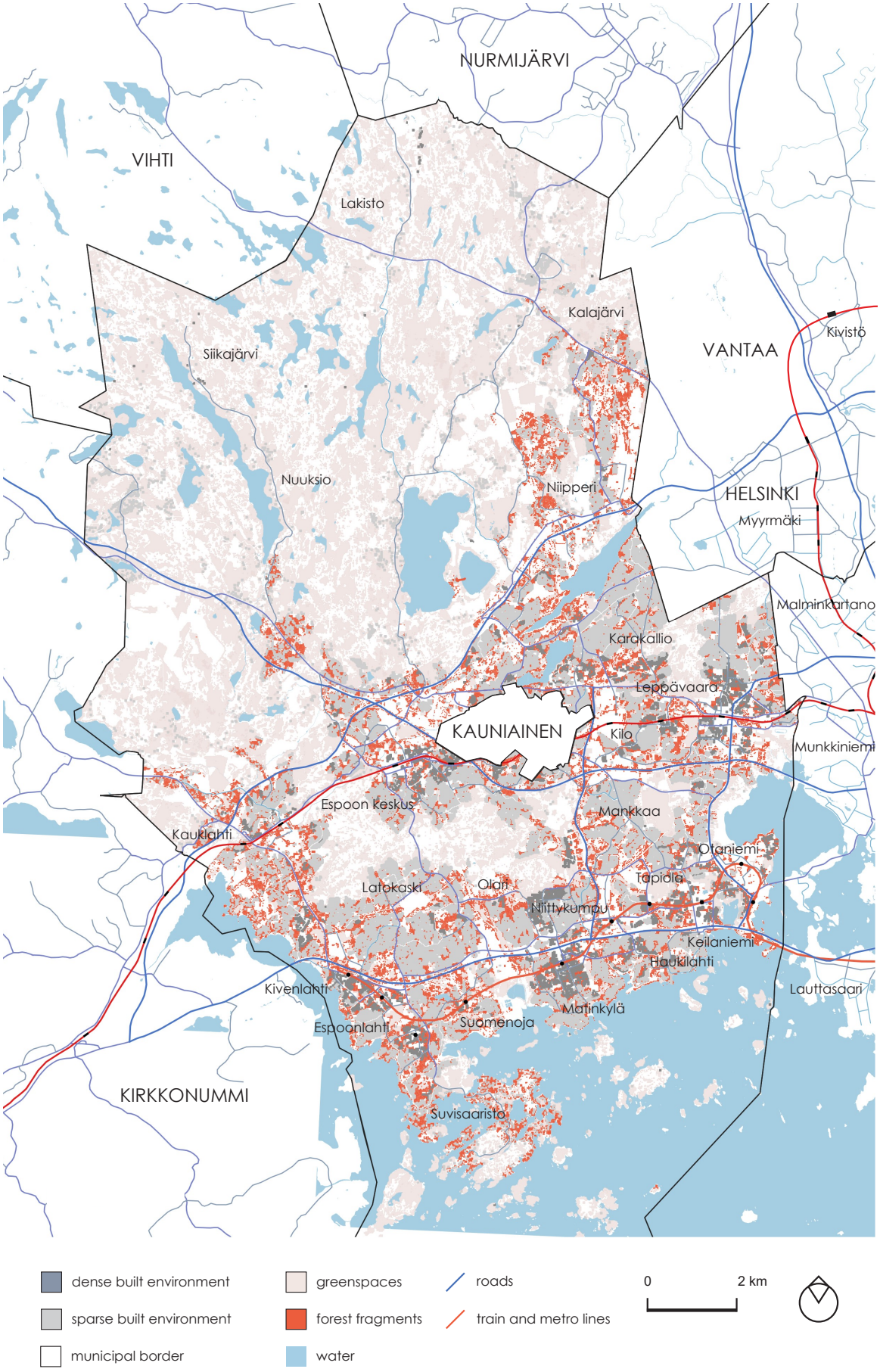


Figure 7. An overview on possible forest fragments in Espoo based on land use data of a 400 m^2 grid. The map visualises vegetated land coverage in grids smaller than 1 hectare, disconnected from the main green bodies and in regions with residential housing as dominant land use. Forest fragments are located mainly in suburban neighbourhoods and are quite evenly spread all over the city.

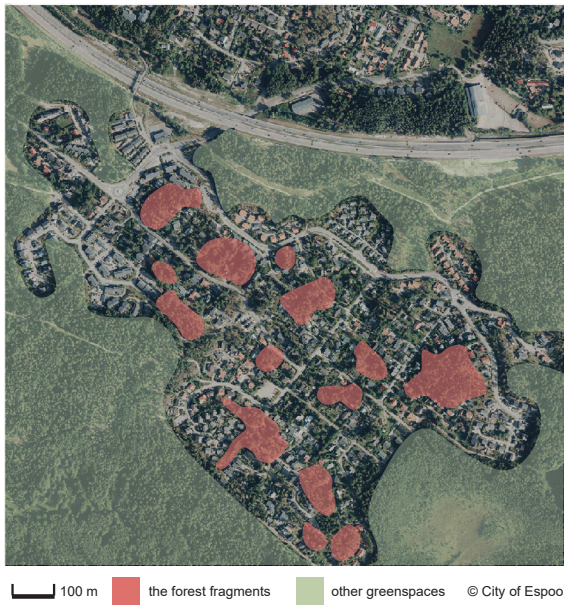


Figure 8. Forest fragments in Kuurinnitty, located in proximity to Espoo Centre. As a traditional Finnish satellite neighbourhood, Kuurinniitty is surrounded by larger greenspaces, but also has a high quantity of greenery within the urban structure.

Urban greenspaces are evenly located in suburban areas in Espoo, some of them categorizable as forest fragments (Figure 7) (see also Chapter 2.2.). The map visualises vegetated land coverage in grids smaller than 1 hectare, disconnected from the main green bodies and in regions with residential housing as dominant land use.

In Espoo, forest fragments are slightly overrepresented in areas with sparse detached housing in both satellite suburbs and forested suburban areas close to the urban green area network. Proximity to Espoo Central Park decreases the quantity of the fragments. At the five urban city centres, forest fragments are scarce within the hub elsewhere than in the Centre of Espoo and Espoonlahti, which are more mixed by their land use and, interestingly, both subjects to major land-use changes in the future (City of Espoo 2021). Figure 8 represents a closer look at a satellite suburb Kuurinnitty, located in proximity to the Centre of Espoo. Residential areas with rather sparse detached housing are favourable to fragmented vegetation and often include a lot of green elements within the urban fabric. In Espoo, forest fragments do occur all over the city and can be considered as contributors to the local landscape in several different locations.

4. Value assets in urban planning

People´s behaviour is always a combination of our personal characteristic based on the genetic prerequisites and external, environmental influences that are formed by our personal history. In this chapter, this behaviour is discussed in light of valuation, societal relevance and use in public debate.

4.1. From values to valuation

A group of values and personal references guide our behaviour (see e.g., Devine-Wright 2009; Stocker 1990), even if the origins of our value patterns are somewhat disputed. Values, that is beliefs that operate as guiding principles in our life, enable us to evaluate situations where multiple different factors require us to evaluate our opinion on the situation and make an opinion on it (Stocker 1990). These beliefs may be collectively shared (social) or personal, that together form an interconnected valuation system of a self or a community. As Tsirogianni & Gaskell (2011) state, values can be comparable to life trajectories as continuous processes of making sense of one´s existence. Based on this existential ontology, our valuation does chance in time and is considered and shifted whenever we navigate ourselves through life.

Lamont (2012) makes a difference between valuation and evaluation by arguing, that the first describes procedures of giving worth to a subject, the latter practices to attain this type of worth. In action-guiding evaluation on what ought or could be done in each situation, not the *act* itself but the *choice of acting* is the stage of moral consideration (Stocker 1990), which highlights the importance of evaluation before a decision to act based on the selected principles. The importance of one´s valuation and moral consideration is simplified to Figure 9, which describes stages of psychological response to external input. When one becomes aware of an input, such as in a discussion situation, one´s self interprets and evaluates the new knowledge, which, then, leads to a decision on acting or non-acting based on this evaluation (Devine-Wright 2009). The whole process is determined by latent constructs on what is preferred, or worth desiring and highly influenced by externalities. Attitudes, on the other hand, have the ability to express values, but they are rather a cause than an effect of evaluating general goals in life ((Tsirogianni & Gaskell 2011).

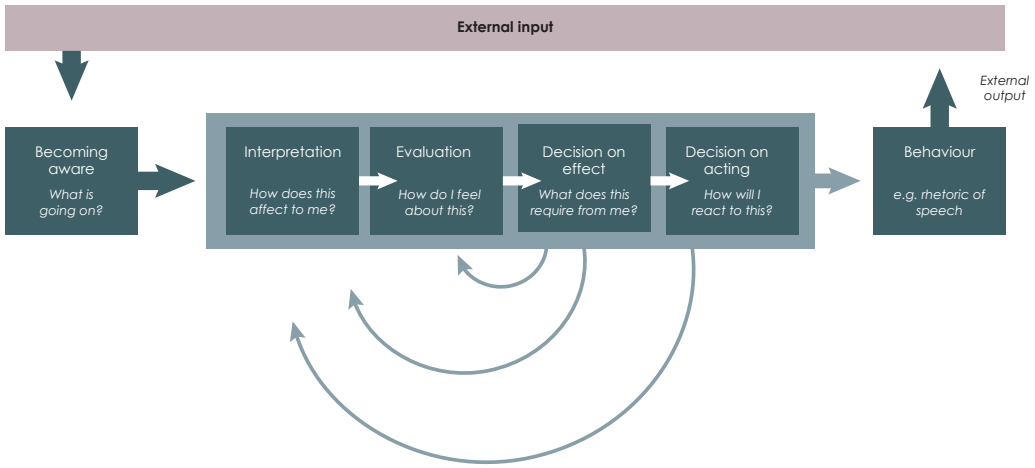


Figure 9. Stages of psychological response, that occur constantly and unconsciously whenever we become aware of external stimuli. The psychological response is a natural psychological instinct that ensures survival but also enables us to evaluate the process for origins of valuation patterns. The critical moment (Boltanski & Thévenot 1999) occurs when the external input is evaluated and compared to one´s modes of engagement.

4.1.1. Social values and individual interest

To interact with the world, Thévenot (2007) suggests three types of engagement – public justification, familiar affinities and individual interests. When used in political argumentation, they form three systems of valuation (Eranti 2016) and ways to justify one's arguments in public debate. When the individual interest is formed on the personal gain from the environment, familiar affinity evaluates the environment as a both material and emotionally constructed, familiar resource. Arguments based on the public good, on the other hand, are justified on objective generalities and the common utility, even if sometimes reined to serve the political or corporate agenda of a single interest group (Neveu 2002). These Thévenot´s three types of engagement are used as a theoretical standing point to evaluate (shared) value patterns among city officials in this study.

Social (or universal) values are "socially collective beliefs and systems of beliefs that operate as guiding principles in life" (Tsirogianni & Gaskell 2011: 442) – compared to social norms, one feels committed to shared social valuation voluntarily rather than acts by it due to stress for social conflict or disgrace. Due to their normative component, social values do not answer to question of what is desirable or undesirable but on how things should be in this case, including a moral imperative.

Also, social values are legitimised based on their shared prescription, that is, people are certain of the fact that others share the same values and perceptions on the matter. Critically, this also gives authority to those who control the knowledge on shared values: the perception of what we think as socially shared values may be over- or underrepresented compared to the actual valuation of the people. Social values are therefore always relational and transferrable based on the given time and context.

Morris (1956) divides social values as conceived (explicit) and operative (implicit), in which the former is about what an individual embraces and the latter on based on what guiding principles s/he actually acts. This is caused by the fact that individuals often have no clear view on their guiding values, which makes it crucial to a researcher to acknowledge if the studied values are perceived (conceived), when, for instance, self-reported, or actual (operative), that are put into practice.

What people consider appropriate is dependent on one´s social relationship to the object of valuation (Beckerman & Pasek 1997). This person–subject relationship may be utilised whenever the aim is not to study the deep moral imperatives of the respondents but to reveal value-loaded approaches and perspectives towards a specific subject. Nevertheless, the rhetoric used in one´s argumentation may simultaneously reveal something on a respondent´s moral stand – using the rhetoric of economy to justify one´s claims on a matter includes a notion on commonly giving worth to economic principles.

4.1.2. Value orientation: a shift in position

Ranking alternatives of choice vary in accordance with types of situations in which behaviour occurs (Kluckhohn & Strodtbeck 1961), but also change based on the role we act in. Therefore, the multiplicity of our positions enables us to obtain different meanings and argumentation as individuals, dependent on the context in question. As Crowe et al. (2015) have evidenced, both one´s demographic characteristics and social position do influence values, beliefs and opinions on a specific matter. Also, in many situations, city officials have a position to represent and support the community, which affect their viewpoints on development projects to support structural factors in a different way than they would do as private individuals (Crowe et al. 2015).

In this study, one´s position plays a crucial part since the respondents act as city officials and are invited to attend the study in this role. Nevertheless, one´s personal valuation patterns can merely be left behind, which is important to acknowledge when the responses are analysed: usually, it is impossible to consider, from which role each question is approached and evaluated. Some statements of Q analysis, presented in detail in the following chapters, are formulated based on personal experiences and preferences, whereas some statements are more easily approached from a more objective point of view and to which the valuation is largely based on the current position, education and professional aspiration.

4.1.3. Values in conflict: trade-off and incommensurability

Values and valuation systems described above are not always compatible with the world around us, but sometimes in moral conflict with each other in operative situations, where several things we appreciate do not come across (Stocker 1990). Even so, we live in a world of scarce resources, where a value trade-off is sometimes necessary, even if often provoking anger, anxiety and discomfort (Fiske & Tetlock 1997).

Contingent valuation is a method of "valuing the benefits of preserving or improving some asset" (Beckerman & Pasek 1997: 65), in which worth is given to a certain asset over another. This is often expressed as cost-benefit analysis, in which monetary value is compared to other valued qualities (McGraw & Tetlock 2005). These moral choices are embedded into practical decision-making processes and political agendas (Ylä-Anttila & Luhtakallio 2016), in which questions on prioritization of economic considerations are put against social wealth, such as healthcare or education. Interestingly, following Beckerman and Pasek (1997), questions dealing with a specific context are often disregarded, but more general cases on *types of [environmental] asset* are more willingly discussed without such anxiety.

To people, some assets belong to a higher mode of valuation, incommensurate to monetary gains – often including environmental valuation (Beckerman & Pasek 1997; Centemeri 2014). To these incommensurate values, a trade-off of values may occur as a taboo, rejected as morally precarious (e.g., Fiske & Tetlock 1997). In the social process of valuation, no pricing can therefore be given to these modes of

attachment to the environment (Centemeri 2014), which makes it more difficult to analyse certain intangible qualities, such as costs of environmental conservation, ecosystem rehabilitation or biodiversity impact assessments.

In this study, the respondents are asked to place statements into a matrix with a fixed form (see Chapter 6.). This aims to force the respondents to value trade-off when not all statements they consider important or less important can be placed into one end of the value line. No follow-up study was, alas, conducted on the feelings of the respondents after filling the matrix to study the difficulty of the task or the possible feelings of discomfort or anxiety.

4.2. Justification in argumentation

A classical publication of *On justification: Economies of worth* by Boltanski and Thevenot (2006, in French 1991) describes the valuation, justification and rules of acceptability as a basis to argumentation in public debates. The common worlds (also: orders of worth) are used in cases where people have a need to find equivalence – to explain a certain situation and reasoning for things as they are, one has to find a varying set of objects, opinions and perspective to understand connections in between them. The question is not merely about associations or personal preferences, but on judgement aiming at generality, when the discussion on these general principles is led to argumentation based on, for instance, technical matters, aesthetic sentiments, common opinions or even political traditions. Based on this generality, the theoretical frameworks enable to evaluate, i) what the people consider as valuable and ii) how they express and implement this worth (Thévenot et al. 2000).

Generally, theories tend to seek for common characteristics of universal convention, even if, in classical sociology, the plurality of values is an outcome of the plurality of social groups (Boltanski & Thévenot 1999). Based on cultural norms, institutional relations and personal interests and histories, every individual holds a unique set of what one perceives as worth desiring or justifying for, even if often these arguments

are generalised on common acceptability (Thévenot et al. 2000). In *On Justification*, these desires are categorised as six common worlds, which each hold a set of commonly accepted and used common goods. These are:

- **the world of inspiration**, in which creativeness, passion and ingenuity are valued, also including notions of spirituality to some extent.

- **the domestic world**, in which close and humane family ties are highly appreciated, with one´s personal social connections as the main driver. Also, trust to (institutional) authorities is somewhat visible.

- **the civic world**, in which the collective interest, solidarity and equality of humans is highly valued. Appreciation may be targeted towards the convergence of both the people in the world or those in close proximity.

- **the world of renown**, in which fame and recognition are valued. A person with worth to recognition is keen on power relations and one´s personal position in the hierarchy.

- **the market world**, which is defined by monetary value and price of things. In the market world, one´s qualification is based on purchasing power and wealth, and other benefits of decisions are compared to the monetary costs.

- **the industrial world**, in which productivity and efficiency are highly valued in subjects, together with professionality and expertise of the people. The desired outcomes have a meaningful function when relevant information is carried out as measurable units and statistics.

To which, based on Lafaye and Thévenot (1993) may be included a seventh common world, known as

- **the world of nature**, in which ecological order of worth is valued. People grounding their argumentation on the natural values acknowledge nature´s intrinsic value and argue for instance on environmental protection and conservation for the sake of the flora and fauna.

In this study, the common worlds are perceived as theoretical discourses that form the basis to understanding the moral evaluation behind the value patterns in a larger context. As Centemeri (2014) states, the original contribution of the common worlds is a link between legitimacy to shared valuation and universal justice, in which commensuration is embedded. The main gain from the common worlds is understanding on how many situations in social life may be analysed by their requirement for the justification of action – when actions are taken to defend some personally significant things, using argumentation based on one´s conception of the world is very natural.

