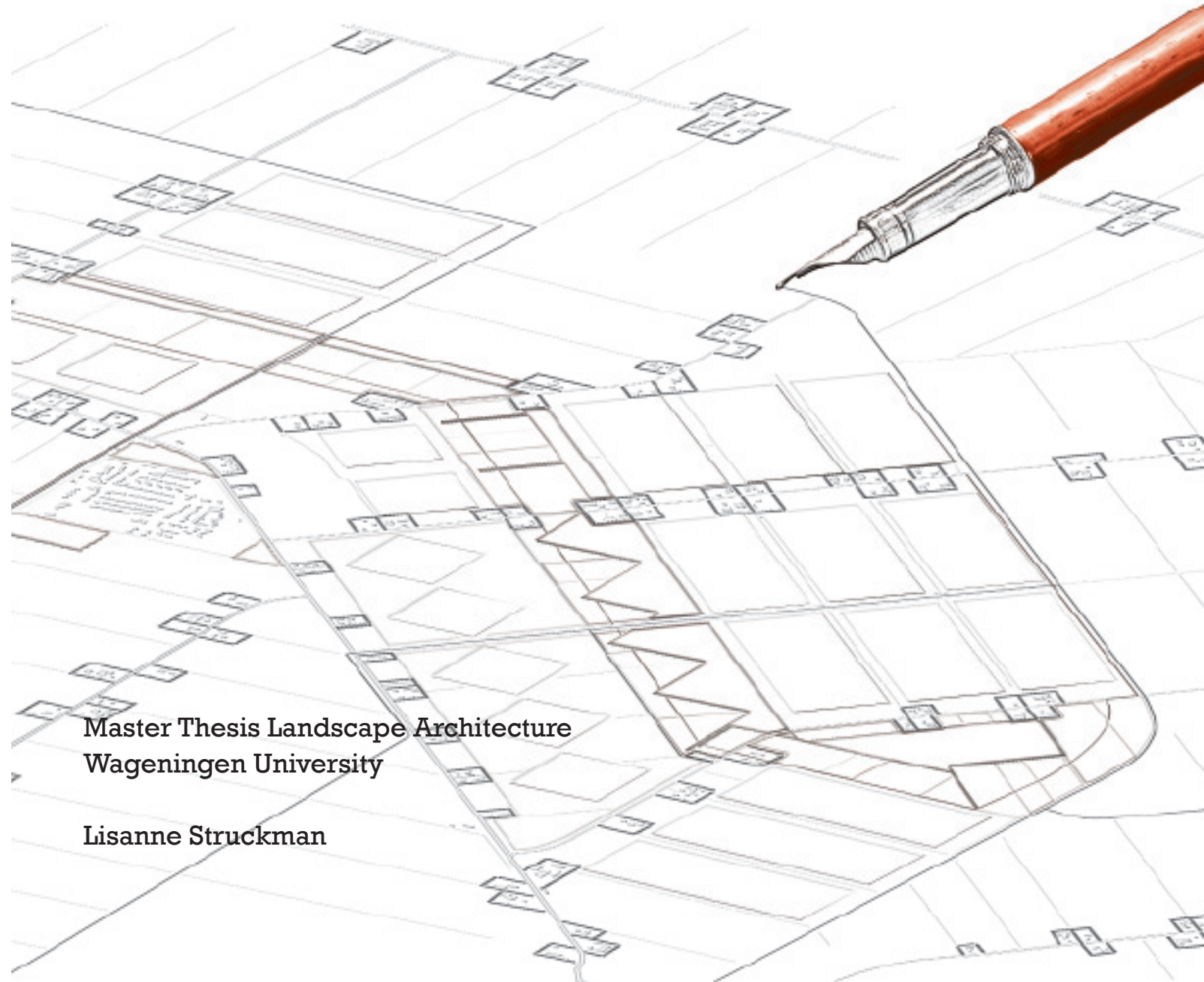


DESIGNED REGIONAL LANDSCAPES

Towards an aesthetical evaluation as precondition
for redesigning the Noordoostpolder

Master Thesis Landscape Architecture
Wageningen University

Lisanne Struckman



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Colofon

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Lisanne Struckman

lisanne.struckman@gmail.com

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Chairgroup Landscape Architecture

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6708 BP

Wageningen

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Prof. Dr. Ir. A van den Brink (examiner)
Chair Landscape Architecture
Wageningen University

Ir. Rudi van Etteger, MA (supervisor)
Assistant Professor Landscape Architecture
Wageningen University

Preface

The designed landscape is for me a well-known phenomenon as I grew up on the edge of Almere in the polder of Southern Flevoland. During my youth, I already noticed that this landscape differed from other landscapes in the Netherlands: the varied cultural landscape of 't Gooi was more appealing to me than the openness and strict lines of Southern Flevoland. Nevertheless, during my study at Wageningen University, I discovered the beauty of this landscape. The fact that the polders were specifically designed fascinated me. This has driven me towards my research topic: fascination about designed landscapes, their designers, and the question about how to redesign these landscapes. I hope that this thesis can contribute to attention for designed regional landscapes and their value for the Dutch landscape architectural history.

Writing and designing this thesis required a huge amount of work and with the help of some people I succeeded in finishing my thesis. First of all, I want to thank my supervisor Rudi van Etteger. Thank you for sharing your ideas about aesthetics and for your comments and feedback which have helped me through difficult phases. Furthermore, I want to thank the employees from the archive of Nieuwland who assisted me in finding the required descriptions and drawings of the original design of the Noordoostpolder.

I want to thank my family and friends who supported me during my thesis project. Dion, who has encouraged me every time to go on and gave me feedback on the moments I really needed it. My father who has driven me to the Noordoostpolder twice due to the absence of my driver's license... Diana, for her scientific skills and critical feedback on my writings, Roel for his criticism and feedback on my designs, and Maartje for her critical feedback on my writings.

With this thesis, I want to give an insight in one part of the history of the Dutch landscape architecture.



Summary

From 1920 onward, the design of landscapes on a regional scale became more often a point of discussion. The Land Consolidation Law of 1924 and the construction of the Zuiderzeepolders in 1930 were important developments whereby the landscape was increasingly regarded as design task. As a result, large parts of the Dutch landscape such as land consolidation plans and polders were designed by professional landscapers who decided to pervert the aesthetical component of the Dutch landscape. For a long time, designed regional landscapes were not considered as different from natural environments and vernacular landscapes. However, designed regional landscapes differ from these environments due to the fact that they are designed as one complete unity by a 'landscape architect avant la lettre' who had clear ideas about the functional and aesthetical appearance and experience of these landscapes.

As these landscapes are different, they also require a different approach when they are adapted to future developments. All landscapes change because of dynamic interaction between natural and cultural forces in the environment. Landscape interventions are always necessary at some stage because time and current society have other demands. Direct spatially intervene in designed regional landscapes can damage the vision of the original designer, so the implementation of large changes in designed regional landscapes requires further research into the design intentions of these landscapes. How this can help guiding future developments is however not addressed in research. This thesis attempts to find an approach where the original design and intended landscape experience is investigated by the use of one case: the Noordoostpolder. The Noordoostpolder is a good example of a designed landscape, but motor traffic, changing agriculture, and the increasing risk of flooding's threatening the state of this landscape. With the original design and intended experience in mind, future developments will be translated into a redesign for the Noordoostpolder. As landscape surrounds us and addresses all our senses, a multisensory analysis is important to capture the whole landscape experience.

The original design of the Noordoostpolder shows that there were clear ideas about the aesthetical appearance of this new landscape. Plantation was an important design tool to give the landscape mass and space. However, the contemporary landscape experience is changed and in order to determine which elements should be modified and which one should be preserved, the design is evaluated

using four parameters: aesthetical appealing, functional, unique, and missed opportunities. After analysing the contemporary landscape of the Noordoostpolder multisensory, it appeared that aesthetical appealing elements are still visible in the field. Nevertheless, due to the enormous car expansion, many aesthetical appealing experiences are diminished or disappeared. Elements which do not function anymore are direct motive for a redesign in order to maintain the main function of agriculture: the water system is too small for optimal functioning and should be elaborated, and a new greenhouse area should be implemented. These new functions should fit within unique elements of the Noordoostpolder which consist of the field pattern, the concentric structure, and the former islands of Schokland and Urk. A missed opportunity is the absence of a network structure for the bike. This should be implemented in order to bring back the intended experience without car noise on the background. Design principles are developed to structure the designs which are derived from the aesthetical evaluation and specified to the specific characteristics of the sites. Zoning is used to structure sounds and smells in the right way to bring back part of the intended experience.

In the end, this thesis offers two results: a redesign for the Noordoostpolder which serves as concrete example about how to design in the Noordoostpolder and an approach i.e. framework to evaluate designed regional landscapes in general. As one case is used to construct such a framework, it cannot be used as a set approach for all designed regional landscapes. Nevertheless, the given framework can be used to guide further research in the field of designed regional landscapes.

Samenvatting

De inrichting van het landschap op regionale schaal kwam rond 1920 steeds vaker ter discussie te staan. De ruilverkavelingswet uit 1924 en de aanleg van de Zuiderzeepolders in 1930 waren belangrijke ontwikkelingen waarbij het landschap steeds vaker werd beschouwd als ontwerpopgave. Grote delen van het Nederlandse landschap zoals polders en ruilverkavelingen zijn daarom specifiek ontworpen door professionele landschapsontwerpers die vastbesloten waren het esthetische component in het Nederlandse landschap te bewaren. Deze ontworpen landschappen werden voor lange tijd niet als anders gezien dan natuurlijke landschappen en culturele landschappen. Echter, onderzoek wijst uit dat er wel degelijk verschillen bestaan: ontworpen landschappen zijn specifiek ontworpen als een geheel door een landschapsarchitect *avant la lettre* die duidelijke ideeën had over het functionele en het esthetische aspect van het landschap.

Kort gezegd, deze landschappen zijn anders, dus moeten ze ook op een andere manier worden aangepast aan toekomstige ontwikkelingen. Alle landschappen veranderen door dynamische interactie tussen natuurlijke en culturele landschapsprocessen. Op een bepaald moment is landschappelijk ingrijpen altijd nodig omdat de tijd en de huidige samenleving andere eisen stellen aan het landschap. Direct ruimtelijk ingrijpen in ontworpen landschappen kan de visie van de oorspronkelijke ontwerper wegvagen. Daarom is er eerst verder onderzoek nodig naar de ontwerpintenties waarmee deze landschappen tot stand zijn gekomen. Hoe deze oorspronkelijke ontwerpintenties een inspiratie kunnen zijn voor het plannen en ontwerpen van toekomstige ontwikkelingen is echter nog niet onderzocht. In deze thesis wordt hiervoor een aanpak gegenereerd waarbij het originele ontwerp en de oorspronkelijke landschapsbeleving is onderzocht door middel van een case: de Noordoostpolder. De Noordoostpolder is een goed voorbeeld van een ontworpen landschap, maar veel verkeer, veranderingen in de landbouw en het risico op wateroverlast in het veld bedreigen de status van dit ontworpen landschap. Deze toekomstige ontwikkelingen zullen worden vertaald in een herontwerp voor de Noordoostpolder, waarbij het originele ontwerp als leidraad geldt. Omdat landschappen ons omringen en al onze zintuigen aanspreken is een zintuiglijke analyse nodig om de hele landschapsbeleving te vangen.

Het originele ontwerp van de Noordoostpolder laat zien dat er duidelijke ideeën waren over de esthetische verschijning en beleving van het nieuwe landschap. Beplanting was een belangrijk ontwerpmiddel om

het landschap massa en ruimte te geven. Echter, de beleving van het hedendaagse landschap van de Noordoostpolder is veranderd en om te bepalen welke elementen moeten worden aangepast en welke elementen behouden moeten blijven is het ontwerp geëvalueerd aan de hand van vier parameters: functioneel, esthetisch aantrekkelijk, uniek en gemiste kansen. Uit de zintuiglijke analyse van het huidige landschap blijkt dat esthetisch aantrekkelijke elementen nog goed zichtbaar zijn. Echter, door de enorme opkomst van de auto blijkt dat sommige fijne esthetische belevingen zijn verminderd of soms zelfs helemaal zijn verdwenen. Elementen die niet meer goed functioneren zijn een directe aanleiding voor een herontwerp om daardoor de belangrijke functie van landbouw te behouden. Om wateroverlast te voorkomen moet het watersysteem worden uitgebreid; een nieuw kassen complex moet worden aangelegd om aan de moderne eisen van de landbouw tegemoet te komen. Deze nieuwe functies moeten passen binnen de unieke structuur van de Noordoostpolder: het verkavelingspatroon, de concentrische opzet, en de voormalige eilanden Schokland en Urk. Een gemiste kans van het oorspronkelijke ontwerp betreft de afwezigheid van een fietsnetwerk. Dit moeten worden aangelegd zodat de polder weer beleefd kan worden zonder constante autogeluiden op de achtergrond. Ontwerpprincipes zijn afgeleid van de esthetische evaluatie en structureren de twee ontwerpen. Door middel van het zoneren van een aantal functies worden positieve en negatieve geuren en geluiden goed verdeeld.

Uiteindelijk biedt deze thesis twee resultaten: een herontwerp voor de Noordoostpolder dat een goede indruk geeft over hoe te ontwerpen in deze polder en een aanpak oftewel framework om ontworpen landschappen in het algemeen te evalueren. Omdat dit onderzoek is gedaan door middel van een case kan dit framework niet worden gezien als de enige aanpak voor alle ontwerpen landschappen. Niettemin kan het worden gebruikt als leidraad voor verder onderzoek betreffende ontworpen landschappen.

Table of contents

1	Introduction.....	12
1.1	Problem statement.....	13
1.2	Purpose.....	15
1.3	Outline of the report.....	17
2	Theoretical framework.....	22
2.1	Designed regional landscapes.....	22
2.1.1	Natural and vernacular landscapes.....	22
2.1.2	Designed landscapes.....	23
2.1.3	Design history of designed regional landscapes.....	25
2.2	The experiential landscape.....	27
2.2.1	Layer approach.....	28
2.2.2	Multisensory approach.....	29
3	Research Design.....	36
3.1	Aim of the research and research questions.....	36
3.2	Research strategy.....	37
3.3	Research procedures.....	38
4	Analysis.....	46
4.1	Original design of the Noordoostpolder.....	46
4.1.1	Design ideas.....	47
4.1.2	Design concepts.....	49
4.1.3	Design tools.....	50
4.2	Current landscape experience Noordoostpolder.....	55
4.2.1	Polder analysis.....	55
4.2.2	Field experience.....	56
4.3	Future developments in the Noordoostpolder.....	67
4.3.1	Outdated infrastructure.....	67
4.3.2	Changing agriculture.....	68
4.3.3	An insufficient water system.....	69
5	Aesthetical evaluation.....	72
5.1	Functional.....	72
5.2	Aesthetical appealing.....	73
5.3	Unique.....	75
5.4	Missed opportunities.....	77

6	Design motives.....	82
6.1	Design task.....	82
6.2	Role of the designer.....	83
6.3	Designing with sounds and smells.....	84
7	Design: water retention area.....	88
7.1	Location.....	88
7.2	Design principles.....	88
7.3	Searching for form.....	94
7.4	Design	98
7.5	Green islands and vegetation types.....	105
8	Design greenhouse area.....	112
8.1	Location.....	112
8.2	Design principles.....	112
8.3	Searching for form.....	118
8.4	Design.....	120
8.5	Phasing.....	128
8.6	Details.....	130
9	Conclusion.....	134
9.1	Results.....	134
9.2	Recommendations.....	139
	References.....	142
	Illustration references.....	148
	Appendix	



1. Introduction



Bird's eye view Schokland (Directie Wieringermeer 1943)

1. Introduction

Designed regional landscapes

The Dutch shaped their land, shown both by their globally renowned designed water system, but also by more unknown designed regional landscapes. Concrete examples of designed regional landscapes are polders and land consolidation plans. Although these landscapes were mainly designed for the functional purpose of agriculture, the first professional landscapers had clear ideas about their appearance and experience and were striving to beautify these landscapes (Steenhuis & Hooimeijer 2009).

Natural landscapes

Designed regional landscapes were not considered as different from other landscapes for a long time, but the genesis and development stage of landscapes shows something different. Natural landscapes are evolved due to natural processes which have shaped their specific forms and appearance. Farmers and builders have made small, incremental changes in the landscape in order to survive and adapt the landscape to their way of living (Van Etteger 2012). As a result, the Netherlands is transformed into a vernacular landscape whereby hardly any place is not altered by human beings (Dirkmaat 2006). Due to large spatial interventions, it became clear that landscapes could also be considered as an object of design. The tradition of designing the environment was for a long time limited to garden design. Parks and cemeteries became afterwards an object of design (Duchhart 2007; Rogers 2001) while landscapes remained in the conservation stage (Antrop 2005). Landscape design was emerging in the period of the twenties (Brinkhuijsen 2008) in order to adapt the Dutch landscape to the changing societal demands. Especially food production and safety were functions of high priority to be implemented in the landscape (Steenhuis & Hooimeijer 2009).

Vernacular landscapes



1.1 The vernacular landscape



1.2 The designed landscape

Designed regional landscapes are precisely different from vernacular and natural landscape due to the fact that they are designed as one, complete unity (Huls et al. 2011) by an author i.e. landscape architect avant la lettre who had clear ideas about its appearance and function (Van Etteger 2012). Due to their large scale appearance, their monotonous land use, and their strict lines these landscapes were considered as mechanical, rational, and uniform: as boring (Steenhuis & Hooimeijer 2009). On the contrary, the vernacular landscape was seen as characteristic and valuable in the Netherlands. This landscape from around 1850 was used as input and inspiration for new designs (Antrop 2005; Dirkmaat 2006); parts which were eventually designed in a later stage were mostly ignored. Recently, historians and landscape architects show a renewed interest in designed regional landscapes

in the Netherlands (Steenhuis & Hooimeijer 2009). The fact that designers who designed these landscapes had a great admiration for the existing landscape and used these old characteristics in new designs (Steenhuis & Hooimeijer 2009) identified that these landscapes certainly have some design value considering the Dutch history of landscape architecture. Traces about these landscapes can be found in the contemporary landscape: land reclamation projects, land consolidation landscapes, nature areas and infrastructural projects show partially the way professional landscapers have designed these landscapes (Steenhuis & Hooimeijer 2009). Although these traces can be valuable, next section shows that it is impossible to preserve these landscapes in their original state.

1.1 Problem statement

All landscapes change because of dynamic interaction between natural and cultural forces in the environment (Antrop 2005, Koh 2008). Due to future developments, landscape interventions are always necessary at some stage because time and the current society have other demands which the landscape does not meet (Huls et al. 2011). Also, designed landscapes serve as a stage for topical design tasks (Steenhuis & Hooimeijer 2009). Space is needed for water storage, dwelling, recreation, traffic and new agricultural developments in order to maintain a landscape which serves the needs of the inhabiting population. Preserving designed regional landscapes in their original state seems thus to disable the implementation of needed measurements. Nevertheless, direct spatial interventions in designed regional landscapes for the cause of future developments may not always be the proper choice because this can damage the vision of the original designer (Papenborg and Van der Togt 2011). Literature review shows that other disciplines such as architecture and site-specific art have their own way to approach this issue.

In architecture, it is impossible for an architect to modify a building without informing the original architect. Copyright of an architect means that the architect may oppose when someone else modifies his or her creation. Each design or building with a minimum of creativity showed in drawings, models, sketches etc. is a piece of art and needs to be protected (Adriaansens 2008, p. 2). Another example of this is the movement of site-specific art where pieces of art are designed for a specific site. The art piece cannot be removed, as that is equal to taking away the meaning of the whole design (Kwon 2004). An example of

Professional landscapers

Future developments



1.3 The Titled Arch by Richard Serra

Site-specific art

this is "The Titled Arch", a site-specific piece of art created by Richard Serra (figure 1.3). This art work was specifically designed for a square in the United States. Inhabitants wanted to place it somewhere else because they did not like it. According to Richard Serra, that was not possible because it was designed for that specific site and replacing it was destroying the design (Serra 1994, in Kwon 2004). Although these disciplines give interesting insights, landscapes differ on an important aspect from buildings or statues: buildings are static, but as explained previously landscapes change (Antrop 2005, Koh 2008). Therefore, copyright cannot be applied in landscape architecture as landscape interventions are always necessary at some stage or as Kerkstra (1994, p. 194) explains: *'owing to the dynamic character of landscape systems, a mere conservation of 'landscape values' can never be a solution.'*

Lack of an approach

Landscapes that are mostly the subject of transformation are vernacular landscapes and natural landscapes. To approach these landscapes, the dynamics of the underlying landscape system should be considered and the final landscape design should respond to the characteristics of the genius loci of the given site. (Kerkstra 1994). Considering the characteristics of designed regional landscapes, this approach can be seen as incomplete because the vision of the original designer is not mentioned. Furthermore, designed landscapes heavily depend on their network structure instead of their abiotic 'system' layer (Van Etteger 2011). Studies that have addressed designed regional landscapes or their original designers recognise the value of design ideas of famous landscape architects. Designs and design ideas of landscape architects and urbanists as Pieter Verhagen (2000), Alle Hosper (2003), Hans Warnau (2006) and J.T.P. Bijhouwer (2011) are captured, and general ideas about design traditions from the last century are well-documented in books as Halve Eeuw Landschapsbouw (1997) and Maakbaar Landschap (2009) (Andela 2000; Papenborg & Van der Togt 2011). Whether these design ideas can give some inspiration for a redesign is not addressed, although Papenborg & Van der Togt (2011) argue that the implementation of large changes in designed regional landscapes requires further research into the design intentions of designed landscapes. Designed regional landscapes have not been the object of a redesign very often due to the fact that these landscapes are relatively 'new' and, as stated previously, because the importance of these landscapes is discovered recently. As a consequence, a literature gap exists: a certain approach lacks to evaluate and redesign designed regional landscapes.

Original design intentions

1.2 Purpose

To tackle this issue, an approach is needed which evaluates a designed regional landscape. A topic which certainly should be taken into account is the experiential landscape. The term 'experience' is important considering living landscapes because landscapes are designed as everyday environments, so not only the appearance matters, but also things you smell, hear, feel and sometimes even taste (Berleant 1997; Saito 2007). Although designed regional landscapes are designed for functional purposes, ideas about aesthetics played a significant role during their development and these ideas shaped partly the Dutch discipline of landscape architecture (Hudig et al. 1928; Steenhuis and Hooimeijer 2009). Therefore, the focus of this research is dedicated towards their intended aesthetical experience versus their current multisensory field experience.

Evaluation

Experiential landscape

To execute this research more specifically, one case is chosen to manage this research: the Noordoostpolder. The Noordoostpolder can be considered as a good example of a designed landscape because clear ideas existed about the aesthetical experience of this landscape. Furthermore, the original design of the Noordoostpolder is still plainly visible in the field. However, direct motive for this case are contemporary problems which are likely to damage design intentions still visible in the field. The design is vulnerable (Feddes & Van Dooren 1999), because characteristic landscape structures and experiences seem to disappear for the cause of traffic, changing agriculture, and the increasing risk of flooding's. This site invites for further research in order to determine whether the design concept is flexible enough to adapt to new developments and to the demands of the current society in the Noordoostpolder.

The Noordoostpolder

Clearly stated, an approach to determine how to evaluate and redesign designed regional landscapes is missing. This thesis attempts to find such an approach where the original design and intended landscape experience is seen as a key solution to guide future developments and can give inspiration for new plans. In order to achieve this, this research focusses on the designed regional landscape of the Noordoostpolder whereby the emphasis is to design a new beautiful landscape with the original design and intended experience in mind.



