Plantations of the past

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DOI
10.47982/spool.2025.1.09

Publication date
2025

Document Version
Final published version

Published in
Spool

Citation (APA)
de Jong, E., & van der Velde, R. (2025). Plantations of the past: Tracing the Roots of the Urban Forest as Forestscape in the Early Modern Period of Delft 1500-1800. *Spool*, *12*(1), 161-180. https://doi.org/10.47982/spool.2025.1.09

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Tracing the Roots of the Urban Forest as Forestscape in the Early Modern Period of Delft 1500-1800

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Abstract

This paper expands on the term 'urban forest' through spatial historical research and via the concept of Forestscape. The city of Delft in the western part of the Netherlands is taken as a case study, with the sixteenth, seventeenth, and eighteenth centuries as the sample period. Based on a methodology examining the spatial history of Delft from both a processes and a patterns perspective, we identify six tree planting practices or 'afforestation events'. These plantings were integral to the early modern cityscape to the extent that the spaces in which they were planted were typologically incomplete without them. We identify tree plantings in group, line, and volume arrangements and posit these arrangements as a foundational scale in a multi-scalar understanding of the urban forest. The term 'plantation' formed the leitmotif for these plantings, interpreting natural features such as copses, groves, woods, and forests. The case study also demonstrates how, even in the early modern period, tree arrangements were established for a variety of benefits which ostensibly resonate with the contemporary notion of 'ecosystem services', but that were instead part of an alternative sensibility of what 'city' and 'nature' is. In this frame, the term Forestscape offers a way forward to retroactively interpret the historic urban forest and counter the current binary city-versus-nature discourse. We find that the collection of tree arrangements established in Delft in the period 1500–1800 presents a 'wooded watermark' of the city, which in many instances was reanimated with new tree plantings, demonstrating how parts of an urban forest can become a fixture in the morphology of the city and the lives of its citizens. At the regional scale, the extent of tree plantings around Delft with urban 'roots' extends far into the urban hinterland, while at the same time, trees and wooded areas with rural 'roots' extend well into the urban area. This condition opens a discussion on the inter-relationship between urban and rural realms and challenges the simplistic division between these two worlds apparent in contemporary spatial planning and design.

Keywords

Afforestation, Delft, forestscapes, garden culture, landscape metropolis, plantation, spatial history, tree language, urban forest, urban region.

DOI

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Urban Forestry: Scope and Historical Perspectives

The scope of urban forestry traditionally encompasses the variety of tree-based resources in cities, their location on the gradient from urban to peri-urban, and the various benefits they generate (Randrup et al., 2005). As such, urban forestry is seen as 'a strategic, integrative, and multi-disciplinary approach to the planning and management of tree resources in and around urban areas' (Konijnendijk et al., 2005). Despite increasing consensus on its scope and agency, however, there is continued debate about definitions, concepts, and terms (Randrup et al., 2005; Forrest et al., 1999). These debates reveal the range of definitions for terms such as 'urban forest' and the need for articulation and consolidation of core terms and concepts, particularly given the growing list of applications for the discipline. Among other things, urban forestry has been advanced as a novel approach to urban greenspace planning, design, and management (Miller, 1997), as a solution to a growing number of challenges cities face (Salbitano et al., 2016), and as a new perspective and model for what cities might become (Guallart et al., 2023). The value of clearer and sharper articulations of terms like 'urban forest' informs deeper understandings of the complex realm of cities and urban environments, not only for disciplines such as landscape architecture—commonly engaged in understanding, shaping, and managing the built environment—but also for those new to the urban realm. Reciprocally, landscape architecture can offer a critical contribution to the articulation of terms such as 'urban forest' and the related scope and agency of urban forestry. While much of the urban forestry discourse is dominated by functional parameters and system-based approaches aligned with forestry and ecology, less attention is given to what can be seen as the human dimension of urban trees and tree complexes: how we create and care for urban forests and greenspace, and how they, in turn, shape our daily lives. Dümpelmann (2019) highlights this relationship as a definitive condition for urban forestry, pointing to the enduring connection between humans and trees, as evidenced by the recurring use of terms such as 'amenity', 'ornament', and 'landscape'. The articulation of the human dimension is encapsulated in terms such as 'Forestscape' (see, for instance, Ekers, 2009; Leger-Smith et al., 2023). As such, this contribution supplements existing perspectives from the earth and life sciences with disciplinary perspectives from the applied sciences (landscape architecture) and the humanities.

An evident domain for better articulating the urban forest is historical spatial analysis. Examples of research, such as that by Forrest and Konijnendijk (2005), use a compound analytical prism to reveal the multiplicity of the (historical development of the) urban forest. From their discussion of some key examples, they elaborate on four topics in the lead-up to 'modern' urban forestry: peri-urban and urban woodlands, tree planting in parks and open spaces, tree planting in streets, and modern urban green planning landscapes. This work not only reveals a much longer pedigree of urban forestry practice (one that spans centuries rather than decades) but also that different historical iterations of the urban forest may exist simultaneously. More research into the particularities of this layered composition will help to elaborate on the distinction of the urban forest as compared to other forestry 'realms' (i.e., those beyond the urban). Other topics that come to the fore through historical research include the relationship between city and hinterland. Most urban greenspace plans tend to stop at administrative boundaries, thus overlooking the intricacies of the urban-rural gradient and the fact that trees and woodland features can extend far into the peri-urban and urban regional landscape (and vice versa). This hybridization—between rural and urban, nature and culture—is also archetypical of the urban forest (Dümpelmann, 2019, p. 5). Historical analysis can shed light on the development of the urban-rural gradient and the proper geographical extents of urban trees over time, thus being valuable in articulating the inherent fluidity of the urban-rural interface (urban landscapes in the countryside, rural and natural landscapes in cities) as well as informing leitmotifs for new urban regional visions wishing to extend beyond traditional planning entities and governance models. Another

critical theme in elaborating the urban forest through historical research via the lens of 'Forestscape' is an understanding of the motivations for the planting of trees in cities in the first place, and backdropping these interpretations of the collective ideas urban societies cultivate about trees, nature, and the natural world. What new understandings of the urban forest might we develop by looking through the lens of the people who inhabit them and for whom the urban forest has been established and maintained in the first place?

FIGURE 1 Map of Delft and surroundings from the early eighteenth century. This highly detailed map, known as the *Kruikiuskaart* after its makers, was commissioned by the local water authority *Hoogheemraadschap van Delfland*. (Map by Nicolaes and Jacob Kruikius, 1712).