4.3. Values in public debate

When attending to the public debate over contested land-use questions, stakeholders justify their arguments based on a set of values and principles, which is somewhat limited to varying understandings of the governmental processes (Kuusisto-Arponen et al. 2014) or common good (Ylä-Anttila and Luhtakallio 2016). This creates a dynamic that is difficult to control and often leads to situations where the interests and needs of different stakeholders do not come across.

By applying pragmatic sociology and types of engagement (Thévenot 2007) into the context of urban planning, the case studies become "site[s] of ambiguity and tension around different cultural-political visions and valuations" (Blok & Meilvang 2014: 21). In local land-use conflicts, personal relationship with a place is often overtaken (Stephenson 2010), which leads to a state where the situation is interpreted as seeking for personal affinity rather than as a conflict of place attachment and expectations to participate in rather traditional urban planning processes. In public debate, what Boltanski and Thévenot (1999) call *critical moments* of compatibility with the world do occur in the disputes, where the course of action is found to be inequivalent with one´s valuation and needs correction. Therefore, local land-use questions become sites where discussed, if the commonly accepted rules of justification have been violated or about which mode of justification to apply to the context at all.

The common worlds offer seven principles for building justification for one´s arguments, all capable of being used in the context of land use (Ylä-Anttila & Luhtakallio 2016). Therefore, they form a relatively institutionalised toolkit for investigating, how claims are justified in the public debate, even if in the modern times new common worlds of the information society (Thévenot et al. 2000) or patriotism, among others, may emerge to expand the understanding of those claims. In this study, I argue that amount, location and quality of urban forests is a political question and discussion on them highly influenced by those whose interests are heard and valued in the decision-making processes.

II Theory

"Nature discloses itself to us only
in so far as it matters to us."

Simon P. James (2009: 66)

5. Value of forest fragments

The world of nature

The world of inspiration

The domestic world

The civic world

The industrial world

The market world

The world of renown

In the following subchapters, forest fragments are discussed by categorisation of the common worlds. Each chapter aims to answer three questions: i) what the common world reveals on value systems, ii) how the common world forms a basis to statements of the Q analysis, and iii) what aspects former literature reveals on forest fragments related to perspectives of the common world. When the Q analysis of this study is formed based on these common worlds, the mode of evaluation, test, spatial formation (based on Thévenot et al. 2000) and statements of the questionnaire are presented in conjunction with each of the worlds at the side of the page. Since not all the statements can´t be allocated to single common worlds, also their connectivity with each other is described following colour coding on the left.

Multiple studies reveal (e.g., Florgård & Forsberg 2006; Björklid-Chu 1974), that forest fragments can be used by local children and who can, then, be considered as one of the main user groups of urban forest fragments. Therefore, the children and youth will be discussed in their own section, even if not part of the categorisation of the common worlds.

5.1. Forest fragments in the world of nature

Ecological valuation and the world of nature arises from respect over the intrinsic value of nature and our responsibility for flora and fauna. Ecological quality is often valued, even if not at expense of neatness in people´s own landscape (Nassauer 1995). Even so, having a quantity of green elements in one´s everyday life enables us to explore, observe and understand better natural phenomena, the richness of species and annual seasonality. When a qualified human being in the framework of valuation in the world of nature is an environmentalist who value preservation of nature for future generations (Thévenot et al. 2000), the statements in Q analysis are formulated in a way that argues for biodiversity (Q1), individual species (Q2), ecosystems (Q3) and harmony between people and nature (Q4), together with increasing consciousness over environmental challenges (Q5), such as climate change,

The world of nature

Mode of evaluation the environment

Test sustainability

Space formation global ecosystem

Such places are important from the biodiversity perspective. Q1

Such places help endangered species to survive. Q2

Such places enable places to endangered biotopes. Q3

There should be more such places in order to maintain the balance between nature and people. Q4

Increasing awareness of the importance of such places would be helpful in the conservation of them. Q5

pollution, microplastics and biodiversity loss (Ryan 2005). A person whose ideology is based on the world of nature considers natural habitats as qualified objects and sustainability as a goal to human actions (Thévenot et al. 2000).

Nature at forest fragments is characterised based on their isolation from the ecological network, small size and often poor biodiversity value. Considering ecological connectivity, forest fragments do not fulfil the minimum measures of ecologically functional connections (Väre & Rekola 2007) and are often isolated from the wider ecosystem of a city. Also, the size of forest fragments is often too small (Söderman & Saarela 2011), when the habitat edge effect (Figure 10) affects their microclimate in terms of change in wind conditions and heat that penetrates to the surrounding asphalt (Hamberg 2009).

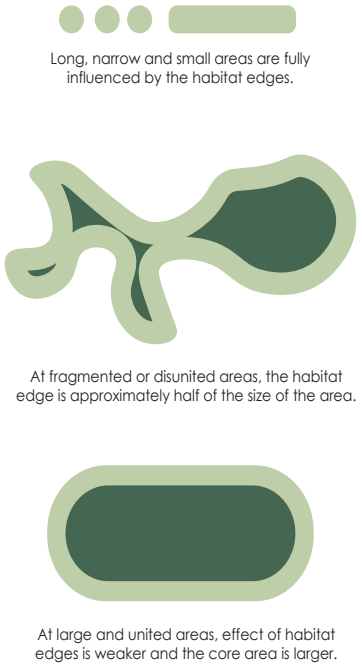


Figure 10. Effect of habitat edges in greenspaces of different shape and size. The smaller and narrower the greenspace is, the more of its area is influenced by the edge, whereas larger greenspaces also have a larger core area. The size and shape of forest fragments are so small they are influenced by the edge entirely. The figure is inspired by Söderman and Saarela (2011).

Forest fragments can have some biodiversity value: they are usually open, include several tree species, multi-layered canopy and both dead and decayed wood (Malmivaara et al. 2002) since they are less intensively managed than commercial forests (Hamberg 2009; Gundersen et al. 2005). Compared to highly maintained urban gardens, yards and parks, the forest fragments may add value to the urban ecology and its preservation, even if separated for the wider network of greenspaces.

The forest fragments, among other urban forests, are susceptible to multiple human actions and urban pressure, such as including invasive species,

changing microclimate and human-influenced disturbance (Ranta et al. 2013). Ecosystems in forest fragments face especially high pressure for trampling (Hirvensalo 2014), especially in areas used by the children. The adults follow a path to a higher extent than the children, whose movement is not so tied to customary ways to follow a path, which means the wear of the ground cover vegetation is somewhat higher (Florgård & Forsberg 2006). The number of residents living in the vicinity of the forest stands as an important factor affecting the understorey vegetation in urban forests (Malmivaara et al. 2002).

The world of inspiration

Mode of evaluation
creativeness

Test
passion

Space formation
presence

Such places are beautiful. Q6

Places restored in their natural condition are part of pleasant environments. Q7

Designed greenspaces increase the pleasantness of the neighbour-hoods more than such places. Q8

Such places make me feel calm. Q9

Such places have many things to watch and observe. Q10

5.2. Forest fragments in the world of inspiration

The world of inspiration is characterised by creativity and passion with respect to individuality (Thévenot et al. 2000). Inspirational values are considered based on aesthetics of the daily landscape, planned versus unplanned landscape and the emotional experiences the landscape offers when the environment is seen as an object used to funnel one´s personal affinities. A qualified person in inspirational worth is creative and enthusiastic, to whom the present is both place and time (Boltanski & Thévenot 2006). The statements of Q analysis are built on aesthetics (Q6, Q10), pleasantness of a landscape (Q7, Q8) and restorative qualities (Q9), all considering environment from an emotional and sensuous framework.

Even if forest fragments are not capable to offer recreational facilities or have no access, they have an influence on people´s everyday environment as visual elements (Byrne & Sipe 2010), especially when connected to walkways and facilities. Vegetation acts as a strong factor in wellbeing and residential satisfaction since visual access to greenery fosters restorative experiences (Kaplan 2001), is considered visually more appealing than formal gardens (Twedt et al. 2016) and influences positively on one´s mood (Nordh et al. 2009). Not only visuality, but forest fragments may also dim noise pollution (Hirvensalo 2014) and offer impulse to other senses as well. In Finland, urban residents prefer forests near their homes and favour openness, easy walkability, visual pleasantness (Hamberg 2009) and expression on biodiversity (Tyrväinen et al. 2003). On the other hand, people may mistake a place with high

biodiversity and heterogeneity of a landscape as lack of human care, since it violates cultural norms of a formal landscape (Nassauer 1995).

As the biophilia hypothesis (Grinde & Patil 2009) suggests, humans have a psychological preference for the natural environment and perceive nature as potential areas to achieve soft fascination, which thereby prevents mental fatigue caused by overused directed attention (Kaplan et al. 1998). This makes natural settings ideal for gaining restorative experiences (Kaplan 1995; Twedt et al. 2016), thus fulfilling the inspirational needs of sublimity (Thévenot et al. 2000).

The domestic world

Mode of evaluation
familiarity

Test
trustworthiness

Space formation
local

Many good memories are attached to such places. Q11

Preservation of such places enable the next generations to experience the environment the same way I do. Q12

I hope such places would be located in my neighbourhood. Q13

Such places are part of the urban landscape of Espoo. Q14

In my opinion, such places increase the feeling of insecurity. Q15

5.3. Forest fragments in the domestic world

One of the main elements in a domestic world is the valuation of a locale, heritage and affiliation to other humans (Boltanski & Thévenot 2006). The domestic world highly values intimate social connections and, from the types of engagement (Thévenot 2007), participate in the public debate from the perspective of familiar affinities. The domestic world is described by people–place relationship, where one´s personal connections form the basis to the valuation of both material and immaterial surroundings. Hypothetically, the people who value domestic worth have more negative beliefs about local land-use proposals based on place-protective actions (Devine-Wright 2009). A qualified human being in the domestic world is an institutional authority (Thévenot et al. 2000), which connects the domestic world into the world of renown (see Chapter 5.7.).

By valuation of past, familiarity and heritage, statements in Q analysis are formulated on memories (Q11), next generations (Q12) and stability of a locale (Q14). This view is a basis to nature´s existence value – or sense of fairness to future generations – as an ethical consideration on the environmental valuation (Beckerman & Pasek 1997). Even if correlation between crime rates and quantity of unmaintained green elements has not been evidenced in former literature (Kuo & Sullivan 2001), increased feeling of anxiety for crime is tested through statement Q15.

The civic world

Mode of evaluation
collective welfare

Test
equality

Space formation
society

Such places increase the sense of community in between the residents. Q16

Such places increase the residents´ possibilities for doing outdoor activities. Q17

Such places have a positive effect on the mental health of the residents. Q18

Such places are important to the local children and their growth. Q19

Such places enable all the residents an equal access for restoration in nature. Q20

Naturalness has been evidenced to add an individual's wellbeing as a mediator in people–place bonding through an emotional component (Knez et al. 2018). Related to restorative qualities of urban forest fragments, attachment to a place fosters restorative experiences more than a place without any special meaning through emotion-regulation processes (Korpela & Hartig 1996). When the domestic world is built on place-specific place attachment, the argument on forest fragments as non-places (Augé 1995) contradicts with the domestic world which particularly loads forest fragments with memories and special meaning. Even so, urban woodlands have many experienced values of favourite places, such as peacefulness, the feeling of forest, naturalness and functionality (Tyrväinen et al. 2007), which connects place attachment closely to the domestic world and will be covered more deeply in the discussion (see Chapter 8.).

5.4. Forest fragments in the civic world

The civic world is built on collective welfare and solidarity (Thévenot et al. 2000). Equal welfare policies are valued, targeting to equality of citizens by their fundamental rights. Space is, in the civic world, a social construct with a global dimension (Boltanski & Thévenot 2006). Therefore, the main elements in the statements of Q analysis are communality (Q16), inclusivity (Q17, Q18, Q20) and the future citizens (Q19, see also Chapter 5.8.). In the valuation of the civic world, these societal objectives are gained through legislative regulation and systems thinking, by that including also trust to authorities and linkage to the world of renown (see Chapter 5.7.). Arguments based on civic worldview are linked to the institutional role of promoting social equality, which makes it an interesting worth in a study with a sample among city officials, whose professional position is, to some extent, to secure this equality of opportunities.

Considering social cohesion, natural outdoor settings have not been evidenced to have any direct correlation with a perceived sense of community (see e.g., Centers & Gómez 2019; Zijlema et al. 2017), even if activities in greenspaces provide facilities for social interaction in between the residents.

The industrial world

Mode of evaluation
technical efficiency

Test
competence

Space formation
geometric

Such places would be more functional, if used for infill development construction. Q21

Negative impacts caused by construction of such places may be compensated by urban planning that acknowledges needs of nature. Q22

Such places encourage people to litter. Q23

Discussion on planning of such places cause unnecessary tensions in between nature activists and urban planners. Q24

A city has enough greenspaces without restoring such places. Q25

Forest fragments with no such facilities have then little significance to social cohesion.

Overall greenness of a cityscape enables all residents to enjoy natural environments, ensuring equal accessibility to natural outdoor settings also to those living with reduced mobility or in weaker economic and social conditions. Differences in environmental quality can, in some cases, lead to health-related segregation (Grinde & Patil 2009). Compensatory distribution of green elements to areas with formerly little greenspaces does improve the quality but may also lead to environmental gentrification (Centers & Gómez 2019), which causes displacement of current residents and increases social segregation due to increased property values.

5.5. Forest fragments in the industrial world

The industrial world is inherently defined through by productivity and competence (Thévenot et al. 2000). An industrial worldview is built on a desire for analytical capability and is keen on the highest rate of production in each situation (Boltanski & Thévenot 2006). A person who relies on industrial ideologies also values systems thinking and considers space as a geometric entity, assessed in an analytical fashion. When long-term planning and statistics are valued, the industrial world has linkages to other statements which acknowledge the importance of information and communications.

When an industrial worldview relies on infrastructure and technicality, also the statements in Q analysis are formulated on a theoretical idea that the current land use of forest fragments is inefficient and adds no value to urban metabolism. Statements Q21, Q22 and Q25 take a stand on the efficiency of land use, when the others consider the social aspects through conciliatory approach (Q24) and unintended (and undesired) use of space (Q23). As a construction-oriented set-up, the industrial dimension will be also analysed through related statements from other common worlds to avoid bias caused by preservation-construction related discussion, which is additive to discussion on valuation systems.

The market world

Mode of evaluation
cost

Test
competitiveness

Space formation
global

As Vilkuna (1992) argue, often the main criterion for allocating land for green areas is their low suitability for construction, even if infill construction has in recent decades begun to gradually alter land use in existing urban fabric into denser settlements (Tyrväinen et al. 2007). Urban design can, nevertheless, be conducted in a way that considers the needs of the environment when new construction is implemented if all aspects of the decisions are carefully analysed during the process.

5.6. Forest fragments in the market world

In the market world, a person is a consumer par excellence – people´s qualification is based on their purchasing power and wealth, and other benefits of decisions are compared to the monetary costs (Thévenot et al. 2000). From a political perspective, the question is not only on personal wealth but applicable to an idea of giving value to things based on cost-effectiveness. This aspect connects the market worth with the industrial world in terms of efficient use of resources. In the market world, goods and services circulate in a flexible way through a networked space.

In the statements of Q analysis, the market world is considered from the perspective of both individual´s and city´s economic vitality. Based on the statements, forest fragments may increase the monetary value of private (Q26) or public (Q30) property and cause public costs (Q29). A statement also tests valuation on the importance of landowners´ supremacy over their property (Q27).

One of the statements in Q analysis is dedicated to ecosystem services (Q28), referring to provisioning, regulating and cultural goods and benefits provided by the ecosystem to humans (Niemelä et al. 2010). Forest fragments provide mainly regulatory and cultural services, including habitat provision, noise cushioning, stormwater absorption and regulation of microclimate (see e.g., Niemelä et al. 2010; Costanza et al. 1998; Potschin & Haines-Young 2011). All these are important contributors to urban metabolism also in terms of decreased need for hard investments in regulatory infrastructure.

Such places increase the monetary value of a neighbour-hood. Q26

Landowners should have authority over planning and use of such places. Q27

Such places provide residents a lot of ecosystem services. Q28

The maintenance costs of such places constitute considerable expenditures to the city. Q29

Construction of such places would bring more tax revenues to the city. Q30

The world of renown

Mode of evaluation
fame

Test
recognition

Space formation
aspatial networks

A city must ensure that flora and fauna living in such places endure, because Finland has committed itself to nature conservation through several international agreements. Q31

Such places may help develop residents´ environmental consciousness. Q32

Such places help building positive mental image on Espoo. Q33

Such places help the city to achieve its aims of carbonneutrality. Q34

Such places help the city to adapt and mitigate to climate change. Q35

When a land-use allocation is seen as regulation of natural resources, cost-benefit analysis operates as a calculative device to make out the monetary valuation of certain acts, functions, services or decisions (James 2009; Beckerman & Pasek 1997). Financial gain from intangible elements, such as biodiversity or restoration in nature is almost impossible to count since the monetary ecosystem service valuation often only obtains the value of services together without supporting the comprehensive synthesis of the system as a whole (Yang et al. 2018). Despite that, economists often see expenditure patterns as a stage where people reveal their normative value judgement the best (Beckerman & Pasek 1997).

Some methods for estimating the market price for urban nature consists of opportunity costs, estimation of maintenance costs, production value of forest (Tyrväinen 1999) or willingness-to-pay on certain ecosystem service (Costanza et al. 1997). By Beckerman and Pasek (1997), nevertheless, contingent analysis surveys tend to provoke anxiety among the respondents, when ideal-regarding principles in environmental value are intended to commensurate with want-regarding principles of economic worth.

5.7. Forest fragments in the world of renown

The world of renown is built on a desire for fame and celebrity (Boltanski & Thévenot 2006). A person with the valuation in the world of renown is keen on one´s position in a hierarchy and pleased when experiencing a feeling of recognition from others (Thévenot et al. 2000). The concept of time is dependent on periodicity, expressed in aspatial communication networks. As the market world, the world of renown also includes a competitive element, measured in fame and audience rather than market competitiveness.