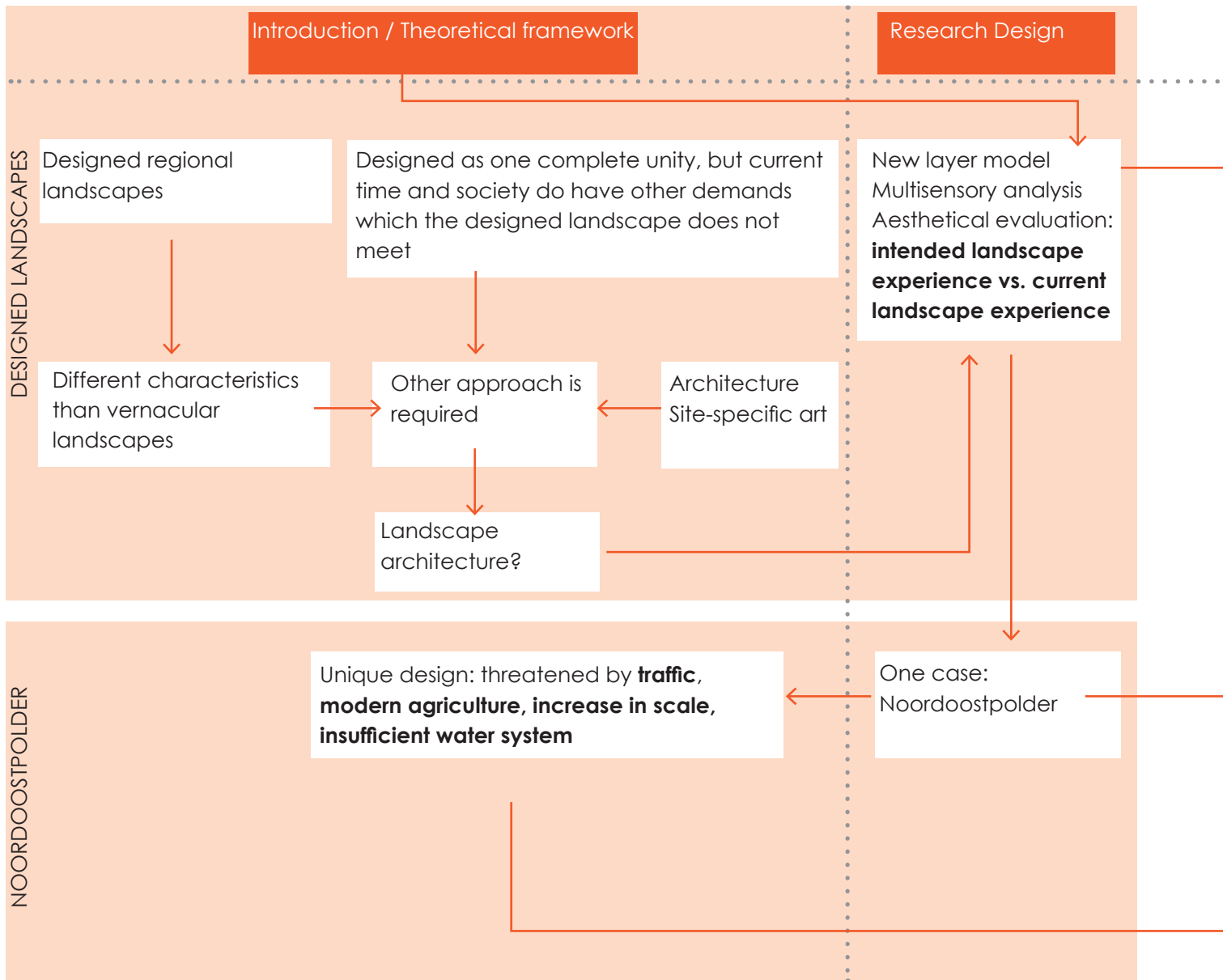
1.4 Increase in scale of farms in the Noordoostpolder

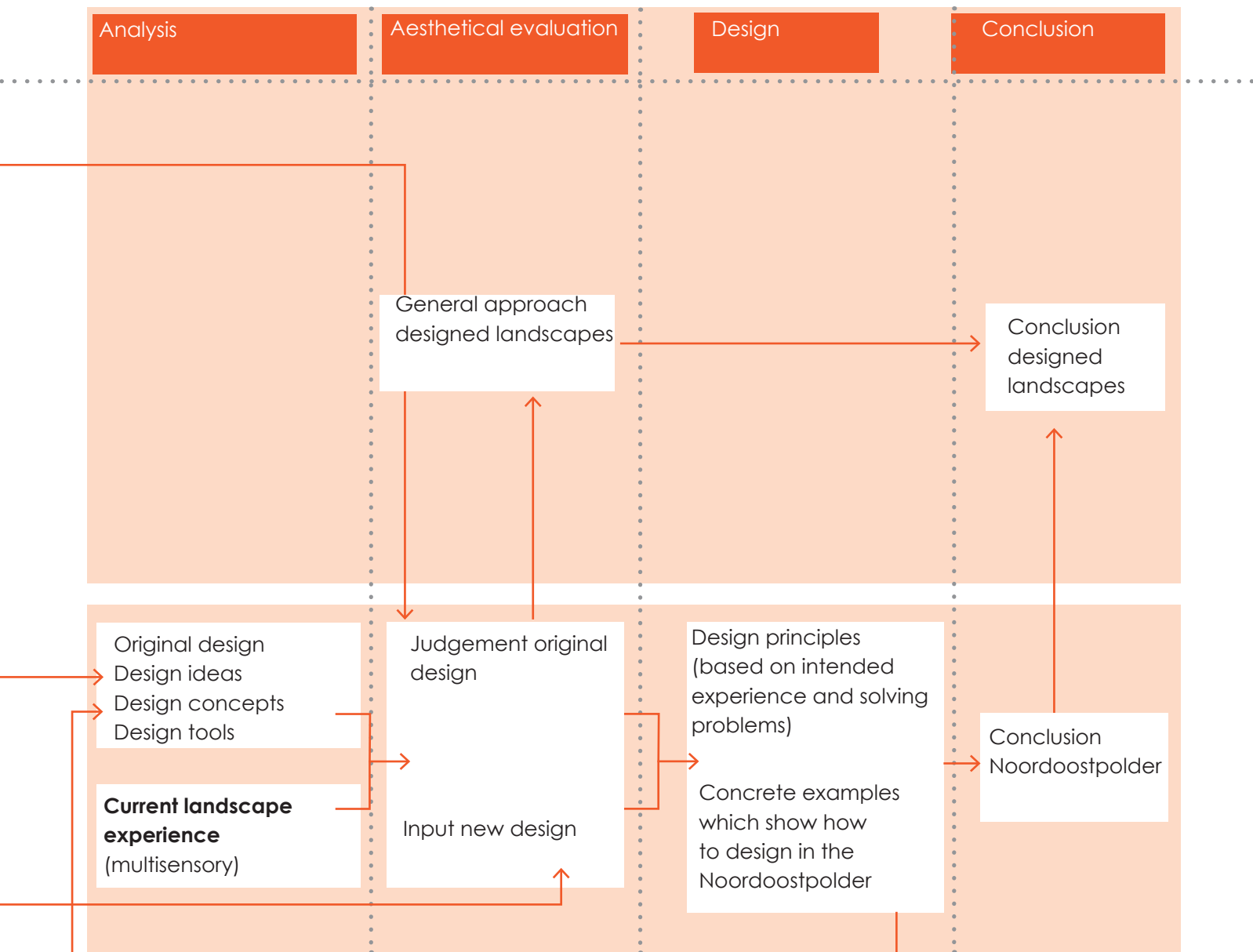
1.3 Outline of the report

Figure 1.5 shows the structure of this report. This chapter has introduced the research topic, explained the main problems, and stated the purpose of this thesis. Chapter two explains the theoretical background in order to gain more insight in the development stage of designed regional landscapes. The characteristics of designed regional landscapes are explored and the way how the landscape is approached multisensory, are discussed. Chapter three elaborates the aim of this thesis and outlines the research questions. The procedures which are used to perform this research are described briefly.

The following chapters are focused on the case for this research: the Noordoostpolder. Chapter four figures out the way this landscape was originally designed, how the landscape is experienced multisensory, and how future developments influence the state of the contemporary landscape. Chapter five evaluates the designed regional landscape of the Noordoostpolder by using several parameters which can identify and guide future developments in a sufficient way, such as an increasing risk of flooding's and modern agriculture (figure 1.4). As Chapter six is explaining some conditions for design and the concept for the Noordoostpolder as a whole, chapter seven and eight explain the two designs for specific sites in the Noordoostpolder. Chapter seven involves a design for a water retention area which uses original design principles in a new way and brings back part of the intended experience. Chapter eight contains a design for a greenhouse area in order to adapt the polder to modern agricultural purposes. Also, at this site the original experience is guiding future developments.

Chapter nine states the conclusions and recommendations for this thesis whereby the research questions are answered and some recommendations for further research are given.



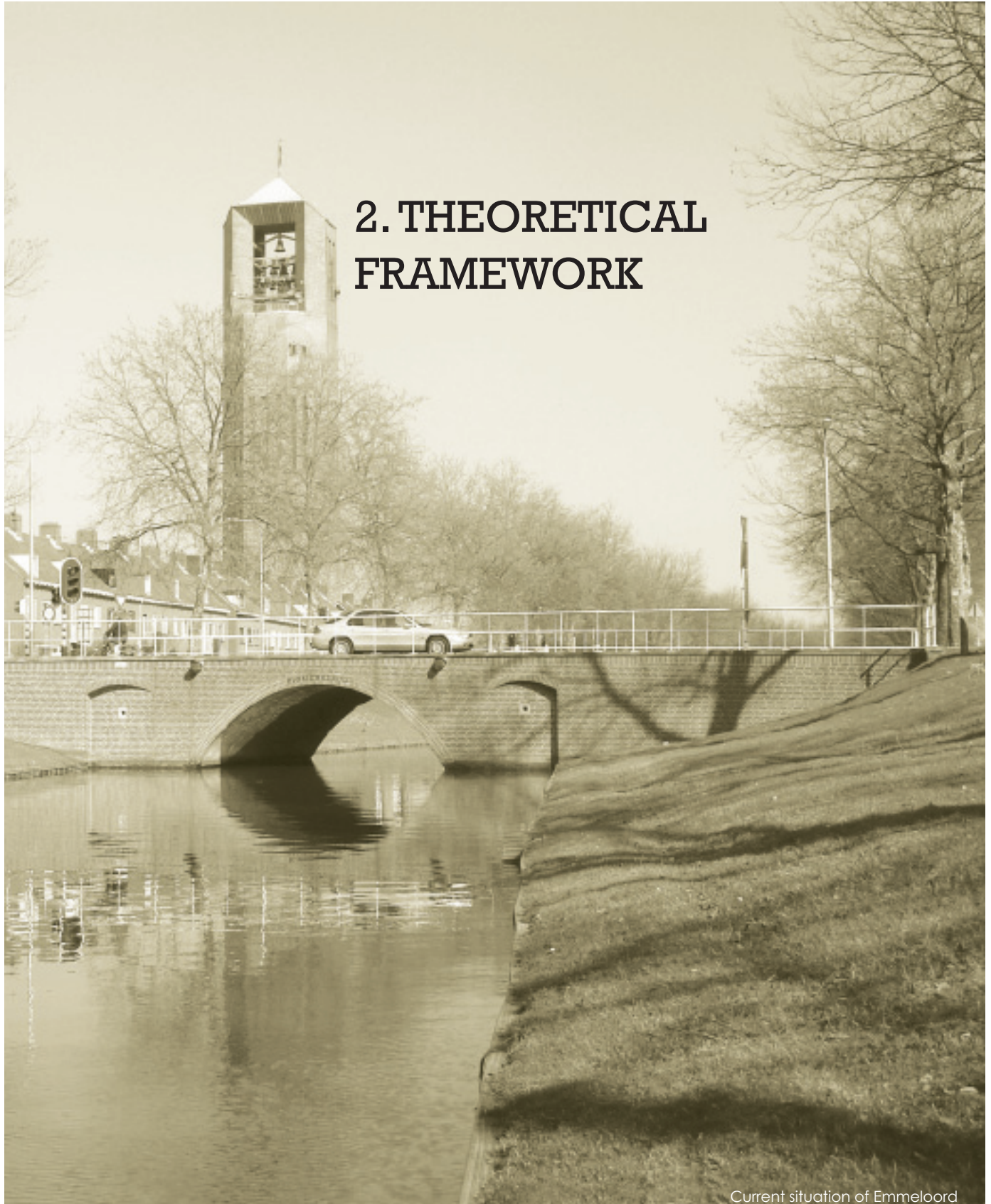


1.5 Research framework



Design for urban square with the central polder tower in Emmeloord (Directie Wieringermeer 1943)

2. THEORETICAL FRAMEWORK



Current situation of Emmeloord

2. Theoretical framework

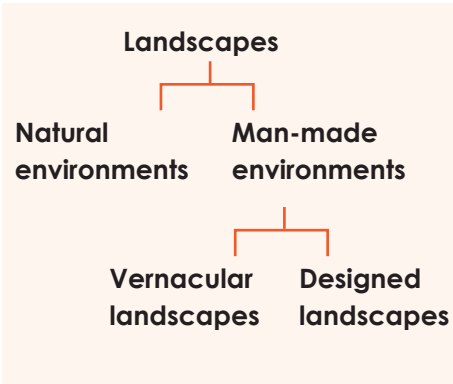
As explained in the introduction, designed regional landscapes face some problems. In order to come up with a good solution and method, this framework explains how this thesis is approached and which theories are used to clarify the subject. Designed regional landscapes have two important characteristics: they are specifically designed by an author as one complete unity and they can be multisensory experienced in the field¹. The first section gives some insight in designed landscapes in general, the specific characteristics of designed landscapes, and their historical background. The second section discusses the way landscape is approached in this thesis whereby sights, sounds and smells play a large role.

2.1 Designed regional landscapes

2.1.1 Natural landscapes and vernacular landscapes

Beauty of natural landscapes

In order to evaluate designed landscapes it is important to understand the difference between designed landscapes and other types of environments which is already discussed briefly in the introduction and illustrated in figure 2.1. First of all, a distinction can be made between natural environments and man-made environments. Natural environments have evolved due to natural processes. These environments are found inherently beautiful because people experience them as having positive aesthetic qualities like graceful, delicate, intense, unified, and orderly (Carlson 2005) Therefore, these environments can never be wrong to human beings because changing natural laws is impossible (Van Etteger 2012). As a consequence, nature can only be evaluated positively as it is part of positive aesthetics (Carlson 2000 in Van Etteger 2012). On the contrary, man-made environments are the result of specific choices human beings have made within the landscape. These choices could have been different, and can therefore be evaluated as well positively as negatively (Van Etteger 2012).



2.1 Different types of environments

Considering the history of man-made landscapes, a further subdivision can be made between two types: vernacular landscapes and designed landscapes (Sijmons 2008 in Blerck et al. 2008). ‘The vernacular refers to distinct landscapes which consist of landscape forms created by people who were not professional designers’ (Dee 2001, p. 41). The vernacular landscape evolves through the centuries because of reclamation, occupation and cultivation (Steenhuis & Hooimeijer

¹ Multisensory experienced is not specific for designed landscapes. Each landscape can be multisensory experienced.

2009). Changes are made by farmers and builders, on a small scale and mostly for functional reasons (Van Etteger 2012). An example of a vernacular landscape is the stonewall landscape in Southern England. One farmer starts to build a wall from stones to enclose his land. Other farmers copy it, and as a result a landscape of stone walls is evolved (Van Etteger 2011). These changes in the landscape can result in beautiful places. However, this beauty is a by-product, not always a specific intention (Van Etteger 2012).

Evolution of vernacular landscapes

2.1.2 Designed landscapes

'Designed landscapes are the coordinated result of reflection before execution, rather than the result of incremental changes' (Van Etteger 2012, p 34).

These landscapes are designed as one unity by professional landscapers who had clear ideas about their appearance (Steenhuis & Hooimeijer 2009; Huls et al. 2011). Designed regional landscapes originate from a vision of the designer, and understanding this origin will enhance understanding of these landscapes (Van Etteger 2012). The vision of the designer or the design intentions are given in maps, drawings and verbal descriptions and should be taken into account during evaluation (Van Etteger 2012). Brinkhuijsen (2008) suggests a way to analyse design intentions. A design is constructed on several levels: design ideas, design concepts, and design tools, which determine the outcome of the final design. The *design ideas* can be considered as design philosophy: a mix of traditions, experiences, knowledge, theories and ideas which become integrated into the design (Brinkhuijsen 2008). These ideas originate from the specific time period where the designer is working in and the vision of the designer (Brinkhuijsen 2008; Papenborg and Van der Togt 2011). Design ideas can only be traced back when they are written down. *Design concepts* represent the essence and the basic principles of the design (Ekkers et al. 1990 in Brinkhuijsen 2008). Furthermore, concepts determine the elaboration into a design and direct and structure the choice for specific design tools (Vroom & Alexander 2006 in Brinkhuijsen 2008). *Design tools* are single or composed spatial elements positioned in a designed environment characterized by form, composition, size and scale, and material (Brinkhuijsen 2008).

Design intentions

Another important characteristic of a designed landscape is the purpose to be beautiful (ECLAS definition; Van Etteger 2012). Designers of designed landscapes, 'landscape architects avant la lettre' can

Purpose to be beautiful

2.2 Vernacular
landscape: stone wall
landscape in Southern
England



2.3 Designed
landscape: the
Noordoostpolder



be considered as professional landscapers as they were concerned with the aesthetics of these landscapes. In the end, they produced a landscape architectural design. Stated like this, designed regional landscapes should meet the requirements for a landscape architectural design defined by ECLAS: *'Landscape architecture involves planning, design and management of the landscape to create, maintain, protect and enhance places so as to be both functional, beautiful and sustainable (in every sense of the word), and appropriate to diverse human and ecological needs'* (Definition by European Council of Landscape Architecture Schools). Also Murphy (2005) recognizes this, by explaining that *'the purpose of landscape planning and design is to guide change in the character of the landscape that will create and sustain useful, healthful and beautiful environments'* (Murphy 2005, p. 2).

Summarized, landscapes contain several stages. First, they are evolved due to natural processes; some natural landscapes are still untouched. Secondly, human beings modified these –natural- landscapes for functional reasons which resulted in the vernacular landscape. Thirdly, large landscape interventions were needed which was performed by professional landscapers. So, a designed regional landscape is a landscape which is designed as one complete unity by an author who had clear ideas about the functional and aesthetical appearance of the landscape. As these landscapes are studied from the field of architectural history (Sijmons 2008 in Blerck et al. 2008), it is important to discuss the architectural background under which these designed landscapes are evolved (Steenhuis & Hooimeijer 2009) in order to gain more understanding about design decisions.

Functional and aesthetical
appearance

2.1.3 Design history of designed regional landscapes

According to Motloch (2001) knowledge of history is important when reading the landscape. He argues that understanding of past decisions prevents us from design mistakes that can be made in the future. Studying designed landscapes requires understanding about their origin because, as Steenhuis & Hooimeijer (2009) state, understanding long lines and traditions in the discipline of landscape architecture can enhance innovativeness in the future. This section discusses the artistic background which shaped the views of landscape architects between 1920 and 1970.

Roughly stated, most designed landscapes in the Netherlands were developed after 1945 (Leeuwen 2009 in Steenhuis & Hooimeijer 2009), but ideas about landscape appearance were developed around 1920 (Andela 2000). Before 1920, design activities were mostly directed to the urban context, such as urban expansions and the

Origin of designed landscapes

construction of residential areas. The influence of the American park system concept, which was later also applied in Germany, provided another mind-set. Landscape in the Netherlands became the object of planning whereby the discipline of landscape architecture arose. Active landscape care -instead of just protecting nature areas- and the creation of new, beautiful landscapes became more often a point of discussion. The Land Consolidation Law of 1924 and the construction of the Zuiderzeepolders started in 1930 were important developments whereby the landscape was increasingly regarded as design task (Andela 2000). From then onward, decisions about land construction were made on a national level. Nonetheless, the urgency for new land became an absolute necessity after the Second World War. New land was used for the cultivation of agriculture and the expanding population. This resulted in major land construction plans such as land consolidation and land reclamation (Steenhuis & Hooimeijer 2009).

Modernism

The dominant art movement in architecture between 1920 and 1970 was Modernism which was founded in rationalism. This movement was inspired by modern science and the speed-up of machine technology, and believed in the unlimited progress of knowledge and social justice (Rogers 2001; Vroom 2005). 'Purity of expression', 'universality of solution', 'breaking with the past', and 'form follows function' were design statements of Modernism (Motloch 2001; Vroom 2005). This is also related to the concept of 'use'. Aesthetical reasons alone were no longer enough in designs. First they had to be legitimized by functional reasoning (Brinkhuijsen 2008). Especially Le Corbusier was an important architect in the Modernist art movement. He strongly influenced the style of rebuilding of the contemporary cities in Europe and Japan after the Second World War where he strove for better living conditions (Rogers 2001).

The influence of Modernism in landscape architecture can mainly be found in the reasons for the construction of new land. Namely as stated previously, the reclamation of the Zuiderzee was focused on use: the production of food and place for the expanding population. Also, other large land interventions between 1945 and 1970 like highways, land consolidation projects, and recreational areas did focus on the concept of use. Therefore, they were in the beginning hardly seen as design tasks for landscape architects, but restricted to the field of culture technique and urban planning (Steenhuis & Hooimeijer 2009). The reclamation of the Zuiderzee and the land consolidation can be considered as a direct motive to think about the appearance of designed regional landscapes. Employees from Staatsbosbeheer (State Forestry Management) who were concerned with professional landscaping were afraid that sanitation of the countryside would lead



2.4 Plan of Le Corbusier for Paris

to mechanical and rational structures and the disappearance of the old Dutch landscape. Therefore, D. Hudig, Th. K. Lohuizen, H.E. Suyver, and P. Verhagen wrote a book (1928): *Het toekomstig landschap der Zuiderzeepolders*.² The main issue of this book was to show that landscape care requires a separate study (Steenhuis & Hooimeijer 2009). Ideas for these designed regional landscapes were a nice living area, harmony between several elements, rhythm and scale, and a plantation system (Hudig et al. 1928; Steenhuis & Hooimeijer 2009). These ideas influenced the appearance of the Zuiderzeepolders for a great deal which will be elaborated in Chapter five.

Although Modernism, which more or less breaks with the past, was the dominant movement between 1920 and 1970, the attitude of landscape architects was significantly different. Designers had a great admiration for the existing landscape and used these old characteristics in new designs (Steenhuis & Hooimeijer 2009). New concepts of use and beauty emerged after 1945 and especially Nico de Jonge, Harry de Vroome, and J.T.P. Bijhouwer were concerned with these aspects (Steenhuis & Hooimeijer 2009). The working area of Harry de Vroome was the old Pleistocene landscape such as Drenthe, Groningen, Overijssel and Brabant. Designing with existing landscape structures was an important aspect of his work. On the contrary, Nico de Jonge was a landscape architect with a conceptual and architectonic approach. He was in favour of new, large gestures which determined the whole landscape: therefore his working area was the Dutch and Zeeuwse delta (Steenhuis & Hooimeijer 2009). An example of such a gesture for Southern Flevoland was to strengthen the border of the large central agricultural area -where the soil was less suitable for agriculture- by the implementation of a large forest on the east side (Feddes & Dooren 1999).

Summarized, many landscapes in the Netherlands are designed and should therefore be considered as historical unities. History is not just the past, but also theory, criticism and interpretation (Steenhuis & Hooimeijer 2009). For centuries, the Netherlands is experienced with the organisation of several functions within a landscape. To be innovative as landscape architects, this historical knowledge is important for the future (Lörzing 1982; Steenhuis & Hooimeijer 2009).

2.2 The experiential landscape

The previous section placed designed landscapes into their historical research context to enhance understanding about their origin. The way the contemporary landscape is approached in this thesis is derived

Landscape architects



2.5 Book: 'Het toekomstig landschap der Zuiderzeepolders'

² The future landscape of the Zuiderzeepolders

from the landscape approach in which landscape is seen as starting point and central point for interventions. The majority of architectural related discourses still see landscape primarily as scenery (Koh 2008). Nevertheless, landscape should also be considered as experiential phenomena and context, geographical, ecological system and process (Koh 2008). A landscape should be responsive to change, context and culture instead of prescriptive and end state-directed (Koh 2008). Therefore, the layer approach is used which considers landscape as a system and shows the interactions between man and nature. To get grip on experiential phenomena in the landscape, the landscape is approached multisensory in order to define the aesthetical field experience.

2.2.1 The layer approach

'Any place is the sum of historical, physical, and biological processes, that these are dynamic, that they constitute social values, that each area has an intrinsic suitability for certain land uses and finally, that certain areas lend themselves to multiple coexisting land uses' (McHarg 1969, p. 104)

Landscape as starting point

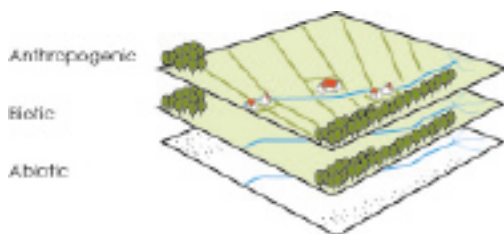
The layer approach sees landscape as a starting point for future interventions. Ian McHarg can be considered as the founder of the classical layer-approach, an analytical tool to reduce landscape complexities. Kerkstra & Vrijland (1988, in Duchhart 2007) developed these thoughts into a model whereby the landscape is separated in three different layers:

- Abiotic layer: consists of bedrock, soils, rivers, and climate
- Biotic layer: consists of patterns of vegetation and fauna
- Anthropogenic layer: consists of patterns of dwelling, agriculture, roads, villages, and cities (Duchhart 2007).

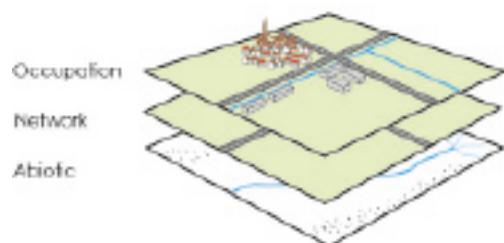
Landscape is under influence of several changes for the cause of human interventions and natural laws. Each change influences its own layer (Kerkstra & Vrijland 1988 in Duchhart 2007).

Designed landscapes were not only structured by their soil-dependency, but also - and more importantly- according to networks of infrastructure. Therefore, the new landscape approach is also required to understand designed regional landscapes. The new layer approach structures modern landscapes according to the following layers:

- Abiotic layer which consists of bedrock, soils, rivers and streams, and climate;
- Network layer which consists of infrastructural networks such as seaways, rivers, roads, electricity lines, ports, airports, nodes and concentrations of people;



2.6 Classic layer approach



2.7 New layer approach

- Cultural layer which consists of patterns of human settlement and activities depending on trade, cycles of development and recession and depression (Van Etteger 2011).

To understand designed regional landscapes, both approaches will be applied.

2.2.2 Multisensory approach

In order to gain a comprehensive image of designed regional landscapes, they should be approached multisensory which is explained in this section. Manmade environments are closest to our everyday life. They are the so-called 'everyday environments' that receive our care and that we care for (Van Etteger 2012). The way designed landscapes are experienced as everyday environments by people is addressed in the first section. Landscape surrounds us and its experience addresses all of our senses. Therefore, landscapes have multisensory qualities (Zube et al. 1982; Gobster 2008). This research also addresses, apart from sight, sound and smell as senses that are inextricably linked to landscapes because they determine for a large part the landscape experience and can give information about things hidden to the eye. According to Ingold (1993) the sights, sounds and smells we experience constitute the specific ambience of a landscape which will be explained in the second section. He considers taste and touch as less important for landscape experience. Hence, these senses are not addressed in this research.

Everyday environments

The experience of everyday environments can be divided into experience of strangeness and experience of familiarity (Haapala 2005). In a strange setting, our senses are more alert than in a familiar environment, and therefore things are more appreciated or disliked because they are new. (Haapala 2005) On the contrary, in familiar environments, objects call our attention when they are changed (Haapala 2005). Familiar environments or everyday environments are appreciated because of a kind of attachment: we have a kind of bond that is called 'attachment' to our home region. Haapala 2005, p. 50) illustrates this:

Experience of strangeness

Experience of familiarity

'Ordinary everyday objects lack the surprise element or freshness of the strange, nevertheless they give us pleasure through a kind of comforting stability, through the feeling of being at home and taking pleasure in carrying out normal routines in a setting that is "safe."

This means we are in control of our surroundings, but most of the time the extraordinary is hidden. However, even the everyday aesthetics

can be experienced consciously, to simply become more aware of the pleasurable things of everyday life (Haapala 2005). Designers can enhance the experience of everyday life by structuring sights, sounds, and smells which evoke nice feelings (Brown & Muhar 2004). Furthermore, the function of dwelling for a place can enhance an aesthetic experience which is illustrated by Spirn (1989, p. 89):

'The specific aesthetic experience of dwelling comes from 'making and caring for a place, as well as contemplating these labours and their meanings'... 'It is through cultivation and construction that individuals and societies forge a place that reflects their own identity- their beliefs, values and dreams' .

Sight, sound and smell

Sight

Sight is always seen as the most important sense of human beings in western culture (Saito 2007). This is not that strange as sight is the most obvious way for a human being to make his or her way into the world. Spatial compositions and other information reaches you through the eyes and most people are regarding sight as their most valued sense (Tuan 1990). Elements which are found mainly visual pleasurable in landscapes are symmetry, repetition, surprise, balance and the use of colour combinations (Karmanov 2009). In line with that, according to Kaplan and Kaplan (1989), elements that people appreciate in landscapes are complexity, legibility, coherence and mystery. They argue that humans appreciate environments that provide rapid, comprehensible information. Also, the practise of planning and design is for a large amount visual oriented. Therefore, it lacks concepts, models and reference objects dealing with other sensory impressions than the visual (Hedfords 2003).