Methodological Approach

Our methodological approach revolves around historical spatial analysis. Within this domain, we use a method combining research into historical spatial processes (the forces, institutions, and individuals who shape cities and territories over time) and related historical spatial patterns (the evolving physical fabric of an urban environment resulting from these processes) (see, for instance, Kostof, 1991). For this research, we used the city of Delft as a case study and present here results from the sample period 1500–1800[1]. Delft

1 This research forms part of a project entitled *Atlas van Boomstad Delft* (Atlas of Tree City Delft) that is planned for publication in 2025 (Van der Velde, De Wit and De Jong 2025). While the research project covered the period 1500-2000, we present here the period 1500-1800 as representing the earliest beginnings of the development of modern western cities as well as subsequent developments, which can provide relevant insights and conclusions for the research goals as well as testing the methodology.

is located in the western part of the Netherlands, midway between Rotterdam and Den Haag. It was one of the largest cities in the region of Holland in the sixteenth and seventeenth centuries and is typical of the dynamics and culture of this period (Niermeyer, 1944; Rutte & Abrahamse, 2014; Van der Gaag, 2015). Having been granted city status in 1246, Delft had a population of approximately 22,000 inhabitants by the sixteenth century. For the process part of the research, we carried out a synchronic analysis of archival material to document the various stages of urban tree plantings in Delft, resulting in summative texts on different stages. In addition to the study of maps, we accessed treatises and archaeological reports, travel descriptions, notarial acts, city descriptions, ordinances, illustrations, paintings, photographs, postcards, placards, design drawings, and planning visions. Relevant contemporary research and professional literature was also reviewed. The archives provide input for where, why, and how citizens, landholders, institutions, and administrative bodies carried out tree plantings in and around Delft in the period 1500–1800. To research the historical spatial patterns, we carried out a diachronic analysis of the sample period, elaborating this in cartographic reconstructions of urban tree plantings in the city and its surrounding territory. We synthesized these sources into a series of spatial plan projections articulating the synchronic dimensions of the development of the urban forest of Delft. An important motivation for choosing Delft as a case study is the large number of cartographic and other supporting visual materials on the early modern period (Van der Gaag, 2015). The Delft archive collection at the *Stadsarchief Delft* comprizes some 600 maps, plans, and related objects, as well as around 5,000 drawings, 4,000 prints, almost 68,000 photographs of a topographical nature, and some 30,000 construction drawings. Of these, maps formed a central source for the study. Various maps include detailed images of trees in various configurations, indicating their importance in this period (Van Rooijen, 1984; Den Dulk, 2021). Of particular note is the so-called *Kruikiuskaart*, illustrating the area called Delfland, which was the responsibility of the waterboard Hoogheemraadschap van Delfland and completed in 1712 by Nicolaas Samuels Kruikius (1678–1754) with the help of his surveyor brother Jacob [fig. 1]. Other valuable cartographic sources from this period include an early map of Delft from the *Civitates Orbis Terrarium*by Georg Braun and Frans Hogenberg from 1585, the *Delfi Batavorum Vernacule Delft* map by Joan Blaeu from 1649, and the *Kaart Figuratief* by Dirck van Bleyswijck from 1678 [fig. 2, fig. 3, fig. 4].

FIGURE 2 Map of Delft from the late sixteenth century. Trees are a highly conspicuous component of this early map depicting the cityscape of Delft. (Map by Georg Braun and Franz Hogenberg, 1581, from the *Civitates Orbis Terrarum*).

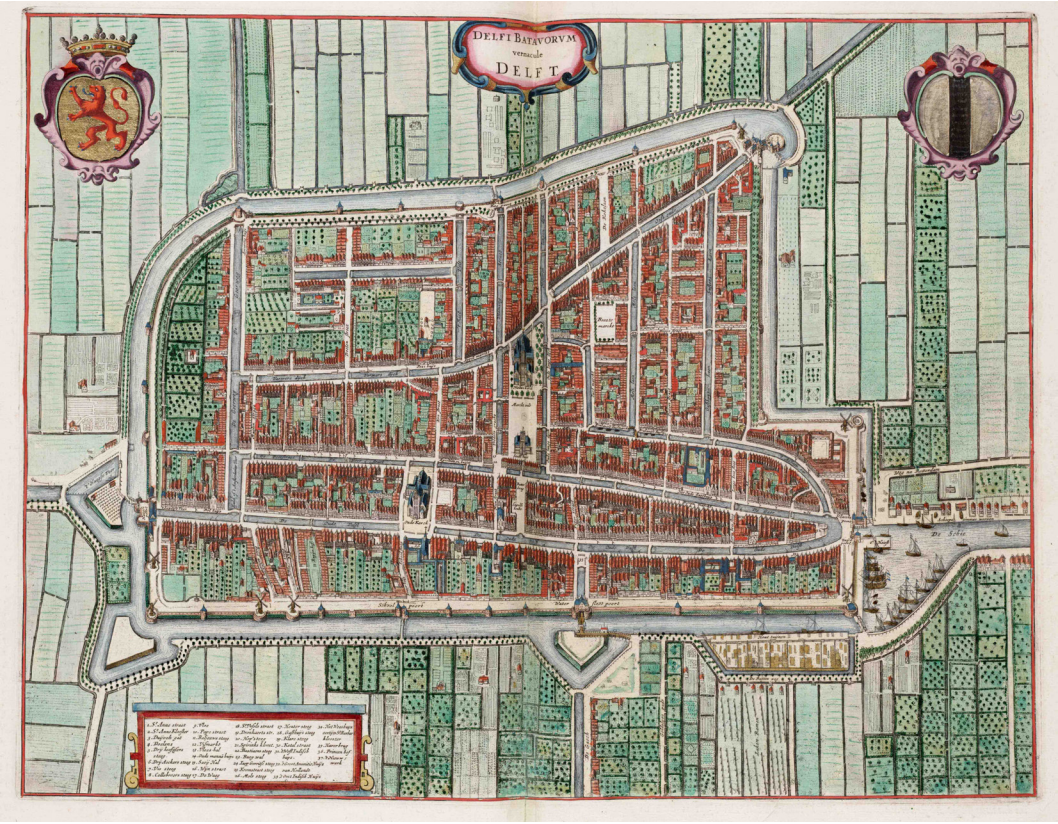

FIGURE 3 Map of Delft from the middle of the seventeenth century entitled *Delfi Batavorum Vernacule*. (Map by Joan Blaeu, 1649).