Recognition in the world of renown does not need to be targeted only to an individual but also to an organisation, which is utilised when the worth is discussed in the valuation of land-use decisions. The statements of Q analysis deal with international recognition and agreements (Q31, Q34, Q35) and positive connotations towards a city (Q33). Organisational values are value systems formulated from individual values by a certain group of people

(Bourne & Jenkins 2013). On an institutional level, they occur both as reported, for instance, in strategies, and perceived, when members of the organisation are asked to characterise the values in their daily activities within the organisation (Bourne & Jenkins 2013). Espoo, as an example, aims to be the most sustainable city in the world (Espoo Story 2017) and has a long-term strategy to forward goals of carbon neutrality, mitigation to climate change and decelerating biodiversity loss. Environmental responsibility is then assumed to be one of the drivers in the employees' daily activities. If this recognition to an institution is valued or not is a question discussed further in the results (see Chapter 7.).

In the information society, the world of renown is expressed in communications networks (Thévenot et al. 2000) and funnelled to overarching environment-related knowledge. This is based on the idea that an organisation gains recognition by the quality of knowledge it produces, in this context, awareness of the correlation between ecological, societal and economic systems. A statement Q32 manifests this environmental consciousness, which supports knowledge-based decision-making processes and increases willingness to act gradually to lower one´s negative influence on nature (Martusewicz et al 2015). Compared to the domestic world, people with conceptual place attachment describe the value of a place based on its characteristics for the common good (Crowe et al. 2015; Ryan 2015).

5.8. Forest fragments in the children´s world

Children´s play in natural environments has benefits for children´s microbiology (Roslund et al. 2018), creativity and empathy (Kalliala 2005), and acknowledgement of natural assets (Ryan 2005). Also, as both Florgård and Forsberg (2006) and Lehikoinen et al. (2014) have found out, forest fragments are ideal destinations to organised groups of children for pedagogic purposes.

To children, play is a key socializing activity, defined by its unpredictability, unproductivity and imaginary elements (Caillois 1961). An ideal environment for a child contains elements of safety and controllability, stability, naturalness, playability and mystery, aesthetics and loose spaces on a human-scale (Horelli & Kyttä 2001). Naturalness is described by children as green environment with flowers, bushes, trees, grass and water elements (Horelli & Vepsä 1995). A mysterious environment

from a child´s perspective contains a number of “unspaces”, such as stairs, hedges, abysses and hollows (Grönholm 2001).

Many of these characteristics are visible in natural surroundings: forest fragments with original vegetation provide exciting playgrounds to the children, complementary to the official, designed play equipment (Florgård & Forsberg 2006). When in official playgrounds the means and type of play are predetermined by the adults´ perception of the play (Valentine 1996), small forests offer children a place for adventure and fascination (Björklid-Chu 1974), acting as ideal places for toyless and creative play Caillois (1961) describes. Compared to large natural forests preferred by adults for recreational uses, a forest fragment near one´s home can be more controllable, safer and accessible from a child´s perspective. If a child is permitted to use spaces without an adult´s supervision, it can also offer a possibility for individual play and escape from the “real life” of adults.

III Analysis

"Espoo is resident- and customer-oriented.
Espoo is a responsible forerunner.
Espoo is fair."

Espoo Story (2017)

6. Methods

Urban studies as a phenomena-based set of different disciplines are not fixed to a single methodology but are rather adaptable to different approaches dealing with complex questions and challenges in an urban environment, so be it from the field of sociology, geography, ecology, architecture, history or such. The strength of the multidisciplinary approach is utilised in this study by investigating urban planning and design-related challenges from a geographical perspective through sociological methods. In the following chapters, the empirical phase of this study will be introduced, described, analysed and interpreted.

In addition to the Q analysis, which forms the main method of this study, some inspiration from the residents´ perspective on Espoo´s current planning scheme is drawn from *My Espoo on a map* survey. In Espoo, the residents were invited to take part in the formulation of the city´s new strategy, Espoo Story 2021-2025, via a map-based survey in autumn 2020 (Parikka 2021). The data comprises 6000 individual respondents with over 70 000 spatial records on the map of the city. Themes that frequently arise from the comments related to forest fragments and other green areas are often dealing with general concerns on rapid construction of the city and notions on the relevance of these sites to specific target groups, such as to nearby residents, children or others. On the other hand, several comments call for outdoor facilities to forest fragments as well, which would, based on the residents´ view, increase the pleasantness of the place and enable people more possibilities for doing outdoor activities.

6.1. Factor analysis

The empirical phase of this study is conducted by Q methodology, which is an exploratory and semiquantitative form of factor analysis (Zabala et al. 2018). As Bandalos and Finney state, “factor analysis is a method of modelling the covariation among a set of observed variables as a function of one or more latent structures.” (2010: 93). This means factor analysis is a statistical procedure to create constructed entities on variables that correlate with each other. Factor analysis is typically used in contexts where the structures are not directly observable, such as in cases that

investigate latent structures of, for example, intelligence, creativity or values. In social sciences, factor analysis is inherently applicable in cases when socio-political attitudes of a sampling need to be observed (Fabrigar & Wegener 2012).

Compared to studies that sum up individual responses, factor analysis has fewer statistical errors and hence has better reliability of the results. By a battery of correlated questions or statements, factor analyses have high content validity, which makes it better suitable to measure complex phenomena (Bandalos & Finney 2010). A common correlation analysis, on the other hand, determines correlation in between two or more measures but lacks the ability to create comprehensive explanatory entities that assist the researchers to understand the nature of underlying interests in the variables.

The purpose of **exploratory factor analysis** used in this study is to identify the latent constructs among the set of variables without a researcher having strong hypotheses on the amount or description of the factors – compared to confirmatory factor analysis, the exploratory analysis does not evaluate already hypothesised structures, but generates these possible structures from the data in hand (Bandalos & Finney 2010). Familiarity with the theory and findings is, then, essential, when many decisions during the analysis of the results are made following existing theoretical basis.

This study is conducted by **principal component analysis**, which is a mode of analysis comparable – but different – to exploratory factor analysis and the most used extraction method in Q methodology (Zabala et al. 2018). The principal component analysis aims to account for the variances (weighting) of the variables rather than explain their correlations in between them. The method does not, like common factor analysis, separate variance of a measure into common and unique variance but are constructed from the measured variables themselves and therefore contain both dimensions (Fabrigar & Wegener 2012). The principal component analysis assumes that each variable´s (statement, in this case) variance can be fully explained by factor extraction (Preacher & MacCallum 2003). Instead of seeking correlations between variables, principal component analysis traces for broader terms, which would summarize and explain why the set of variables are loaded in the specific factor.

In this study, axes of the initial factor analysis were rotated for easier interpretation, conceptual meaningfulness and replicability of the study. The rotation was conducted by **orthogonal varimax rotation,** which maximizes the variability in the factor loadings and is also the most used in other studies applying Q methodology (Zabala et al. 2018). The basis of this rotation lies in the idea that the squared loadings of the variables become more variable and simpler in structure. (Fabrigar & Wegener 2012).

6.2. Q methodology

Q methodology was introduced by William Stephenson (1953) to the intra-individual study of subjectivity. It is commonly used in social sciences to measure a range of opinions about a topic within a sample population, and how these opinions differ and converge (Bredin et al. 2015). As Tsirogianni and Gaskell (2011) state, quantitative and qualitative methods are rather complementary than incompatible with each other, but often the use of the former in questions concerning values has led to a situation where values are seen as fixed particles of individuals´ psyche. This lacks the notion of the values as rather and context-dependent entities which transform in time and situation. A semiquantitative method with a descriptive dimension, like the Q methodology, allows to study values through statistical analysis but with a possibility for deeper interpretation of the data in question.

Reflection of values is one of the general aims discerned from Q methodology (Zabala et al. 2018). In a study on human perspectives, Q methodology can be

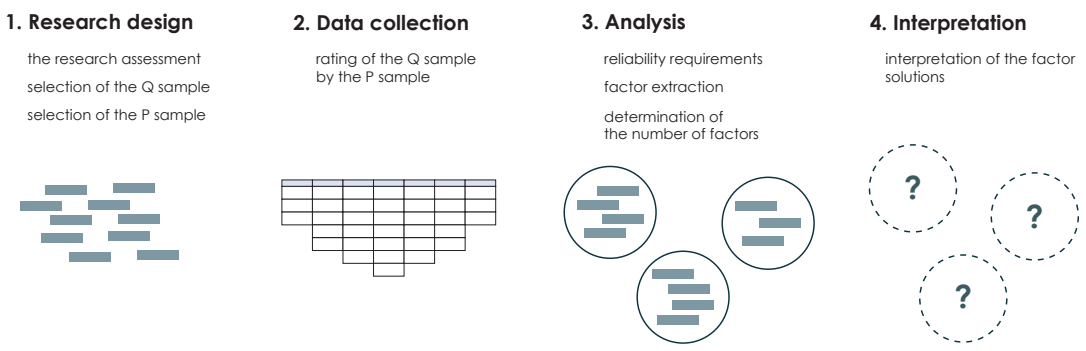


Figure 11. Phases of Q analysis in this study, adapted and edited from Zabala et al. (2018). Interpretation of the results is based on semiqualitative and exploratory methods and hence is always somewhat an object to the subjective description of the data.

applied to i) map varying perspectives on a certain topic, ii) to cover value patterns underlying people´s attitudes and explain why people hold certain perspectives, and, iii) to build a shared consensus and common ground in contradictory contexts (Vaas et al. 2019). To this basis also this study is conducted: respondents´ perspectives are mapped in order to analyse the underlying value patterns, even if the study setting is not able to reveal reasoning for the respondents having these certain perspectives.

In practice, the collection of the data through Q methodology consists of two stages: selection of Q statements (Q-set) and selection of participants (P-set) (Bredin et al. 2015) (Figure 11). The scope of the Q-set includes both positive and negative aspects of the topic at hand. A prerequisite for the study is that the participants of the P-set have expertise and knowledge over the topic to critically attend to the study. During the survey, the P-set validates the statements in the Q-set on a fixed matrix presented in Figure 12. In the context of this study, this fixed categorisation is hypothesised to cause value trade-off (see Chapter 4.1.3.), when the respondents are supposed to evaluate mutual valuation in between different variables. This may provoke anxiety and discomfort among the respondents (Fiske & Tetlock 1997), but it also imitates real-life situations, where several things we appreciate do not always come across (Stocker 1990).

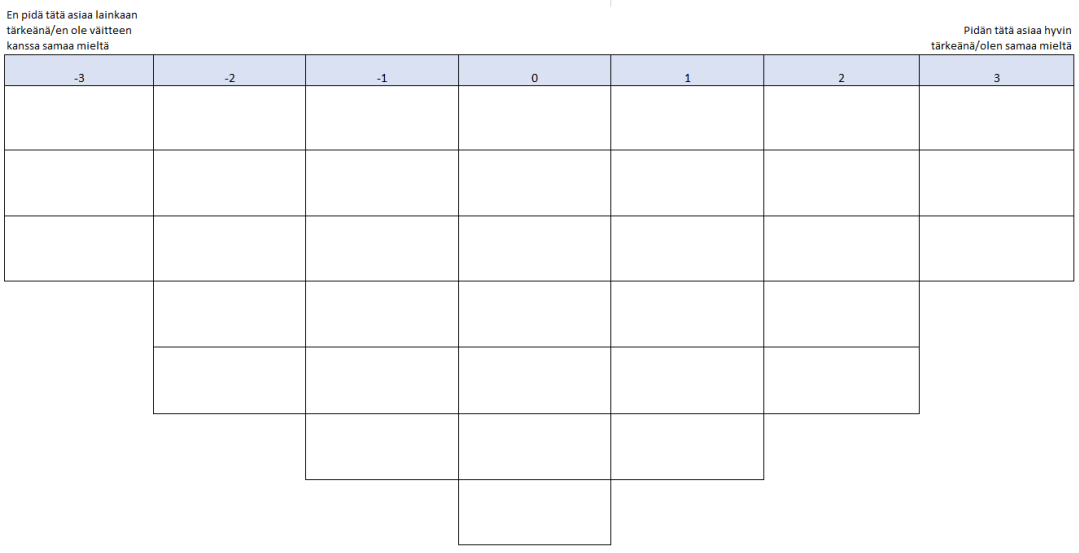


Figure 12. In Q methodology, valuation is based on a trade-off, when the statements are validated in a preset matrix. In the pyramid-shaped matrix used in this study, the two segments of the line indicate that ”I don´t consider this important at all/I don´t agree with the statement” (at the left) and ”I consider this very important/I agree with the statement” (at the right).

As the main strength of the method, Q analysis acknowledges not only the main principal factors but also reveals the latent and marginalized views in a way a regular correlation analysis would not. Although perceptions on the advantages of forest fragments are latent, the respondents may be capable of articulating their valuation on certain perspectives, which can be formed as several ideological patterns and linked to the argumentation over forest fragments. When considering the value patterns, the method is reliable in finding small nuances in opinions as a basis for feasible policymaking processes and decisions. On the other hand, Q methodology does not allow generalisation on how the different opinions are represented in a larger population, even if it gives insights into the range of opinions about a certain topic within the given sampling (Zabala et al. 2018). Therefore, it may be used as a basis for further research and observation with more general population surveys. Also, as a method with a respective need for subjective interpretation, validity and limitations of the data must be also carefully discussed within the study process.

7. Q analysis on the value of forest fragments

This thesis studies a combination of conceived value structures in an operative context when value-loaded perspectives are measured through questions on cultural, political, economic and ecological issues in imagined land-use decisions. Q methodology does not reveal the respondents´ fundamental principles but sheds some light on moral evaluation processes that are used in this context.

7.1. Description of the data

The empirical phase of this study was conducted as a Q statement analysis targeted to the city officials working at the City of Espoo. All together 27 anonymous respondents from all four main operative units of the city attended the study, working with nature, urban planning, culture, youth and healthcare.

The Q questionnaire was delivered to the respondents via email in January and February 2021 together with instructions and a short description of forest fragments (Appendices 1–3 [in Finnish]). The survey was conducted in Finnish and translated for the purposes of the thesis. The Q-set (statements) of the study was formulated by

the author based on academic literature and the common worlds of Boltanski and Thévenot (2006), every seven common worlds represented by five statements. The order of the statements was randomised for the questionnaire handed to the respondents and indicated no hint on the common worlds they represented. In a context with a concrete planning application, the Q-set was also formulated in a way that acknowledged different perspectives on a scale from infill construction of the forest fragments to their conservation in their current stage.

Most of the respondents represent the Technical and Environment Services, which includes the City Planning department, Public Works department and Environment department, among others (Figure 13). Some responses were also received from the Education and Cultural Services, the Social and Health Services and the Mayor´s Office. In conjunction with the Q matrix, the respondents were asked for information on their gender, length of the position at the city, frequency of visits to greenspaces and environment-related studies (Figure 14). These variables were, nonetheless, not systematically compared to the factor analysis to protect the anonymity of the respondents in sampling this small.

Most of the respondents of the study were female and had conducted some environment-related studies, such as biology, geography, architecture, landscape architecture or such. The frequency of green area visits was significantly high, since almost all the respondents visited their local green areas at least once a week. Over 1/3 of the respondents are senior experts with positions of over ten years at the city organisation. By that, it may be concluded that many of the respondents are well aware of the current state, history and development of Espoo and have significantly much expertise on the

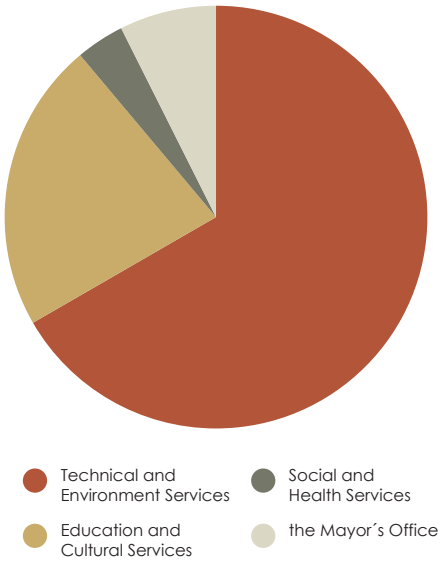


Figure 13. Respondents of the study by their operational units at the City of Espoo. Exact and relational quantities are eliminated from the figure for the anonymity of the respondents. N=27.

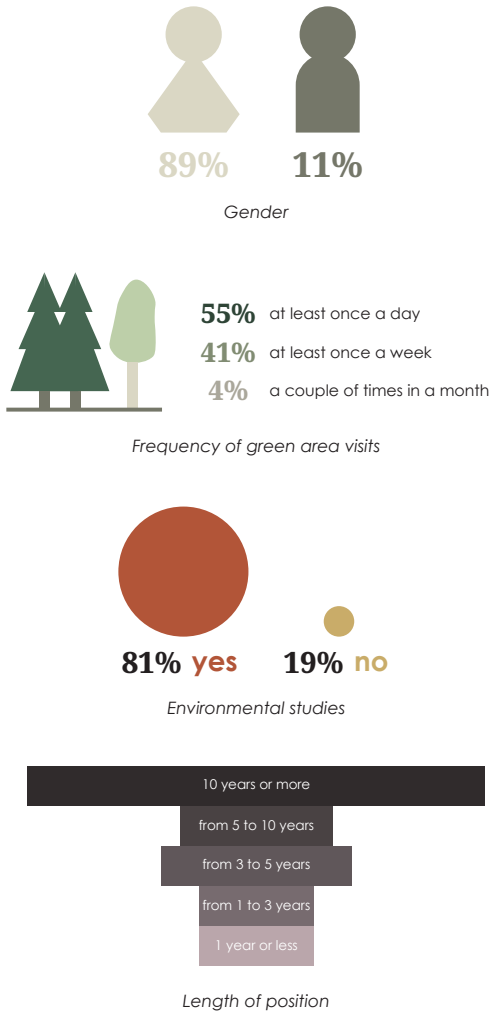


Figure 14. Additional information from the respondents: gender, frequency of visits to greenspaces, environment-related studies and length of the position at the city. N=27.

questions at hand. This is also supported by the high percentage of respondents from the Technical and Environment services, which is responsible for land-use decisions, urban design and environmental conservation, among others.