Sound

Sounds have a large impact on the landscape experience (Schafer 1977) and are important to discuss because they transmit information about their surroundings (Hedfords 2003). In former times, survival was a continuous struggle in landscapes against the dangers of nature. Soundscapes were definitely of greater importance than visual properties of landscapes because danger was first heard and then seen (Schafer 1977). Even in our current society, we heavily depend on sound to warn of possible danger, such as the cry of a baby, the loud sirens of a fire truck, or impact of a large tree in a storm (Blessner & Salter 2009). Murray Schafer first came up with the term soundscape which consists of 'events heard not objects seen' (Schafer 1977, p. 8). A soundscape does not only indicate noises, but also other sounds such as twittering of birds, water sounds, and the rustle of leaves that identify a place (Szeremeta & Zannin 2009). The soundscape of a place consists of its sonic or acoustic environment, with the receiver or



2.8 Dense forest: sight is restricted

listener at the centre of the sonic landscape (Porteous & Mastin 1985 in Brown & Muhar 2004). Landscape character can be defined by sounds which are heard (Hedfords 2003). By judging sounds, a conclusion can be formed about the current landscape experience. Although Schafer (1977) argues that sounds are personal, Brown & Muhar (2004, p. 834) distinguish wanted and unwanted sounds:

- Wanted sounds: church bells, sounds of nature, sounds of city vitality, footsteps, sounds of running water, music, twittering of birds, sounds of insects and frogs, sounds of festivals and fireworks, wind movement in trees and grasses, wind chimes, etc. Wanted sounds are mainly natural sounds and sometimes specific cultural sounds.
- Unwanted sounds: road traffic, human sounds, amplified music, machinery noises.

The concept of smell is even less addressed in research than sound. Smell is powerful because it is a very basic emotion arousing sense (Porteous 2006), so odours can affect us on physical, psychological and social levels. Smell can be used as a means of spatial orientation and localisation, especially in places where sight is restricted, for example in forests (Classen et al. 2003). But also different local odours in a city can create the effect of an olfactory map whereby inhabitants can explore their city by a way of smell (Classen et al. 2003). Even in landscapes in general, scent is important to investigate because it can play an important role in the identification of a landscape through its sensory characteristics (Coeterier 1996).

Smell

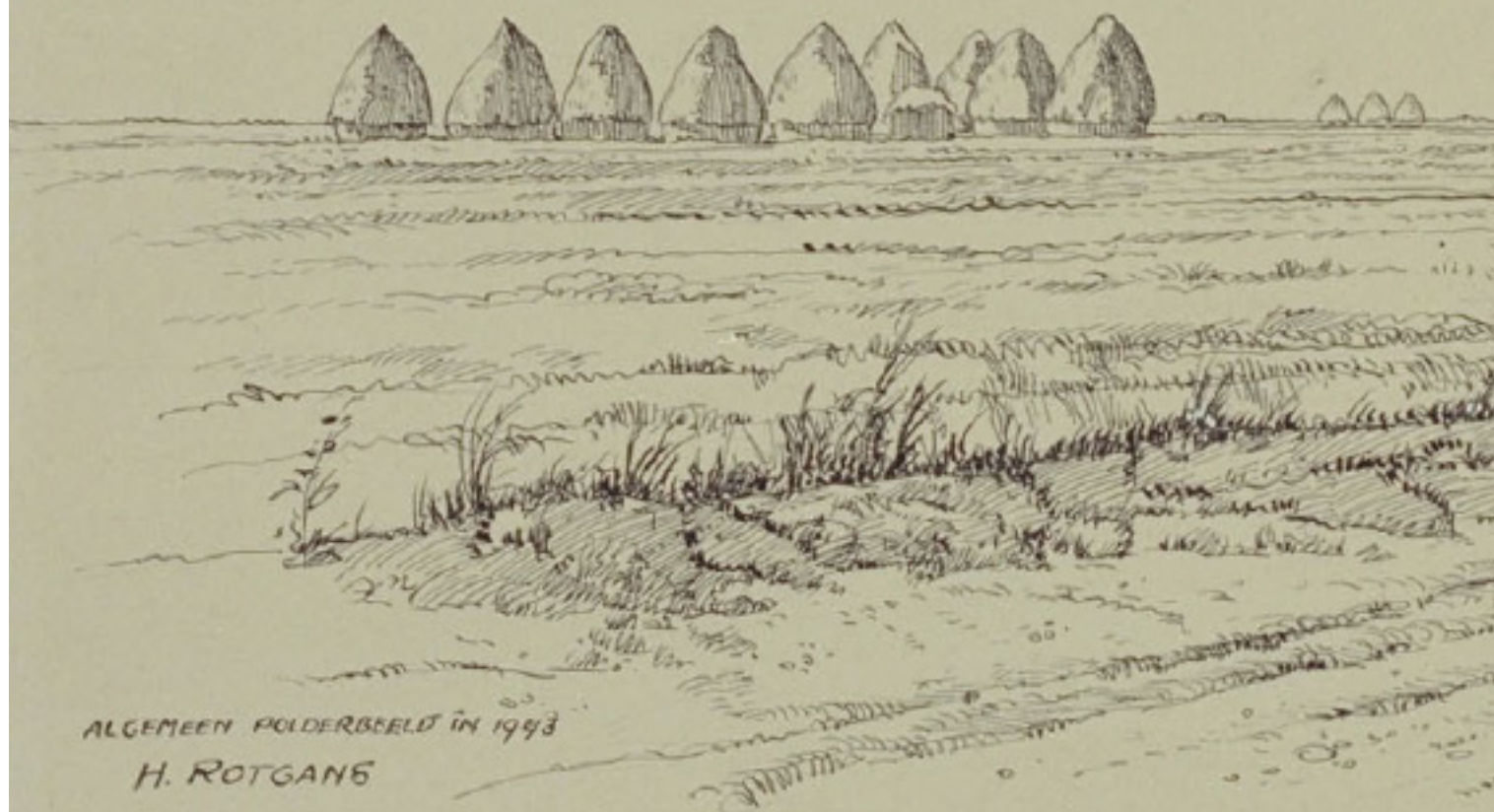
A scent which is associated with a good experience can bring a rush of joy. So, a nicely scented environment is likely to be evaluated highly by many people. However, smells are always associated with experiences and emotions, so it differs per person which smells are preferred. This makes it quite difficult to design with smell, although there are some smells (flowers, freshly mown grass, and bread) which are mostly generally preferred by people (Porteous 2006). One design principle considering smell can be found on the small scale: 'the European medieval garden was traditionally walled, so that the scent of the aromatic herbs and flowers was intensified in this enclosed space' (Classen et al. 2003, p. 65).

Designing with sounds and smells is possible by means of zoning. Masking occurs when the sounds we wish to hear are rendered inaudible by other sounds (Brown & Muhar 2004). For example, bird sounds cannot be heard when they are masked by the noise of road traffic. This is also the case for smells: due to increasing 'smognification' the diversity and subtlety of smellsapes is overwhelmed by odours of metal, oil and

exhaust fumes. As a result, the principle of blandscape evolves: the area becomes so empty of stimuli that a sense of placelessness alienates (Porteous 2006). This means that it is not possible anymore to spatially orientate yourself by ways of smell, which is a pity because aromatic places remain a significant influence in memory, personal history and sensory cultivation (Porteous 2006). Therefore, pleasant environmental odours should be promoted in order to avoid moving through a future blandscape (Porteous 2006).

The Noordoostpolder

Considering the Noordoostpolder, analysing sounds and scent apart from sight is expecting to have a significantly different result. The Noordoostpolder is designed with an idea about its appearance, but also the intended experience was described: this landscape was meant for dwelling (Steenhuis et al. 2007). Many elements can change in seventy years: comparing the original experience to the current landscape experience will probably give an interesting perspective which cannot be achieved by just analysing sights. For example, the Noordoostpolder was designed as predominantly agricultural landscape, but due to changes in agriculture, differences in scent (heavy smell of manure instead of smell of crops) and sound (noise of agricultural machinery instead of human sounds on the land) is expected.



ALGEMEEN POLDERBEELD IN 1993

H. ROTGANS

3. RESEARCH DESIGN



Drawing of the polder just after reclamation by H.J. Rotgans 1943-1947

3. Research Design

3.1 Aim of the research and research questions

Designed regional landscapes are significantly different from natural and vernacular landscapes in the sense that they are vast projects, designed from a vision about the regional level to the local street level. The main characteristics of designed regional landscapes consist of the vision of the author given in descriptions and drawings, their multisensory qualities, and their purpose to be beautiful. Therefore, designed landscapes are in this research approached as the result of design ideas which shaped the original appearance and experience of these landscapes. As these landscapes are designed as one unity, but also under influence of changes, they should be adapted in order to maintain a working landscape for the future. How to do this has however not been investigated yet. Therefore, the goal of this research is:

To gain knowledge and understanding of the characteristics of designed regional landscapes in practice, and to develop an approach which evaluates and redesigns designed regional landscapes by the use of an exemplary case: the Noordoostpolder.

Aim of the research

This goal can be divided in two specific aims:

- to develop and test a specific approach for designed regional landscapes;
- to create a redesign for the Noordoostpolder with the original design in mind.

To achieve these aims, one main question is formulated and divided into four sub questions. These two aims have shaped the research questions and the type of research that is conducted to perform this research.

Main question

Main question: What approach can be developed to evaluate and redesign designed regional landscapes which evolved after 1920?

1. What are the characteristics of designed regional landscapes?
2. What were the original design intentions for the Noordoostpolder?
3. To what extent can the original design ideas be experienced in the contemporary landscape of the Noordoostpolder?
4. How can future developments contribute to the reinvention and restoration of original design intentions in the Noordoostpolder?

The type of research that is conducted to perform the research will be described briefly. As illustrated in the figure 3.1, each research question requires specific procedures in order to gain answers. To achieve more clarity, the research questions are structured in order of time. To understand and redesign a designed landscape, several stages can be distinguished: pre-designed landscape, designed landscape, developments, and a new design. Each stage requires also different research procedures (figure 3.1).

3.2 Research strategy

The overall research strategy is evaluative research. In general, 'evaluations are used to measure current conditions or outcomes against a predetermined standard by using norms or parameters' (Deming & Swaffield 2011, p. 51). The goal of such an evaluative study is that it contributes to better decision making by designers, planners and

Evaluative research

Time	History	Present	Future
	Pre-designed landscape and designed landscape	Contemporary landscape	New landscape
	What are the characteristics of designed regional landscapes? What were the original design intentions for the Noordoostpolder?	To what extent can the original design intentions be experienced in the contemporary landscape of the Noordoostpolder?	How can future developments contribute to the reinvention and restoration of original design intentions in the Noordoostpolder?
	Procedures		
	Literature study Document study Archival research Map study Old layer model Visualisation of findings	New layer model Fieldwork: multisensory analysis Aesthetical evaluation	Interview municipality Sketching to evoke ideas Designing (different levels of scale) Structuring sounds and smells

3.1 Research Design

policymakers (Zube 1984). One case study should be used to evaluate over time, to investigate if the design performed as the designer promised (Deming & Swaffield 2011). For this research, the Noordoostpolder is chosen as case. The Noordoostpolder is almost designed like a blank sheet: only the smooth surface of the Zuiderzee, the connections to the mainland, and the location of the two former islands Schokland and Urk determined the landscape appearance (Steenbergen et al. 2009). Every other function was specifically designed and well-documented in sketches, drawings and descriptions. The original values and standards consist of design ideas for the Noordoostpolder. It was designed seventy years ago; therefore it is interesting to evaluate how this site has developed over time. The Noordoostpolder is therefore considered as a good example of a designed regional landscape and chosen as case.

3.3 Research procedures

The procedures that are used which require some explanation are described below in order of time. A design analysis and the new layer model are necessary to understand the original designed landscape. The multisensory analysis provides information about the experience of the contemporary landscape in the field whereas the aesthetical evaluation derives several parameters which can guide future developments in the Noordoostpolder in a sufficient way.

Design analysis

Original design

The design intentions are given in maps, drawings and verbal descriptions and should be taken into account during evaluation (Van Etteger 2012). A design is constructed on several levels: design ideas, design concepts, and design tools. To investigate design ideas, books from the original designer(s) and about the original designer(s) are studied in order to determine what the design intentions were. The book of Hudig et al. (1928) about the appearance of the Zuiderzeepolders contains many design ideas. Design concepts are sometimes visualised in old drawings and sketches which can be partly found – in case of the Noordoostpolder- in the archive of Nieuwland, a museum about the Zuiderzeepolders. Design tools of the original design can also be found in books, descriptions and drawings. As many design ideas, concepts and tools consist of a description, visualisation of the intentions is an important step during the design analysis in order to enhance a better understanding about the design intentions for the Noordoostpolder.

The new layer model

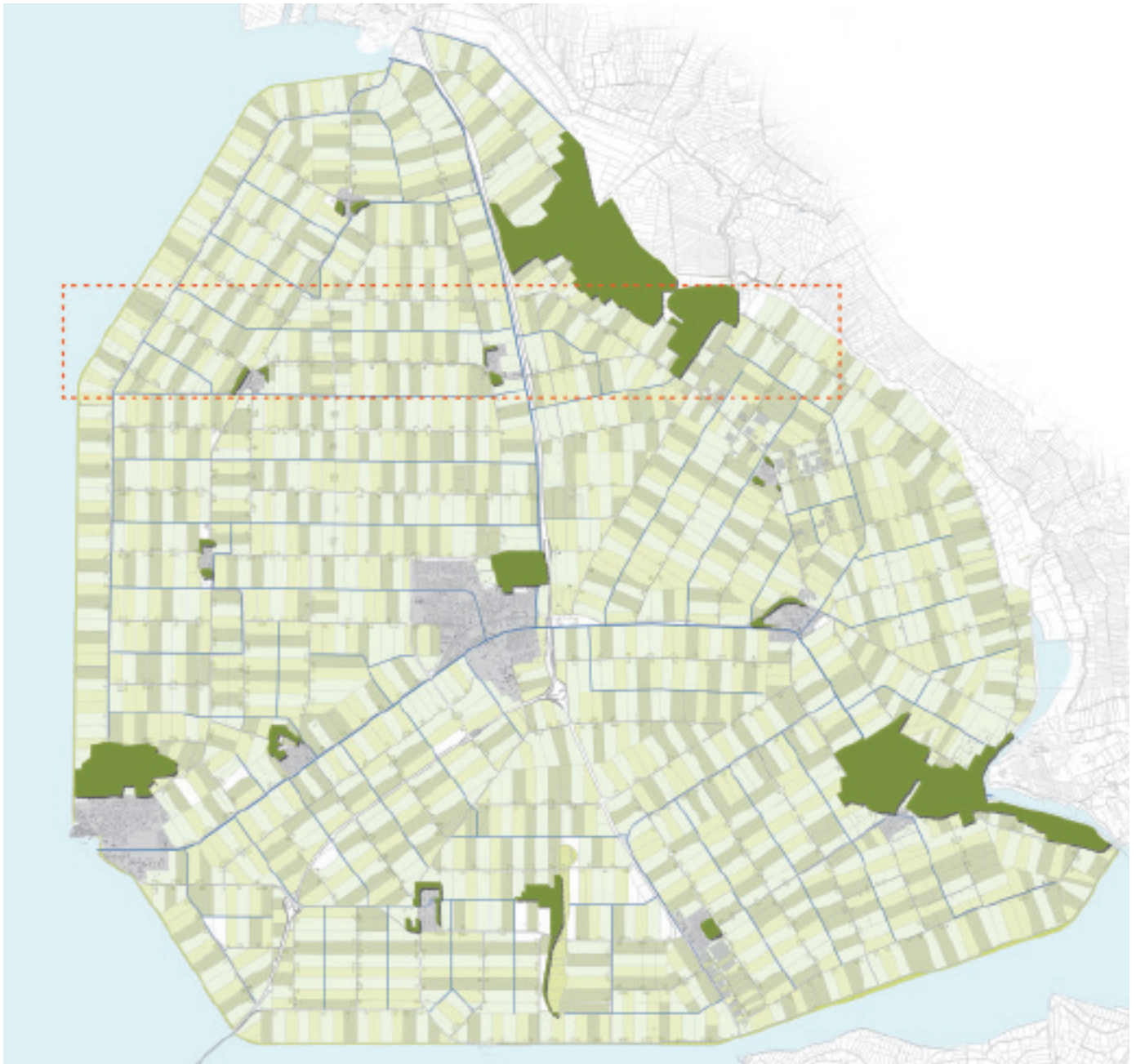
The new layer model will be applied to get a complete overview of the Noordoostpolder. Each layer - abiotic, network, cultural- will be analysed

by a map study. Main conclusions of each layer are combined in order to gain a comprehensive image of the existing landscape structure.

Multisensory analysis

As explained in the previous chapter, sight, sound, and smell should be taken into account to define the landscape experience. These senses are used to gather information during fieldwork. The Noordoostpolder is a large area; it will therefore be impossible to analyse the whole area

Current landscape experience



3.2 Fieldwork area

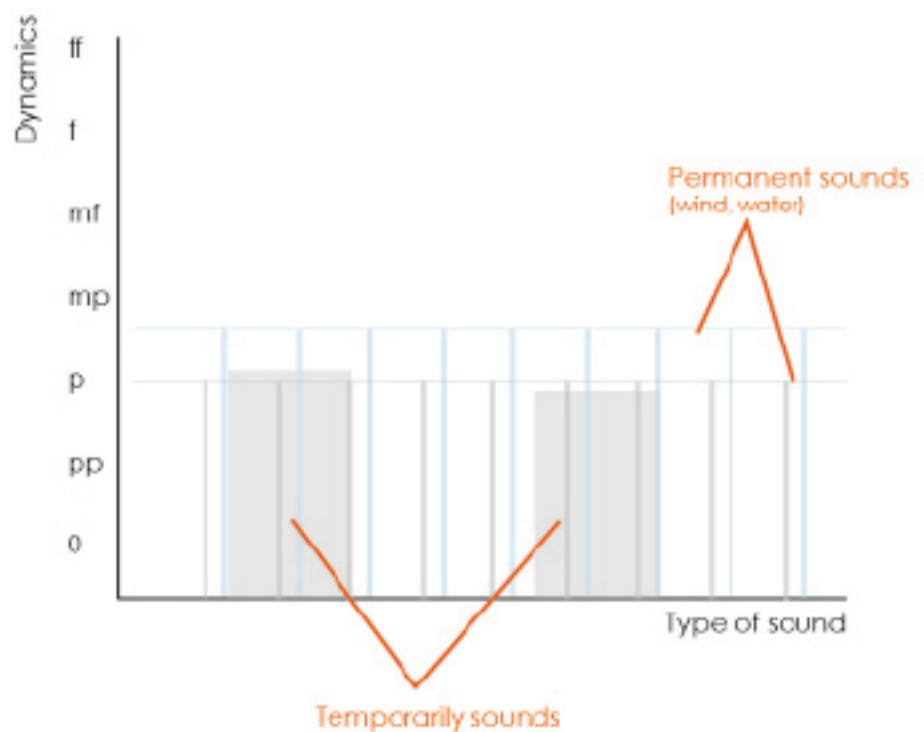
multisensory. One strip of the Noordoostpolder is chosen for fieldwork (figure 3.2) where many changes in landscape appearance and experience are expected. Starting point is the dike, one of the edges of the Noordoostpolder. When moving through the area by walking and cycling, places where changes in sounds, smells or sights are noticed are measured. Each place will be analysed by photographs, panoramas, drawings, sound notations, sound recordings, and smell notations. Overall goal is to capture all the different landscape unities of the Noordoostpolder and to determine whether landscape experiences have changed over time.

Analysing sights

The visual aspects of the Noordoostpolder are inventoried by making photographs, panorama's drawings, and map analyses. Photographs are used to create a clear image of the current landscape. Visual notes as concepts, structures, and schemas are used to clarify and explain certain conclusions: it directs to aspects with cannot be immediately seen through a camera (Crowe & Laseau 1984).

Analysing sounds

Analysing sounds in landscapes requires a different method:
'It is less easy to formulate an exact impression of a soundscape than of a landscape. There is nothing in sonography corresponding to the instantaneous impression which photography can create.' (Schafer 1977, p.7)



3.3 Sound Chart

The first step in analysing soundscapes is to discover the significant features of a soundscape, made up by the sounds which are important because of their individuality, their numerousness, or their domination (Schafer 1977). Kersten & Noordhuizen (2011) developed a method derived from Schafer (1977) to analyse sounds within a landscape which is partly applied to this research. Whereas the Noordoostpolder is relatively large and monotonous, sound conceptions are only written down when changes in the area are noticed. The sound notations are conducted by me as observer. The advantage of one observer is unity in sound notations, while the disadvantage is subjectivity. To minimize the effect of subjectivity, the sounds are also recorded. When moving through the area evokes specific sounds which are part of the area -for example leaves on the ground in a forest which are rustling- sounds are conducted by moving through the landscape. Sounds are presented in a chart, using the notation ff, f, mf, mp, p, pp, 0 (whereby ff is very loud and 0 is silence) (Schafer 1977 in Kersten & Noordhuizen 2011). An example of such a chart is showed in figure (3.3).

How smell can be used in landscape analysis and design is hardly addressed in research. Fact is that smells are difficult to capture or to record because each odour is a complex mixture of hundreds of volatile chemicals (Margolies 2006). Smells and sounds are quite identifiable in the present, but they are hard to preserve. We do not know what the past smelled like, and we also do not know by how many decibels the noise level may have risen for a comparable period of time. Therefore, descriptions are the best guide available in the reconstruction of sound- and smellscape of the past (Schafer 1977; Classen et al. 2003). Smells can only be described by the reference to the things from which they emanate, for example the smell of grass, the smell of manure, the smell of salt (Classen et al. 2003). Mapping smells is difficult because smells are temporary and transitory whereas conventional maps are made of permanent features (Margolies 2006). Smells are also written down on each measure point to give an overview of scent in the Noordoostpolder.

Analysing smells

Aesthetical evaluation

Designed landscapes which are designed with the purpose of being aesthetical appealing should also be aesthetically evaluated to determine if the design is successful (Van Etteger 2012). Consequently, this research requires an aesthetical evaluation. In order to guide future developments, the current landscape should be evaluated using four parameters derived from literature. The first parameter is aesthetical appealing: the intended landscape experience which was found in the design analysis is compared to the current landscape experience which was found in the multisensory analysis. However, landscapes

Aesthetical appealing

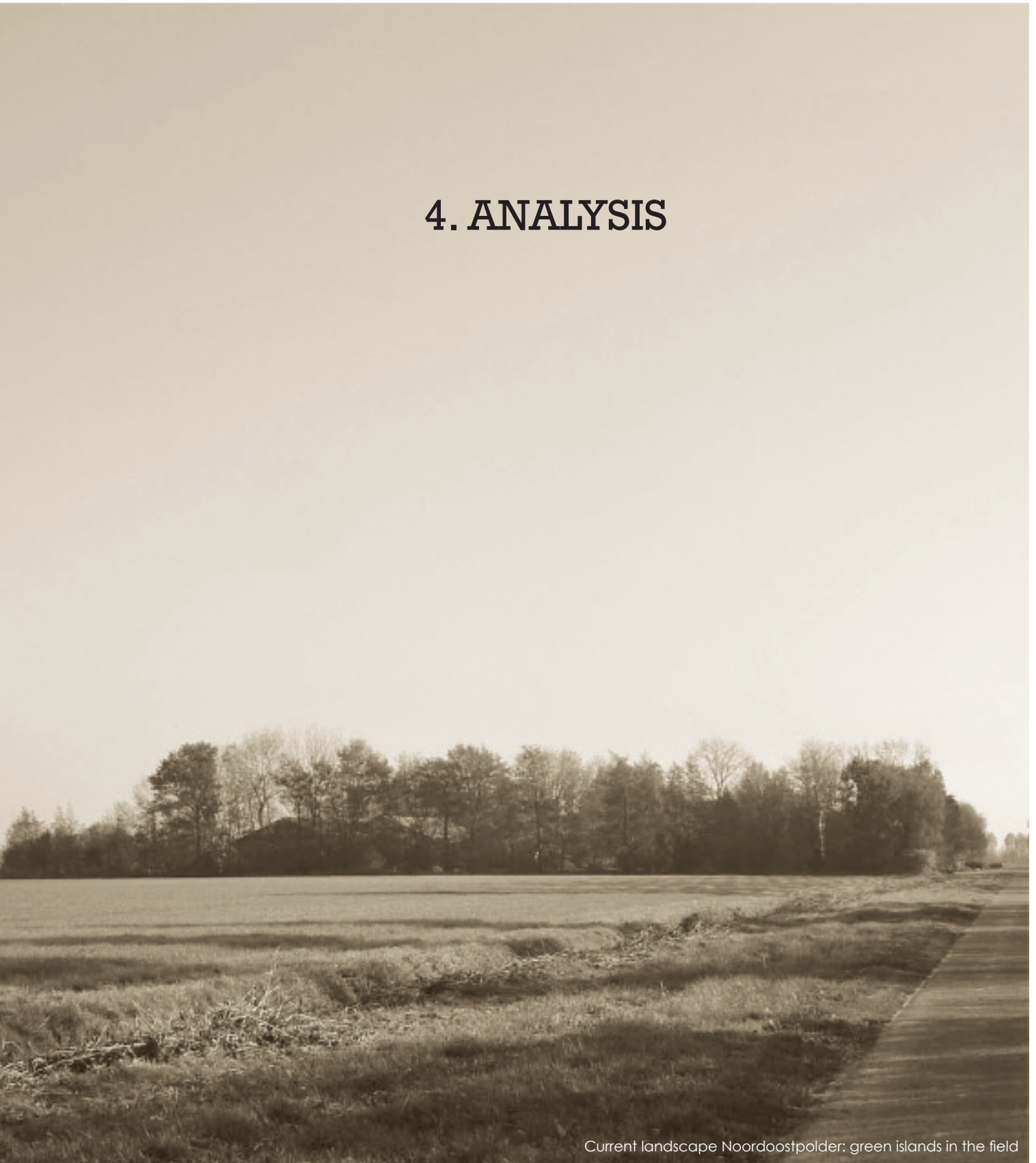
Functional also have other functions such as functionality and durability which concerns the second parameter (Van Etteger 2012). How to investigate which elements do not function properly, policy documents are investigated and the municipality of the Noordoostpolder and Water board Zuiderzeeland are interviewed briefly.

Unique Saito (2007) comes up with another factor for evaluation: uniqueness. She argues that landscapes which are unique and aesthetically superior to the rest of the world will provide a ground for nationalism. '*Landscape identity can be found by distinguishing itself from other landscapes*' (Saito 2007, p. 67). To determine which landscape elements are unique in the Noordoostpolder, a comparison will be made to three other landscapes which are similar: Wieringermeer, Eastern Flevoland and Southern Flevoland.

Missed opportunities Designed regional landscapes are different in the sense that they could have been different (Van Etteger 2012). Their end goals can be wrong or their design tools which are used to achieve these certain goals can be wrong. For example, interesting landscape characteristics may not be used in the original design which can be considered as a missed opportunity. Therefore, the fourth parameter is missed opportunities of the original design. Thus, the Noordoostpolder should be evaluated on aesthetical appealing, functional, unique and missed opportunities.