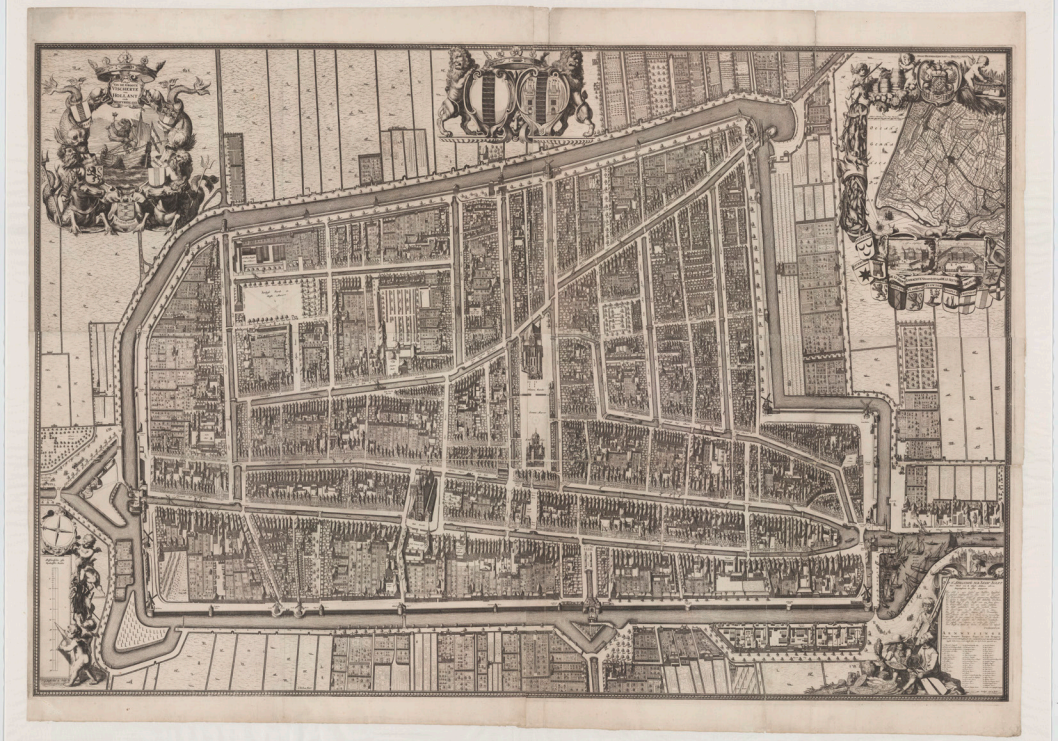

FIGURE 4 Map of Delft from the second half of the seventeenth century entitled *Kaart Figuratief*. (Map by Dirck van Bleyswijck with surveyors Jacob Spoors, draughtsman Johannes Verkolje, and engravers Johannes de Ram and Coenraet Decker, 1678).

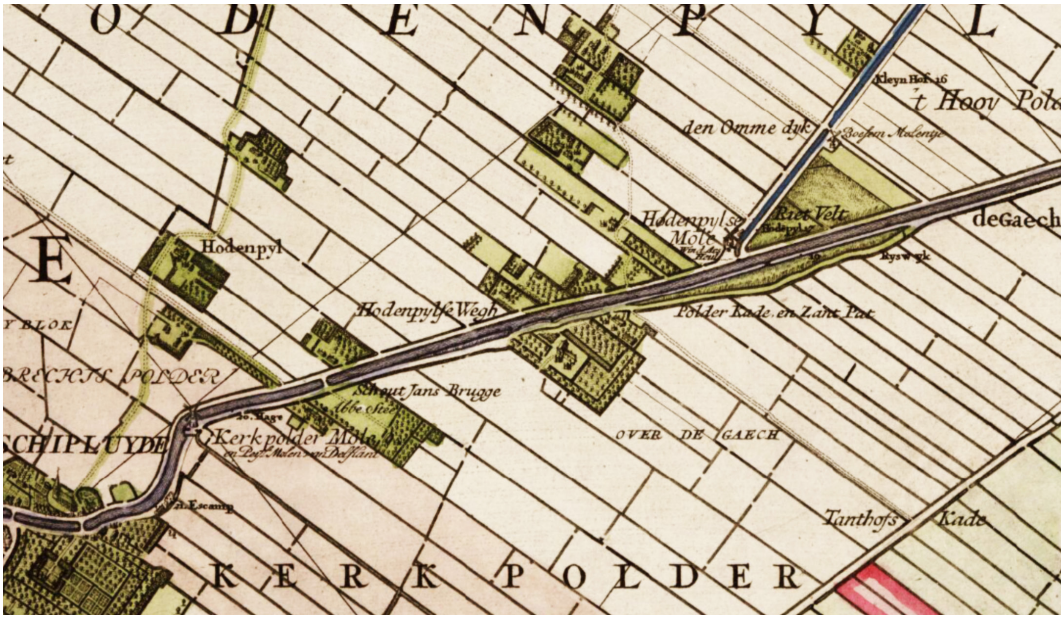

FIGURE 5 Section of the *Kruikiuskaart* map of an area to the south-west of Delft. The map section shows a mosaic of tree groups, lines, and wooded areas typical for the hinterland of Delft in the period 1500–1800. (Map by Nicolaes and Jacob Kruikius, 1712).

Hybrid Rural Trees

Various archival documents support depictions in maps such as the *Kruikiuskaart*, showing that a mosaic of tree groups, tree lines, and wooded areas was established in the hinterland of Delft early in the period 1500–1800[2]. Tree groups include farmyards, shelterbelts, wood coppices, decoy forests, orchards, *pestbosjes* (small, wooded plots where deceased animals with infectious diseases were buried), *geriefbosjes* (groves to provide wood for the farmer's own use), and *koebochten* (L-shaped woodrows used to herd and contain cattle for milking, etc.) (Buis, 1993; Landschapsbeheer Nederland, 2003). Many of these elements are visible in a sample area of the *Kruikiuskaart* [fig. 5]. A range of tree lines are also visible in this part of the map, including coppice plots on island strips in peat extraction areas and narrow strips of land planted with trees to mark the boundaries of plots of land and as shelterbelts (woodrows). This landscape was further complemented by larger tree volumes (expanses of woodland of various kinds) whose function is not always clear but, given the location and period, were either production woodlands consisting of one or two tree species in a regular planting arrangement, *grienden* (willow coppice), plots of deciduous species under coppice management as fodder for livestock, coppices mixed with mature trees (middle woods), nurseries for ornamental or other purposes, or orchards (Jansen & Van Benthem, 2005; Busz & Hine, 2001).

2 These plantings replaced the pre-settlement ('natural') landscape around Delft, which given the underlying soil types and hydrology would have included oak-elm-ash woodland on the banks of waterways, ash-willow woodland between the creeks on clay soils, and alder-birch woodland on the swampy peatlands. These woodlands gradually disappeared in the period 500-1500, when the land was progressively drained to create pastures and croplands and towns and cities began to appear.

Despite their connection to agrarian use, many of these wooded features were connected to urban life, either directly in the form of firewood, building materials, game, or produce, or indirectly as wood-based products destined for use in cities like Delft.