The additional information on the respondents did not show any strong correlations with the unique variables or the factors – in general, respondents with no environmental studies showed no more willingness either to preserve nor construct forest fragments or defined no variance in monetary valuation. Also, respondents working with administration showed no significant interest for statements related to the city´s strategy (Q33, Q34 & Q35). Length of position at the city did, on the other hand, show a small correlation with Espoo-specific statements (Q14 & Q33) with a mean of 0.75 of these statements compared to –0.1 of those with a shorter position at the city. Interestingly, people who reported working with the environment addressed less biodiversity-value (Q1-Q5) to forest fragments with a mean of 0.5, compared to those who do not work with ecology (with mean of 0.659) and, hypothetically, have less environment-related knowledge. On the other hand, those same respondents rated significantly high the value of forest fragments for developing environmental consciousness and awareness on ecological values (Q5 & Q32) with a mean of 0.85 compared to a mean of 0.441 of the others. Hence, those working with nature conservation consider forest fragments especially important to the people-nature relationship and as a mean to promote environmental valuation in the other contexts and sites. When Crowe et al. (2015) have showed that some demographic characteristics and one´s position both influence values and opinions in specific matters, is this a case of further research.

When city officials have both knowledge and a position to drive societal development (Crowe et al. 2015), they do not attend the study only as private individuals but as representatives of an organisation, which is, the City of Espoo. Hence, the results are analysed in the light of organisational valuation which emerges among a group of people who share a common cultural understanding (Bourne & Jenkins 2013; see also Chapter 5.7.). In Espoo, for example, the City´s strategy (Espoo Story 2017) and studies on local forests next-door to schools and kindergartens (Lehikoinen et al. 2014) and on the ecological network (Hirvensalo 2014) are actively used in the daily work by many of the respondents.

7.2. Rating of the Q sample

In the Q study, some statements argued for preservation, others for infill construction of forest fragments. Here, I introduce the rating of the individual Q statements before diving more deeply into the factor analysis. The histograms on the frequency of responses to certain statements are presented in a chart that is directed downwards to help a reader to see the connection between the histograms and the pyramid-shaped value matrix used in the questionnaire the respondents have filled in (see Figure 12).

The minimum and maximum values include the whole range of the matrix in almost all the statements, even if the actual weighting between them varies, as the average and standard deviation indicate in Table 2. The statements that argue for infill construction and demolition of the forest fragments have mainly negative values, which means the respondents have valued them as statements they disagree with. These arguments may be mainly found in the industrial world (Q21-Q25) and the market world (Q26-Q30). Statements that argue for the construction of forest fragments in these common worlds are also the most correlated variables (Appendix 4). From this may be concluded that the respondents are, in general, for the preservation of forest fragments and do not consider industrial functionality or the market worth very high in their preferences.

Considering aesthetic aspects of the forest fragments, statements of “Such places are beautiful” (Q6) and “Places restored in their natural condition are part of pleasant environments.” (Q7) have an interesting linkage: the forest fragments are not considered as merely beautiful, with mean of 0.259, but as one of the components of

Variable		Mean	Std. Dev.	Min	Max
Q1	Such places are important from the biodiversity perspective.	0,889	1,188	-2	3
Q2	Such places help endangered species to survive.	0,370	1,573	-2	3
Q3	Such places enable places to endangered biotopes.	-0,222	1,086	-3	2
Q4	There should be more such places in order to maintain the balance in between nature and people.	0,963	1,531	-3	3
Q5	Increasing awareness of the importance of such places would be helpful in the conservation of them.	1,000	1,441	-2	3
Q6	Such places are beautiful.	0,259	1,289	-2	3
Q7	Places restored in their natural condition are part of pleasant environments.	1,741	1,509	-2	3
Q8	Designed greenspaces increase pleasantness of the neighbourhoods more than such places.	-1,000	1,359	-3	2
Q9	Such places make me feel calm.	0,556	1,340	-2	3
Q10	Such places have many things to watch and observe.	-0,333	1,038	-3	2
Q11	Many good memories are attached to such places.	0,481	1,312	-2	3
Q12	Preservation of such places enable the next generations to experience the environment the same way I do.	-0,444	1,601	-3	2
Q13	I hope such places would be located in my neighbourhood.	0,630	1,597	-3	3
Q14	Such places are part of the urban landscape of Espoo.	0,593	1,185	-2	3
Q15	In my opinion, such places increase the feeling of insecurity.	-2,000	1,468	-3	2
Q16	Such places increase the sense of community in between the residents.	0,185	1,618	-3	3
Q17	Such places increase the residents´ possibilities for doing outdoor activities.	0,593	1,526	-3	3
Q18	Such places have a positive effect on the mental health of the residents.	1,259	1,095	0	3
Q19	Such places are important to the local children and their growth.	2,074	1,174	-1	3
Q20	Such places enable all the residents an equal access for restoration in nature.	1,074	1,662	-3	3
Q21	Such places would be more functional, if used for infill development construction.	-1,704	1,382	-3	3
Q22	Negative impacts caused by construction of such places may be compensated by urban planning that acknowledges needs of nature.	-0,667	1,569	-3	3
Q23	Such places encourage people to litter.	-1,667	1,544	-3	3
Q24	Discussion on planning of such places cause unnecessary tensions in between nature activists and urban planners.	-0,556	1,476	-3	3
Q25	A city has enough greenspaces without restoring such places.	-2,185	1,415	-3	3
Q26	Such places increase the monetary value of the neighbourhood.	-0,444	1,423	-3	2
Q27	Landowners should have authority over planning and use of such places.	-1,037	1,126	-3	2
Q28	Such places provide the residents a lot of ecosystem services.	0,222	1,188	-2	2
Q29	The maintenance costs of such places constitute considerable expenditures to the city.	-1,815	0,962	-3	1
Q30	Construction of such places would bring more tax revenues to the city.	-1,667	1,109	-3	2
Q31	A city must ensure that flora and fauna living in such places endure, because Finland has committed itself to nature conservation through several international agreements.	0,667	1,593	-3	3
Q32	Such places may help develop residents´ environmental consciousness.	0,185	1,594	-3	3
Q33	Such places help building positive mental image on Espoo.	-0,037	1,285	-2	2
Q34	Such places help the city to achieve its aims of carbonneutrality.	0,852	1,292	-2	3
Q35	Such places help the city to adapt and mitigate to climate change.	1,185	1,495	-2	3

Table 2. Variable variation, the mean and standard deviation of the 35 statements. N=27.

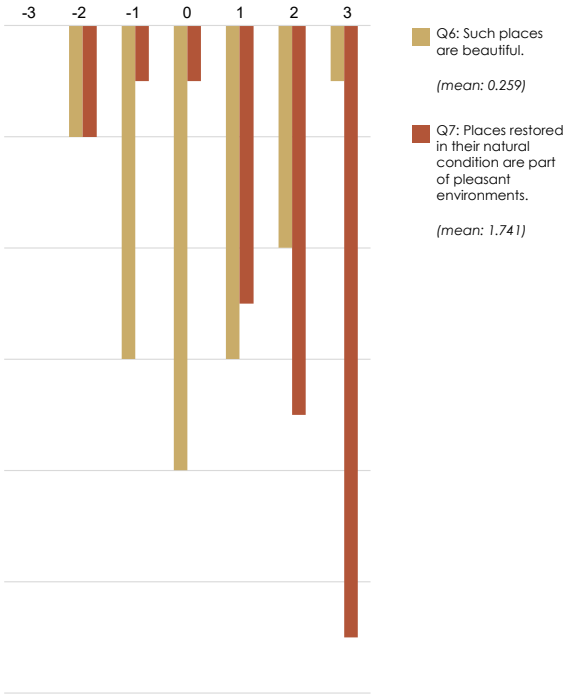


Figure 15. Histogram of statements Q6 and Q7, which describe pleasantness and aesthetics of forest fragments. In general, forest fragments are not considered especially beautiful, but the pleasantness of indigenous nature is acknowledged by the respondents.

a pleasant environment (Figure 15). Also, as *Mun Espoo on a map* survey revealed, green elements are considered as an integral part of the urban landscape in Espoo (Q14). This can, of course, be connected not only to forest fragments per se but to the other characteristics of an environment where they are the most often located, such as less dense neighbourhoods with detached housing. Even if within a framework of the biophilia hypothesis people have a tendency to prefer natural and green environment as pleasant and restorative (Twedt et al. 2016), the most preferred landscapes have a cue on human care (Nassauer 1995). This, hypothetically, indicates that forest fragments

could be perceived as more attractive with more visible signs on maintenance, such as mowing, trimming, paths, fences or other equipment.

The statement “Such places are important to the local children and their growth.” (Q19) was the only one dealing with children, but also the one from which the respondents agreed with the most with a mean of 2.074. Hence it may be argued that the respondents both acknowledge the current knowledge on the importance of green elements to the children, but also prefer it on a personal level. The statement “Many good memories are attached to such places.” (Q11) has only a low positive correlation with Q19 (variable correlation 0.201), but on an ideological level personal memories and affiliation with the children´s nature experiences may still be connected (Figure 16). Even if the respondents were not merely for preservation of the forest fragments from nostalgic reasons (e.g., Q12 with mean of –0.444), their personal history, possibly in such places where forest fragments have been located, may have an effect on the responses to these statements.

Statements that argue for the preservation of forest fragments from biodiversity perspective (Q1-Q4) were perceived mainly in a positive manner (Figure 17). From the statements related to ecological biodiversity, biotopes and individual species, “Such places are important from the biodiversity perspective” (Q1) was the most preferred one with a mean of 0.889. The statement “There should be more such places in order to maintain the balance between nature and people.” (Q4), includes a notion on the connection between the people

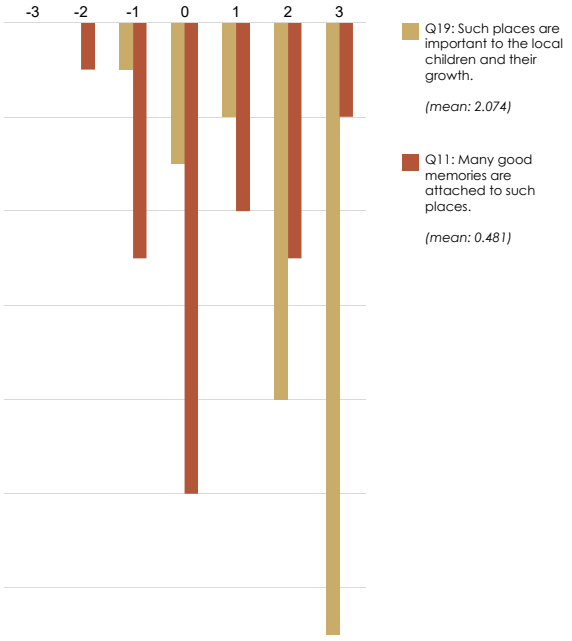


Figure 16. Histogram of statements Q11 and Q19, which seeks for connection in between valuation of forest fragments to children in relation to personal nostalgia. As the results indicate, the importance of forest fragments to children is acknowledged, but not merely for the sake of personal memories related to such places.

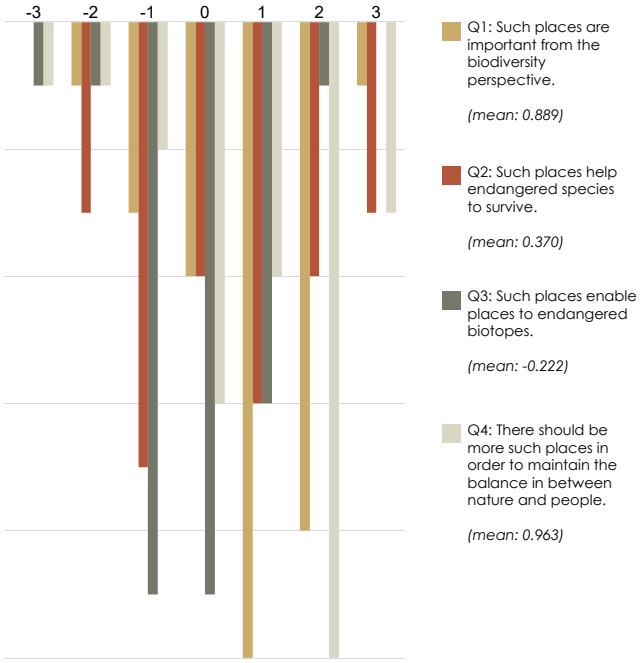


Figure 17. Histogram of statements Q1, Q2, Q3 and Q4, which form the basis to the world of nature and ecological worth. From these, the importance of forest fragments to ecosystems is relatively acknowledged, but from the perspective of their worth to humans.

and nature, which arises interestingly from among the other statements – as the most preferred one from these statements drawn from the world of nature, with a mean of 0.963 the respondents valued humans as part of nature, a connection which should, then, be also visible in the urban environment in the form of forest fragments. More information would be needed to reveal if designed pocket parks (Nordh & Østby 2013) would awaken similar connotations related to human-nature connection than forest fragments with indigenous vegetation.

From the urban planning perspective, the forest fragments are valued over designed greenspaces, which is indicated by the strongly negative mean value (-1.00) of the statement "Designed greenspaces increase the pleasantness of the neighbourhoods more than such places." (Q8). Therefore, the respondents also see that the negative impacts caused by infill construction of forest fragments are not able to be compensated by urban planning that acknowledges the needs of nature (Q22). Also, the forest fragments are considered important, when the quantity of greenspaces in a city is considered (Q25). Most of the respondents also wish to have such places in their own neighbourhood (Q13) with a mean of 0.630 (Figure 18). These results may also be Espoo-specific since the city is currently facing an ongoing debate over naturalness (Parikka 2021) and the need for supplementary construction surplus due to population growth (Espoon väestö... 2020).

Feeling of insecurity (Q15) and forest fragments as places where people do litter (Q23) had a strong correlation (variable correlation 0.560) with each other – those respondents who saw the forest fragments in a negative light did connect them to both unpleasantness and insecurity, and vice versa. As the strongly negative mean (-2.00) of the statement arguing for insecurity (Q15) indicates, the respondents do not consider forest fragments as places that would cause a threat at the neighbourhoods. This outcome is also evidenced by, for instance, Kuo and Sullivan (2001).

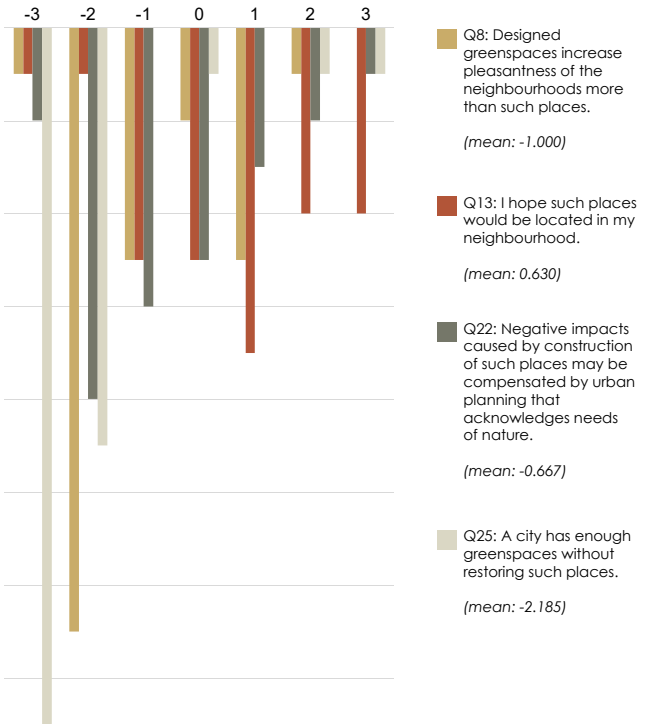


Figure 18. Histogram of statements Q8, Q13, Q22 and Q25, related to the construction of forest fragments. As the statements indicate, the respondents are for the preservation of forest fragments, valuing them especially for the sake of green area quantity in Espoo. Distribution on a statement for having forest fragments in one´s own neighbourhood is, nevertheless, relatively evenly split.

Interestingly, however, only feeling of insecurity – not littering – has a correlation with statements that argue for further design and/or construction of the forest fragments, such as more functional use of the forest fragments by infill construction (Q21) (variable correlation 0.607) or the patches as irrelevant section of the green urban network (Q25) (variable correlation 0.648). Littering is hence not seen as such a high inconvenience that would require construction-related actions.

In terms of increasing residents´ knowledge on environmental matters, the respondents have a consensus that forest fragments may be helpful in developing residents´ environmental consciousness (Q32, mean 0.185) and in maintaining the balance between nature and the people (Q4, mean 0.963). These statements are also strongly correlated with each other (variable correlation 0.532), together

with a notion of the preservation of such places due to the desire to preserve the environment in its current state for the next generations (Q12). This may be connected to the fact that many of the respondents have conducted environmental studies and therefore call for environmental stewardship for the sake of the human-nature balance, so nature and biodiversity are preserved for future generations to enjoy.

7.3. Formation of the factors

The formation of the factors based on the variables (statements) consists of the following phases (see e.g., Bandalos & Finney 2010; Fabrigar & Wegener 2012; Zabala et al. 2018):

1. Reliability requirements
2. Factor extraction
3. Determination of the number of factors
4. Interpretation of the factor solutions

Based on these phases, I shortly describe the analysis in the formulation of the factors before a deeper analysis of the factors themselves.