4. ANALYSIS



Current landscape Noordoostpolder: green islands in the field

4. Analysis

The Zuiderzeepolders

The Noordoostpolder is an example of a designed regional landscape and chosen as specific site for this thesis. This polder is one of the four Zuiderzeepolders, which can be seen as the largest ambitious land reclamation project in Dutch history (Geurts 1997). This project involved several stages which will be described briefly. First, the Afsluitdijk was built to enclose the Zuiderzee. Secondly, a test polder near Andijk was created to experiment with possible soil structures for agriculture. Finally, between 1930 – 1968, the Wieringermeer (1930), the Noordoostpolder (1942), Eastern Flevoland (1957), and Southern Flevoland (1968) were constructed. This resulted in 166.000 hectares of new land (Feddes & Van Dooren 1999). The planned fifth polder, the Markerwaard, has never been constructed for several reasons (Geurts 1997). Due to the fact that the capital, Lelystad, was planned in Eastern Flevoland and because Eastern Flevoland was situated closer to the Wieringermeer and the Noordoostpolder, the construction of the latter was of more importance than the construction of the Markerwaard. Also, Southern Flevoland had a higher priority due to its location close to the Randstad where expansion was necessary for the growing population. Subsequently, the extra surface of the Markerwaard was unnecessary (Geurts 1997; Feddes & Van Dooren 1999). The Dutch polders were traditionally designated for functional purposes like new farmland, but especially during the design phase for the Noordoostpolder, aesthetical considerations also played a role (Steenbergen et al. 2009).

This analysis is set up in three sections. Considering designed regional landscape, the original design is extremely important; therefore this is discussed in the first section. The second section describes the appearance and experience of the current landscape of the Noordoostpolder while the third section deals with future developments.

4.1 Original design of the Noordoostpolder

As explained in chapter three, the original design for the Noordoostpolder is analysed using three different concepts: design ideas, design concepts and design tools.

4.1.1 Design ideas

Ir. C. Lely

The original plan for the construction of the Zuiderzeepolders was designed by Ir. C. Lely and consisted of four large pieces of new land in the Zuiderzee. This new land was required for the expansion of agriculture (Feddes & Van Dooren 1999) and plans were only directed towards civil engineering in order to gain maximum profit. The first

landscape architects –although the title of landscape architect did not exist yet (Steenhuis & Hooimeijer 2009) – were afraid that plans for these polders were not concerned with the aesthetical component and landscape experience. They argued that the planned geometric structure of squares from two by two kilometres would lead to a monotonous repetition in the landscape (Steenbergen et al. 2009). Therefore, D. Hudig, Th. K. Lohuizen, H.E. Suyver, and P. Verhagen wrote a book in 1928: *Het toekomstig landschap der Zuiderzeepolders*. This book was structured according to general, philosophical ideas about designing landscapes which were almost blank sheets towards more specific ideas about the appearance of landscape elements.

*Het toekomstig landschap der
Zuiderzeepolders*

First, they discussed some conditions which they considered as significant for the Zuiderzeepolders:

- *'The requirements for life such as traffic, settlement, business and leisure should fit within one solution, a beautiful form. Each requirement is important: bring them together in the right way will give this landscape power and unity'* (Hudig et al. 1928, p. 2, translated by the author)³.
- *'The character of the new landscape should be contemporary. It should be constructed on the basis of strict objectivity which should be expressed in the rational field pattern and network structure. Also, requirements for human needs should be integrated in the landscape'* (Andela 2011, p. 56, translated by the author).
- *'Dwelling should form the basis of this new landscape'* (Steenhuis et al. 2007). *'Only a landscape which was more than a reflection of the farm will make sure that inhabitants feel at home'* (Verhagen in Steenhuis et al. 2007, p. 347, translated by the author).

Roughly stated, this new landscape should become a powerful, contemporary landscape which differed from existing landscapes in the Netherlands. *'The polder landscape cannot be a copy of beautiful landscapes elsewhere in the country'* (Overdijkink 1946 in Steenhuis & Hooimeijer 2009, p. 183). Furthermore, the writers argued that striving for beauty should be an important goal in the design (Hudig et al. 1928).

A powerful contemporary landscape

Secondly, Hudig et al. (1928) analysed several existing polder landscapes in order to determine how beauty could be created as they argued that beauty will not arise out of nowhere. On the one hand, the Beemster was seen as an inspiring example, but applying this

The Beemster

³. All citations of the Hudig et al. (1928) are translated by the author from Dutch. The original quotes can be found in the appendix

concept to the Zuiderzeepolders was not possible. A repetition of that same structure was seen as boring for the Zuiderzeepolders because they were of larger scale than the Beemster (Hemel 1994). On the other hand, the Haarlemmermeer polder was considered a bad example of a designed polder landscape because designers did not make effort to beautify this polder (Feddes & Van Dooren 1999). A comparison to the old South-Holland area made clear that landscapes which are built-up from the same elements (roads, water ways, buildings, field pattern, and plantation) can have a complete different appearance in the field. These elements should also be used to shape the new polder landscapes (Hudig et al. 1928).

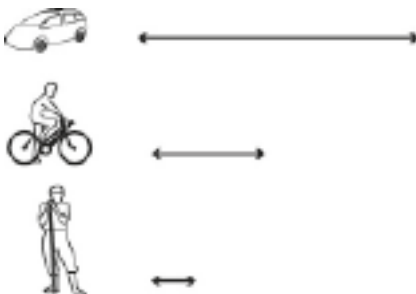
The appearance of the Zuiderzeepolders

Thirdly, after analysing existing landscapes, plans for the appearance of the Zuiderzeepolders were described concrete. The landscape character should consist of human creation, partly architectonic enclosed, partly a large, wide area without trees (Hudig et al. 1928). The creation of powerful contrasts of mass and space, bound to a straight structure should enhance rhythm and scale in the polder. In order to achieve this, trees should be divided in groups over the land, and villages should be surrounded by forest (Steenbergen et al. 2009). Villages, farmyards, and roads should be planted to enhance contrast between these massive structures and the empty space of the polder. Local roads should remain empty, so that space and size corresponds to the enormous land (Hemel 1994).

Stratification of society

The Haarlemmermeer

Apart from design ideas, there were also ideas about the organisation of the society. When the land was constructed, a new society should be capable to maintain the land. After realization of the Haarlemmermeer polder, every farmer who was able to pay for new land was invited to farm in the Haarlemmermeer. This was a spontaneous process without any selection procedures. As a result, bad conditions such as poverty and alcoholism occurred because some farmers were not suitable to farm under hard conditions in a bare and windy polder. Finally, after three generations, the agriculture in the Haarlemmermeer polder was on a proper level. To avoid such a situation in the Zuiderzeepolders, a selection phase for farmers was designed (Most 2005, in Geuze & Feddes 2005). A management was set up to select suitable farmers.



4.1 Stratification of society and distance

New polder land was the best soil for agriculture and many farmers from all over the Netherlands were willing to take this opportunity. Already during the reclamation phase of the Noordoostpolder, young farmer sons were cultivating the grounds because they were hoping for a farm in this polder (Geurts 1997). However, during the division phase of the lots it became clear that new farmers had to meet a lot of requirements

in order to qualify themselves for a piece of land. A form of agricultural education was necessary in order to cultivate the land in the best possible way. Furthermore, an impeccable way of life was required: even the farmer's housewife was checked by the management. Selectors of this management came to check their houses at irregular times to determine whether the place was clean enough (Sociaal Historisch Centrum Flevoland 1992, nr 1.). Two exceptions were made: pioneers could not be excluded for a farm because they reclaimed the whole polder. Also, farmers from Walcheren who had to move out of Zeeland due to business reorganisations could immediately start farming in the Noordoostpolder (Most 2005, in Geuze & Feddes 2005).

All these new farmers had to build a new society together. Their norms and values, traditions and cultures were mixed in the Noordoostpolder (Sociaal Historisch Centrum Flevoland 1992 nr. 12; Simon 2005). Social life was of great importance. Therefore, farmyards were clustered to enhance social life in the Noordoostpolder (Steenbergen et al. 2009). Also, the farmhands were selected on their competence, age, religion and origin. Their houses were mostly located in the surroundings of the farm on a walking distance. All villages were allocated to a local care area which meant that farmers and other polder inhabitants lived on a cycle distance of the villages or in the villages. As illustrated in figure 4.1, only the employees of the management, the doctor, and the vicar were driving a car (Sociaal Historisch Centrum Flevoland 1992 nr. 6).

4.1.2 Design concepts

The general design ideas about the Zuiderzeepolders were used to develop a design concept for the Noordoostpolder. Although most landscape architects were involved just during the plantation phase, urbanist Verhagen already had some influence in the parcelling plan of 1937. Due to his actions, forms became more regular in order to enhance a better orientation in the polder (Steenhuis et al. 2007). To create a clear landscape structure, the axis crossing divided the area in four compartments. However, this was not sufficient enough for a clear structure. Plantation was necessary to create a visual division and to strengthen symbolical elements in the Noordoostpolder such as the former islands Schokland and Urk (Steenhuis et al. 2007).

The general concept of the Noordoostpolder consisted of a concentric structure: everything was directed towards to the polder centre. The concept of middle point – field - frame is each time repeated for the polder, the villages, and the farmyards. Emmeloord as a centre situated in a large, empty agricultural area was surrounded by a ring of villages which were directed towards this centre. The villages were also framed with forest. This structure was surrounded by the dike as edge of the

A new society



4.2 Design Concept Noordoostpolder (derived from H+N+S Landschapsarchitecten 2003)

Concentric structure

polder. Plantation was used as a tool to create rhythm in three layers:

- Accentuation of the borders of the polder and the axis crossing;
- Plantation in four compartments of the axis crossing;
- Plantation to surround farmyards within those four compartments (Steenhuis et al. 2007; Steenhuis & Hooimeijer 2009). These green islands should provide division of space.

Agriculture was the main function and organization mode, so further division of the area was determined by waterways and the field pattern (Geurts 1997).

4.1.3. Design tools

In *Toekomstig landschap der Zuiderzeepolders*, the designers distinguished five elements which were used in the construction of the polders. These elements are considered as design tools: field pattern, water ways, roads, architecture, and plantation (Hudig et al. 1928). The intended appearance and experience of these elements are described in this subsection.

Field pattern

Size of the lots

Economic considerations like cost effective measurements were determining the field pattern with lot sizes of 300 by 800 meters (in total 24 hectares per lot). The width of the lots was determined by the maximum length of a drain (300 meter). Although the size of the lots was purely functional, the whole field pattern expresses also some aesthetical considerations as it is a direct expression of the basic polder form (Steenbergen et al. 2009). Accessibility of lots was economically arranged: the shortest side of the lots was situated next to roads or waterways for transportation of products (Geurts 1997).

Waterways

Waterways were of great importance, although it was already clear that cars were determining future transport modes (Geurts 1997). The water system consisted of three main canals which were connected to three different consorts. These main canals were situated in the centre of the polder (both in width and length). Other small canals and ditches collected the water from the lots and transported it to those three main canals (Stuvel 1967; Bobbink 2009). This is illustrated in figure 4.6.

Reed to accentuate water ways

The commission of the Zuiderzeepolders suggested some aesthetical ideas about the arrangement of water in the polders. '*Water is able to bring in a rush of joy (...) reed cannot be missed*' (Hudig et al. 1928, p. 84). Beautiful reed banks could accentuate the straight lines of the canals and waterways. However, during the construction of the water system, the design of the water itself was never an object of discussion and was organised in an economical way (Feddes & van Dooren 1999).

Roads

The main structure of the polder was based on the infrastructural cross-section of the main roads between Lemmer-Emmeloord- Ramspol and Urk-Emmeloord-Vollenhove. Of secondary importance was the village ring or bypass, the main road between the ten villages which is shown in figures 4.7 and 4.8. The rest of the road pattern consisted of small polder ways between farms and villages. Because of the small depth of lots, the raster of roads and waterways was also smaller than in other Zuiderzeepolders which provided a relative small-scaled landscape pattern (Steenbergen et al. 2009).

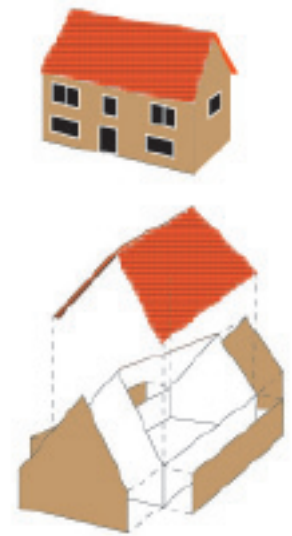
Hudig et al. (1928, p. 77) proposed and performed interesting ideas about moving through the landscape: *'Roads should not be too long to avoid weariness and boredom'*. Therefore, nodes in the roads were designed in order to provide some variety during driving and cycling. Roads with wide views left and right should have bridges over small canals to introduce a sense of Romanticism in the polder: an element which is hard to insert, but should be taken into account (Hudig et al. 1928).

Architecture

To determine the distance between the villages, the means of transport were normative. As the bike was the main transport mode, the maximum distance between the villages was 5 kilometres, a reasonable cycling distance (Geurts 1997; Feddes & Van Dooren 1999; Steenbergen et al. 2009). The size of the villages was derived from population statistics of other agricultural areas in the Netherlands. Planning of the villages was an economical matter and was derived from the Central Place theory of Christaller. Ten small villages with a local-care function were situated around a central core, Emmeloord. Villages were intended to serve the surrounding countryside; hence they were situated on the crossing of polder roads or waterways, although the buildings itself were situated on one side of the main road in order to prevent traffic jam (Hudig et al. 1928). The design of the villages was traditional: enclosed villages with houses for tradespeople and farmhands, with some facilities as shops, schools and churches (Steenbergen et al. 2009).

'Church towers will serve as reference points in the polder' (Hudig et al. 1928, p. 85). To achieve unity, all the farms were created in the same architectural style. Moreover, farms were situated within a rhythmic structure (Steenbergen et al. 2009). Designers had a clear image in mind of the appearance of Emmeloord, showed on page 23. This idea is has worked out well as it differs not that much from the contemporary situation.

Small-scaled landscape



4.3 Prefabricated farms

Cycling distance between villages

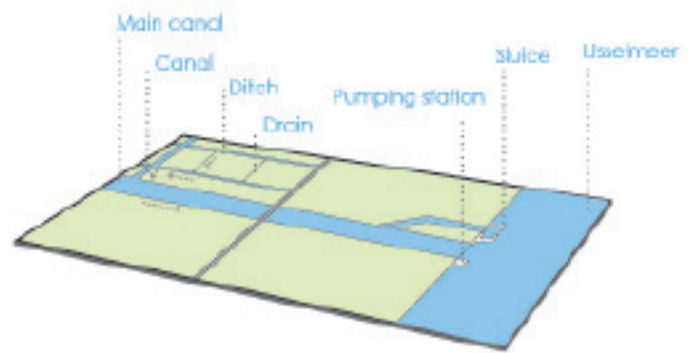


4.4 Vegetation type: poplar and ash

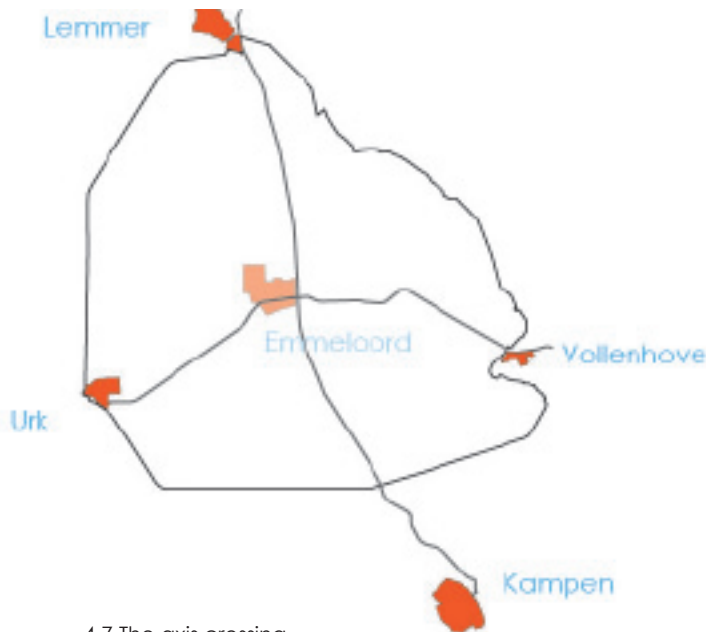
Original design principles Noordoostpolder



4.5 Parcelling plan



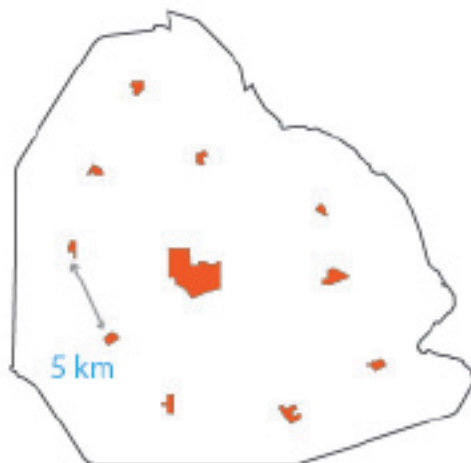
4.6 Water system



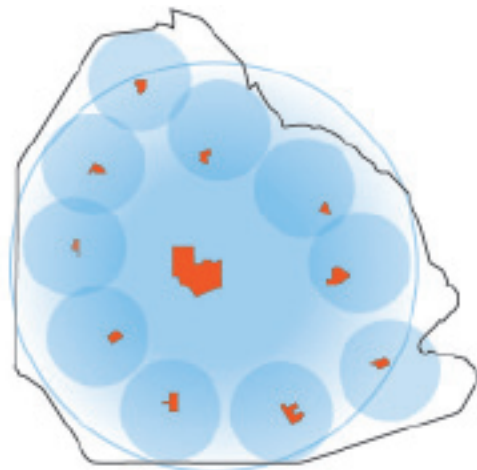
4.7 The axis crossing



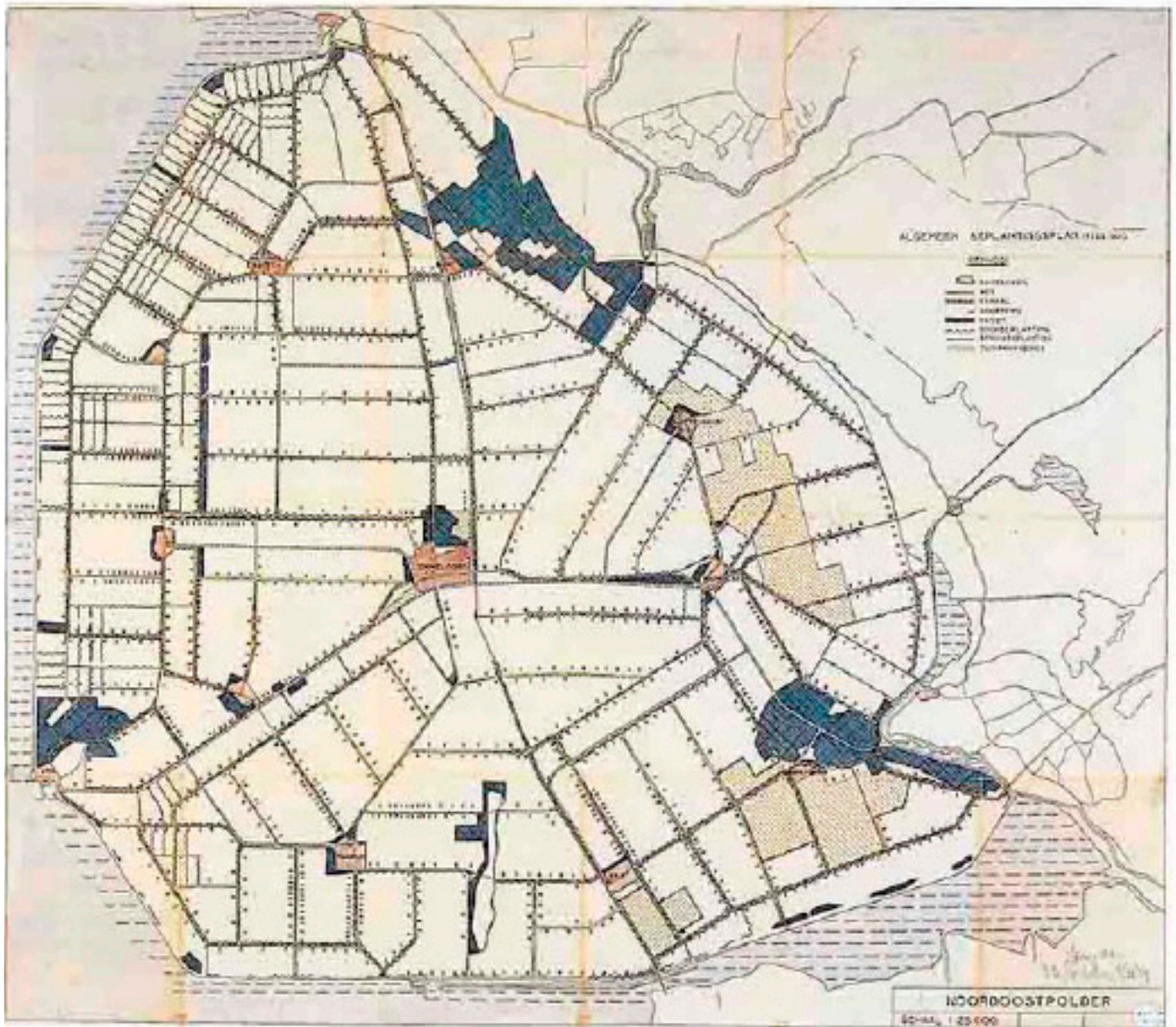
4.8 The village ring



4.9 Distance between villages



4.10 Local care areas of the villages



4.11 Common Planting Design Noordoostpolder designed by inter alia Buys, Pouderoen and Bijhouwer (1947)

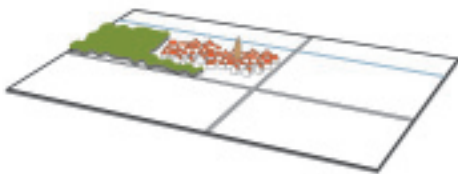
Plantation

Plantation was seen as a very important element in the polder. The commission of the Zuiderzeepolders explained the urgency for plantation:

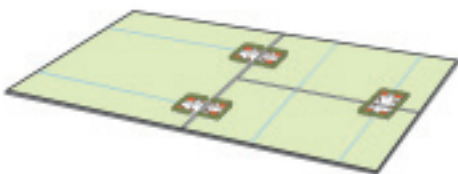
'For human beings, plantation is a benefaction. A canopy of leaves provides shelter against sun and wind. Without trees, the wind blows too hard' (Hudig et al. 1928, p. 73).

Common planting design

The large scale agriculture was used as starting point for the size and accent of the planting design. The basic ideas for the organization consisted of rhythm and human scale, a clear landscape hierarchy, spatial diversity, and coherence (Steenbergen et al. 2009). To achieve these objectives, the borders, the regional centre, and the roads were strengthened by vegetation. Lands in between were divided into compartments by the use of treelines (Steenhuis & Hooimeijer 2009). The west side of the polder was a smaller-scaled landscape whereas the middle area remained quite open for large farms. To strengthen the openness of the middle area, the roads were not planted as well (Steenhuis & Hooimeijer 2009). The original planting design is showed in figure 4.11.



4.12 Village forest



4.13 Farmyards as green islands



4.14 Plantation provides the farms shelter, protection, and aesthetical appeal

The polder was primary qualified for agriculture, but some soils were not suitable for this type of land use. Large forest complexes were implemented near Urk, Kuinre and De Voorst. Production of wood was the main function of these forests; another function which gained more importance during the years was recreation. Also, near the villages small forests were implemented for recreational activities as walking and sporting facilities. At the same time, these forests were functioning as windscreen against the dominant north-western wind (Sociaal Historisch Centrum Flevoland 1992). The use of deciduous trees in these forests determined the difference between the appearance of forest villages and large forest complexes (Geurts 1997).

Farmyards were clustered in groups of two, three or four and surrounded by several tree rows. These trees were implemented to protect against the wind, but they also provided a nice, aesthetical landscape image. Farmyards were arising as green, massive islands in the landscape (figure 4.13). In order to achieve unity and homogeneity within the landscape the type of wood used was the same as the trees along the roads (Steenhuis & Hooimeijer 2009; Steenbergen et al 2009). The soil type determined the type of tree: poplar, ash, oak, beech, and elm were trees which were often used. Especially the poplar was well suited for the polder, because this tree is growing fast (Geurts 1997).

4.2 Current landscape experience Noordoostpolder

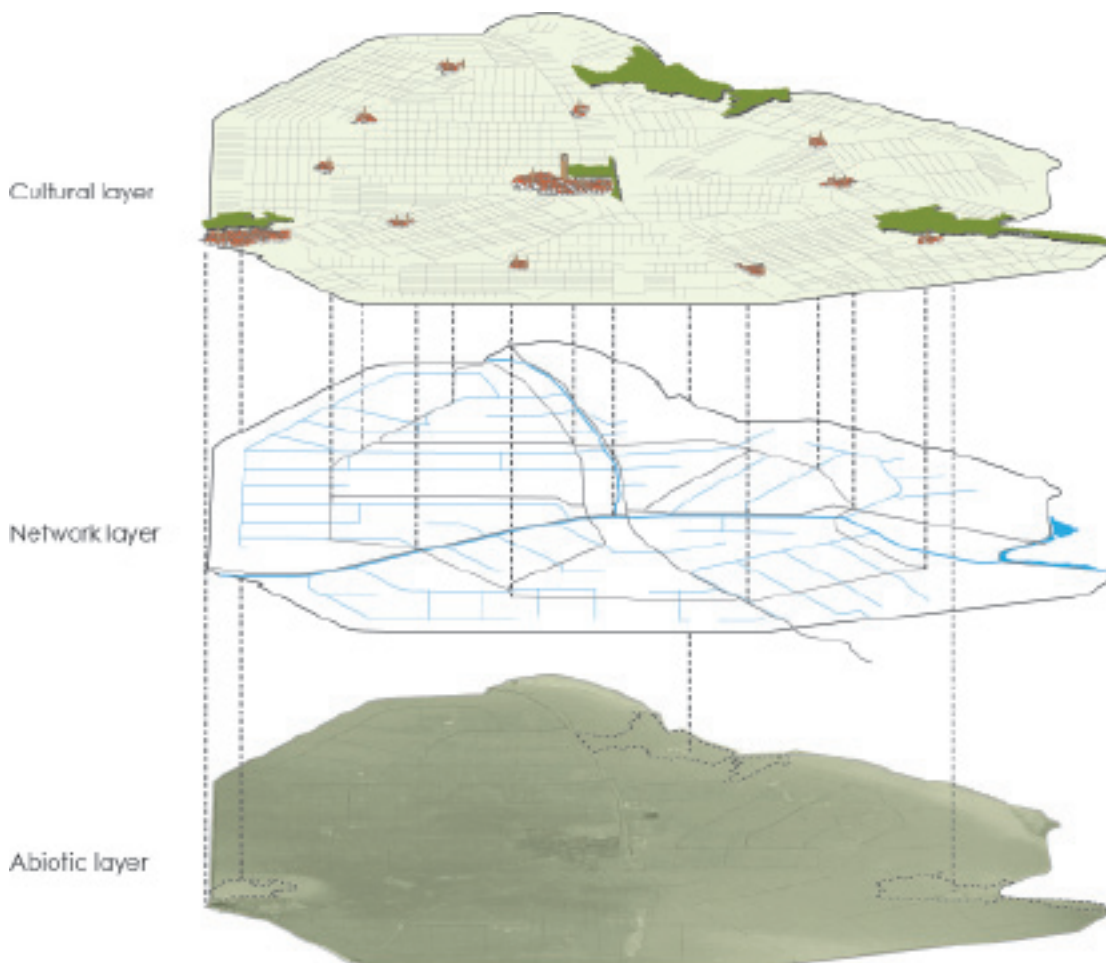
Previous section discussed how the polder was designed and which ideas the designers had about the appearance, the experience, and the originally assigned function of the Noordoostpolder. This chapter gives some insight about the current state and experience of the Noordoostpolder, seventy years after the reclamation phase.