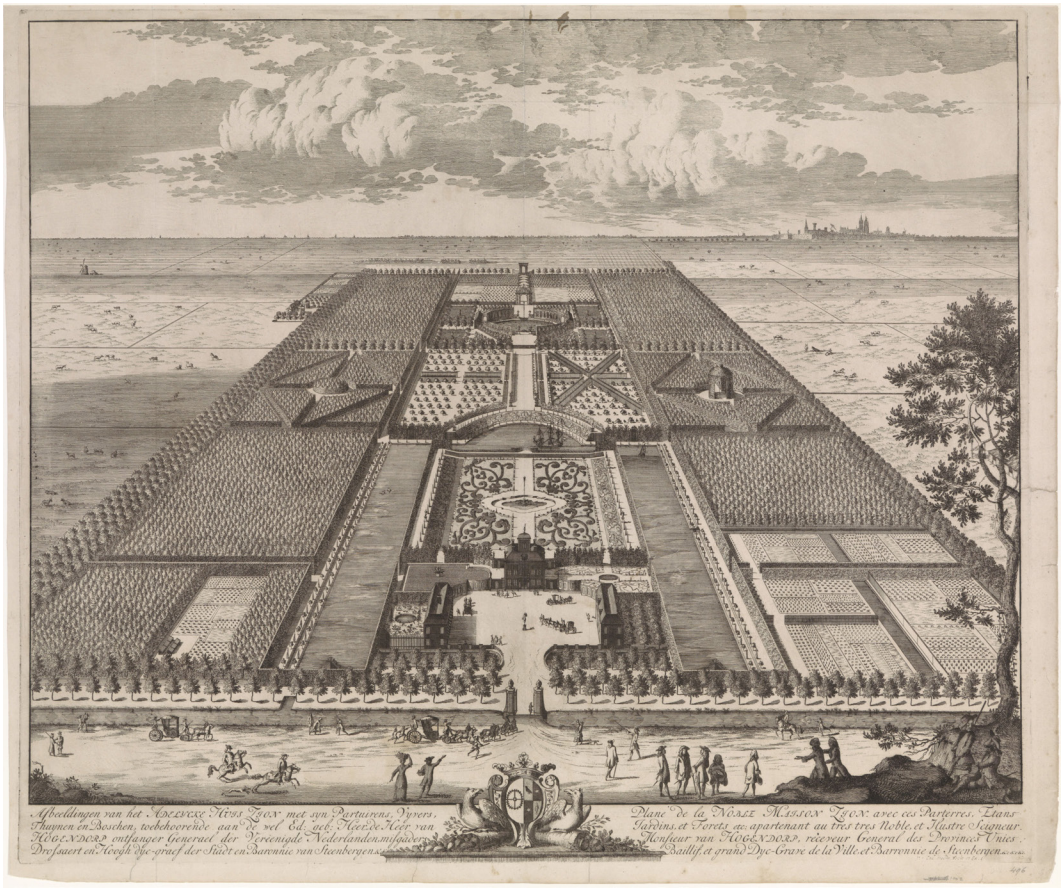

FIGURE 6 Bird's-eye depiction of the Sion manor house north-west of Delft, early seventeenth century. This aerial perspective depicts how avenues and plots of the country house were planted out with trees in a variety of arrangements. (Engraving by Pieter van Call II, ca. 1725).

Tree Plantations in an Urban Hinterland

From the early seventeenth century, wealthy city dwellers began building country houses and pleasure gardens in the landscape around Delft. Some were founded on former monasteries and castle farms, such as on the site of the former convent *Sancta Maria in Monte Sion*, where a large complex of trees was established as part of the formal garden composition of the country house Sion [fig. 6]. In the course of the seventeenth century, a series of country estates and pleasure gardens emerged along the Delftse Vliet waterway towards Leiden [fig. 7] (Buitenhuis, 1983). A kilometres-long series of tree complexes also emerged in the Rijswijk estate zone between Delft and Den Haag. Together, these trees provide the impetus for what can be seen as the first wooded features around Delft that were exclusively the result of urban culture and practices. The emergence and expansion of these country estates also triggered demand for seedlings of new and interesting species and subsequently the rise of a plant nursery industry in the seventeenth century (De Jong, 1993, p. 191; Den Dulk, 2021).

FIGURE 7 Country house Pasgeld on the Vliet, mid-seventeenth century. Trees follow the contours of the bridle path along the canal while other trees frame the manor house. (Painting by Jan van der Heyden, c.1660 © Royal Collection Enterprises Limited 2024 | Royal Collection Trust).

Tree Avenues for an Urban Region

To connect these country houses with Delft, linear tree configurations in the form of tree avenues were planted. Rows of trees were also planted along connecting roads and canals between settlements, as part of a broader development of tree plantings along canals, towpaths, and connecting roads. The main watercourse of the area—the Schie (canalized in stages between the tenth and fourteenth centuries)—was lined with trees by the late eighteenth century (Abrahamse, 2016). Tree planting (and its maintenance) along the Delftse Vliet fell under official municipal authority from 1783 (Abrahamse, 2016).

Tree Lines for an Expanding City

Closer to Delft, a radial array of tree lines appeared in parallel with the development of the regional tree avenues, emanating from the city fortifications out into the landscape. This network can be understood as a distinctive wooded figure, much like the spokes of a wheel, which defines how the city of Delft started to develop outside its city walls with trees as its basis. Such avenues began at the city walls, which were also planted as part of the fortification system and offered a fresh wood supply in case of siege (Steenbergen, De Jong, & Van de Vlist, 1997). A circumferential road just beyond the city moat was also lined with a double row of trees and provided access to institutions such as the *Pesthuis* (Lazar or Leper house) [fig. 8].

FIGURE 8 View of the Pesthuis near Delft, late seventeenth century. Tree planting may have been intended to purify the air around the Pesthuis. (Engraving attributed to Coenraet Decker, 1678 – 1703).

Tree-lined Allotments, Pleasure Groves, and Orchards

Alongside the trees on the 'tree wheel', a variety of tree arrangements could be found in extensive garden complexes in and beyond the city walls. Composed of numerous tree-lined allotment gardens, these complexes emerged to the west, southeast, and south of the city. Functionally, they were the result of population growth in the seventeenth and early eighteenth centuries and the scarcity of space within the city walls to grow food. These zones were also the location of tree plantings in ornamental gardens established by Delft's burghers. Examples of these gardens can be seen on the *Kaart Figuratief* from 1678, drawn in detail in plots on either side of the *Laan van Overvest* [fig. 9]. From the analysis of maps and archive material, we also establish that many trees were planted in the more than 200 orchards situated to the west and east of the city, and along the Schie to the south, by the end of the seventeenth century. All these allotments, pleasure groves, and orchards were furthermore bordered by wood-rows, resulting in many tens of kilometres of tree lines.