Reliability requirements

Before investigating data by factor analysis, several requirements must be tested in order to confirm the reliability of the data to be used in the analysis (Fabrigar & Wegener 2012). These are:

- Measurement scale appropriateness: equidistant scale points, five or more response categories. *Requirement filled by an equidistant ordinal scale with 7 categories from –3 to 3.*

- Sample size: number of valid observations by communality ratio. *Requirement partly filled – the sample size of the study is relatively small, but, with communality (equal to 1 – uniqueness) of all variables above 0.60, the sample size is adequate.*

- Independent study: unrelated observations with no external correlations. *Requirement partly filled; observations are conducted independently, but the respondents represent the same organisation and, to some extent, are working together, which may have an influence on the responses in a harmonizing way.*

- Sufficiently correlated variables, indicating whether the variance in the dataset can explain the correlations between variables. *From 35 statements, 24 have either a strong positive or negative correlation (correlation value < -0.5 or > 0.5) with other variables, which may be considered sufficient.*

By this, it may be argued that the data is reliable and valid by content.

Factor extraction

Factor extraction is done by choosing an appropriate procedure for the data at hand. As discussed more in detail in Chapter 6.1., this study is conducted as a principal component analysis, which is comparable to exploratory factor analysis. Principal component analysis traces for broader terms, which would summarize and explain why the set of variables are loaded in the specific factor. In the analysis phase of the results, the initial factors were rotated by orthogonal varimax rotations in order to maximize the variability in the factor loadings.

Determination of the number of factors

The number of factors in this study, represented in Table 3, is first determined by the Kaiser criterion, which extracts all the factors with an Eigenvalue greater than 1 (Fabrigar & Wegener 2012). Hence it reduces the number of variables. Using the Kaiser criterion of Eigenvalue > 1, a maximum quantity of factors is set to 11. By 11 factors, 83% of the variance is explained, which is highly satisfactory (Figure 19). Common factors with only a single measured variable are often difficult to interpret and define as major factors, which argues for overtaking them to the interpretation of the results. Also, since “a factor analysis is useful only if it provides a conceptually sensible representation of the data” (Fabrigar & Wegener 2012: 66), the theoretical utility of the factor models acts as the final criterion for factor count.

In this study, the first seven factors have been discussed more in detail based on a theoretical interestedness in their components, the potential to academically reliable

interpretation and value they add to the analysis of the results. The first seven factors are included in the analysis for two reasons: first, by their relatively sufficient Eigenvalue (> 1.55) and, secondly, by their cumulative proportion (> 4%.), which indicates, how much of the results can be explained by the factors. Additionally, a too large number of factors would extend the scope of the study and have an influence on the interpretation and discussion of the results.

FACTOR CORRELATION

Method	principal-component factors
Rotation	unrotated
Number of objects	27
Retained factors	11
Number of parameters	330

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor 1	7,614	3,369	0,218	0,218
Factor 2	4,245	0,224	0,121	0,339
Factor 3	4,021	1,519	0,115	0,454
Factor 4	2,501	0,374	0,072	0,525
Factor 5	2,128	0,271	0,061	0,586
Factor 6	1,856	0,175	0,053	0,639
Factor 7	1,681	0,142	0,048	0,687
Factor 8	1,539	0,146	0,044	0,731
Factor 9	1,394	0,238	0,040	0,771
Factor 10	1,155	0,089	0,033	0,804
Factor 11	1,067	0,067	0,031	0,834
Factor 12	0,999	0,081	0,029	0,863
Factor 13	0,918	0,181	0,026	0,889
Factor 14	0,737	0,103	0,021	0,910
Factor 15	0,634	0,131	0,018	0,928
Factor 16	0,504	0,072	0,014	0,943
Factor 17	0,432	0,040	0,012	0,955
Factor 18	0,391	0,075	0,011	0,966
Factor 19	0,316	0,098	0,009	0,975
Factor 20	0,218	0,025	0,006	0,982
Factor 21	0,193	0,011	0,006	0,987
Factor 22	0,181	0,071	0,005	0,992
Factor 23	0,111	0,040	0,003	0,995
Factor 24	0,071	0,014	0,002	0,997
Factor 25	0,056	0,019	0,002	0,999
Factor 26	0,038	0,038	0,001	1,000

Table 3. Factor correlation by principal component analysis, unrotated. From 26 factors, 11 explain over 83% on the variance of the variables, which is highly satisfactory. The first factor has an Eigenvalue greater than 7 and an explanatory proportion of over 21 % on the variance, which means it alone explains over 1/5 of the results. N=27.

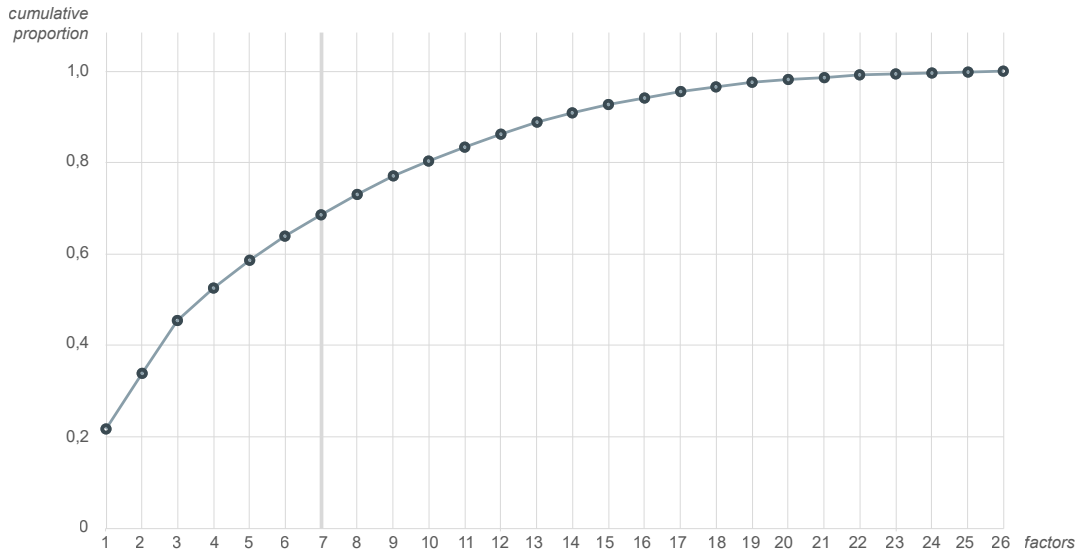


Figure 19. The cumulative extracted variance of the factors. From the factors, the first seven factors have been included in the analysis. From the extracted factors, first eleven have an Eigenvalue greater than 1 and altogether 26 explain the whole variance of the variables.

Interpretation of the factor solutions

Analysis of the content of factors involves assigning each variable to one or more factors based on their loading. In the interpretation of the resulting solutions, the researcher´s substantial knowledge on the topic is, therefore, crucial, since general guidelines for interpreting factor models are difficult to draw (Fabrigar & Wegener 2012).

In the academic world, there is no qualified consensus on what may be considered as statistically significant, even if Peterson´s study (2000) indicates that in social sciences a threshold for factor loading is set to a minimum of 0.3. Loading of more than 0.4 may be considered important and values greater than 0.5 as highly significant. By strong descriptive dimension of Q methodology, in measured variables factor loadings greater than 0.3 will be included in the battery as additive components to the principal variables, to which the limit value is set to 0.5. Variables with loading in more than one factor should be handled in the factors in more detail in order to better conceptualize, why the certain variable is constructive to several factors and may have more descriptive value in the general discussion on the theme. The naming of a set of values indicates the factor as a representation of a particular construct (Fabrigar & Wegener 2012) and is done in a manner that acknowledges and judges all included variables as reflections of the broader theme.

In some cases, some variables can be ignored to achieve a consistent and descriptive factor structure (Fabrigar &Wegener 2012). When the aim of exploratory factor analysis is to reflect on a single construct that is constituted on several, mutually descriptive and compatible measures, an error caused by, for instance, human externalities can be ignored without causing harm to the reliability of the factor (Fabrigar &Wegener 2012). Since the components of this study are statements that are loaded with certain value assets, some of the statements have been ignored as variables with no explanatory value in the factors. This applies to both principal variables and additive components.

Since the factor loading in a scale from positive to negative is merely a result of a statistical operation, the scale can then be inverted from positive to negative and vice versa. To produce a more consistent and relevant analysis, this inversion is operated

with some of the factors. This inversion has no effect on the interpretation and loadings of the other factors and causes no contradictions with the reliability of the study.

7.4. Value patterns in factors

The aim of Q methodology is to draw factors that explain the current phenomenon based on descriptive interpretation of statistical data (Bredin et al. 2015). Factors of this study are hence described as **value patterns**, in other words, descriptions of shared value systems in problematic public debate (see also Vaas et al. 2019). Even if such larger systems of valuation can´t be applied to real-life contexts and individual stakeholders per se, they give an idea on the connection of possible value patterns and argumentation which could be used in this specific context. Table 4 indicates, how certain statements are loaded in each of the factors and used as a basis for the factor analysis.

Human-centred biophilia factor 1

Human-centred biophilia is based on a strong idea of forest fragments as valuable from the human perspective: those whose ideology is based on the human-centred biophilia consider, that the forest fragments may have a role in the promotion of environmental consciousness (Q32) and they may make people feel relaxed (Q9). Nature itself is included in argumentation only in parallel with the human dimension and desire for balance in between the people and nature (Q4). Therefore, based on the ideology, the people have a right to act over nature. In all the main variables the forest fragments are seen as supplements to the green infrastructure of a city and subjugated to human-related purposes. In human-centred biophilia, conservation of the environment is valued either from nostalgic reasons (Q12) or their mediating role in maintaining the people´s connection and awareness of nature (Q32). It is important to note, how the world of nature (Q1-Q5) is not represented in the biophilic valuation– based on the factor it seems like affiliation to nature isn´t always in parallel with affiliation to the gains nature offers to an individual. In human-centred biophilia, the ideology value the causes from nature, not nature itself.

Variable		signs inverted Factor 1: Human-centred biophilia	Factor 2: Conciliatory capitalism	signs inverted Factor 3: Community-building	signs inverted Factor 4: Landscape-oriented localism	signs inverted Factor 5: Nature-dominant conservation	Factor 6: Nature-inspired aestheticism	Factor 7: NIMBY nostalgia	*Factor 8*	*Factor 9*	*Factor 10*	*Factor 11*	*Uniqueness*
Q1	Such places are important from the biodiversity perspective.	-0,056	-0,247	0,020	-0,168	0,799	-0,016	-0,004	*0,065*	*-0,145*	*0,043*	*-0,028*	*0,241*
Q2	Such places help endangered species to survive.	0,284	-0,578	0,072	-0,084	0,283	0,104	-0,229	*0,119*	*0,428*	*-0,077*	*0,112*	*0,214*
Q3	Such places enable places to endangered biotopes.	0,105	-0,236	-0,422	0,042	0,351	-0,107	-0,130	*0,138*	*0,356*	*0,019*	*0,542*	*0,162*
Q4	There should be more such places in order to maintain the balance in between nature and people.	0,682	0,146	0,155	0,121	0,364	-0,202	-0,061	*0,229*	*0,231*	*0,022*	*0,196*	*0,153*
Q5	Increasing awareness of the importance of such places would be helpful in conservation of them.	-0,238	-0,241	0,146	-0,048	0,289	-0,177	0,519	*0,353*	*0,072*	*-0,304*	*-0,314*	*0,157*
Q6	Such places are beautiful.	0,190	-0,235	-0,077	-0,120	0,171	0,484	0,232	*-0,208*	*0,147*	*0,527*	*-0,133*	*0,211*
Q7	Places restored in their natural condition are part of pleasant environments.	0,156	-0,120	-0,140	0,018	0,061	0,102	-0,049	*0,038*	*-0,209*	*0,872*	*-0,131*	*0,102*
Q8	Designed greenspaces increase pleasantness of the neighbourhoods more than such places.	-0,586	0,004	-0,001	-0,224	-0,633	0,102	-0,019	*0,100*	*-0,027*	*-0,221*	*0,030*	*0,135*
Q9	Such places make me feel calm.	0,423	0,219	0,163	0,502	0,029	-0,091	0,074	*-0,338*	*0,004*	*0,332*	*-0,145*	*0,235*
Q10	Such places have many things to watch and observe.	0,157	0,023	-0,236	0,095	-0,462	0,727	-0,025	*0,031*	*0,085*	*0,166*	*-0,047*	*0,129*
Q11	Many good memories are attached to such places.	0,237	-0,029	-0,010	-0,032	-0,102	-0,098	0,914	*-0,021*	*-0,021*	*-0,011*	*0,004*	*0,086*
Q12	Preservation of such places enable the next generations to experience the environment the same way I do.	0,783	-0,061	0,319	-0,021	-0,107	-0,188	0,172	*-0,122*	*-0,025*	*0,066*	*0,054*	*0,182*
Q13	I hope such places would be located in my neighbourhood.	0,000	0,010	-0,120	0,298	0,044	0,211	-0,005	*-0,036*	*-0,082*	*0,310*	*-0,746*	*0,190*
Q14	Such places are part of the urban landscape of Espoo.	0,169	-0,310	0,023	0,582	-0,299	0,043	0,158	*0,179*	*-0,154*	*0,204*	*-0,114*	*0,311*
Q15	In my opinion, such places increase the feeling of insecurity.	-0,762	0,332	-0,168	-0,027	0,058	-0,292	-0,331	*0,085*	*0,102*	*-0,047*	*-0,011*	*0,062*
Q16	Such places increase the sense of community in between the residents.	0,011	-0,156	0,853	0,074	-0,135	-0,036	-0,026	*-0,064*	*0,026*	*-0,046*	*0,163*	*0,189*
Q17	Such places increase the residents´ possibilities for doing outdoor activities.	0,155	0,001	0,216	0,002	0,036	-0,062	0,144	*-0,867*	*0,133*	*-0,042*	*0,066*	*0,129*
Q18	Such places have a positive effect on the mental health of the residents.	0,041	0,056	0,034	0,061	0,065	0,046	0,135	*0,024*	*-0,894*	*0,137*	*-0,103*	*0,136*
Q19	Such places are important to the local children and their growth.	0,228	0,013	-0,016	-0,013	-0,066	-0,903	0,096	*-0,016*	*0,042*	*0,001*	*0,095*	*0,107*
Q20	Such places enable all the residents an equal access for restoration in nature.	0,192	-0,021	0,812	-0,090	0,206	-0,154	-0,084	*-0,096*	*-0,041*	*-0,197*	*-0,001*	*0,172*
Q21	Such places would be more functional, if used for infill development construction.	-0,794	0,307	0,115	-0,137	-0,161	0,012	0,221	*0,070*	*0,067*	*-0,171*	*0,138*	*0,110*
Q22	Negative impacts caused by construction of such places may be compensated by urban planning that acknowledges needs of nature.	-0,206	0,190	0,007	-0,707	-0,403	-0,080	0,020	*-0,128*	*-0,040*	*-0,137*	*0,016*	*0,216*
Q23	Such places encourage people to litter.	-0,434	-0,118	-0,629	-0,012	-0,153	0,054	-0,369	*0,150*	*0,055*	*-0,154*	*0,201*	*0,150*
Q24	Discussion on planning of such places cause unnecessary tensions in between nature activists and urban planners.	-0,307	0,492	-0,355	-0,308	0,068	0,224	-0,094	*-0,046*	*-0,029*	*-0,475*	*0,080*	*0,144*
Q25	A city has enough greenspaces without restoring such places.	-0,645	0,350	-0,140	0,009	0,001	0,052	-0,186	*0,036*	*-0,022*	*-0,184*	*0,549*	*0,068*
Q26	Such places increase the monetary value of the neighbourhood.	-0,170	-0,126	-0,170	0,228	-0,005	0,376	-0,008	*-0,513*	*-0,335*	*0,125*	*-0,347*	*0,222*
Q27	Landowners should have authority over planning and use of such places.	-0,158	0,920	0,005	0,013	-0,065	-0,094	-0,044	*-0,015*	*0,037*	*-0,179*	*0,070*	*0,076*
Q28	Such places provide the residents a lot of ecosystem services.	-0,226	-0,259	-0,581	-0,470	0,028	-0,157	-0,129	*-0,035*	*-0,119*	*0,005*	*0,093*	*0,258*
Q29	The maintenance costs of such places constitute considerable expenditures to the city.	-0,497	0,502	0,035	-0,263	-0,204	0,138	-0,004	*0,208*	*0,206*	*0,134*	*0,178*	*0,235*
Q30	Construction of such places would bring more tax revenues to the city.	-0,363	0,481	0,020	-0,124	-0,083	0,236	0,132	*-0,131*	*0,617*	*-0,053*	*0,042*	*0,139*
Q31	A city must ensure that flora and fauna living in such places endure, because Finland has committed itself to nature conservation through several international agreements.	0,177	-0,530	-0,077	-0,014	0,317	-0,043	0,062	*0,551*	*0,000*	*-0,059*	*0,163*	*0,242*
Q32	Such places may help develop residents´ environmental consciousness.	0,756	-0,082	0,091	0,448	-0,182	-0,055	-0,010	*0,101*	*-0,089*	*0,029*	*0,185*	*0,123*
Q33	Such places help building positive mental image on Espoo.	0,155	0,124	0,019	0,722	-0,239	0,023	-0,030	*-0,398*	*-0,194*	*-0,241*	*-0,116*	*0,112*
Q34	Such places help the city to achieve its aims of carbonneutrality.	0,179	-0,125	-0,057	-0,213	-0,129	-0,131	-0,680	*0,372*	*0,239*	*-0,123*	*-0,046*	*0,195*
Q35	Such places help the city to adapt and mitigate to climate change.	-0,023	-0,266	-0,359	-0,147	0,104	0,105	-0,234	*0,241*	*-0,374*	*-0,124*	*-0,533*	*0,205*

	>	0,5	**principal variables** (strong correlation, positive)
0,49	<>	0,3	additive components (significant correlation, positive)
-0,3	<>	-0,49	additive components (significant correlation, negative)
-0,5	<		**principal variables** (strong correlation, negative)

Table 4. Factor loading and unique variances by principal component, rotated by orthogonal varimax. Uniqueness indicates, how stand-alone the statement is when compared to other variables. When in almost all statements uniqueness is less than 0.3, variables correlate very well with each other. A correlation table in between statements may be found in Appendix 4. N=27.