4.2.1 Polder analysis

To gain a comprehensive image of the Noordoostpolder this landscape is analysed according to the new layer model shown in figure 4.15.

- The abiotic layer shows that the soil is overall quite heterogeneous because the soil was improved for the cultivation of agriculture. Only the boulder clay and sandy soils near Urk, Kraggenburg and the Voorst differ from the rest. Therefore, they were

New layer model



4.15 Cultural elements can be explained by the network layer: villages are situated on nodes in the network

unsuitable for agriculture, so another land use type, forest, was implemented (Steenbergen et al. 2009). Furthermore, two areas in the Noordoostpolder are higher situated than the rest. These areas are former islands, named Schokland and Urk and can be considered as important historical relicts in this large land reclamation project (Steenbergen et al. 2009).

- The network layer consisting of road patterns and waterways shapes and structures the polder. Connections to the old land and the distribution pattern of villages defined the road pattern. The road plan was designed in a hierarchical structure: the axis with main roads, two ring roads, and small polder roads as local connections (Steenbergen et al. 2009).
- The cultural layer is closely related to the network layer. Villages are situated on nodes in the network and the polder centre Emmeloord is located on the axis crossing.

So, the forests and the former islands are somewhat surprising elements in the planned, geometrical structure which is determining the rest of the polder. The fact that villages are situated on nodes in the network is not only clearly visible on a map, but also noticeable in the field. For example, the road curves a little when you enter a village. This is really striking after driving for a couple of minutes along a straight road. It makes people aware that something is about to change in the landscape. Furthermore, the network layer in its totality is quite dominant because -which was also suggested by the Commission of the Zuiderzeepolders-: *'there is no place for picturesque coincidences in this landscape'* (Hudig et al. 1928, p. 69). As a result, the rigid network structure is prominent.

No picturesque coincidences

4.2.2 Field experience

Fieldwork

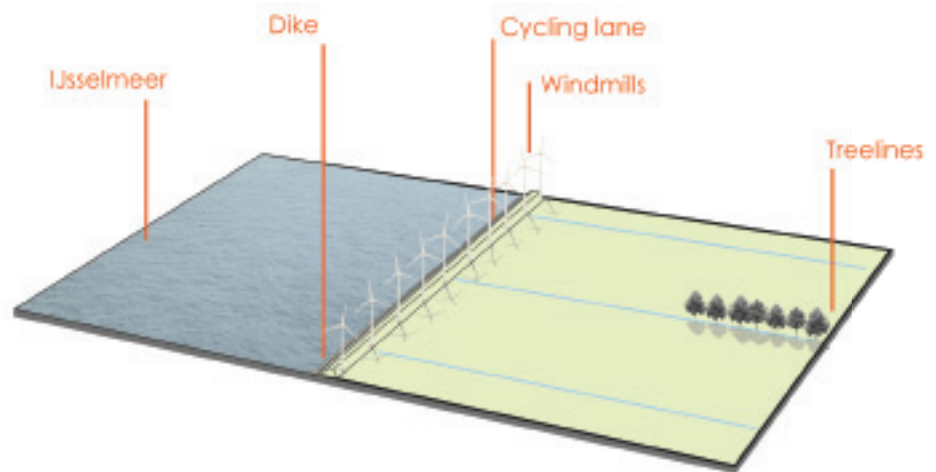
The Noordoostpolder is designed as one unity, but during fieldwork it became clear that several parts of the polder not only appear different, but also smell and sound in a diverse way. Using this information, there are several landscape unities to distinguish. These differences have formed the basis for the landscape unity map shown in figure 4.16. The most striking conclusions of each specific landscape type are described below and illustrated by corresponding pictures.



4.16 Landscape unities of the Noordoostpolder

Dike

The dike offers an experience that is different from the rest of the polder. The sound of the water and the magnificent view across the IJsselmeer offers a sense of freedom. Furthermore, this place has a great potential for recreational water activities. However, the dike itself is barely accessible and really the edge of the polder instead of a place for human activities. Windmills along the dike are visually a nice structuring principle, but they cause a lot of noise pollution during a walk on the dike.



4.17 Characteristics of the dike



4.18 Valuable and undesirable experiences on the dike

Farmyards

Almost all farmyards are surrounded by windbreaks i.e. rows of trees. This is an important visual landscape quality because they structure the landscape. Moreover, their massiveness gives the impression of green 'islands' in the field (Feddes & Van Dooren 1999). Furthermore, many birds are singing because they inhabit the surrounded trees. As a result of the increases in scale, buildings are becoming too large for the farmyards and entering the field which leads to the disappearance of some windbreaks. This disturbs the landscape rhythm and because the size and appearance of these barns does not correspond to the original farms, visual landscape quality decreases.



4.19 Characteristics of the farmyards

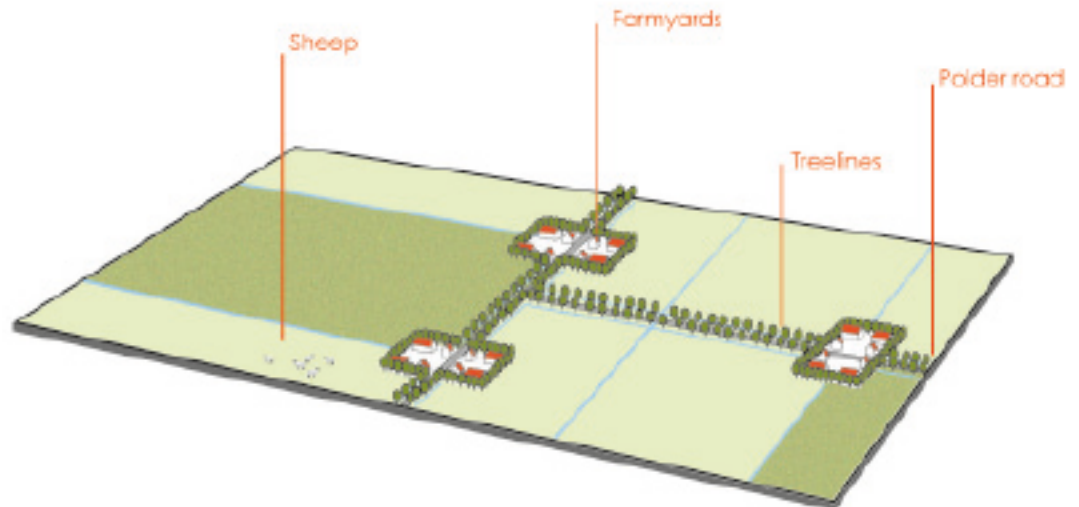


4.20 Valuable and undesirable experiences of the farmyards

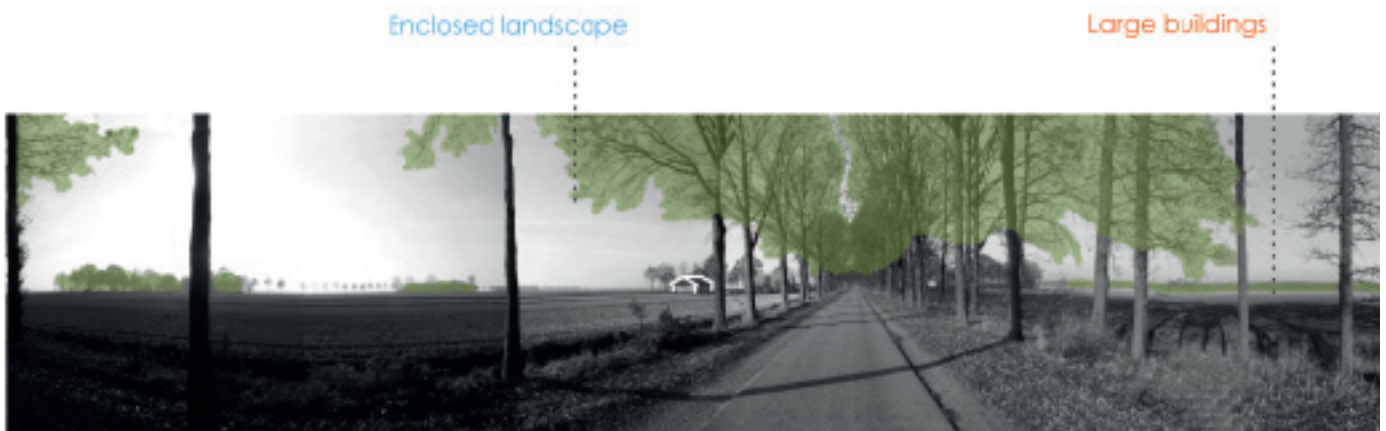
Closed agricultural landscape

The landscape character in the edges of the polder -close to the dike and at the border between Overijssel and Flevoland- is quite enclosed because of the presence of forests and several tree lanes. These lanes and the windbreaks along the farmyards provide a varied landscape view which recalls to the 'kamerlandschap'⁴ in the Achterhoek. This area is suitable for recreational activities such as cycling and walking. To enter this type of area, you have to make use of other cycling lanes situated along busy roads which is the fastest way to cycle from one village to the other; this is not a very pleasant way of cycling due to car noises. Also, there are more cattle breeding farms located in this area which can be experienced by the sight, sound and sometimes smell of sheep.

4. A landscape which is divided into several compartments, 'rooms', by the use of tree rows



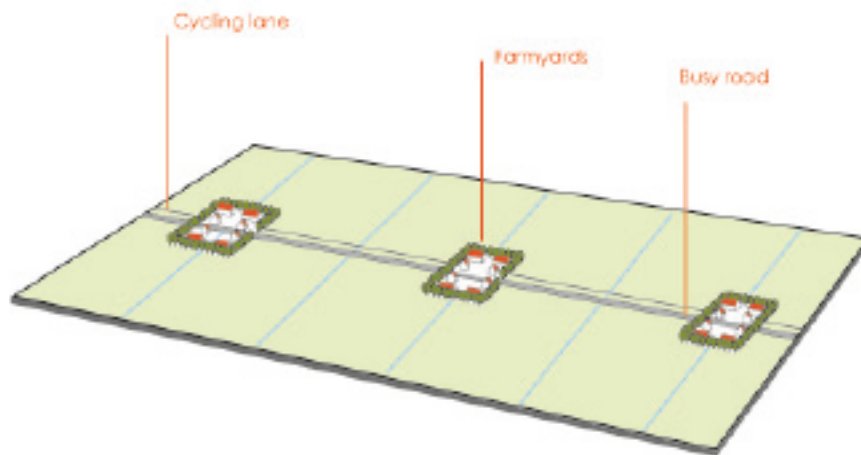
4.21 Characteristics of the closed agricultural landscape



4.22 Valuable and undesirable experiences of the closed agricultural landscape

Open production landscape

The central area in the Noordoostpolder can be considered as an open production landscape. There are no signs or sounds of other types of land use than agriculture. This open character was intended by the designers and still visible in the field. The openness makes the presence of windbreaks important as they are the only green signs in this landscape and providing mass in the huge open space. However, this area also deals with some problems. Especially in this area, windbreaks are disappearing due to increase in scale: buildings are too large in relation to farmyards and entering the field.



4.23 Characteristics of the open production landscape



4.24 Valuable and undesirable experiences of the open production landscape

Large forests

There are three large forests in the Noordoostpolder: forest of Kuinre, forest of Urk, and the forest of Voorst. Originally, the main function of these forests was wood production, nowadays many recreational opportunities are taking place such as walking, cycling, playing and motor crossing. The atmosphere in the forest is nice due to the large grown trees and the smell of pine needles and mushrooms. Farms in the centre of the forest are disappearing and this results in the diminishing of open space and a decrease in forest variety. (Papenberg & Van der Togt 2011).



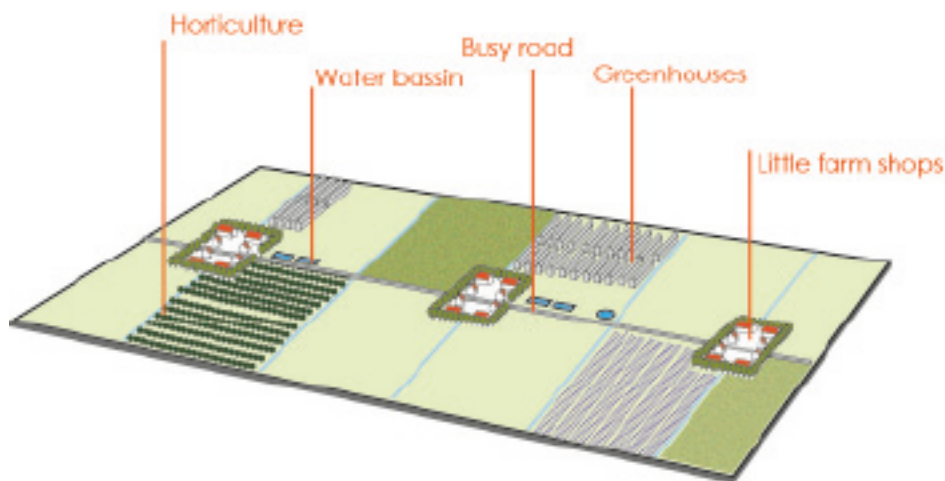
4.25 Characteristics of large forests



4.26 Valuable and undesirable experiences of the large forests

Greenhouse area

The greenhouses in this area produce vegetables, flowers, and plants which have to be sold and transported. The area is very lively because of small farm shops, garden centres, and flower shops which are attracting inhabitants of the Noordoostpolder. For the transportation of all these goods there is much traffic on the road. This results in a messy landscape with no clear structure and busy roads. There are no facilities for taking a nice walk along these shops and that can be considered as a missed opportunity.



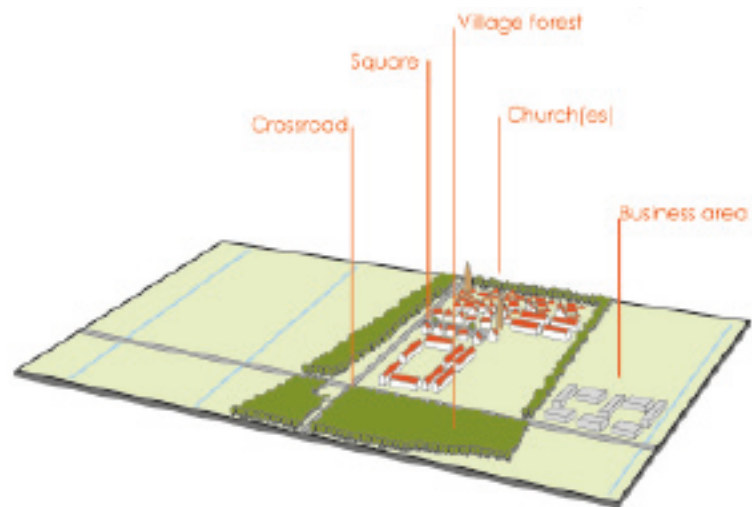
4.27 Characteristics of the greenhouse area



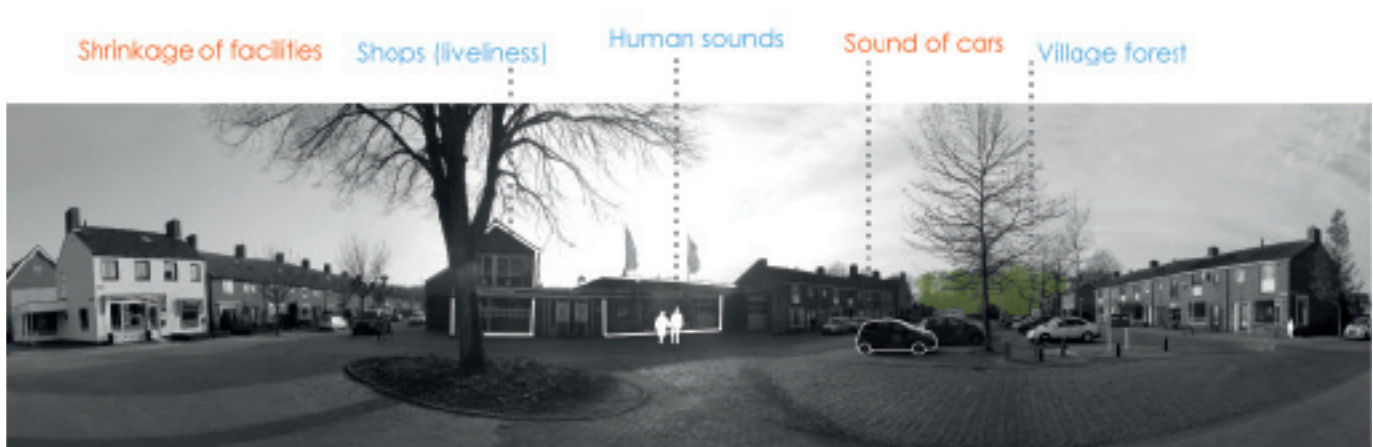
4.28 Valuable and undesirable experiences of the greenhouse area

Villages

When a village in the Noordoostpolder is entered, this is noticeable because of different sounds, smells, and sights. A village contains more people and therefore also more liveliness. As a result, the experience of a village completely differs from a countryside experience. Each village in the Noordoostpolder has its own forest where many inhabitants can recreate. A disadvantage of these forests is that they are all situated next to a busy road which gives some noise pollution.



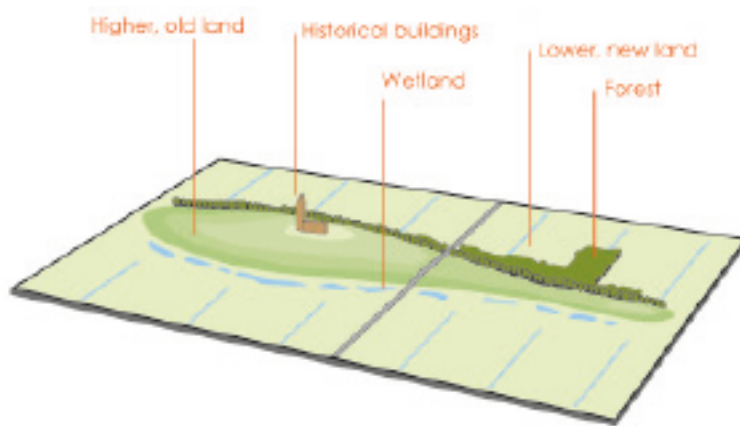
4.29 Characteristics of the villages



4.30 Valuable and undesirable experiences of the villages

Cultural heritage

The smooth surface of the Noordoostpolder is induced by the fact that it was a former sea. Other elements that were not designed, but which were already there are the two former islands, Schokland and Urk. These two areas do have a completely different character compared to the rest of the polder, and can therefore be considered as a different landscape unity. The authenticity of their historical buildings, old trees, and the fact that they are situated higher than the polder grounds provide these areas with a high aesthetic appeal.



4.31 Characteristics of cultural heritage



4.32 Valuable and undesirable experiences of the greenhouse area

Sound in the polder

Some general conclusions can be drawn considering the multisensory analysis. Considering sounds, the sound of cars was very dominant in the whole area. All roads are accessible for cars and there are hardly any apart cycling lanes or walking paths. As a result, the sound of cars is always dominantly present in the area. Experiencing the Noordoostpolder in the field is much nicer, but these places are only accessible for farmers.

Smell in the polder

The presence of smells is absent when the outside temperature is low. During first time fieldwork, it was much easier to indicate which smells were present in the area, because of higher temperatures (around 20 degrees). An explanation for this can be seasonality. During the winter, smells are not that overwhelming, they are deadened by the cold (Porteous 2006). On the contrary, other kind of weather situations can enhance smells. The landscape smells clean after rain (Porteous 2006). After a heavy shower the odours of a forest are much more overwhelming than in a dry situation.

4.3 Future developments in the Noordoostpolder

The original population is significantly changed over the past few decades (Municipality Noordoostpolder 2011) and new inhabitants are dealing with some site-specific problems. The landscape of the Noordoostpolder should be modified in order to adapt itself to a sustainable future. The main problems which are threatening the landscape of the Noordoostpolder are briefly described.

4.3.1 Outdated infrastructure

During the design phase of the Noordoostpolder, the bike was the main travel mode. Therefore, the ten villages in the Noordoostpolder were placed on five kilometres distance of each other: a tolerable cycling distance. The whole network structure was designed specifically for the bike. The intended experience was thus directed to the quietness of the countryside as some roads were specifically designed for a small walk. This is explained in *Toekomstig landschap der Zuiderzeepolders* (1928):

'Roads in the surrounding of villages will give inhabitants the opportunity to take a small walk. This recreational function should be taken into account during their construction and plantation.' (Hudig et al. 1928, p. 29)

Nevertheless, over the past few decades, car use has expanded enormously. As a result, the roads that ought to be used by bikers are currently occupied by cars, tractors, and other agricultural machinery. The intended experience of the quite countryside is completely lost due to overwhelming car noises and smells.

Bike as main transport mode



4.33 Roads originally designed for bikes are nowadays occupied by large agricultural machinery and cars

4.3.2 Changing agriculture

The reason for the construction of the Noordoostpolder was for the production of food (Geurts 1997). Almost every square meter was used for the purpose of agriculture, and still agriculture is the main function of this polder. However, agricultural techniques are changing, and as a result the appearance of the landscape changes. The intended appearance and experience of agriculture was described by Hudig et al. (1928):

'Agriculture will dominate this landscape. The land will show specific colours, diversity, and roughness of farmland instead of the velvet smoothness of grassland' (Hudig et al. 1928, p. 69).

Greenhouses

A major change in land use is the implementation of new greenhouse areas in the Zuiderzeepolders (Pols et al. 2005). The existing greenhouse area near Luttelgeest and Ens will be expanded with 250 hectares near Luttelgeest and 125 hectares near Ens. 273 Hectares is designed for glass, basins, and buildings while the rest of the area should consist of a green zone, canals, and roads (Municipality Noordoostpolder 2011). This new agricultural type of land use differs greatly from the intended function of cropland.

Increase in scale

Another change in agriculture is increase in scale⁵ and different cultivation types that have changed the landscape image in ways of colour and texture (bulbs instead of potatoes). Because of increases in scale the number of farmyards has decreased with almost 50 per cent, while the size of farmyards has increased (CBS 2012). When farmers go out of business, neighbouring farmers buy the released lots and add them to their own farm (Municipality Noordoostpolder 2011). A result of increase in scale is that new build barns are too large for the farmyards

5. In Dutch: schaalvergroting



4.34 Agriculture is showing different colours as it was meant



4.35 Greenhouses as new agricultural function

and enter the field and windbreaks which are surrounding the farmyards are disappearing. Originally, they were meant to strengthen the contrast in the polder:

'Farms should also fulfil their role. They should be surrounded by massive plantation' (Hudig et al. 1928, p. 71).

Disappearance of this plantation and appearance of large barns are disturbing the landscape rhythm.

4.3.3 An insufficient water system

The water system, one of the structuring elements in the polder and also of great necessity for drainage, is outdated and too small for optimal functioning. Problems as waterlogging are expected to occur in low-lying areas due to subsidence and extreme precipitation. The drainage of the polder leads to subsidence: decreasing the distance between the water level and the ground level and extreme precipitation is caused by climate change. As a result, some parts of the polder can be flooded because of water level rise in canals (Waterschap Zuiderzeeland 2011). Before 2050, 2000 hectares of new water should be implemented to avoid water problems in the future (Pols et al. 2005; Municipality Noordoostpolder 2011).

To conclude, the Noordoostpolder is a unique design, but future developments such as a large water retention area and greenhouses are necessary in order to adapt the Noordoostpolder to future demands. Furthermore, the current landscape also contains some elements which were not originally planned such as the expansion of motor traffic.

Waterlogging



4.36 Large barns breaking through windbreaks



4.37 Flooding's on the field



4.38 Drains on the field to prevent waterlogging



5. AESTHETICAL EVALUATION



5. Aesthetical evaluation

Guide future developments

Previous chapter discussed the original design, the current field experience, and future developments in the Noordoostpolder. The design for designed regional landscapes forms the basis for the landscape appearance. To find a way to guide future developments which threaten the contemporary and future landscape of the Noordoostpolder, this chapter compares those three stages –original design, contemporary landscape, future developments- with each other in order to determine which landscape structures should be preserved and which one should be modified.

Parameters for evaluation

This aesthetical evaluation starts to evaluate whether the intentions of the designer are achieved. The resulting landscape is evaluated to determine whether it lives up to the expectations raised by the design ideas and concepts (Deming & Swaffield 2011) and it judges the original design on several points. As it turns out that elements which are designed as aesthetical appealing are not attractive anymore, the designers failed, as it was their intention to produce a beautiful landscape (Van Etteger 2012). Also, as it turns out that many features in the landscape do not function anymore, the original design was not very durable and should be adapted. So the parameters 'aesthetical appealing' and 'functional' are determining which landscape elements should change in order to maintain a healthy landscape.

As explained in chapter three, landscape elements which can be considered as unique should also be preserved. Unique elements provide a distinctive character for landscapes or cities: removing these elements will damage the landscape identity (McHarg, 1969). However, an element which is unique does not have to be specifically a result of the original design.

Designed landscapes are different in the sense that they could have been different (Van Etteger 2012). Their end goals can be wrong or their design tools which are used to achieve these certain goals can be wrong. Considering the Noordoostpolder, Feddes & Van Dooren (1999) argue that certain parts of the design could have been different or better. Therefore, another parameter is missed opportunities of the original design. Perhaps these could be integrated in a new design to provide a better landscape experience.

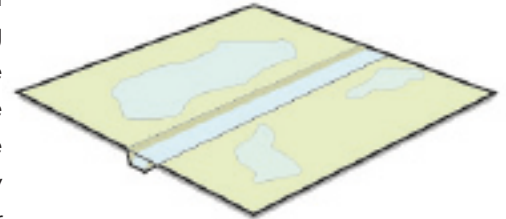
5.1 Functional

The reason why designed regional landscapes were constructed was functionality. New land was necessary for the production of food and place for the expanding population. To maintain a well-functioning landscape, elements which do not function anymore should be adapted. The main function of the Noordoostpolder was agriculture and this is still the most important land use factor in the landscape. The lots of 300 by 800 meters are functioning well as they are still perfectly suitable for modern agricultural purposes (Municipality Noordoostpolder 2011) and the soil is one of the best soils of the world for agriculture (Peek et al. 2010). However, as explained in policy documents, the type of agriculture should change in some places to answer the demands of the current society. Greenhouses are a new type of agriculture (Pols et al. 2011) which was not implemented during the first construction phase. Nevertheless, these new greenhouses should fit within the existing landscape structure. Also, the farmyards are too small for modern agricultural purposes. Nowadays, larger barns are necessary for increase in scale and extensive modernisation. Windbreaks around farmyards provide shelter against the predominant hard western wind. However, their function becomes affected due to increases in scale. Also, a lot of tree rows were damaged due to elm diseases (Feddes & Van Dooren 1999).