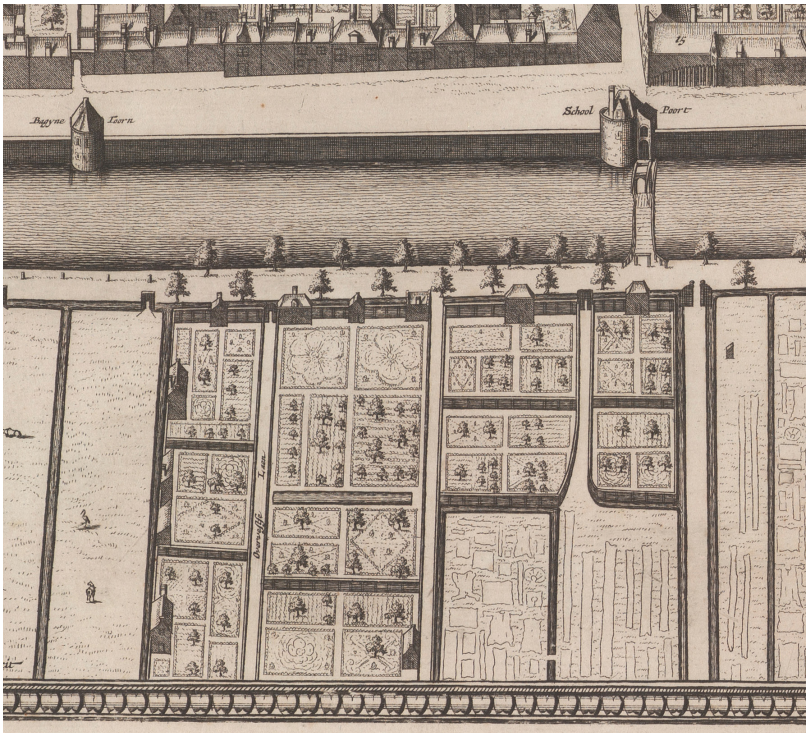

FIGURE 9 Avenue of Overvest, excerpt from the *Kaart Figuratief*. The map shows gardens with tree plantings just outside the city walls and along the towpath opposite the defense walls. (Map by Dirck van Bleyswijck with surveyors Jacob Spoors, draughtsman Johannes Verkolje, and engravers Johannes de Ram and Coenraet Decker, 1678).

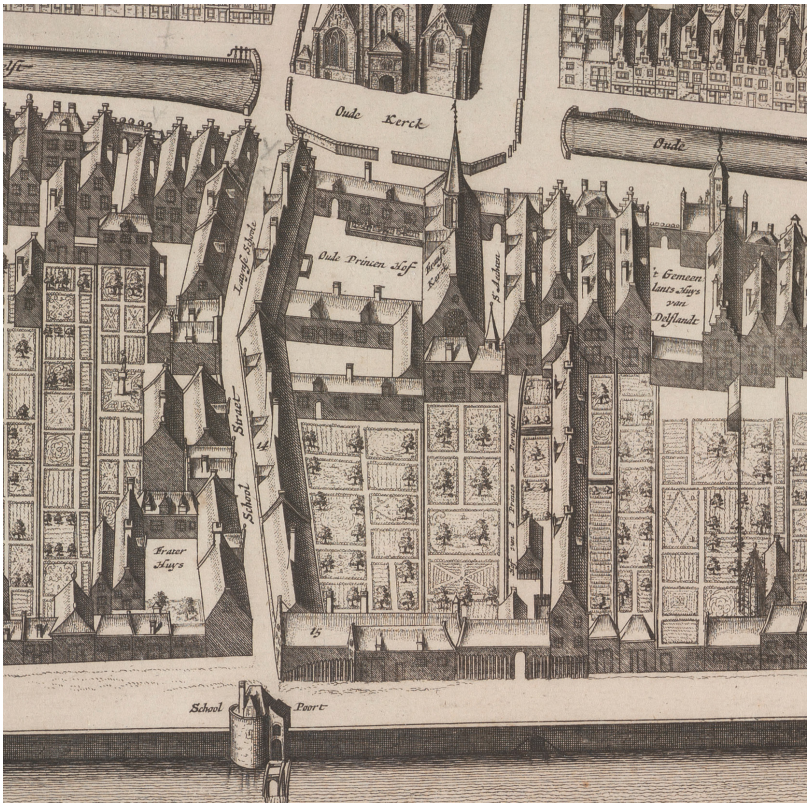

FIGURE 10 Section of the *Kaart Figuratief* depicting the St. Agatha cloister. Trees in the courtyard of this large cloister show how the city was as much a landscape as a built environment.

FIGURE 11 Courtyard scene Delft, mid- seventeenth century. The integral nature of trees growing in rear gardens and courtyards are depicted in this painting by Pieter de Hooch of a typical domestic scene in the seventeenth century show trees were an integral part of the cityscape. (Painting by Pieter de Hooch,1658-1660).

Courtyard Trees

By the end of the seventeenth century, a diverse typology of green spaces existed within the city walls, with trees as defining features, both in public and private areas (Hart, 2009). The *Kaart Figuratief* shows trees in one of the oldest monastery gardens–the St. Agatha Klooster–which grew into the largest monastery in Delft in the sixteenth century [fig. 10] (Soutendam, 1882). Other plantings were established in former Catholic monasteries, where fruit trees stood in enclosed ornamental and utility gardens, and in private gardens and courtyards throughout the city. Large trees appear in paintings, such as those by Pieter de Hooch [fig. 11].

FIGURE 12 View of the Oude Delft, mid- seventeenth century. This painting shows how lines of trees were integral to the cityscape of Delft in the period 1500–1800. (Painting by Jan van der Heyden, ca 1660).

Tree-lined Streets and Market Squares

Lines of trees along canals and streets were an increasingly visible addition to the cityscape of Delft in the period 1500–1800, as were tree plantings in market squares [fig. 12]. In the course of the seventeenth century, city authorities progressively assumed responsibility for planting and upkeep of tree plantings in the city's public spaces, such that by the end of the seventeenth century, three-quarters of its canals were lined with trees, and all of its market squares included some form of tree planting. To keep up the supply of the growing number of trees needed in public spaces, a dedicated tree nursery was established just north of the city.

Patterns of Urban Tree Establishment

Building on this synchronic analysis and through the study and comparison of various maps of the period[3], we reconstructed the cumulative spatial extent of Delft's tree configurations for the city and the

3 Cartographic reconstructions based on analysis of maps by Blaeu (1649), Van Bleyswijck (1678) and Kruikius (1712). Sources supplemented and validated by archival documents, cityscapes and paintings of the period.

surrounding territory for the period 1500–1800[4]. The city and regional scale maps present a composite representation of the configurations, functions, and location of the urban forest of Delft in the period 1500–1800. We mapped tree plantings in their respective geographical locations across the city and the territory at the scale of the configuration. A second layer in the mapping focused on the motivations for tree establishment. The cartography was carried out at two different scales: at the scale of the city and at the scale of the city region. The maps omit other topographical information except for permanent waterbodies, a layer that functions primarily as an orientational device [fig. 13, fig. 14].