Apart from the variables the human-centred ideology agrees with as positive elements of forest fragments, undesirable consequences from the construction of them are even more strongly agreed. In human-centred biophilia, forest fragments are seen as important places unsuitable for infill construction (Q21) and more desirable than designed greenspaces (Q8), such as parks and gardens. Also, the overall greenness of the city and forest fragments´ role in it is highly valued (Q25). In this evaluative approach, the forest fragments are not places to cause a feeling of insecurity among the residents (Q15) or as places people would significantly litter (Q8). Monetary gains from the construction of forest fragments (Q29 & Q30) are also seen as subordinates to the other, humane gains the greenspaces have to offer.

The statements are not bound to any single of the common worlds but represent all of them in either positive or negative terms. Worldview in the human-centred biophilia is relatively civic, not only due to the exact categories of the statements but based on the descriptive analysis of the variables. To those who value human-centred biophilia, nature seems to act as an object to subdue and harness to human-related purposes, but only to some extent, hence making it, if not industrial, but educational, functional and restorative. When applied to urban planning, appearing statements indicate forest fragments as a valuable resource to the city and especially to its residents. Human-centred biophilia explains almost 22% of the responses of the study and can hence be used as a strongly explanatory valuation among a larger number of people.

Conciliatory capitalism

factor 2

Factor 2 is strongly based on the contradiction between the economic worth and environmental valuation, interpreted as a critique against one common world lying on an evaluative basis of another (Thévenot et al. 2000). In the conciliatory capitalist ideology, nature conservation is confronted with economic worth, which means the people who value economic vitality are not interested or aware of environmental concerns, or they are ready to trade-off such values for other goods. The strongest statement in conciliatory capitalist ideology is the landowners´ authority over their own property (Q27). From the standpoint of the factor, forest fragments are seen through the lenses of their monetary value – from the statements, they argue

for the construction of forest fragments to gain tax revenues (Q30) and to reduce maintenance costs of such places (Q29).

The conciliatory approach is presented in the factor through discussion on forest fragments as a matter that causes unnecessary tensions between the nature activists and urban planners (Q24). Also, those whose ideology is based on conciliatory capitalism don´t argue strongly for or against the preservation of forest fragments but justify one´s arguments on an industrial ideology of functional utilization of space. Money is valued, but also the importance of conciliation, discussion and solidarity between the people is acknowledged. Conciliatory approaches can be assumed to be overrepresented especially in this sample by city officials, whose role as preparatory local government officials is to achieve a consensus in common matters and in between differing interests (see e.g., Kuusisto Arponen et al. 2014; Crowe et al. 2015).

Conciliatory capitalism has a negative loading in statements that argue for forest fragments as suitable places for environmental conservation and especially endangered species. The ideology does not either value nature conservation for recognition or educational reasons. Statement for forest fragments as places for endangered species (Q2) has a strong correlation with the statement for ensuring the preservation of such places due to international agreements (Q31) (variable correlation 0.512). International agreements as a basis for the preservation of the forest fragments indicate also, to some extent, a conciliatory approach and knowledge-based decision-making (Crowe et al. 2015; Ryan 2015) in the common matters.

From Boltanski & Thévenot´s (2006) common worlds, conciliatory capitalism is keen on valuing the market and industrial world. The factor can be linked also, to some extent, to civic valuation based on concerns over just and representation of interests of common citizens, even if in individual statements, the civic world does not occur. As all the principal variables in the conciliatory capitalistic approach have a negative mean value in the responses (see Table 2), the value pattern represents valuation by only a small minority of people.

Community-building

Community-building values strongly the local community and forest fragments as places for the people to enjoy their time together. Two of the most explanatory variables of the factor argue for forest fragments as places that increase the sense of community in between the residents (Q16) and forest fragments as a possibility to all the residents to equally enjoy restorative qualities of nature (Q20). The mentioned statements also have a strong correlation with each other (variable correlation 0.652), which means that in parallel with the valuation of a community, equal possibilities to all the residents are also seen as a valuable matter.

Valuation in community-building does not value nature or forest fragments by their intrinsic value but as a mediator and enabler in the community-building process. Forest fragments are also seen as enablers to the future generations to experience the local environment in its current state (Q12), possibly related to local history, sense of place and place attachment.

When conciliatory capitalism reflects land-use issues based on their economic value, community-building ideology thinks of the people the land-use choices may affect. For community-builders, the forest fragments are not a matter of debate (Q24). Even if the same statement was presented in the conciliatory capitalist ideology, the economic perspective sees the discussion as a conciliatory platform for mutual debate between the stakeholders, but the community-building valuation concentrates on the local community and prefers discussion *within* the community. Therefore, they see no interest in a debate with other stakeholders or do not see the forest fragments as a subject under discussion.

Compared to human-centred biophilia, community-building is highly concentrated on the direct effects of the forest fragments to local issues and the people, when human-centred biophilia seeks for indirect influence that is larger in scale. A difference may be seen in the scope of the approach in these different value patterns - the human-centred biophilia acknowledges long-lasting consequences to a wider scope of people, whereas the community-building ideology concentrates on the local level and people in close proximity. This makes it relatable to the domestic world, in which patrimony and locale are highly valued (Thévenot et al. 2000).

The main statements of the community-building valuation were relatively valued in responses with positive mean values (see Table 2), which indicates the city officials acknowledge the importance of urban nature to the residents and, regardless of their position or expertise, feel responsible to work for better living conditions and environment to the local citizens.

Landscape-oriented localism

factor 4

In landscape-oriented localism, one of the main characteristics is pride over one´s city and local environment. Statements for the preservation of forest fragments are based on building positive mental image on Espoo (Q33) and the forest fragments as part of the urban landscape of the city (Q14), these two variables as relatively correlated (variable correlation 0.469). Even if not quite statistically relevant, place attachment and familiarity are also visible by a desire of having such places in one´s own neighbourhood (Q13).

Compared to the community-building valuation, preservation of the forest fragments is not supported due to the local people, but for the sake of both the physical and mental landscape of the city. Reasons for this affiliation with the landscape in the local perspective is also supported by restorative elements of the forest fragments (Q9). The statement “Negative impacts caused by construction of such places may be compensated by urban planning that acknowledges needs of nature” (Q22) is also presented in the landscape-oriented localism with a negative correlation with the factor (factor correlation -0.7072). The argument acknowledges the consequences of constructing forest fragments, not from nature´s perspective, but for the sake of the city´s overall appearance. In landscape-oriented localism, all other values are subordinates to the physical environment and its quality, which, from this perspective, is created by restoring a vast amount of greenery in its natural stage.

By the valuation and pride over one´s locale, landscape-oriented localism is connected to the world of renown, when the statements in landscape-oriented localism are considering the benefits of the urban environment from the common utility perspective. Hence, the value pattern can be interpreted as a recognitive worth, where the city is seen as an embodiment of organisational values and public recognition. When applied to urban planning context, the argumentation of these

localists would possibly be based on value structures of knowledge-based progress (Crowe et al. 2015) in a way that makes it attractive to others and increases the pride of the locals towards their own city and neighbourhood (Devine-Wright 2009).

Nature-dominant conservation

Nature-dominant conservation is strongly affiliated with the world of nature and forms a consistent narrative on the environment-related appreciation. The main argument in nature-preservative urbanism is to argue for the value of biodiversity (Q1), but also more specific statements on endangered biotopes (Q3) and species (Q2) are notably high. Altogether, the world of nature is alone represented in the value pattern, where the intrinsic value of nature is dominant over other values of the forest fragments. The statements related to nature conservation are justified by other, additive components, such as by the balance between people and nature (Q4), whereas arguments for utilization of nature and forest fragments are not visible in the nature-dominant conservation.

As knowledge-based argumentation, both international agreements for nature conservation (Q31) and increased awareness on the significance of the forest fragments (Q5) are both present in the value pattern of nature-preservative urbanism, even if the latter not as statistically significant. All the statements in nature-dominant conservation call for environmental consciousness and actions for nature conservation through acknowledgement and appreciation of nature´s value - the people are not considered as gainers from nature, but the international agreements and environmental consciousness only as indirect tools for the objectives of nature conservation.

The strongly ecologically oriented ideology does not highlight the forest fragments through their indirect effects on people, such as the forest fragments as places to watch and observe (Q10). Also, forest fragments are not seen as places where the people would prefer in their own neighbourhood (Q13) or specifically beautiful (Q6). Therefore, it could be argued, that even if nature would be valued per se, nature-dominant conservation values other characteristics when merely aesthetic pleasantness is considered.

Unsurprisingly, the value pattern does not consider that environmentally conscious urban planning would be able to compensate for the negative impacts infill construction would cause to forest fragments (Q22). Also, natural greenspaces are preferred in a city over designed greenspaces (Q8). Both statements are relatively neutral in tone and take a stand in urban planning processes from nature´s perspective. The value pattern then passes all statements related to local residents, economy or land-use decisions as irrelevant. In the responses, biodiversity-related statements were represented in a rather neutral but polarised way (see Figure 17), which indicates that knowledge on natural assets (i.e. environmental studies) acts as a strong factor for nature-dominant conservation (Ryan 2005).

Nature-inspired aestheticism

factor 6

Nature-inspired aestheticism has a strong tendency to the world of inspiration through aestheticism and pleasant characteristics of the environment. In nature-inspired aestheticism, forest fragments appear as beautiful places (Q6) with many things to watch and observe (Q10). Statements related to nature conservation do not emerge in the aesthetic valuation, when nature is seen as an instrument for one´s personal experiences and emotions - which is, as a source of inspiration, creativity and recovery. To land-use decisions or perceived aesthetic characteristics of forest fragments, the value pattern does not take a stand. What the value pattern does not reveal is, if the approach actually values forest fragments, the greenness of the environment in general or nature per se.

Interestingly, valuation of the children has a strong negative correlation with inspirational and aesthetic values of the forest fragments, when for example the statement “Such places have many things to watch and observe.” (Q10) has a correlation variance of -0.579 with the statement related to the children (Q19, mean 2.074), a statement the respondents agreed the most. This finding would possibly be a matter of further research since studies seeking characteristics that children prefer in their local environment have found several elements which would add aesthetics value to the environment as well. As, for example, Horelli and Kyttä (2001) have found out, an ideal environment for children contains elements of naturalness, playability, aesthetics and loose spaces in human-scale, which are all

characteristics found in studies on connections of life quality and spatial environment (e.g., Gehl 2010). When turned around, nature-inspired aestheticism values input the environment offers to the children over any other qualities.

NIMBY nostalgia

Factor 7, the NIMBY nostalgia, is highly dependent on good memories at the forest fragments (Q11) and all other variables are discussed in the light of this nostalgia. When supported by statements of forest fragments as places where people do not litter (Q23) or cause no distraction from others (Q15), ideology in NIMBY nostalgia is described as valuation in which (domestic) stability is significantly important.

By valuation of past, familiarity and heritage (Thévenot et al. 2000), preservation of forest fragments in NIMBY nostalgia is based on personal attachment to place, which has a strong descriptive correlation with the domestic world. This is also supported by an initiative to increase awareness of the importance of forest fragments (Q5), even if the statement does not take a stand on specific qualities of the forest fragments, only to the acknowledgement of them. The battery of NIMBY nostalgia does not, however, reveal other reasons for this preservation than the people–place relationship, which is often used but poorly justified in the public debate (e.g., Eranti 2016). In practical contexts, where urban planners aim to make changes to the local environment, people–place relationship – and stability – often cross paths in a way that provokes anxiety (Stephenson 2010).

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Factor 8 is built on (international) recognition and communication networks but, in other means, considers forest fragments as negative contributors to the city. An inverted **factor 9** strongly values how forest fragments benefit the mental health of the residents and, by that, increases the value of a neighbourhood. **Factor 10** strongly values forest fragments as pleasant, beautiful and restorative environments, which are desired locations in one´s own surroundings. **Factor 11** values endangered biotopes but does not wish such to one´s own neighbourhood or consider them otherwise important.

IV Implementation

"Social reality is inherently marked by change,
conflicts and diversity."

Tsirogianni & Gaskell (2011: 458)

8. Discussion

The implementation phase answers the research questions laid to this study on value patterns as a basis for argumentation in the context of small forest fragments in the City of Espoo. The main research question introduced more closely in the introduction (see Chapter 1.), asked, what kind of value patterns are associated with small forest fragments. When the results in Chapter 7 described, how these value patterns emerge in the study sample, in the discussion I aim to find out, how these theoretical value patterns could be utilised to better understand differing perspectives on land-use decisions.

8.1. Value of the forest fragments

As a conclusion on the results of the study conducted by Q methodology, the city officials at the City of Espoo do consider forest fragments important sites in the urban environment, especially considering their value to the wellbeing of local citizens, people–place and human–nature relationships. In the value patterns, different perspectives related to forest fragments are described through seven different narratives, which each hold a unique combination of values. These are:

- **Human-centred biophilia**, in which indigenous nature is a subject to human endeavours and, for that, is seen as a valuable resource. In urban planning decisions, forest fragments should be restored for future generations to enjoy.

- **Conciliatory capitalism** considers forest fragments as a potential to urban development and landowners as supreme decision-makers. For the sake of industrial and market worth, forest fragments should be used for other land-use purposes.

- **Community-building**, in which inclusivity and equality of opportunities are valued and forest fragments enable the community-building process. For the sake of the local people, forest fragments should be restored.

- **Landscape-oriented localism**, in which both physical and mental landscape is valued and considered as factors to gain recognition. In land-use decisions, the physical environment should be restored in its current stage.

- **Nature-dominant conservation**, in which nature´s intrinsic value is highly acknowledged over other goods. Construction of such sites with indigenous vegetation causes only negative consequences.

- **Nature-inspired aestheticism** considers forest fragments as places of inspiration, adventure and wonder. To land-use decisions, the value pattern does not take any strong stand.

- **NIMBY nostalgia**, in which personal memories attached to forest fragments form the reasoning for their preservation through a strong people–place relationship.

These value patterns complement the classification of the common worlds by Boltanski and Thévenot (2006) and, by nature, are better compatible to explain differing perspectives that occur in the complex setting of land-use regulation. Compared to the common worlds, forest fragments don´t contain only ecological or civic worth, but, as the value patterns indicate, are complex combinations of different gains the city officials do value. To most of them, urban nature is not incommensurate to urban development but seem to be in a moral class of its own – at least in this conceived valuation (e.g., Morris 1956; Beckerman & Pasek 1997; see also Chapter 4.1.3.).

Critique in argumentation usually lays the evaluative basis based on another valuation, which means some common world is used to justify one´s opinions against another worth (Thévenot 2007). This is clearly visible, for example, in differing interests in conciliatory capitalism and nature-dominant conservation. Figure 20 represents an evaluative connection between the value patterns and the common worlds. From these, the domestic and civic world, together with the industrial and the market world, share a common understanding and certain value patterns which are strongly influenced by valuation in linked common worlds. This means the value patterns can be understood as what Thévenot et al. (2000) call a *compromise* when several common worlds emerge together and express one´s cultural understanding.

As Thévenot (2007) suggests, categorisation to public justification, familiar affinities and individual interest can be applied to political argumentation as three systems of

valuation. In a land-use context, familiar affinity is interpreted as a desire for stability of the local landscape. No value pattern was able to include valuation of both public utility and an individual´s personal advantage but took a stand at either end of the scale.

Especially in the economy-oriented ideology of conciliatory capitalism, the value of forest fragments is justified based on an idea of an individual as a sovereign stakeholder. Even if both conciliatory capitalism and nature-inspired aestheticism seek personal interest, nature-inspired aestheticism is built on one´s emotional gain from nature, which is seen as a source of intangible cultural ecosystem services, such as beauty and recovery, which requires no harm to the environment.

Figure 20. Connection in between the value patterns and Boltanski and Thévenot´s (2006) common worlds. All the value patterns can be characterised based on one or more of the common worlds with either valuation in public justification, familiar affinities (i.e. landscape-related valuation) or individual interest (Thévenot 2007). From the value patterns, nature-dominant conservation and NIMBY nostalgia have a relatively strong connection to one of the common worlds, the world of nature or the domestic world. By this, their ideology is relatively close to the description by Boltanski and Thevenot´s ideas on justification in argumentation.

Factors connected to the domestic world argue for constancy of the environment and are hence linked to the familiar affinities (Thévenot 2007) based on the valuation of both landscape and place (Stephenson 2010). Especially landscape-oriented localism is keen on the appearance of both the physical and imaginary landscape of a city. The same wish emerges also both in NIMBY nostalgia valuation and the domestic world, where the stability of the environment is one of the leading principles (Boltanski & Thevenot 2006; see also Korpela & Hartig 1996). Interestingly, valuations of nature-inspired aestheticism and nature-dominant conservation show no interest towards the urban environment per se but reflect issues through their consequences to the general ideal of nature.

When the framework from the world of recognition doesn´t appear in the value patterns per se, it emerges in several contexts by interpretation of the other statements. As an example, forest fragments as places that help the city to adapt and mitigate climate change (Q35, mean 1.185) is rather valued, but in the light of the other statements, it has not raised as the leading principle. Both climate change and carbon neutrality are one of the main goals for the City of Espoo as an organisation (Espoo Story 2017). This does not mean, however, that the gain for climate change adaptation would be explicitly undervalued by the city officials, but when only an appointed number of statements is admitted for each of the columns, other statements succeed at cost of others. In the context of city organisation, social values are partly formed by the social group we act in (Kluckhohn & Strodtbeck 1961), and therefore the valuation and moral emphasis of the city organisation may have an effect on the mindset and conceived values of the respondents (Bourne & Jenkins 2013). Not only the institutional authority, but one´s position and expertise may also influence the moral stand (Crowe et al. 2015). When the respondents categorised communal valuation higher in their preferences than organisational recognition, land-use decisions should, on an ideological level, be more based on the residents´ accessibility to the greenspaces rather than forest fragments as instruments to achieve the city´s aims of, for instance, carbon neutrality (Q34), climate change (Q35) or positive association with the city (Q33).