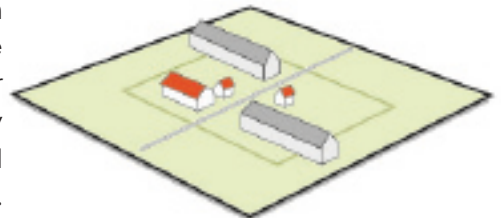
The designed water system which is necessary to drain the polder is too small for optimal functioning in the future. Interventions are necessary to make sure that farmers can cultivate their grounds. The main task for the future is to implement 2000 hectares of water in the Noordoostpolder by the extension of several water ways or by the construction of a water retention area (Municipality Noordoostpolder 2011). The function of villages to serve the surrounding countryside is outdated. The car gives people the opportunity to buy their daily stuff further from home. As a result, some villages cannot maintain all their facilities (Municipality Noordoostpolder 2011).

Summarized: the overall structure of the polder still functions. A new water retention area and greenhouses should be implemented to maintain the general function of agriculture. Furthermore, the size of windbreaks should be enlarged to surround new, larger, barns.

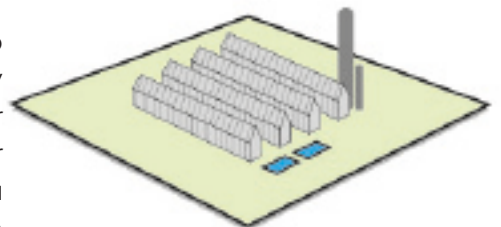
Main functional problems



5.1 Increasing risk of flooding's



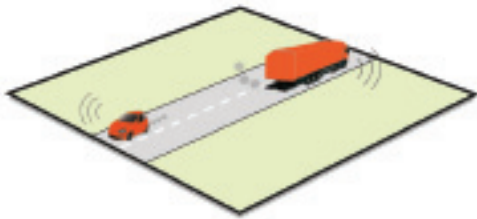
5.2 Farmyards are too small for large barns



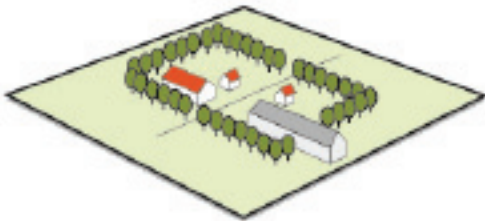
5.3 Modern agriculture: greenhouses

5.2 Aesthetical appealing

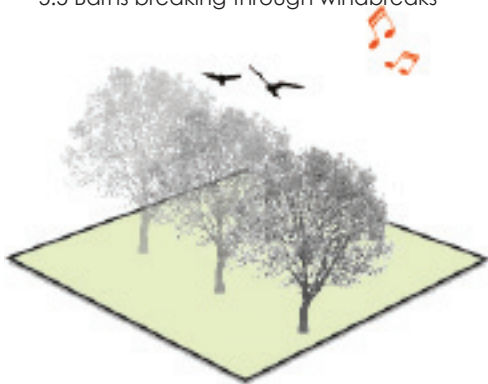
Aesthetical problems and qualities



5.4 Sound and smell of cars



5.5 Barns breaking through windbreaks



5.6 Trees are attracting singing birds

An important characteristic of designed landscapes is that their final goal is to be aesthetically appealing, and therefore they must be evaluated aesthetically (Van Etteger 2012). An essential aesthetic intention was to enhance rhythm and scale in the polder by the use of plantation. This is partly achieved: windbreaks around farmyards are visible and can be seen as green islands which are dividing the surrounding space into several compartments. However, they also suffer from agricultural developments due to increase in scale. Farmers start to build larger barns which break through windbreaks and entering the field. This disturbs the existing landscape structure. The designers also suggested a massive planted axis crossing and plantation of the village ring. This has not been executed during the final implementation phase of the design.

Plantation is also aesthetical appealing in the ways of sound and smell. Trees are attracting birds and smell natural. Especially the windbreaks are providing a nice experience due to the twittering of many birds which occupy the trees. As the twittering of birds is regarded as favourable by many people, this is a significant aesthetic quality (Brown & Muhar 2004) just as the smell of leaves. Another dominant smell in agricultural settings is the smell of manure. As this is normal in an agricultural landscape, this is therefore tolerated, sometimes even preferred (Classen et al. 2003). In general, most urban smells are negatively rated while almost all rural smells are regarded as positively (Porteous 2006). Beautiful reed banks could accentuate the straight lines of the waterways. This design idea was originally not executed, but later on still implemented. The sound of reed and the smell of water enhance definitely the aesthetic experience of some waterways.

An unforeseen point in the design which leads to a negative aesthetic experience was the enormous expansion of cars. The network system was designed for the bike; so the polder was meant to be experienced from the bike. This idea has completely failed due to car noises and the overwhelming smell of exhaust fumes which can be experienced on every single place in the Noordoostpolder. As a result, wanted sounds are masked by unwanted sounds. Nice sounds and smells are overwhelmed by sounds of engines and odours of metal, oil, and exhaust fumes.

Summarized: elements which are aesthetical appealing should be preserved or sometimes even reinvented: due to car noises and increase in scale, some aesthetical appealing experiences are diminished or disappeared.

5.3 Unique

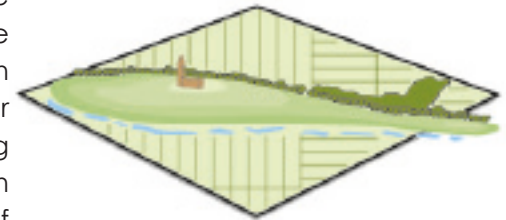
Elements which can be considered as unique in the Noordoostpolder are the concentric structure, the field pattern, and Schokland and Urk. This first element was designed as such: the general concept of the Noordoostpolder, consisted of a concentric structure with a centre surrounded by a frame is still visible on a map and can be experienced in the field. It is perfectly clear that the central area in the Noordoostpolder is predominantly used for farming and some other activities are taking place in the border. According to Yttje Feddes (Feddes & Van Dooren 1999; Papenborg & Van der Togt 2011), the concentric structure of the Noordoostpolder, although very vulnerable, makes the design for the Noordoostpolder an icon for the Dutch landscape architecture. Therefore, the concentric structure can also be considered as a unique concept. Hence, new interventions should fit within this structure.

The field pattern was designed for functional reasons, although Verhagen did some suggestions which enhanced a better structure. Compared to a worldwide context, the field pattern is unique. The rest of the world considers polder landscapes as unique elements because they are one of the results of the Dutch struggle against water (Steenbergen et al. 2009). The Netherlands contains 9000 polder unities (Steenbergen et al. 2009) and to determine which characteristics are distinctive for the Noordoostpolder, a comparison should be made. The other Zuiderzeepolders are designed during the same time period; therefore Wieringermeer, Noordoostpolder, Eastern Flevoland and Southern Flevoland are compared⁶. The overview, shown in figure 6.9, shows that the dimensions of the Noordoostpolder differ from those other three polders. The small scaled field pattern is a unique element in the Noordoostpolder: enlarging the field pattern will lead to a landscape which is similar to the landscape of Southern Flevoland.

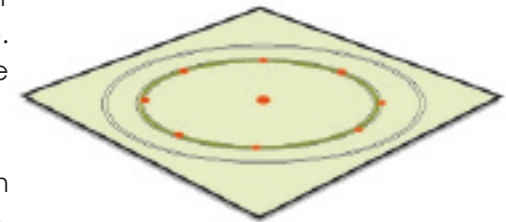
The two former islands, Schokland and Urk, are breaking through the regularity of the straight field pattern and provide therefore a nice landscape experience. They are higher situated than the rest of the polder, which in case of Schokland is also accentuated with trees. Especially Schokland can be considered as unique as it is part of Unesco World Heritage. Those islands symbolise the age-old struggle of the Dutch against the encroachment of water (Fowler 2003).

Summarized: to maintain, strengthen, and show unique elements, new developments should be taking place within the concentric structure and the original field pattern, without damaging Schokland and Urk.

Unique elements



5.7 Cultural heritage



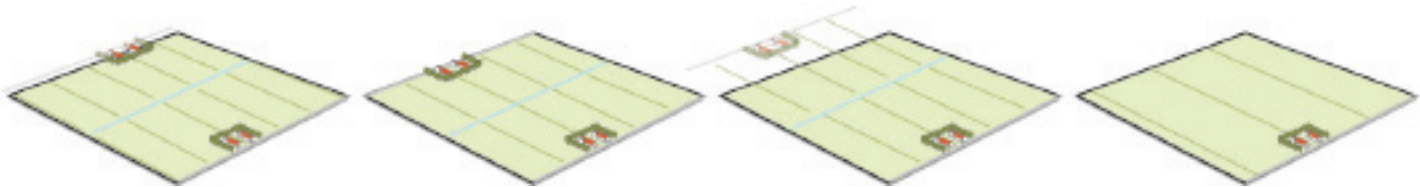
5.8 Concentric structure

⁶. The complete comparison can be found in the appendix

Zuiderzeepolder:	Wieringermeer	Noordoostpolder	Eastern-Flevoland	Southern-Flevoland
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Dimensions

Lot size	250 x 800 meter	300 x 800 meter	300 x 1000 meter	500 x 1700 meter
Business size	20 - 35 hectares	12 - 25 hectares	15 - 40 hectares	40 hectares
Distance between polder roads	1.7 kilometres	1.5 kilometres	2 kilometres	2.5 kilometres
		Small-scaled		



Cultural Heritage	Wieringen	Urk and Schokland	-	-
		Two important cultural heritage sites		

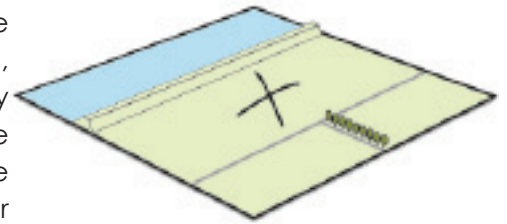
Design Concept	3 villages mark and structure the polder centre	Concentric structure	Asymmetric structure	Parallel sequencing of functions and connections to the surroundings
		Fascinating design concept		

5.9 Comparison between the four Zuiderzeepolders

5.4 Missed opportunities

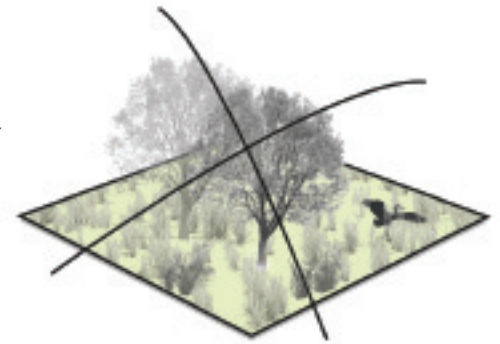
Certain parts in the design for the Noordoostpolder could have been different or better (Feddes & van Dooren 1999). Although the design concept is very interesting, the polder structure is inwards oriented. The dike is not an interesting landmark where you can experience the strict lines of the polder and the smoothness of the IJsselmeer. Instead, the dike serves as a border of the Noordoostpolder and is hardly accessible. This can be considered as a missed opportunity because water provides always a promising experience for people due to the potential for recreational opportunities and their function as habitat for wildlife (Dee 2001).

Missed opportunities



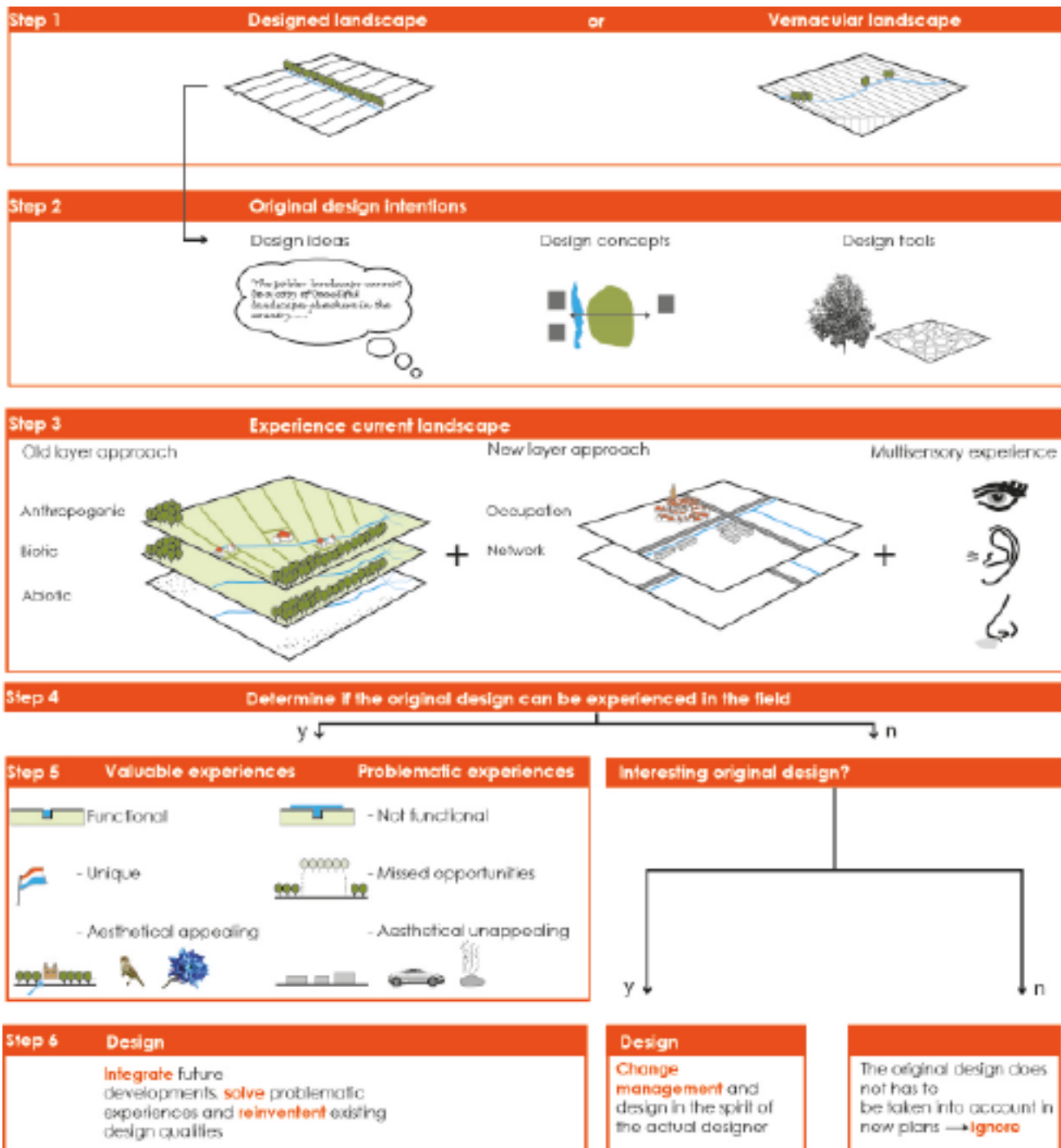
5.10 No access to the dike

Recreation is hardly not addressed in the original design, but there is a complete absence of place for ecology. Except of the forests, place for other types of nature was not incorporated in the design for the Zuiderzeepolders (Feddes & Van Dooren 1999). Plants form habitats for wildlife and people, and can contribute to biodiversity (Dee 2001, p. 63) which makes nature development an interesting land use function to integrate in the existing polder structure (Feddes & Van Dooren 1999).



5.11 No place for ecology

Summarized: place for ecology, connections to the dike, and accesses to walk and cycle in the countryside can be seen as missed opportunities of the original design.



5.12 Approach designed regional landscapes

To conclude, the landscape of the Noordoostpolder is evaluated by four parameters: aesthetical appealing, functional, unique and missed opportunities. How this evaluation was set up is summarized in the following scheme (figure 6.12). First, the original design and intended experiences should be analysed and compared to the current landscape experience. When there is still a match between those two, elements which are not aesthetical appealing and functional anymore provide good reasons for a redesign. Unique landscape elements should be preserved; missed opportunities can be integrated in a new design. When there is no match between the current landscape experience and the original design, the landscape architect has two choices: either to ignore the original design or to integrate the original design. For example, the original design is not visible in field anymore because the design was not very durable. The choice is then to ignore the original design. The original design, although not visible, can also appear to be an interesting reference point which leads to the integration of original intentions in a new design.

Approach to evaluate designed landscapes

For the Noordoostpolder, it means that new developments should fit within the concentric structure and existing field pattern. Elements which are not functioning anymore should be repaired. A missed opportunity is the absence of a network structure for the bike. Implementing such a structure in the Noordoostpolder, apart from motor ways, can bring back aesthetical appealing experiences.

Future of the Noordoostpolder





6. DESIGN MOTIVES

Country road in the Noordoostpolder: part of the enclosed landscape

6. Design motives

The outcome of the aesthetical evaluation proposes new functions and experiences to be implemented and restored in the Noordoostpolder with the original design in mind. This chapter explains how that is translated into two concrete design tasks which solve the main problems in the Noordoostpolder and function as example for other design tasks in the future. To approach these design tasks, the second section explains the role of a landscape architect who redesigns designed regional landscapes. In order to integrate a nice landscape experience, designing with sound and smell is discussed in the third section.

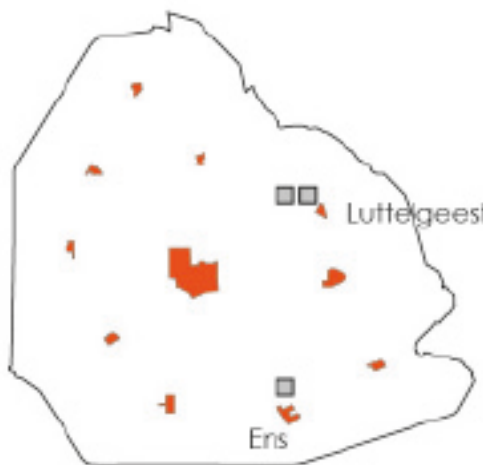
6.1 Design task

Elaboration greenhouse area

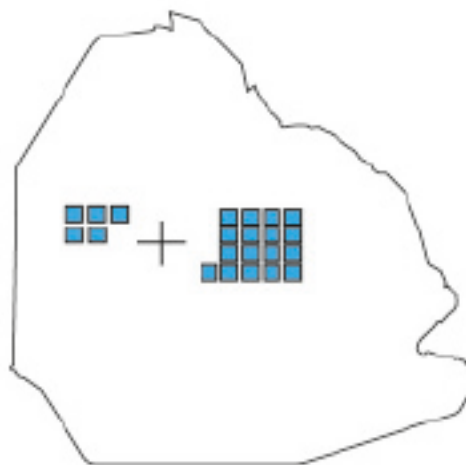
The future perspectives for the Noordoostpolder and the conclusions from the aesthetical evaluation are translated into concrete design tasks. Modern agricultural functions such as greenhouses need a place in the polder. To give some insight how this can fit within the existing structure, this is one design task. The municipality suggests two places in the polder which are suitable for the elaboration of greenhouses (figure 6.1). These places are closely located to existing greenhouse areas (Municipality Noordoostpolder 2011).

Design water retention area

The second design task concerns the design for one specific water retention area (figure 6.2). The existing water system is outdated and too small for optimal functioning in the future. Problems such as flooding's are expected to take place in low-lying areas because of subsidence and extreme precipitation. Before 2050, two thousand hectares of new water should be implemented in the polder to avoid



6.1 Elaboration greenhouse area



6.2 Elaboration water system

water problems in the future (Municipality Noordoostpolder 2011; Waterschap Zuiderzeeland 2011). Places which already suffer from water problems are potential areas to collect and retain water.

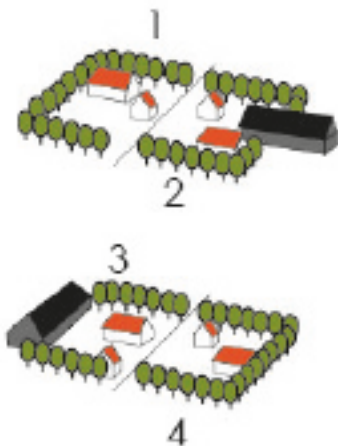
Additionally, the Noordoostpolder can only be experienced with the smell and sound of cars on the background. To avoid this negative experience, a new network structure for recreational purposes should be implemented in the Noordoostpolder. Furthermore, design principles for farmyards are required in order to adapt them to increase in scale and to maintain their aesthetical appeal. Solutions for these two problems will be interwoven in the two designs. Figure 6.4 illustrates the design concept for the Noordoostpolder.

New network structure

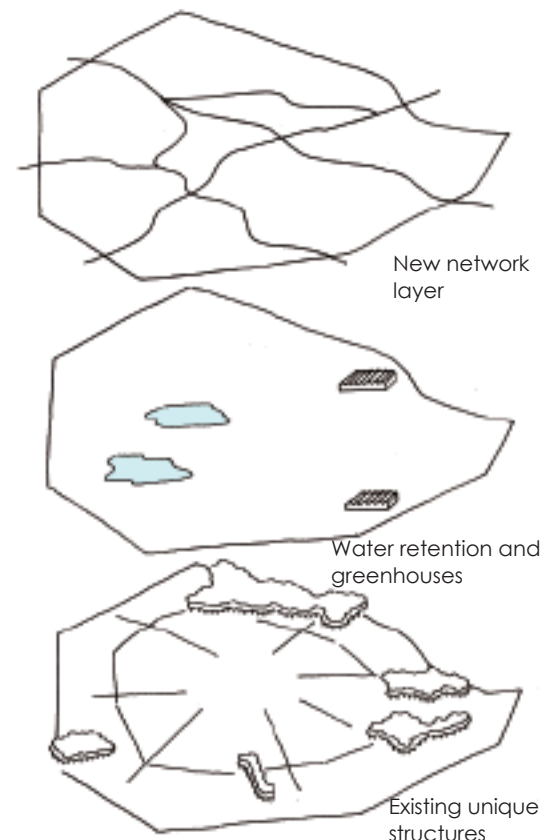
Solutions farmyards

6.2 Role of the designer

'The opportunist chooses the most suitable historical information which can be used within a new designed composition. The design solution consists of adding a new layer to the garden or landscape, whereby the influence of the new designer is clearly visible' (Luiten 2011, in Huls et al. 2011 p. 39, translated by the author).



6.3 Find solutions for farmyards



6.4 Concept Noordoostpolder

The opportunist

According to Luiten 2011 (in Huls et al. 2011), you can distinguish four types of designers who design with historical, green heritage: the taxonomist, the antiquarian, the biographer, and the opportunist. Although his observation is mostly related to garden design, it can also be a way to deal with designed regional landscapes as they are also part of historical green heritage. Huls et al. (2011) state that the opportunist is best role for a designer. Certainly considering designed regional landscapes because they are not static, but living nature. Back to the past, as the taxonomist and antiquarian suggest, cannot solve future problems and needs. Therefore, the approach towards the Noordoostpolder will be adding a new layer which respects the historical features, give them a new boost, but which also meets the needs of the current society.

6.3 Designing with sounds and smells

Acoustic design

In order to enhance a nice landscape experience in the future landscape of the Noordoostpolder, structuring sounds and smells in the right way is significant. This requires an 'acoustic design' which is discovering the principles by which the aesthetical qualities of the acoustic environment may be improved (Brown & Muhar 2004). These principles can be either enhance certain sounds or delete certain sounds. This includes diminishing certain noises, the preservation of sounds that give character or sense of place to a location - 'soundmarks' as the acoustical equivalent of landmarks-, or the implementation of elements to attract certain sounds to create attractive environments (Brown & Muhar 2004). For example, the plantation of certain tree species which attract songbirds or the plantation of a specific vegetation type which is nicely scented.

To design an acoustic landscape, the first step is to determine which activities are taking place at that site. This includes existing activities, but also activities that should be taking place in the future. Furthermore, it is good to state which sounds are wanted and which sounds are not wanted at that site, which is also related to the planned activities (Brown & Muhar 2004). To make sure that valuable sounds and smells⁷ will stand out, disturbing sounds and smells should be banned from that specific site. In case of the Noordoostpolder, this will be hard to achieve as it is unrealistic to remove the car. Therefore a new network layer should be add to avoid disturbing smells and sounds.

⁷. An overview of sounds and smells which people generally appreciate was given in chapter two



7. DESIGN: WATER RETENTION AREA



Photo montage for new water retention area

7 Design: water retention area

7.1 Location

Catch water in lowest places

As concluded in the previous chapter, one part of the agricultural area in the polder should be sacrificed to collect water in order to maintain dry land in the rest of the polder. The elevation of the Noordoostpolder is analysed to investigate the best place to collect water (figure 7.1). Water always runs to the lowest places. Places which are very low and suffer from subsidence are potential to be flooded in the future (Waterschap Zuiderzeeland 2011). Collecting water in these specific places (figure 7.2), which is northwest of Emmeloord, around Tollenbeek, and northwest of Schokland, seems the most logical solution. This new water can be implemented in two ways: by increasing the amount of surface water or by designing a more flexible water system. As the second option can affect the agricultural system, the first option is more desirable (Waterschap Zuiderzeeland 2011).

Tollenbeek

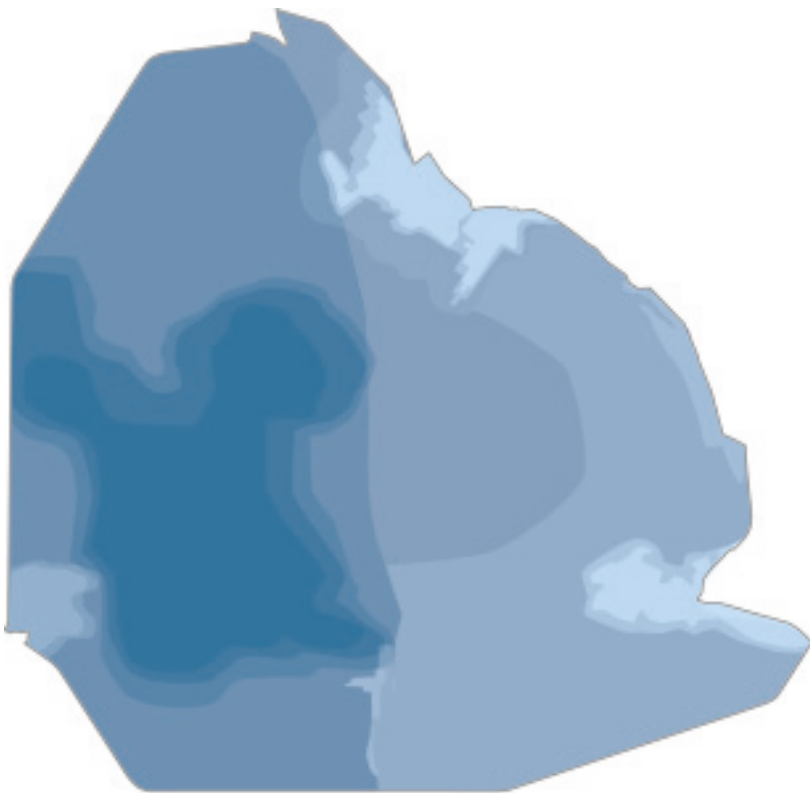
Water problems are already noticeable around Tollenbeek which is shown in figure 7.4. Two consorts are working to keep the area dry. As this is still not sufficient, a third consort is under construction. Many drains are visible in the fields and some farmers have left their farmyards which contain nowadays other functions than farming. In other words, farmers which experience water problems are likely to stop farming in the future. Taken measurements will not be adequate for the future so increasing the amount of surface water seems the best option for this area. Therefore, this site is chosen for a design.