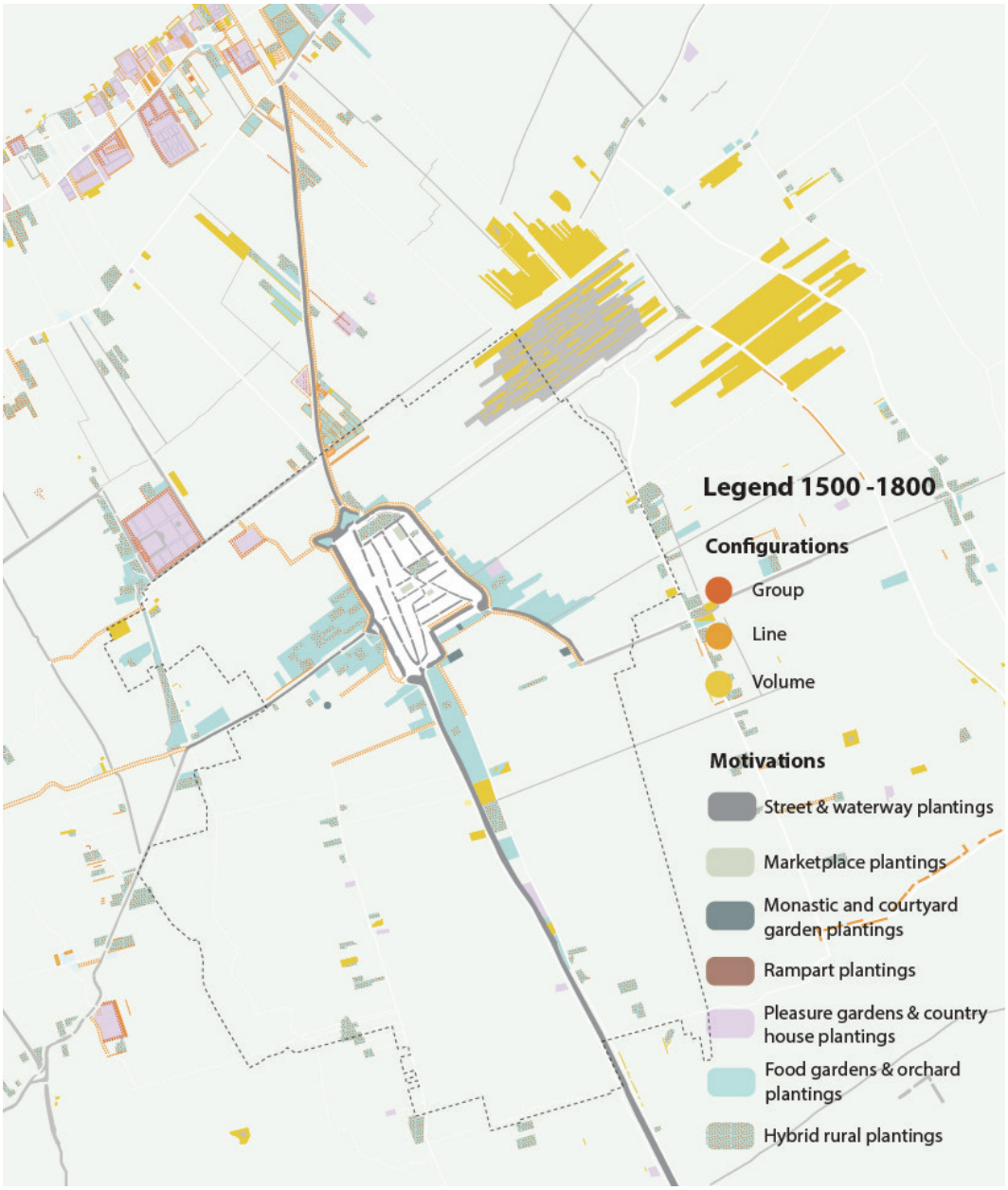

FIGURE 13 Cartographic reconstruction of tree configurations and their various motivations, at the regional scale (Delft and larger hinterland). (Drawing: Jantine van Halsema, René van der Velde, Erik de Jong).

4 For this research we focus on the configuration scale given its relevance for the method, as compared to the specimen, ensemble or system scale.