8.2. Value patterns in urban planning practices

When the first definition of forest fragments in Chapter 2.2. argued on forest fragments as non-places (Augé 1995), results of the study indicate the complexity of valuation in this regard, arguing on forest fragments as *contested* non-places. When urban planning officials have for long has supremacy over definitions on what is a good city and how it is planned (see e.g., Eranti 2016; Bäcklund & Mäntysalo 2010), a need has arisen on their expertise to be expanded from planning practices to conciliation and facilitation of this discussion over general interests in times of public participation in urban planning processes. When considering geographical decisions over land use, I add the normative component on "what ought to be" to a descriptive model, which attempts to describe "what is" based on behaviour (and valuation) of stakeholders in the process (Malczewski & Rinner 2015).

Political agendas are delicate compositions of worth, where one needs to take a moral stand on what is worth desiring in a situation with several personally and socially significant alternatives (Ylä-Anttila & Luhtakallio 2016). As Beckerman and Pasek (1997) argue, rational choice in between incommensurate options may be easy for an individual but much more complex to a society, which must conduct allocation of limited resources. Also, consequences of such societal choices consider not only private goods but other people and society as a whole. This resource constraint is present in environmental valuation in a way hardly known to other modes of valuation when cultural or monetary value needs to be set to certain ecosystem services (e.g., Yang et al. 2018). All in all, both officials and politicians have sometimes a little interpretation between alternatives, which are considered sensible or fair by the residents as well (Beckerman & Pasek 1997).

In this discussion over resources, the municipal authorities are caught in a crossfire in between economic and political ambitions, residents´ wishes and ecological, social and societal needs, when contributing to alteration of land use and, by it, people-place relationship (Stephenson 2010). Understanding of different value patterns may, hence, help to conciliate this discussion and relieve anxiety caused by a land-use alteration in personally important places. In the context of forest fragments, this

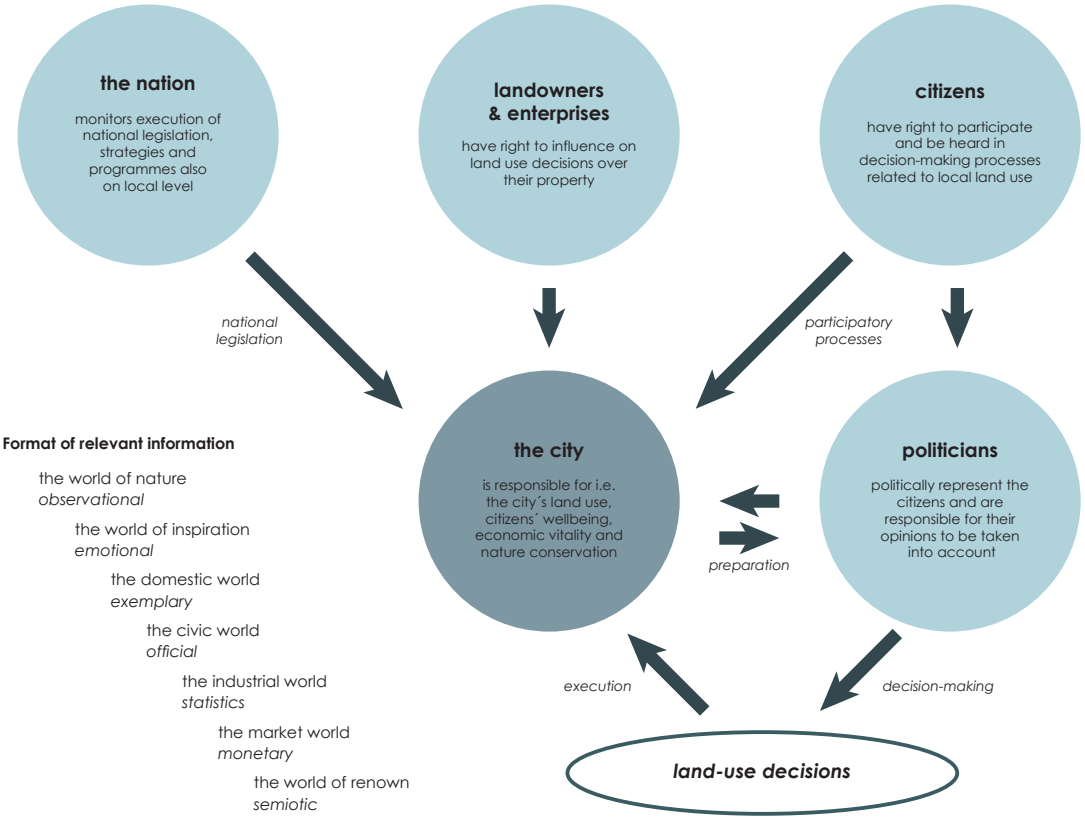

Figure 21. The role of city officials as conciliators of discussion over political land use decisions with stakeholders, who all have their unique valuation, desires and aspirations. In addition to personal value patterns, the city and the nation also have their organisational values. In local policymaking, the residents have a right to influence the decisions the municipality does through representative democracy (i.e. local politicians) and public participation processes. Formats of relevant information (Boltanski & Thévenot 1999) help to understand, what kind of communications each of the common worlds require and accredit.

may be even more essential if this land-use alteration is targeted to a land reserve with temporary status (Niemi 2019) the residents have not been aware of (Kuusisto-Arponen et al. 2014).

In a democratic and just society, neither technocratic knowledge nor city officials´ interests lead decisions over land use in cities – therefore, Figure 21 represents the complexity of current land-use decisions and the main stakeholders who take part in it. When considering differing roles of the stakeholders, the preparatory local government officials are often only seen as experts of their own field, whereas, for example, political actors step to the scene with their personal and political convictions, often deeply loaded with personal beliefs of what is good and worth desiring, in the other words, with values (Stocker 1990). An interesting question is, then, if the urban planning experts and other city officials are also legitimised to

bring their personal perspectives to the imaginary planning table or if those can be excluded in the first place.

When one of the additional research questions asked, how these theoretical value patterns could be utilised to better understand differing perspectives on land-use decisions, I conclude by aiming to find some of the implications, where these value patterns could be utilised in different urban planning contexts.

Public discussion and participation processes on urban planning

- Communications on forest fragment -related plans in both traditional and social media should be aware of different value patterns and aim to predict possible contradictions between them.

- In participatory processes and proposed plans, different aspects of value patterns should be communicated in a way that considers these differing perspectives in a way that provokes no unnecessary anxiety – even if contradictions in politics are, to some extent a prerequisite to progressive decision-making processes, unnecessary and fruitless contests can be avoided by better understanding on the other´s perspectives.

Preparatory inquiry of the planning process

- Whenever possible, the rapporteurs should be aware of their personal and other stakeholders´ valuation, so that all necessary aspects of the matter are taken into account, evaluated and assessed during the process.

- In addition to value patterns, this study has also collected and evaluated knowledge on the forest fragments. These aspects on actual benefits and futilities regarding forest fragments can be utilised in both urban planning practices and as a starting point for further research.

- Based on this general knowledge, more place-specific information should be collected to understand the unique needs of a certain site and context.

8.3. Limitations of the study and suggestions for further research

Here, I shortly introduce some of the inaccuracies, biases and possible improvements that have turned up along the process for conducting the thesis.

As a small improvement of the study setting, a larger sample would have conducted a more admissible study and maybe reveal more latent structures, factors and emphases in between them. Nevertheless, the sample size to accurately obtain the parameter in factor analyses is dependent on the characteristics of the data (Bandalos & Finney 2010). The reliability is counted by factor loading and coefficient correlations between the variables and factors. Based on the level of *communality*, representing the amount of variance in variables, a sample of 100 would be needed if three factors are expected and a larger sample with more actors (Bandalos & Finney 2010). Even so, Q analyses have been conducted with substantively smaller samples (e.g., Vaas 2019; Bredin & Lindhjelm 2015), which argue for the reliability of this study as well.

Open answers in the study would have allowed more interpretation and depth to the analysis of the results, so the respondents would have been able to argue for their decisions in a descriptive way. Also, the selection of Q statements (the Q-set) (Bredin et al. 2015) could have been formulated in a collaboration with a selected group of professionals to achieve a more coherent sampling of statements.

As a limitation of the study, the wording in the value matrix may have been chosen inaccurately. The wording of the value matrix (see Figure 12) indicated two formulated sentences, another on i) agreeing/disagreeing with the statement and another on ii) consideration of the topic of the statement as important/unimportant. This formulation was chosen to the matrix due to the wordings in the unique statements, in which some were questions on personal preferences (e.g., “Preservation of such places enable the next generations to experience the environment the same way I do.” (Q12)), when others on consideration of general importance (e.g., “Such places provide the residents a lot of ecosystem services” (Q28)). During the questionnaire, the respondents may have interpreted both the statements and the wording in the two varying ends differently than intended. This may have affected the responses if another from the two formulations have affected their responses more than the other.

In the future, **follow-up studies** could be conducted with several interesting directions. A confirmatory factor analysis would possibly be used to confirm the findings of the study at hand. A confirmatory factor analysis, according to Bandalos and Finney (2010), is a more restrictive form of factor analyses and used in a situation where the items have already been identified to measure specific aspects of a construct.

A similar study would be conducted among the residents of Espoo or in a similar city to reveal if there lay any contradictions or differing interests when dependent on the role of the respondents. The citizens are "insiders" of their own local environment (Stephenson 2010), even if current land-use planning tend to rely on expert assessment method, defined by "outsiders" of the everyday life on a site. Also, when locals have less expertise in related topics and stronger affiliation to a certain place, could a follow-up study be formed from a different, less societal and more local perspective.

Targeting the study into a specific case study would possibly conclude if a more concrete case reveals other or similar value patterns – putting the values and argumentation into an even more concrete case would possibly bring up more personal interests among respondents with personal affiliation with the specific site. To reveal more operative values instead of conceived valuation (Morris 1956), in a theoretical choosing stance, a follow-up study could also be conducted by studying the actual planning decisions at hand. A place-specific study with a juxtaposition between different land-use alternatives, even in an imagined setting, would be more suitable to reveal operative values in a situation that would possibly have more variables and conflicts than the current study.

Separated from valuation, to formulate a consistent idea on concrete planning guidelines to land use of forest fragments should a more place-specific study be conducted. Based on the results of this current study should be made no planning principles when more place-specific knowledge should be gathered to adapt the existing knowledge into concrete planning challenges.

9. Conclusions

Cities are arrangements of plural and contested common world, born from tension and compromise (Blok & Meilvang 2014). In modern societies, the importance of moral valuation and evaluation has become increasingly relevant, when understanding the variety of values and ideologies that holds the key to social resilience (Lamont 2012). By deepening academic understanding of moral principles in land-use context, I have taken the first step for conciliation of differing evaluation and interests that guide the people and the discussion on questions that matter to us.

In this study, valuation was considered as a moral principle and people´s behaviour as an outgrowth of this personal procedure of evaluating what is worth desiring. This valuation was, then, evaluated by allowing the people to qualify these values based on concrete statements for or against a certain planning decision. This concrete theme in the contemporary urban planning scheme was chosen to represent valuation related to the planning of small forest fragments located in an urban environment and without any recreational activities, but, to some extent, other good qualities which can be valued differently. The chosen method, on the other hand, imitated a real-life trade-off of several principles we value, therefore revealing the latent and marginalized views in a way a regular correlation analysis would not.

This value-based argumentation was discussed in light of Boltanski and Thévenot´s (2006) common worlds and complementary literature (Boltanski & Thévenot 1999; Lafaye & Thévenot 1993; Thévenot 2007), which present seven orders of worth – the worlds where either nature, inspiration, civilisation, domestic sphere, industry, market economy or recognition is valued. Value patterns drawn from the empirical phase of the study complement the classification of the common worlds by Boltanski and Thévenot (2006) and, by nature, are better compatible to explain differing perspectives that occur in the complex setting of land-use regulation.
As the value patterns indicate, forest fragments show an expected complexity and combination of different valuation. By Thévenot's (2007) cognitive formats of engagement, individual´s advantage is inherently in conflict with the valuation of the common good. Furthermore, the valuation of natural assets is somewhat separated from human-centred gains from forest fragments, even if these do not show strong

contradictions. Hence, as the results indicate, the ecosystem services provided by the forest fragments are seen as more valuable and worth preservation over gains from infill construction of the sites, even if other urban planning regulation motives, in addition to valuation by the city officials, also need to acknowledged and considered.

In March 2020, a worldwide pandemic spread out due to rapid expansion of the Covid-19 virus, gradually restricting social meetings, recreation and exercise in an urban environment all over the world. Movement restrictions and the lock-down affected significantly the use of urban greenspaces and, as Ugolini et al. (2020) state, had an influence on visitation of urban greenspaces and attitudes against it in the altered reality. In the time of social isolation, urban greenspaces have served as places where people can find respite and recreation within the crowded city for non-essential purposes.

In this post-pandemic altered reality, the importance of accessible greenspaces has only increased - in addition to large greenspaces, smaller pocket parks and gardens can guarantee, that all residents will have access to an urban greenspace within walking distance from their home (Ugolini 2020). An interesting question, therefore, would be to know how the changing world changes the valuation of the people and if both personal and urban resilience could be increased by ensuring the preservation of forest fragments also in the future.

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Figure	Data	Source	Publisher/ copyright holder	Year	Access
4, 5, 7	Municipal borders	Helsinki Region Infoshare	Land survey agencies in Helsinki, Espoo, Kauniainen and Vantaa	2011	Open access at hri.fi
5, 7	Infrastructure in Espoo (roads, train, metro, water bodies)	Helsinki Region Infoshare	City of Espoo, Technical Department	2019	Open access at hri.fi
5, 7	CORINE Land Cover dataset	Finnish Environment Institute	the European Environment Agency	2018	Open access at ckan.ymparisto.fi
6	Green Area Maintenance statistics in the City of Espoo	private	City of Espoo	2019	All rights reserved
8	Up-to-date town plan	Map service by City of Espoo	City of Espoo	2021	Open access at kartat.espoo.fi
8, Appendix 2	Aerial photographs	Map service by City of Espoo	*Information not available*	2019	Open access at kartat.espoo.fi
Appendix 2	photographs	private	By author	2020	Available for use, when accurately cited

Appendix 1 – the covering letter and Q questionnaire sent to the respondents [in Finnish].

Tervetuloa osallistumaan opinnäytetyön tutkimukseen

Olet esimiehesi tai kollegasi kautta osoittanut kiinnostustasi gradutyöhön liittyvään kyselytutkimukseen, jossa tarkastellaan Espoon kaupungin työntekijöiden maankäytön suunnitteluun liittyviä arvostuksia viheralueiden merkityksen kontekstissa. Kiitos jo etukäteen arvokkaasta panoksestasi työn eteen.

Tästä viestistä löydät ohjeet kyselyn täyttämiseksi, kyselyn pohjana käytettävän taulukon sekä tarvittavia lisätietoja. Toivon sinun vastaavan kyselyyn ja lähettävän sen takaisin minulle mahdollisimman pian, kuitenkin viimeistään XX.XX.2021.

Tutkimuksen tausta ja tarkoitus
Moni tutkimus osoittaa kaupunkiluonnon lukuisat hyvinvointivaikutukset kaupunkilaisille. Kaupungin pienet, epävirallliset viheralueet asuinalueiden keskellä ovat kuitenkin usein niitä, jotka jäävät kaupungin tiivistymisen jalkoihin usein ilman, että niiden arvoa tunnistetaan tai siitä keskustellaan. Tässä tutkimuksessa tarkastellaan kaupunkisuunnittelun tapausesimerkkinä näitä pieniä metsikköjä ja viheralueita, jotka eivät suoraan linkity suurempiin viher- ja virkistysalueisiin, mutta jotka tuovat kaupunkirakenteeseen vehreyttä, väljyyttä ja luonnollisia leikkipaikkoja. Tutkimus käsittelee erityisesti Espoon henkilöstön näihin alueisiin liittämiä arvostuksia ja argumentteja, jotka ohjaavat kaupunkisuunnittelua. Lisätietoja sekä kartta- ja kuvamateriaalia näistä alueista löydät liitteestä *Jäännösvihreä_tutkimusalueet.pdf.*

Opinnäytetyön kieli on englanti. Kyselytutkimuksen aineistot ovat suomeksi. Kyselyyn osallistuminen vie noin 15 minuuttia. Tutkimuksen kannalta ei ole oleellista, kuinka tiiviisti vastaajan työnkuva liittyy kaupunkisuunnitteluun tai viheralueisiin. Voit siis halutessasi kannustaa myös muita kollegoitasi osallistumaan tutkimukseen lähettämällä aineiston ja ohjeistuksen eteenpäin.

Kyselytutkimukseen osallistuminen
Tutkimus toteutetaan liitteestä löytyvän Powerpoint-pohjalta löytyvän taulukon avulla (liite: *Jäännösvihreä_tutkimuspohja.ppt*). Seuraa seuraavia vaiheita osallistuaksesi tutkimukseen.

1. **Lataa liite** ja tallenna se tietokoneellesi, esimerkiksi työpöydällesi. **Nimeä tiedosto** muotoon *Jäännösvihreä_yksikkösi lyhenne*.

2. Avaa tiedosto tietokoneesi Powerpoint-ohjelmalla. Tiedostossa on kaksi välilehteä: taustatiedot ja arvomatriisi. **Täytä ensin taustatiedot** valitsemalla haluamasi vaihtoehto ja kirjoittamalla valkoiseen ruutuun “X”.

3. Tiedoston toiselta välilehdeltä löydät arvomatriisin sekä listan satunnaiseen järjestykseen asetettuja väittämiä. Tehtävänäsi on asettaa väittämät pyramidinmuotoisen taulukon ruutuihin siten, että väitteet, joille annat eniten painoarvoa, asetetaan asteikon oikeaan laitaan (“Pidän tätä asiaa hyvin tärkeänä”) ja vastaavasti mielestäsi vähemmän merkitykselliset väitteet asteikon vasempaan laitaan (“En pidä tätä asiaa lainkaan tärkeänä”). **Siirrä kaikki väitteet arvomatriisiin**. Väitteiden keskinäisellä järjestyksellä sarakkeessa ei ole merkitystä. Ethän muokkaa laatikoiden tekstejä. “Tällaiset paikat” väitteissä viittaavat pieniin viheralueisiin (nk. jäännösvihreä, kts. liite). Väitteitä on yhtä monta kuin taulukossa on ruutuja.