7.2 Design principles

The element which is not functioning properly is the water system. In order to design a water retention area which suits the designed landscape of the Noordoostpolder, design principles are developed. These principles are derived from the original design intentions and the aesthetical evaluation and further specified to the characteristics of this particular site.

Aesthetical appealing

Aesthetical appealing elements which were designed as such and are still visible in the field will be used in a new design. '*Show diversity in the land*' (Hudig et al. 1928) by using several vegetation types or varying in grazing. Use '*waterways as structuring principle*' because '*water can bring in a rush of joy*' (Hudig et al. 1928). Furthermore, reed is used, '*to accentuate the straight lines of the water ways*' (Hudig et al. 1928, p. 72). The '*green islands*' provide a totally different landscape experience



7.1 Elevation map of the Noordoostpolder



7.2 Potential places for flooding

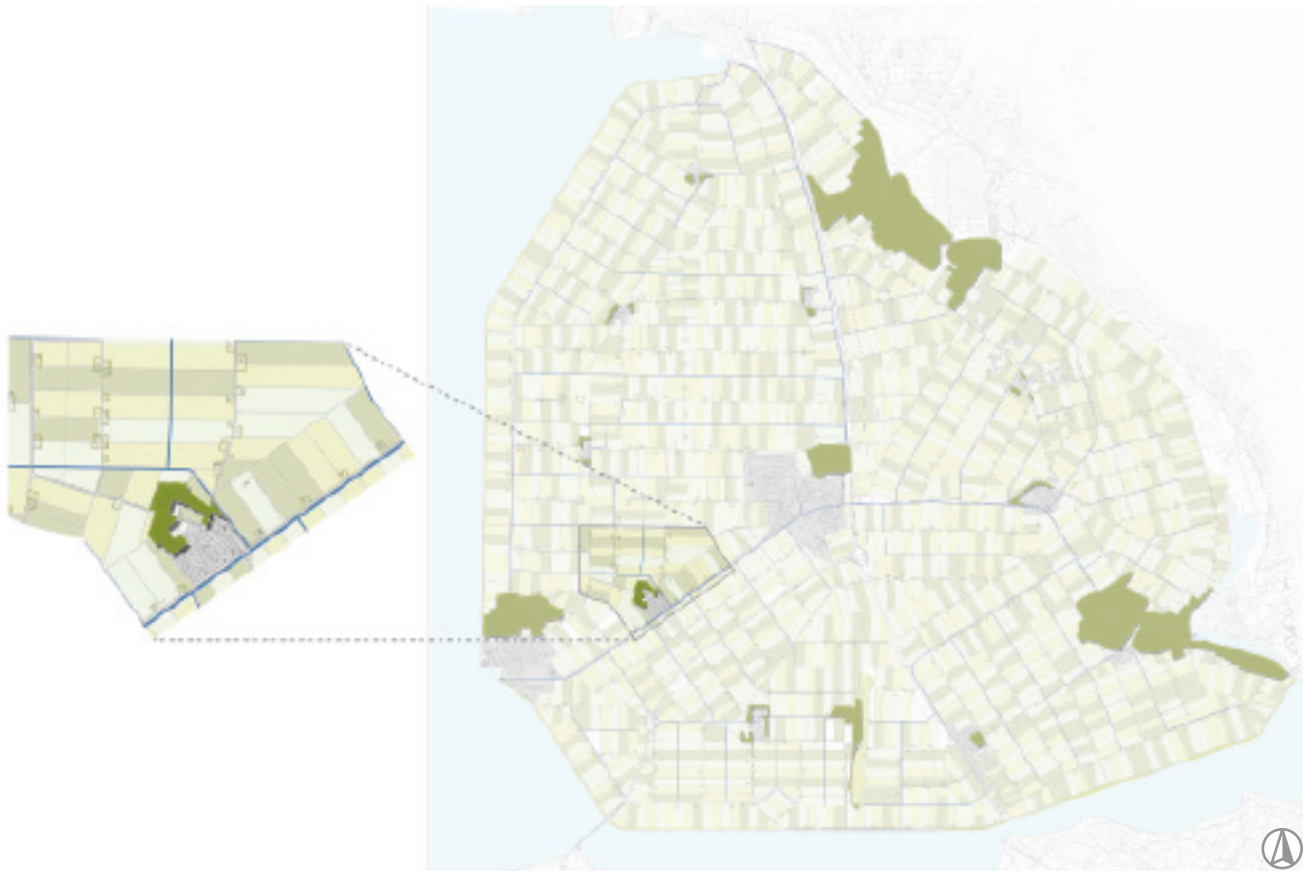
when compared to the rest of the polder. Two will be used in a new way for recreational purposes. Some general solutions for green islands will be given in order to deal with increase in scale.

Unique

The area around Tollenbeek is characterised by a large, open agricultural land on the east side, while the western part of the area is quite enclosed and contains more trees. This difference between open and enclosed should be enhanced as it was part of the unique concentric structure in the design concept for the Noordoostpolder. Another unique element is the field pattern which should be an important element in the design: by using contrast, it will enhance a better experience of the regularity of the field pattern.

Missed opportunity

Furthermore, the missed opportunity, a new network structure should be added which connects to existing pedestrian paths in the area. Nature development i.e. place for ecology will also be implemented. Water can be retained in several ways. By using different vegetation types such as open water, reed land, and swamp forest, many species will develop.



7.3 Design location



Drains in the field



Consort I

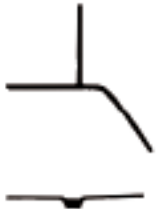


Consort II



Consort III

7.4 The construction of new consorts shows the necessity for a solution concerning water problems around Tollenbeek



7.5 Water ways as structuring elements



Aesthetical appealing

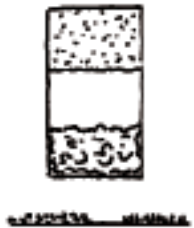
'Water as structuring principle: water can bring in a rush of joy' (Hudig et al. 1928, p. 84).



7.6 Accentuate water with reed



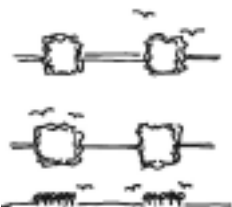
'Beautiful reed banks could accentuate the straight lines of the canals and waterways' (Hudig et al. 1928, p. 72).



7.7 Show diversity in the land



'Agriculture will dominate this landscape. The land will show specific colours, diversity, and roughness of farmland instead of the velvet smoothness of grassland' (Hudig et al. 1928, p. 69).



7.8 Restore and reinvent green islands



'Farms should also fulfil their role. They should be surrounded by massive plantation' (Hudig et al. 1928, p. 71).

Unique

Open landscape



Enclosed landscape



7.9 Use concentric structure: enhance difference between open and enclosed landscape



7.10 Show unique field pattern by using contrast

Missed opportunities



7.11 Add a recreational network layer

7.3 Searching for form

Design phase

The different vegetation types in the design are determined by the design principles: open water, reed lands to accentuate the straight lines of the banks, swamp forest on the one side (to show the difference between open and enclosed landscape), and an open cattle breeding area which can potentially be flooded on the other side. Although design principles can really help in guiding the design, to come to a final design requires a lot of sketching. To gain insight in this process, some sketches which were 'breaking' during this process are showed on the next page. In this section, I will explain shortly the choices I made during the design phase.

1st sketch: clear forms were missing, but it was a nice starting point for the organisation of the different vegetation types.

2nd sketch: swamp forest on the west side of the bypass enhances the difference between open and enclosed landscape. To remove all the farms in the rest of the area is unrealistic.

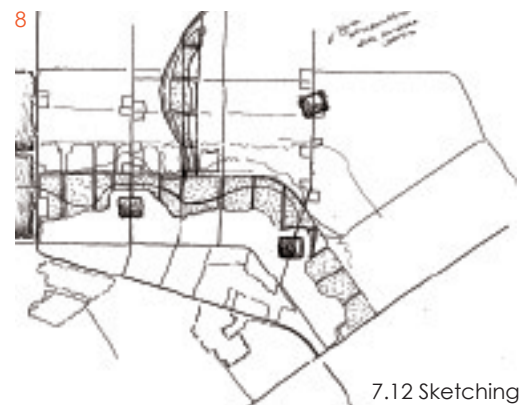
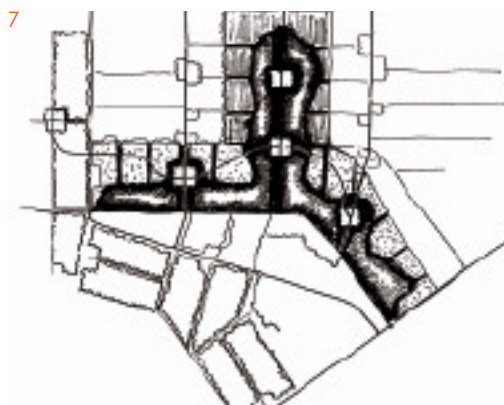
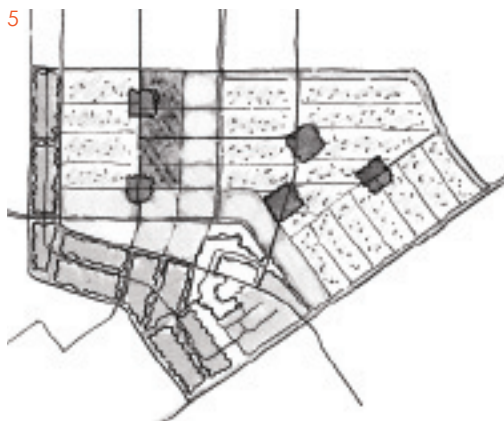
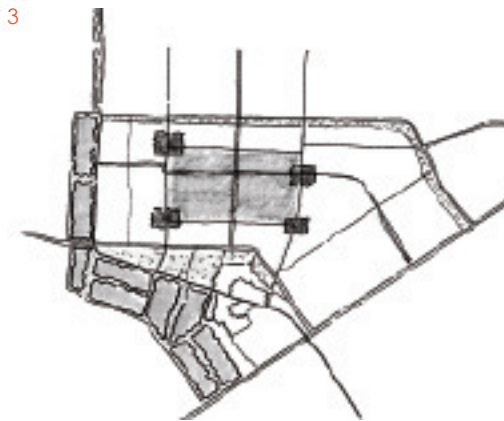
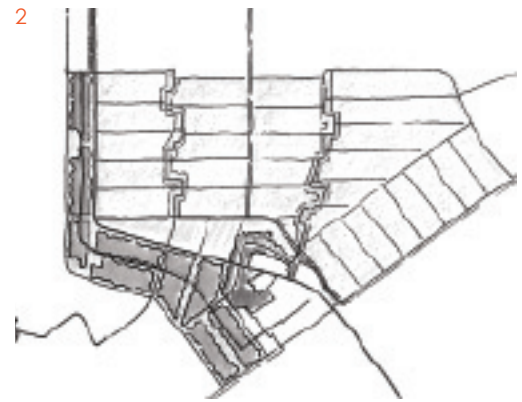
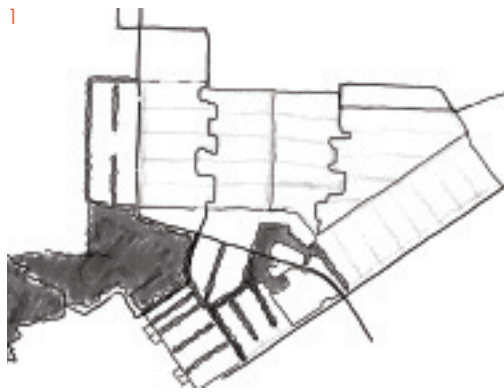
3rd sketch: a large open water in the centre is a kind of statement, but it does not fit well in the existing landscape structure.

4th and 5th sketch: reed lands situated on the eastern side of the swamp forest diminishes the contrast between open – enclosed because reed can become very tall. So, the area east of the bypass should remain open.

6th sketch: reed is structured along waterways which are enlarged to accentuate their straight lines. However, this design fits exactly in the existing structure, whereas the original designers had somewhat different in mind: *'the character of this new landscape should be contemporary'* (Andela 2011, p. 56 translated by the author) and *'the creation of powerful contrasts of mass and space'* (Hudig et al. 1928, p. 71).

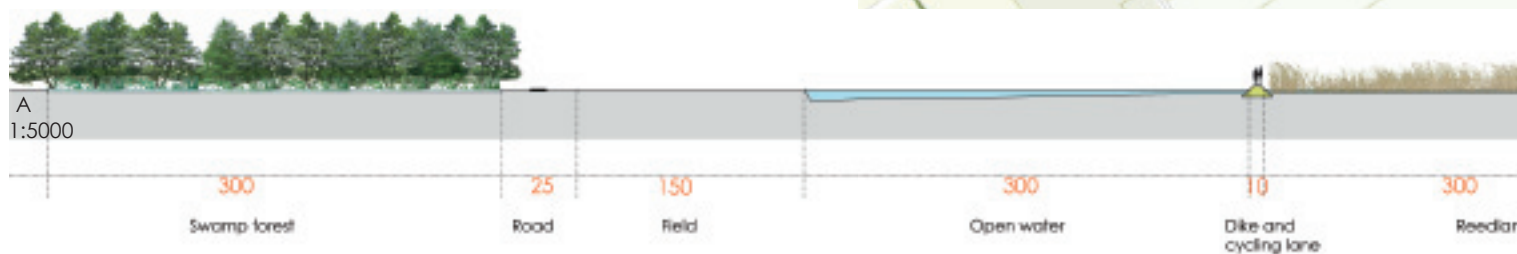
7th sketch: the form of the reed areas is softened to enhance contrast with the straight bank on the other side of the open water. The path is winding. However, a winding road within a reed land will not show the regularity of the field pattern.

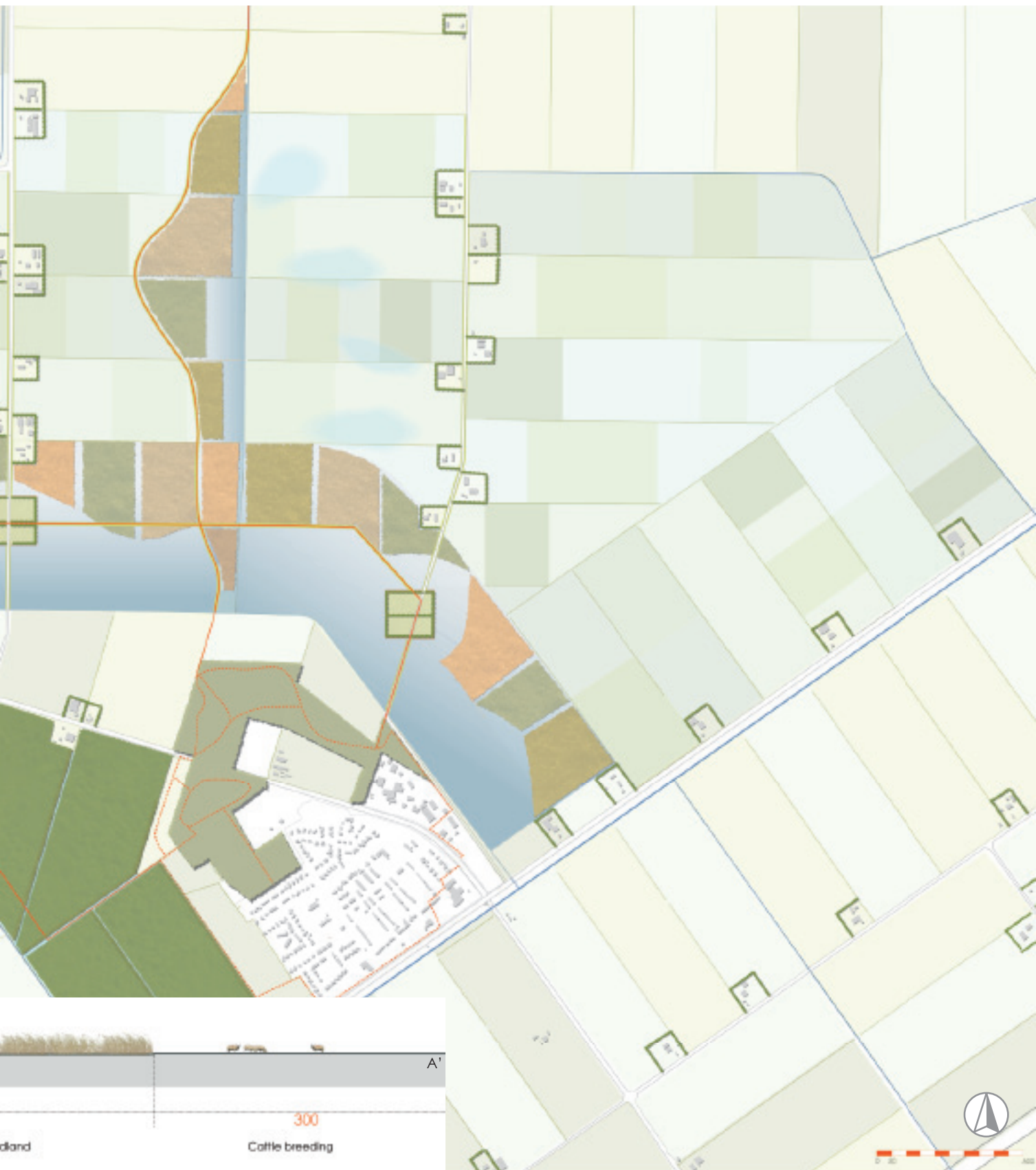
8th sketch: therefore, a winding path is situated between the reed land and the meadow.





7.13 Design water retention area





7.4 Design

In the final design, the form of the winding path is optimized whereas the rest of the paths are straight to show this contrast. The existing canals are enlarged to create open water. Reed lands are implemented to accentuate this water. Two green islands in the area becoming literal islands with a new recreational function. The rest of the area is used for cattle breeding, but can be flooded during heavy rainfall which is illustrated in figure 7.20. The area can be experienced by walking and cycling on dikes which are not accessible for cars (figure 7.18).

Multisensory experience

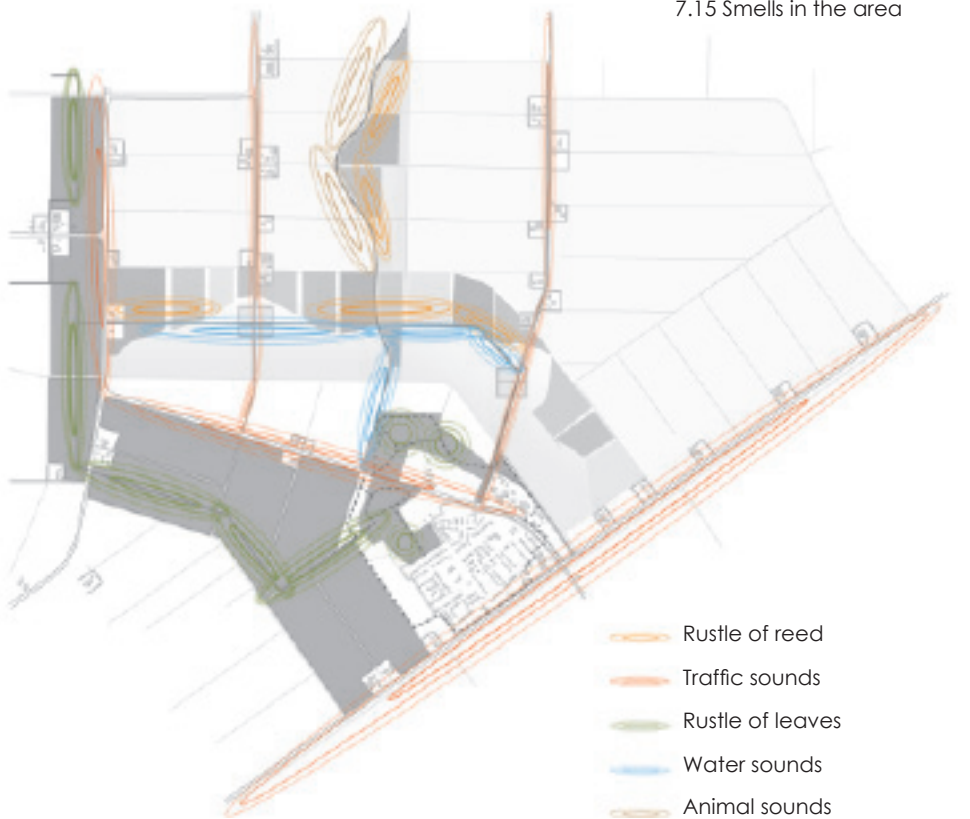
Landscape experience did also play a role in design decisions. As illustrated in figure 7.14, a new network layer was added far away from car noises and smells in order to restore the intended experience: bird sounds, rustle of reed, water sounds, and farmer activities. Unwanted sounds and smells cannot be banned out of the area, as removing the car is unrealistic. Therefore, the wanted sounds and smells are structured along the new network layer while existing roads are still accessible for cars (figure 7.15 and 7.16).