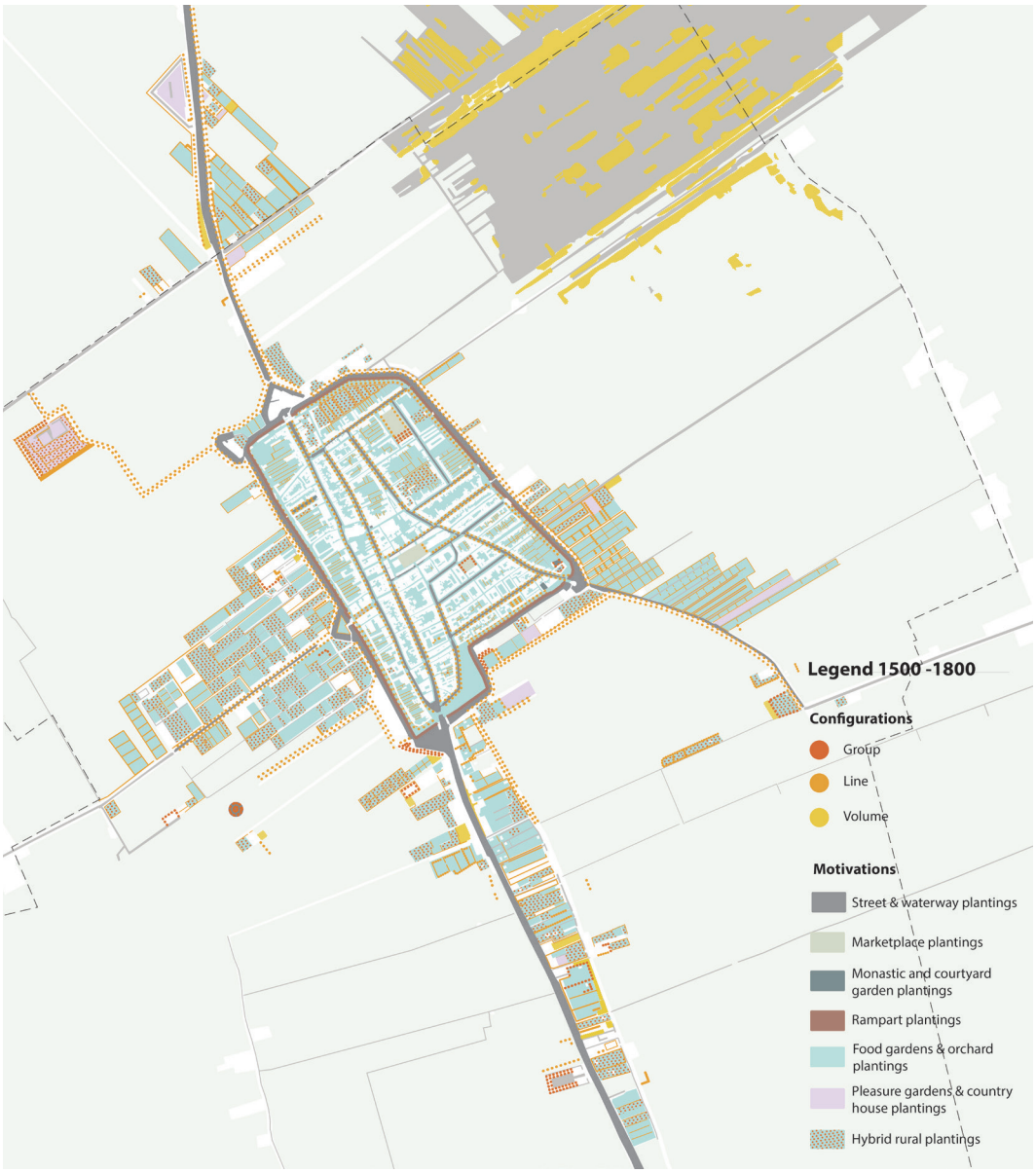

FIGURE 14 Cartographic reconstruction of tree configurations and their various motivations, at the city scale (Delft and surroundings). (Drawing: Jantine van Halsema, René van der Velde, Erik de Jong).

Tree Canopy Cover

From the two reconstruction maps depicting the early development of the urban forest of Delft, we identified a significant area of tree cover developed in the period 1500–1800 that can be directly or indirectly attributed to urban practices, activities, and/or conditions. While the source material is not accurate enough for an exact calculation of the total area of canopy cover in this period, we estimate that at least 10% of the land area of the territory (regional scale map) was covered by (planted) tree canopy, and approximately 20% of the mapped area in the city-scale map. These estimates indicate that in the early modern period, tree plantings, at least in the city and its immediate environs, became an increasingly integral part of the fabric of Delft in the period 1500–1800.

Trees Defining Urban Spaces

Given the relative distribution of trees on the city-scale map, trees played an important role in the cityscape. This appearance of the early modern city of Delft challenges abiding conceptions that nature and natural features were largely absent from cities in this period and that, as environments, they were opposite (and opposing) to rural and natural landscapes. This conclusion is supported by travel descriptions (of comparative cities in Holland) at the time. During his 1696 visit, William Mountague marvelled at the number of trees in Dutch cities, whose presence made him write: 'The Dutch are great Improvers of Land, and Planters of Trees, of Ornament as well as Profit' (Mountague, 1696). His observations also indicate that these plantings may have contrasted with situations elsewhere, suggesting that cities like Delft were more wooded and perhaps even somewhat atypical for European countries of the period.

Type and Configurations of Tree Plantings

Analysis of cartographic material for the reconstruction maps resulted in three basic types of tree planting arrangements identified: lines of trees, groups of trees, and volumes or areas of trees. At the city scale, linear plantings of trees were profuse in number and distributed across the city and in clusters outside the city walls. Linear tree plantings are a familiar arrangement in the sample city of Delft in the early modern period. The ubiquity of the tree line, as also emerging in other studies (see, for instance, Woudstra & Allen, 2022), establishes them as the baseline arrangement of the urban forest. Tree lines are by far not the only wooded features in the early urban forest of Delft, however. We found considerable group and volume plantings in the source maps; hybrid vegetation forms particular to the emerging tree stock of Delft.

Motivations and Typo-Morphological Situations

We furthermore found the different sub-category configurations of line, group, and volume tree plantings to vary in terms of the motivations for their planting and the locations they were planted in, leading to a range of distinctive typo-morphological categories. For the period 1500–1800, we identified six types of tree plantings with a distinctive functional and related typo-morphological specificity: *Straat- en grachtbomen* (plantings along streets and waterways), *Plein/Marktbomen* (marketplace plantings), *Hofbomen* (monastic and courtyard garden plantings), *Vestingwerkbomen* (rampart trees), *Siertuin/Buitenplaatsbomen* (pleasure gardens and country house plantings), and *Moestuinbomen* (food gardens and orchard plantings). These categories indicate that in the early modern period, tree plantings were an integral part of the domestic, social, commercial, and institutional life of the city of Delft.

Rural-Urban Complex

In the regional scale map, we identified a seventh category–*Weiland/landbouwgrondbomen* (hybrid rural tree plantings). Drawing on literature and archive research, we included these plantings as they were shown to be interrelated to urban requirements or practices. From the reconstruction maps, combined with other planting types from the city-scale map, the extent of woodland features with urban roots played out across most of the ten by ten-kilometre area depicted by the *Kruikiuskaart*.

Discussion and Conclusions

Afforestation Events and the Early Modern Cityscape

The synchronic analysis reveals a series of tree plantings in and around Delft in the period 1500–1800 which, given their scale and intentionality, may be considered as 'afforestation events'. Except for the hybrid rural trees, these episodes were driven by forces and practices in the urban realm and by urban figures, communities, and institutions active in Delft in the period. In terms of numbers and types of developments, and drivers for tree establishment, these events expand on existing reviews of the historical development of the urban forest in Europe. There is also evidence of a strong interrelationship between tree plantings and the city as a built environment, whereby—in contrast to common conceptions of greenspace as relatively autonomous features in cities—trees were integral to the architectonic space of the city. In this period, a cityscape emerged in which trees formed a foundational component of streets, canals, squares, courtyards, and fortifications, to the extent that these spaces were typologically incomplete without them. The underlying biophysical conditions seem to have played a passive or minor role in these creations. The integrality of trees in the cityscape stands in stark contrast to the abiding image of cities projected through their architecture only. The role of trees in the development of urban spatial types also extended to the tree plantings in orchards and allotment gardens, along the many roads and waterways leading to and from the city, and in the estates and gardens in the urban hinterland. These spaces, in which trees form the critical architectural component, represent the genesis of novel urban (greenspace) types emerging in the early modern period in western cities like Delft.

'Plantation' as Spatial Archetype of an Emergent Urban Forest

From the cartographic reconstructions, we derive that linear tree arrangements were common in Delft in the early modern period and that a variety of group and volume planting arrangements were also commonplace. These tree arrangements share characteristics that have a strong relationship to garden culture and, within that, to the concept of 'plantation'. As arrangements, tree plantings in avenues and along canals beyond the city walls were spatially comparable to those along canals within the city walls, while plantings on country estates resonated with plantings on marketplaces and city walls, and tree groups on the edge of the region paralleled those growing in gardens and courtyards within the city walls. These commonalities are the essence of the concept of *plantagie* or plantation. At the end of the eighteenth century, gardener Knoop proposed the concept of plantation to describe places or gardens planted in an order, i.e., regularly, as opposed to wild crops and trees not created by human hand (Knoop, 1790). As also elaborated in other gardening and architecture treatises of the time, order for Knoop meant symmetry and succession in straight lines (avenues, rows of trees along canals and fortifications, single or double). It referred to trees in *carrés* (markets, courtyards) or in symmetrical planting arrangements (triangle, quincunx, rectangle). Order radiated distinction, beauty, utility, and ornamentation (De Jong, 1993). A plantation, according to Knoop, is a deliberately planted place, connecting utility with entertainment, profit with ornament as basic givens. As an important cultural activity for both city and countryside, garden culture created the conditions for tree plantings, with botanical science and horticultural craft as its allies (De Jong, 1993). These arrangements may be understood as architectural interpretations of natural features such as a wood, a copse, a grove, and a forest (Hunt, 2000).