4. Tallenna vastauksesi ja **lähetä tiedosto** sähköpostitse osoitteeseen [sähköpostiosoite] viimeistään XX.XX.2021.

Vastaajien anonymiteetti
Tutkimusaineisto käsitellään niin, että yksittäisiä vastauksia ei ole mahdollista tunnistaa tutkimuksen tuloksista. Aineistoa käsittelevät ainoastaan opinnäytetyöntekijä sekä työn ohjaaja. Aineisto kerätään ja tulokset raportoidaan kyseisessä opinnäytetyössä ja mahdollisesti 1-2 tieteellisessä artikkelissa. Aineisto on opinnäytetyöntekijän hallussa 7/2023 saakka, jonka jälkeen se tuhotaan.

Yhteystiedot
Vastaan mielelläni kaikkiin kysymyksiin. Kiitos avustanne!

Ystävällisin terveisin
Anna Hakala
Opinnäytetyöntekijä
Kaupunkitutkimuksen ja –suunnittelun maisteriohjelma
Geotieteiden ja maantieteen osasto
Matemaattis-luonnontieteellinen tiedekunta
Helsingin yliopisto
[sähköpostisoite] / [puhelinnumero]

Appendix 2 – the Q questionnaire sent to the respondents [in Finnish].

Vastaajan taustatiedot

Yksikkö

Sukupuoli

- mies
- nainen
- muu
- *en halua kertoa*

Vierailen kotikaupunkini viheralueilla tai luonnossa

- kerran päivässä tai useammin
- kerran viikossa tai useammin
- muutaman kerran kuukaudessa
- harvemmin kuin kerran kuukaudessa

Olen opiskellut ympäristöalaa, ympäristötieteitä tai luonnontieteitä

- kyllä
- en
- *en halua kertoa*

Mihin seuraavista työtehtäväsi läheisimmin liittyvät? Valitse yksi.

- hallinto ja johtaminen
- opetus ja kasvatus
- liikunta
- kulttuuri
- kaupunkisuunnittelu
- ympäristö
- elinvoima ja talous
- sosiaali- ja terveysala
- *en halua kertoa*

Kuinka kauan olet ollut töissä Espoon kaupungilla?

- alle 1 vuoden
- 1-3 vuotta
- 3-5 vuotta
- 5-10 vuotta
- yli 10 vuotta
- *en halua kertoa*

En pidä tätä asiaa lainkaan tärkeänä/en ole väitteen kanssa samaa mieltä

Pidän tätä asiaa hyvin tärkeänä/olen samaa mieltä

-3	-2	-1	0	1	2	3

Tällaiset paikat saavat minut tuntemaan oloni rauhalliseksi.

Tällaiset paikat tarjoavat kaikille kaupunkilaisille yhtäläisen mahdollisuuden nauttia luonnosta.

Tällaiset paikat luovat yhteisöllisyyttä lähialueen asukkaiden välille.

Tällaiset paikat auttavat uhanalaisia lajeja selviämään.

Tällaisten paikkojen säilyttäminen auttaa kaupungin hiilineutraaliustavoitteiden saavuttamisessa.

Luonnolliseen tilaan jätetty luonto on miellyttävää ympäristöä.

Maanomistajilla tulisi olla päätösvalta siihen, kuinka tällaisia alueita suunnitellaan ja käytetään.

Tällaisten paikkojen suunnitteluun liittyvä keskustelu aiheuttaa liikaa tarpeettomia jännitteitä luonnonsuojelijoiden ja kaupunkisuunnittelijoiden välille.

Tällaisten paikkojen säästäminen tarjoaa tuleville sukupolville mahdollisuuden kokea ympäristö samanlaisena kuin itse koen.

Tällaisia paikkoja tulisi olla enemmän, jotta ihmisen ja luonnon tasapaino säilyisi.

Tällaiset paikat ovat tärkeitä lähialueen lapsille ja heidän kehitykselleen.

Kaupungin tulee varmistaa että tällaisissa paikoissa asuvat eliöt säilyvät, sillä Suomi on sitoutunut luonnonsuojeluun useiden kansainvälisten sopimusten kautta.

Tällaisten paikkojen rakentamisesta aiheutuvat haitat ekosysteemille voidaan korvata huolellisella kaupunkisuunnittelulla.

Tällaiset paikat ovat tärkeitä luonnon monimuotoisuuden kannalta.

Tällaiset paikat kuuluvat espoolaiseen kaupunkimaisemaan.

Tällaiset paikat ovat tärkeitä ihmisten ympäristövastuullisuuden kehittymisen kannalta.

Tällaisten paikkojen säilyttäminen auttaa kaupunkia sopeutumaan ilmastonmuutokseen.

Tällaiset paikat tarjoavat kaupungissa tilaa harvinaisille luontotyypeille.

Suunnitellut viheralueet lisäävät asuinalueiden miellyttävyyttä enemmän kuin tällaiset paikat.

Toivoisin, että tällaisia paikkoja olisi omalla asuinalueellani.

Tällaisista paikoista löytyy paljon katseltavaa.

Tällaiset paikat lisäävät asuinalueiden taloudellista arvoa.

Tällaiset paikat vaikuttavat positiivisesti kaupunkilaisten henkiseen hyvinvointiin.

Tällaiset paikat ovat kauniita.

Tällaisten paikkojen rakentaminen toisi kaupungille lisää verotuloja.

Tällaiset paikat rakentavat positiivista mielikuvaa Espoosta.

Tällaisten paikkojen hoitokustannukset ovat kaupungille tarpeettoman suuri menoerä.

Tällaisiin paikkoihin liittyy hyviä muistoja.

Tällaiset paikat lisäävät mielestäni turvattomuuden tunnetta.

Tällaiset paikat lisäävät asukkaiden ulkoilumahdollisuuksia.

Tällaisista paikoista saataisiin suurempi hyöty tiivistävällä rakentamisella.

Kaupungissa on jo tarpeeksi viheralueita ilman että tällaisia alueita säilytetään.

Tällaiset paikat tarjoavat kaupunkilaisille paljon ekosysteemipalveluita.

Tällaiset paikat kannustavat ihmisiä roskaamaan.

Tiedon lisääminen tällaisten paikkojen merkityksestä voisi auttaa niiden säilyttämisessä.

Appendix 3 – a short description on forest fragments introduced to the respondents together with the Q questionnaire matrix [in Finnish].

Jäännösvihreä kaupungeissa

Tässä tutkimuksessa tarkastellaan kaupunkisuunnittelun tapausesimerkkinä pieniä metsiköitä ja viheralueita, jotka eivät suoraan linkity suurempiin viher- ja virkistysalueisiin ja täyttävät seuraavat kriteerit:

Jäännösvihreät ovat kaupunkivihreää, joka

- on pinta-alaltaan enintään puolen hehtaarin kokoinen
- useimmiten metsäinen ja kasvillisuuden peitossa ja jonka luonnonhoidon intensiteetti on kevyt
- ei ole luokiteltavissa puistoksi tai virkistysalueeksi eikä kaupunkilaisten näkökulmasta palvele mitään ilmeistä käyttötarkoitusta
- ei ole suoraan kytköksissä suurempiin viher- ja virkistysalueisiin tai kaupungin laajaan viheralueverkostoon
- rajautuu kiinteistöihin, teihin tai yksityisiin pihoihin

Esimerkkejä jäännösvihreän alueista

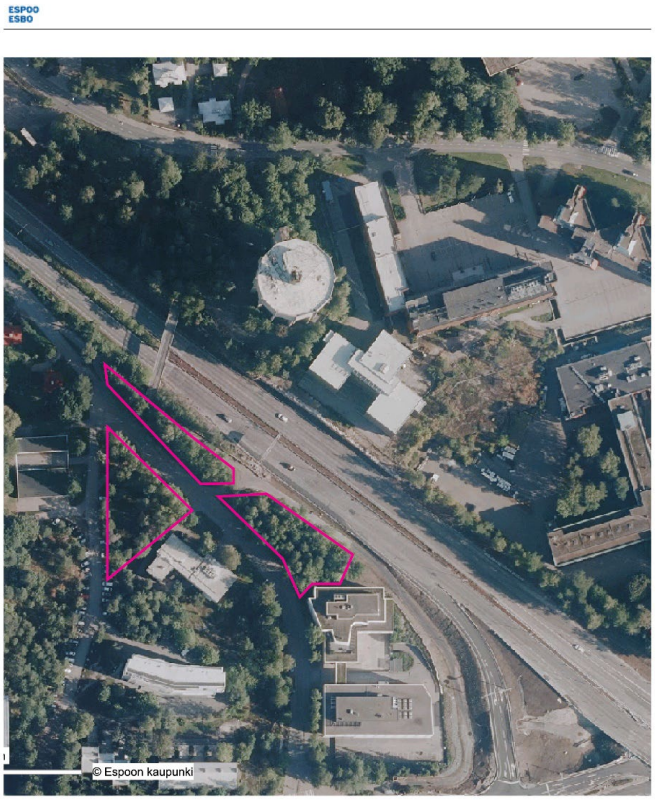
Huom. Tutkimus tarkastelee jäännösvihreän suunnitteluun liittyviä kysymyksiä yleisesti, ei ainoastaan esimerkeissä mainittuja alueita.

Otaniemi, Kivimiehentie

- kevyesti hoidettu, pirstaleinen viheralue, joka rajautuu kävelytiehen (Tutkijanpolku), autoteihin (Kivimiehentie, Betonimiehenkuja), rakennuksiin ja viereisen kiinteistön nurmialueeseen. Länsipuolen metsikkö on usein viereisen koulun oppilaiden käytössä. Lähimmät viher- ja virkistysalueet löytyvät Otarannasta (n. 200 m) ja Otsonlahdelta (n. 250 m), eikä Kivimiehentieltä ole alueille viheryhteyttä.

Tapiola, Kimmeltie

– useita kevyesti hoidettuja, pieniä viheralueita tien molemmin puolin. Alueet rajautuvat Kehä I moottoritiehen ja autoteihin (Kimmeltie, Otsonkallio) sekä rakennuksiin. Pohjoisin pienistä alueista nousee rinteeseen Kehä I ylittävälle kevyen liikenteen sillalle. Lähin viheryhteys löytyy Otsonkalliolta (n. 50 m) tien ja asuinrakennusten toiselta puolelta.



Appendix 4 – variable correlation matrix

Variable correlation matrix

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30	Q31	Q32	Q33	Q34	Q35
Q1	1,000																																		
Q2	0,311	1,000																																	
Q3	0,189	0,433	1,000																																
Q4	0,167	0,357	0,319	1,000																															
Q5	0,360	0,357	-0,123	-0,105	1,000																														
Q6	0,145	0,357	0,070	0,044	-0,124	1,000																													
Q7	0,155	0,357	0,010	-0,054	-0,212	0,491	1,000																												
Q8	-0,405	0,357	-0,261	-0,610	0,039	-0,264	-0,319	1,000																											
Q9	-0,105	0,357	-0,176	0,292	-0,279	0,092	0,302	-0,465	1,000																										
Q10	-0,406	0,357	-0,171	-0,274	-0,309	0,326	0,287	0,164	0,055	1,000																									
Q11	-0,063	0,357	-0,138	0,048	0,387	0,151	-0,012	-0,130	0,214	0,009	1,000																								
Q12	-0,108	0,357	-0,015	0,558	-0,100	0,095	0,094	-0,389	0,478	-0,069	0,344	1,000																							
Q13	-0,043	0,357	-0,338	-0,179	0,017	0,329	0,390	-0,160	0,352	0,294	-0,040	-0,127	1,000																						
Q14	-0,061	0,357	-0,073	0,013	-0,023	0,147	0,261	-0,072	0,269	0,167	0,181	0,225	0,242	1,000																					
Q15	-0,066	0,357	0,072	-0,377	0,036	-0,447	-0,191	0,405	-0,313	-0,278	-0,460	-0,704	-0,033	-0,442	1,000																				
Q16	-0,129	0,357	-0,326	0,096	0,050	-0,116	-0,184	-0,018	0,110	-0,099	0,065	0,241	-0,166	0,001	-0,178	1,000																			
Q17	-0,005	0,357	-0,196	-0,007	-0,140	0,173	-0,081	-0,204	0,341	-0,065	0,179	0,269	-0,128	-0,159	-0,275	0,265	1,000																		
Q18	0,053	0,357	-0,370	-0,178	0,024	0,005	0,322	-0,103	0,082	-0,023	0,097	0,024	0,255	0,114	-0,120	-0,028	-0,119	1,000																	
Q19	-0,104	0,357	0,134	0,365	0,114	-0,293	-0,097	-0,193	0,046	-0,579	0,201	0,346	-0,272	-0,033	0,067	0,094	0,146	-0,045	1,000																
Q20	0,121	0,357	-0,118	0,258	0,112	-0,171	-0,222	-0,204	0,119	-0,409	-0,052	0,461	-0,120	-0,121	-0,173	0,652	0,225	0,052	0,135	1,000															
Q21	-0,143	0,357	-0,211	-0,504	0,193	-0,261	-0,405	0,635	-0,363	-0,143	0,024	-0,529	-0,262	-0,229	0,607	0,043	-0,141	-0,154	-0,156	-0,110	1,000														
Q22	-0,227	0,357	-0,181	-0,347	-0,153	-0,140	-0,255	0,577	-0,366	-0,095	0,013	-0,107	-0,271	-0,338	0,234	-0,116	-0,005	-0,030	0,007	0,034	0,414	1,000													
Q23	-0,126	0,357	0,413	-0,369	-0,138	-0,238	-0,110	0,458	-0,483	0,216	-0,424	-0,560	-0,057	-0,196	0,560	-0,426	-0,397	-0,144	-0,120	-0,534	0,186	0,095	1,000												
Q24	-0,015	0,357	0,064	-0,316	-0,018	-0,245	-0,413	0,345	-0,421	0,075	-0,155	-0,466	-0,140	-0,530	0,462	-0,326	-0,121	-0,098	-0,242	-0,202	0,442	0,365	0,456	1,000											
Q25	-0,036	0,357	0,172	-0,287	-0,132	-0,373	-0,348	0,440	-0,390	-0,070	-0,323	-0,581	-0,457	-0,299	0,648	-0,068	-0,108	-0,142	-0,153	-0,256	0,698	0,150	0,505	0,575	1,000										
Q26	-0,030	0,357	-0,315	-0,361	-0,188	0,401	0,213	0,040	0,175	0,208	-0,108	-0,124	0,433	0,185	-0,074	-0,197	0,232	0,324	-0,371	-0,262	-0,028	-0,121	0,000	0,006	-0,100	1,000									
Q27	-0,262	0,357	-0,227	0,022	-0,190	-0,391	-0,323	0,151	0,091	-0,077	-0,092	-0,202	-0,158	-0,300	0,442	-0,123	0,036	-0,023	0,060	-0,040	0,477	0,269	-0,015	0,519	0,502	-0,227	1,000								
Q28	0,209	0,357	0,219	-0,355	-0,045	-0,115	0,055	0,095	-0,419	0,000	-0,071	-0,371	-0,097	-0,289	0,243	-0,383	-0,118	-0,016	0,043	-0,437	0,076	0,268	0,482	0,249	0,231	-0,076	-0,166	1,000							
Q29	-0,150	0,357	-0,143	-0,178	-0,083	-0,195	-0,125	0,500	-0,292	0,103	-0,134	-0,394	-0,254	-0,235	0,463	-0,072	-0,182	-0,230	-0,217	-0,249	0,623	0,391	0,190	0,319	0,591	-0,162	0,539	0,097	1,000						
Q30	-0,350	0,357	0,032	-0,174	-0,024	0,045	-0,268	0,230	-0,207	0,200	-0,035	-0,346	-0,080	-0,390	0,402	-0,036	0,152	-0,454	-0,197	-0,056	0,510	0,287	0,090	0,399	0,359	-0,097	0,503	-0,117	0,589	1,000					
Q31	0,264	0,357	0,467	0,342	0,268	0,062	0,027	-0,249	-0,270	-0,163	0,043	0,000	-0,096	0,048	-0,197	-0,035	-0,454	0,051	0,075	0,039	-0,250	-0,231	0,047	-0,327	-0,233	-0,305	-0,522	0,163	-0,335	-0,326	1,000				
Q32	-0,212	0,357	0,047	0,523	-0,167	0,013	0,165	-0,426	0,454	0,225	0,176	0,576	-0,017	0,408	-0,608	0,225	0,096	0,126	0,280	0,096	-0,655	-0,487	-0,323	-0,412	-0,410	-0,132	-0,189	-0,368	-0,500	-0,428	0,177	1,000			
Q33	-0,330	0,357	-0,254	-0,040	-0,291	-0,203	-0,164	-0,110	0,504	0,135	0,011	0,104	0,218	0,469	-0,163	0,040	0,345	0,198	-0,024	0,037	-0,167	-0,242	-0,168	-0,173	-0,110	0,369	0,185	-0,372	-0,274	-0,072	-0,288	0,379	1,000		
Q34	0,039	0,357	0,168	0,172	-0,103	-0,207	-0,040	0,044	-0,284	0,019	-0,524	-0,052	-0,214	-0,041	0,122	-0,005	-0,305	-0,407	0,109	-0,048	-0,190	0,044	0,219	0,076	0,048	-0,351	-0,057	0,198	-0,008	-0,152	0,143	0,163	-0,281	1,000	
Q35	0,229	0,357	-0,140	-0,182	0,125	0,034	0,142	0,019	-0,303	0,041	-0,204	-0,205	0,288	0,109	0,000	-0,396	-0,371	0,275	-0,183	-0,269	-0,177	-0,060	0,222	0,031	-0,201	0,330	-0,247	0,344	-0,132	-0,387	0,237	-0,241	-0,056	0,254	1,000

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