From Plantation to Urban Forest Syntax

A further discussion on the concept of plantation can be contextualized within emerging insights on urban Forestscapes. Building on the concept of 'tree language' coined by De Josselin de Jong (2009), De Wit and Van der Velde (2024) observe that, like every language, a tree language has a vocabulary that forms part of the wooded narrative of an urban environment. This wooded narrative plays out at different scales, from the individual tree to the tree arrangement, to multiple arrangements forming ensembles, to a collection of ensembles forming wooded areas at the scale of a city quarter or city (ibid., 2024). In this way, tree language offers a framework to back-cast to the historical development of the urban forest and its genesis in the concept of plantation. Our conclusion is that from its beginnings as a foundational syntax of tree arrangements, the urban plantation has evolved to include different scales in a multi-scalar tree language particular to the urban realm. In application terms, challenges such as health and liveability can benefit from this (historical) spatial understanding of the urban forest, whereby species, arrangements, ensembles, and wooded areas are critical scales in making places, neighbourhoods, and cities to be valued and appreciated. As De Wit and Van der Velde (2024) note, the structure and character of an urban forest are critical in providing a meaningful agent for urban life, and that tailoring measures to build on the existing can strengthen the relationship between greenspace and quality of life in cities. This stance resonates with an important category of ecosystem services as developed by the Millennium Ecosystem Assessment (2005): cultural services, which include cultural diversity, spiritual values, knowledge systems, educational values, inspiration, aesthetic values, social relations, sense of place, cultural heritage values, recreation, and ecotourism.

Ecosystem Services in a Historical Perspective

The concept of plantation also helps to place the current focus in urban forestry on concepts such as nature-based solutions and ecosystem services in a historical perspective. In contrast to the implicit narrative in these approaches that cities are largely devoid of nature (and thus in need of nature-based solutions), the case study city of Delft demonstrates how already in the early modern period, an urban forest was emerging with trees planted for aesthetic appreciation, for the birds and insects they attracted, for the fibres, firewood, tannin, fodder, and fruit they produced, for their positive impact on shade, wind, and air quality, and for their effect on health and social interaction. This fact by no means cancels out the need to continue with nature-based measures in cities, but it does call for a better understanding of the nature of—and in—cities (such as its urban forest) and a tailoring of ecosystem solutions to those insights. These historic 'ecosystem services' were contiguous to an urban forestscape that articulated ideas about nature and cities by urban societies, which stand in stark contrast to contemporary viewpoints. Urban societies such as in Delft cultivated a worldview informed by garden culture, which brought forth hybrid urban spaces of which trees were an integral part. A Forestscape thus emerged, drawing on concepts and principles from garden culture and its associated infrastructure of gardeners, arborists, nurseries, and the like. The Forestscape of Delft was part of designerly ways of 'knowing and making', and ascribed a diversity of functional, social, and cultural meanings and experiences based on a wish for functional and ornamental order. Further study should reveal how, for 300 years, changes occurred in the motivations behind and configurations of the Delft urban forest, with some having a long span and others short-lived. How did configurations continue while land use changed? How did making and caring, adding, changing, and removing, as part of a dynamic process, keep the design of trees present in the urban fabric?

The Urban Forestscape as a Distinct and Extended Composite

Analysis of the reconstruction maps also presents discussion material on the extent and configuration of the early modern Forestscape of Delft, with implications for contemporary 'readings and writings' of cities and urban regions. From the reconstruction maps, we estimate that by 1800, Delft already had a tree canopy area covering almost twenty percent of the city-scale mapped area (a figure very similar to the current canopy cover of the city). This underscores how tree plantings were an integral part of the fabric of Delft by the end of the early modern period. The configuration of this canopy, a composition of tree arrangements, ensembles, and wooded areas unique to Delft, presents a 'wooded watermark' of the city, metaphorically speaking. The tree lines branching out from the city walls into the countryside like spokes on a wheel, for instance, are central to this footprint, as are the configurations of canal-side, courtyard, and marketplace tree arrangements. Many of these figures have endured beyond the lifespan of a tree in the sample period, showing that the location of trees has become a permanent fixture in the morphology of the city and the minds of its citizens. At the regional scale, the extent of tree plantings with urban 'roots' extends to the limits of the 22 by 22-kilometre area depicted by the *Kruikiuskaart*, effectively extending the city's 'wooded watermark' far into the urban hinterland. As such, Delft's emergent urban forest challenges contemporary projections of urban regions in which a sharp distinction is made between the city and the hinterland.
At the same time, in this same sample area, the existence of trees and wooded areas with their 'roots' in rural economies and practices extends at times right up to and even within the walls of the city. The early modern urban forest of Delft thus enables us to see the city and its agrarian environment as a complex and intertwined mosaic, opening a discussion on the inter-relationship between urban and rural realms since the early modern period. By extension, this phenomenon challenges the simplistic division between these two worlds apparent in contemporary spatial planning and design, as well as in other scientific and societal domains. The interrelationship of these separate worlds, for which the urban forest is one of its physical manifestations, resonates with emerging conceptual frameworks to understand, order, and act in dispersed urban territories via approaches such as Landscape Metropolis. In this concept, the urban region is posited as a dynamic, intertwined, and layered mosaic (Van der Velde & De Wit, 2009; Steenbergen & Reh, 2011). As such, Delft's emergent urban forest challenges contemporary projections of urban regions in which a sharp distinction is made between the city and the hinterland.

Acknowledgements

This paper forms part of an initiative by the Urban Forestry research group at TU Delft for an Atlas of the Dutch Lowlands, with Delft as pilot case city. The research was financially supported by National Regieorgaan Praktijkgericht Onderzoek SIA (part of NWO), and a financial contribution from the Royal Association of Hoveniers en Groenvoorzieners (VHG) and the municipality of Delft. Students from the master track at TU Delft contributed to this research including Roberto Wijntje, Machteld Zinsmeister, Emma Kannekens, Jianing Liu, Ioanna Kokkona, Lotte Oppenhuis, Jan Houweling, Floris Beijer, Willemijn Schreur. Other contributions came from Lotte Dijkstra, research assistant urban forestry, and Sandra den Dulk, heritage specialist.

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