7.14 New network structure

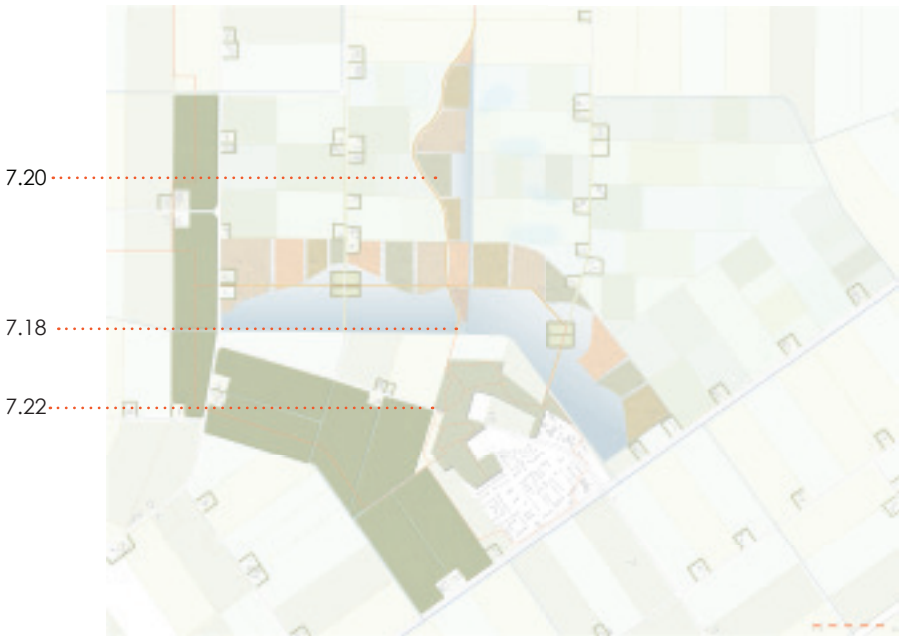


7.15 Smells in the area



7.16 Sounds in the area

Photo montages water retention area



Locations photo montages

Attractive area for birds Smell and sound of water Rustle of reed





7.17 Existing situation

Network structure for cyclists on new dikes

Farmyards surrounded by hedgerows as green islands



7.18 New situation



7.19 Existing situation

Different grazing types

Cattle breeding area: can be flooded during heavy rainfall

New network structure for cyclists

Reed lands



7.20 New situation

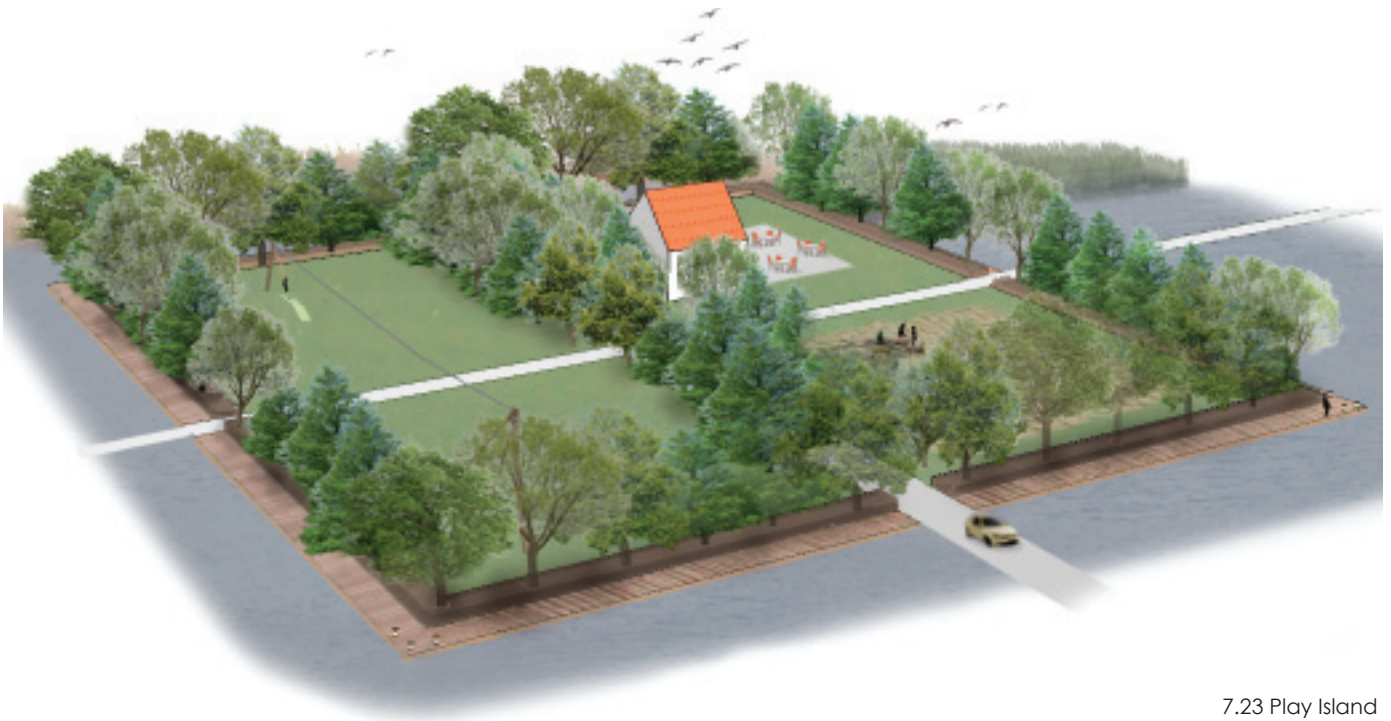


7.21 Existing situation

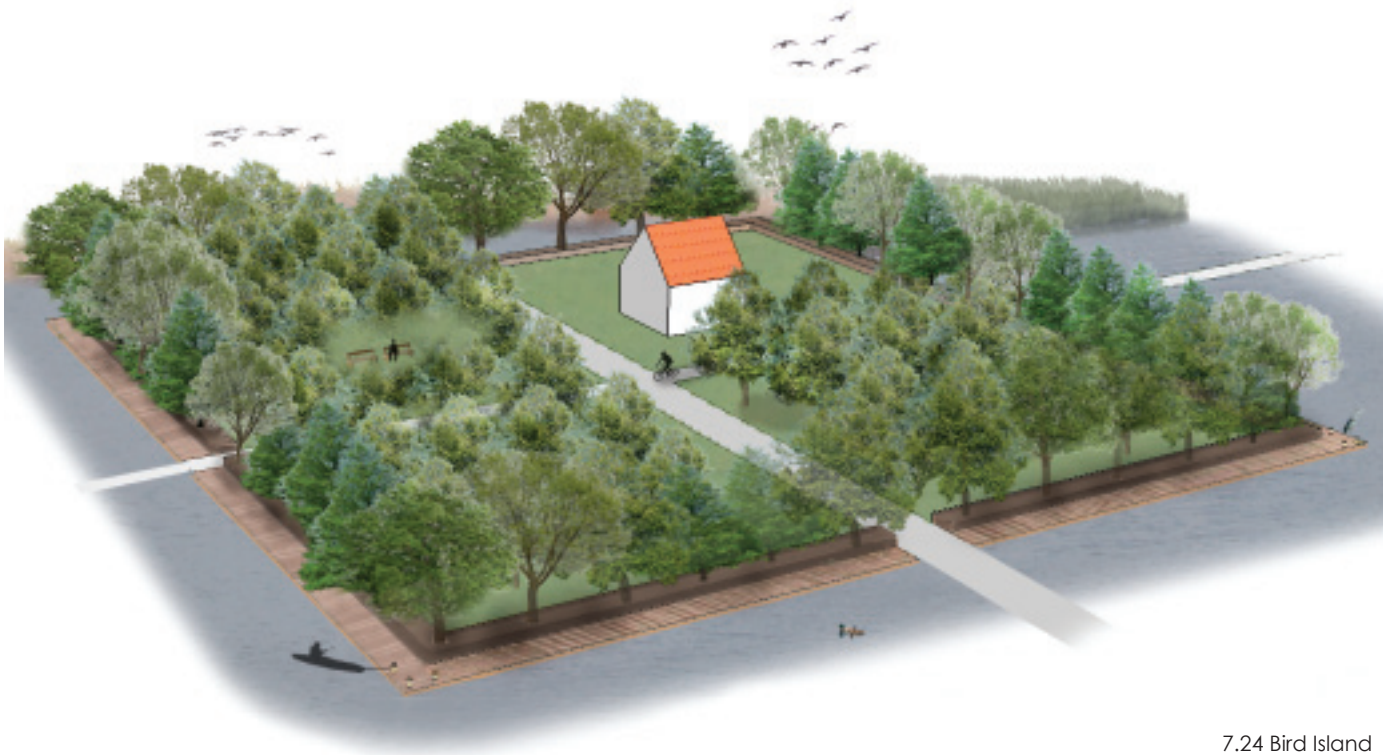


7.22 New situation

New recreational functions for two green islands



7.23 Play Island

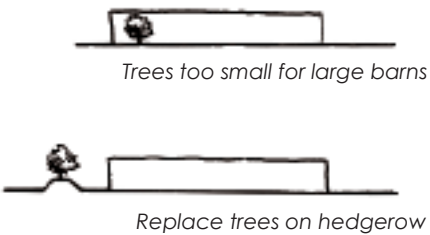


7.24 Bird Island

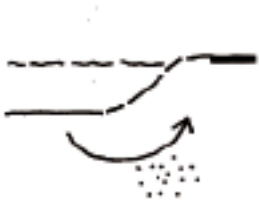
7.5 Green islands and vegetation types

The different colours which the former agricultural land always shows inspired the choice of vegetation by using different types of reed and different grazing types (figure 29 - 32). Planting a whole swamp forest at once is difficult. Therefore, the land is excavated (0.2 metres), flooded and reed is sown mixed with a few characteristic species for a swamp forest like alder (*alnus glutinosa*), gale (*myrica gale*), gray willow (*salix cinerea*) and hop (*Humulus lupulus*). Within a couple of years, the reed will disappear and a whole swamp forest will develop (Schaminée et al. 2010).

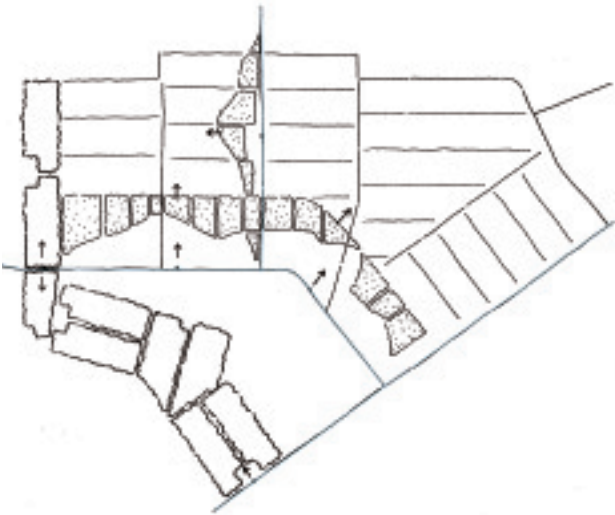
Aromatic places are important because they remain a significant influence in memory, personal history and sensory cultivation (Porteous 2006). Vegetation's as gale and hop are chosen because of their scent. Gale is strongly scented: especially the leaves are aromatic. Naturally, hop is growing in swamp forests. Hop bells disseminate a nice scent in august (Schaminée et al. 2010). Also, the reed lands are scented due to the use of calamus (*Acorus Calamus*) which is famous by his strong, sweet smell. As the root depth is thirty centimetres, it will be planted in the lower parts of the reed area (figure 7.28) (Zimmermann 2011).



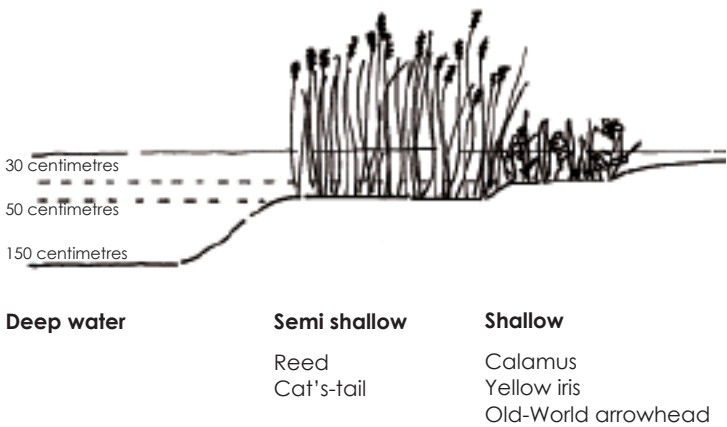
7. 25 General solution green islands



7. 26 Excavate land for water retention and use soil for dikes

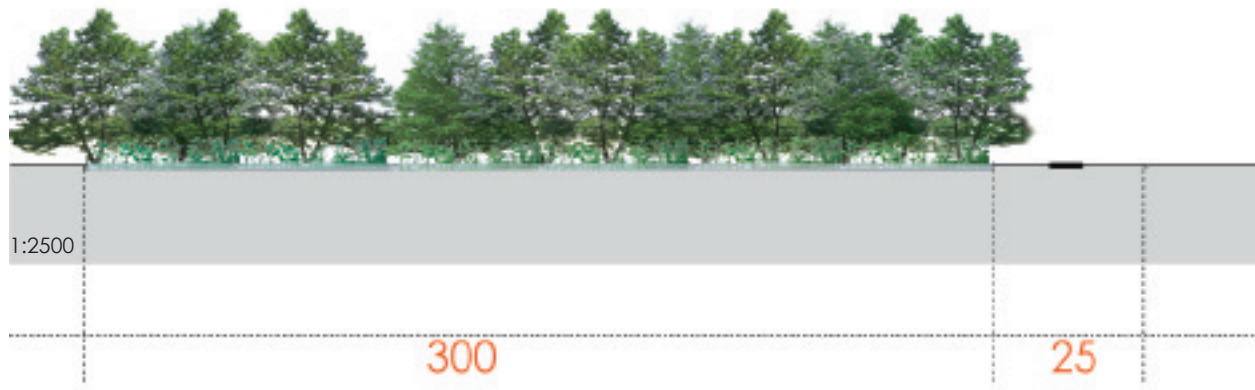


7.27 Access points for waterflooding



7.28 Plantation reed area (Adapted from: Zimmermann 2011)

Swamp forest



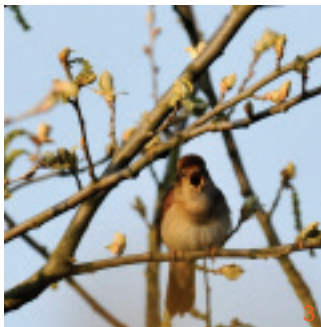
Vegetation types



Alnus glutinosa



Salix cinerea



Nightingale



Myrica gale

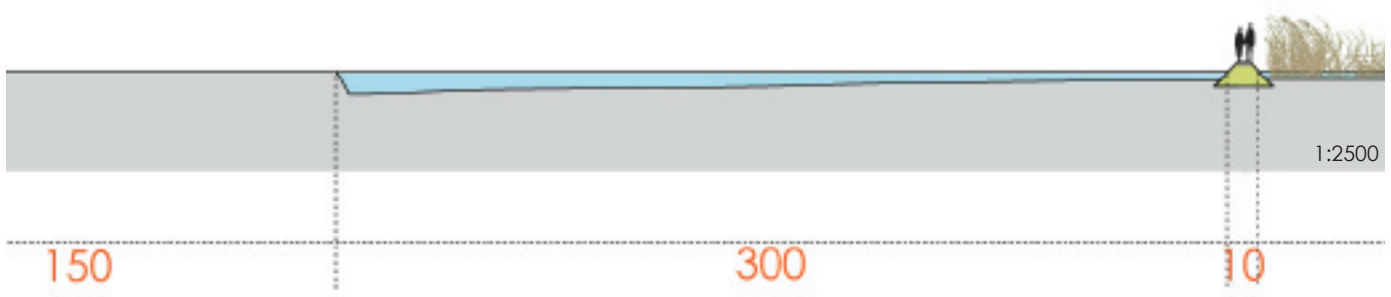


Humulus lupulus

Recreational opportunities



Swamp forest



Smells



Smell of water (1)

Sounds

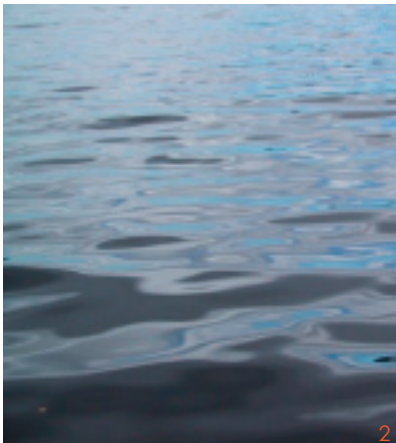


Geese

Recreational opportunities



Sailing



Smell of water (2)



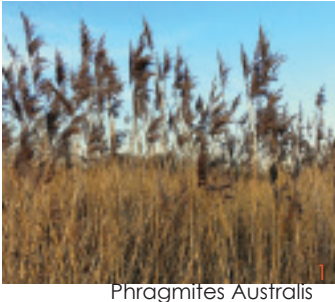
Grey Heron



Fishing

Reed land

Vegetation types

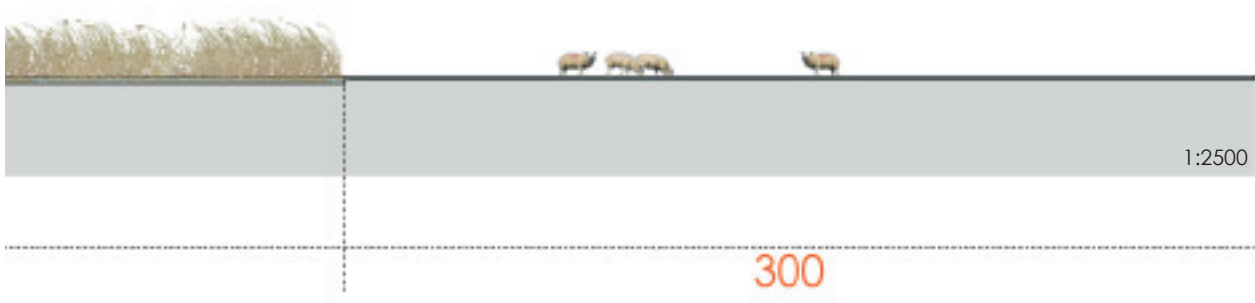


Sounds and smells



Recreational opportunities





Vegetation types



Extensively grazed grassland



Intensively grazed grassland

Sounds and smells



Sheep



Trifolium repens

Recreational opportunities



Cycling trough farmland



8. DESIGN: GREENHOUSE AREA



Photo montage of the new greenhouse area

8. Design: Greenhouse area

The previous chapter has illustrated how another function than agriculture could be implemented in the Noordoostpolder. As agriculture is still the most important land use type, this section describes how to deal with modern agricultural devices.

8.1 Location

Luttelgeest

The existing greenhouse area near Luttelgeest and Ens is going to be elaborated with 250 hectares near Luttelgeest and 125 hectares near Ens (Municipality Noordoostpolder 2011). One new plan will be designed for the area near Luttelgeest. This is a logical place for greenhouses. Due to the location of the existing greenhouse area nearby, infrastructure is already up to date. As this area is also part of the enclosed landscape type in the Noordoostpolder, greenhouses can enhance the border between open and enclosed landscape. Furthermore, the existing greenhouse area is a kind of messy: adding new greenhouses can improve the structure of this area.

8.2 Design principles

The appearance of the new greenhouse area is determined by two specific features: site-specific characteristics derived from the aesthetical evaluation and business components of a greenhouse area. This includes the greenhouse facade, office and canteen, green, storage and production of water and energy, parking and logistics, and dwelling and external functions (Stroeken et al. 2011).

Business components

Greenhouse areas are mostly experienced by people as unattractive (Stroeken 2009; Stroeken et al. 2011). Several guidelines are used to design a greenhouse area which can also be beautiful:

Transparent facade

- A transparent greenhouse facade softens the border between inside and outside. Furthermore, people can see and experience which crops are cultivated (Stroeken et al. 2011).

Green elements

- Green elements can add value to a greenhouse area. Some farmers consider trees as a threat as it causes some shade on their crops. To prevent this, an acceptable distance from approximately 20 metres between a tree and the greenhouses is necessary. Using tree species which are already present in the landscape provides coherence between farmyard and landscape (Stroeken et al. 2011).



8.1 Design location



8.2 Tulip route

Water

- Water is necessary in a greenhouse area for the growth of crops. Rainwater is collected in basins to provide irrigation water of good quality. The capacity of a basin for the storage of rainwater should be between 500 and 2000 cubic metres per hectare (H+N+S 1993). Although water can be a nice element in a greenhouse area, it is not visible in many places due to clay walls covered with black plastic. A basin can be dug into the land to provide a view over the water. Green banks with grass and reed can support a natural appearance (Stroeken et al. 2011).

Logistics

- A greenhouse area also requires a lot of parking space which means that a large area is covered with asphalt. Situating parking space behind the buildings will hide this large amount of paved surface. Energy elements can be either placed out of sight or designed in a nice way (Stroeken et al. 2011).

Site-specific characteristics

Aesthetical appealing

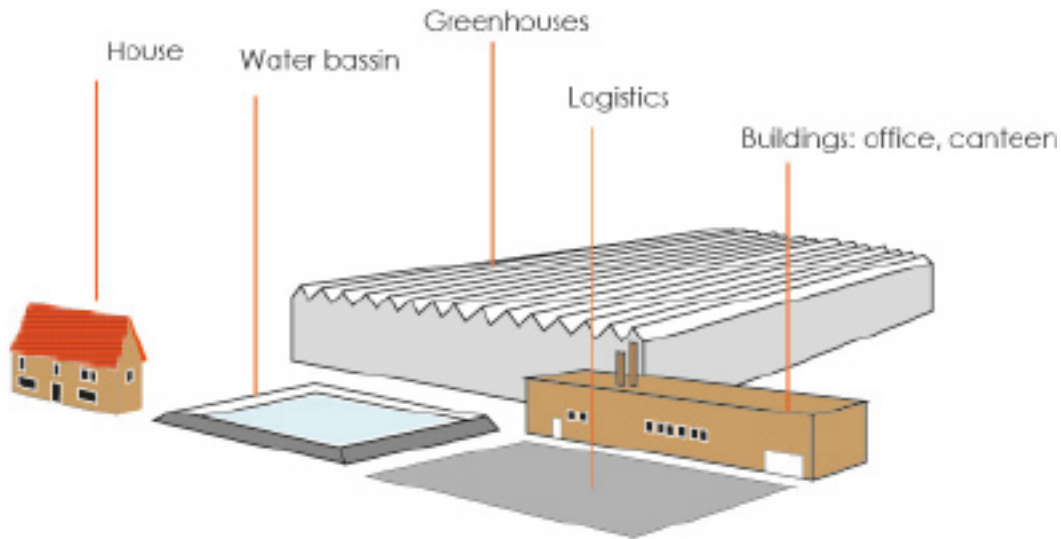
To maintain a well-functioning greenhouse area, the existing area is elaborated. Aesthetical appealing elements which are still visible in the field will be used in a new design. Water ways are structuring the Noordoostpolder; therefore they are used as the main structuring elements in the design. An interesting route in April which crosses Luttelgeest is the 'tulip route', a route composed from several existing roads along tulip fields. This route is originally designated for the car, but it will be far more interesting to connect to this route by implementing new tulip fields which are accessible with cycling lanes. When cycling through tulip fields, it is not only possible to see tulips, but also to enjoy their aromatic smell. Diversity in the land is shown by using tulip species in varying colours.

Unique

Unique element are the concentric structure and the field pattern. The greenhouse area is situated east of the bypass which is part of the enclosed landscape of the Noordoostpolder. Planning greenhouses in this area enhances the contrast between the open and enclosed landscape. The different lines in the field pattern are interesting and should be preserved, accentuated or showed by using contrast because an original design principle was: 'the creation of powerful contrasts of mass and space bounded to a straight structure' (Hudig et al. 1928, p. 71).

A missed opportunity of the existing greenhouse area is the absence of apart cycling lanes. The existing greenhouse area already attracts a lot of traffic for the supply and delivery of products. Some farmers are selling their products in small farm shops which attract many people. Cycling lanes are connecting those farm shops with the nearby villages, and are situated alongside of busy traffic lanes which makes it not very attracting to visit the shops. A solution for this is the construction of two separate network structures which will provide a 'quite' network for cyclists along shops and another network for cars.

Missed opportunity



8.3 Business components (derived from Stroeken et al. 2011)



8.4 transparant greenhouse facade



8.6 Natural water basins



8.5 Green elements





8.7 Water ways as structuring elements



Aesthetical appealing

'Water as structuring principle: water can bring in a rush of joy' (Hudig et al. 1928, p. 84).



8.8 Show diversity in the landscape



'Agriculture will dominate this landscape. The land will show specific colours, diversity, and roughness of farmland instead of the velvet smoothness of grassland' (Hudig et al. 1928, p. 69).



8.9 Add a new network layer



Missed opportunities

'Roads in the surrounding of villages will give inhabitants the opportunity to take a small walk. This recreational function should be taken into account during their construction and plantation' (Hudig et al. 1928, p. 29).

Unique

Open landscape



Enclosed landscape



8.10 Use concentric structure; enhance difference between open and enclosed landscape

'The creation of powerful contrasts of mass and space, bounded to a straight structure should enhance rhythm and scale in the polder' (Hudig et al. 1928, p. 71).



8.11 Show field pattern by using contrast

8.3 Searching for form

Model study

As discussed in the previous section, the main structure for the new greenhouse area is derived from existing water ways. To arrange greenhouses in a sufficient way, a model study is performed where dimensions, form, and directions are investigated. Design decisions are made either by form choices (does it fit into the landscape), original design characteristics (make sure that the underlying landscape still can be experienced) and practical choices (best economical way to arrange greenhouses).

1st sketch: the area was too small to structure the greenhouses in the right way. There was no open space left.

2nd sketch: by occupying a larger area, space in the centre can be used to preserve some openness. However, greenhouses are integrated in the existing structure, whereas the original designers had somewhat different in mind: *'the character of this new landscape should be contemporary'* (Andela 2011, p. 56 translated by the author).

3rd sketch: searching for contrast by using a complete different form: circles. This looks really strange and out of place, so rectangles are preferred.

4th model: keep open many space creates a nice rhythm. But in practice, this space is probably absorbed by new greenhouses, basins, and other disturbing elements.

5th model: the canal serves as a border between the greenhouse area and the rest of the landscape. Locating greenhouses in another direction than the field pattern gives a nice contrast but sketching on a more detailed level of scale shows that delivery of products is not possible.

6th and 7th model: a square as greenhouse varies also nice with the field pattern. But too many directions in one design disturbs the original landscape structure.

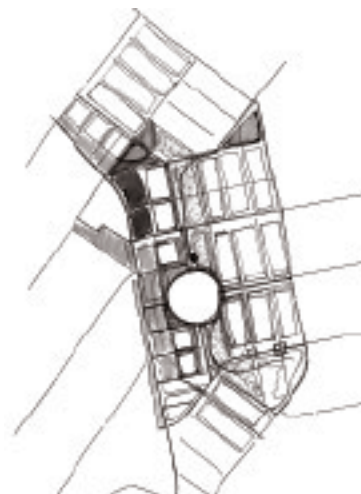
8th and 9th model: oblique greenhouses contrast in a nice way with the existing field pattern. By locating them at the front of the area, they become the eye catcher for the greenhouse area of Luttelgeest. Placing all the greenhouse oblique is in practice not possible. Sketching on a more detailed level of scale shows that supply and delivery of products becomes difficult.



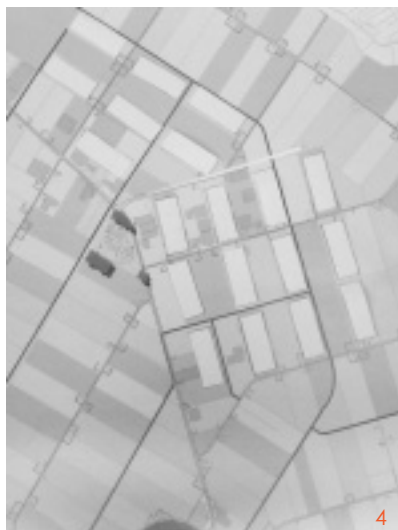
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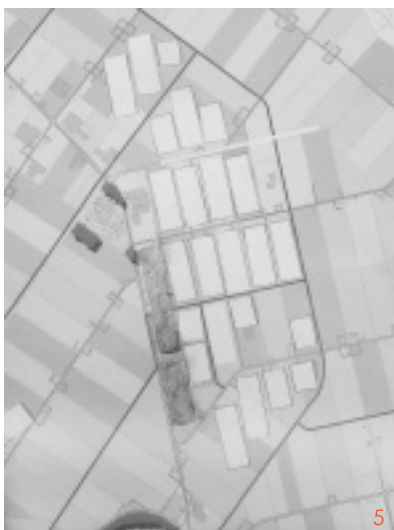
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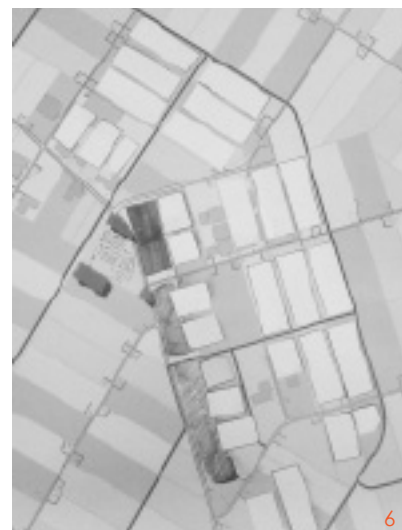
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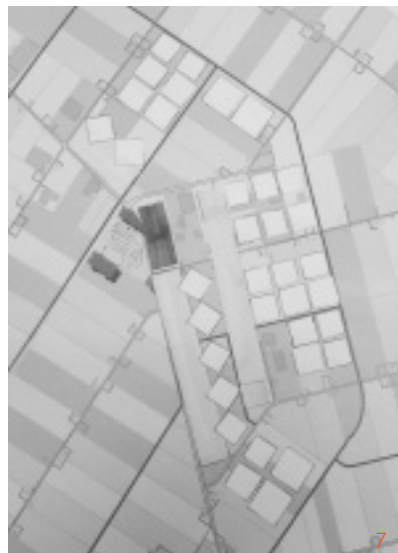
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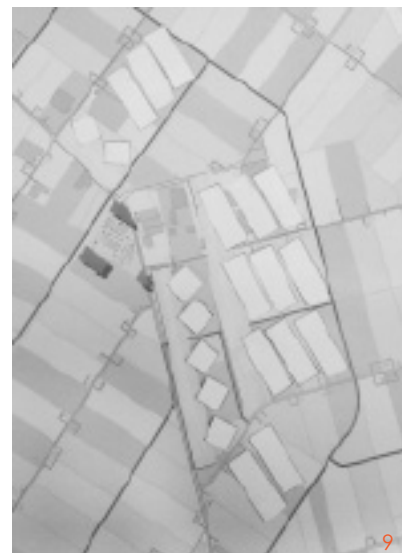
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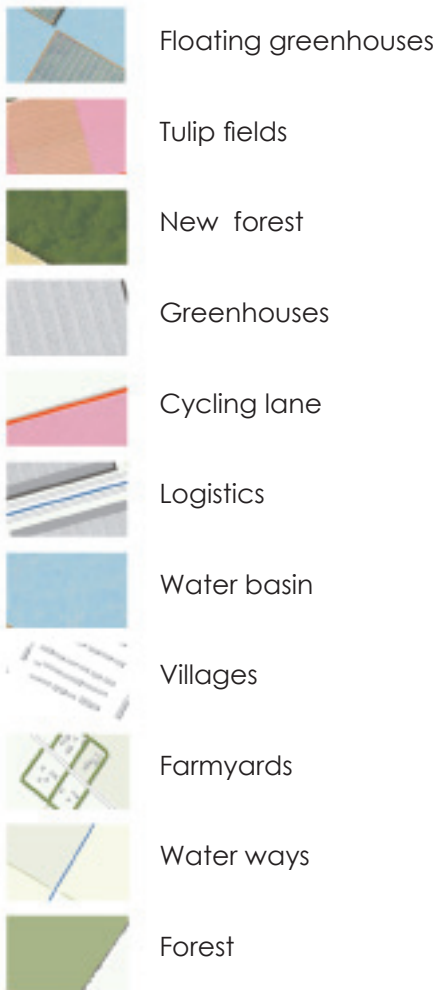
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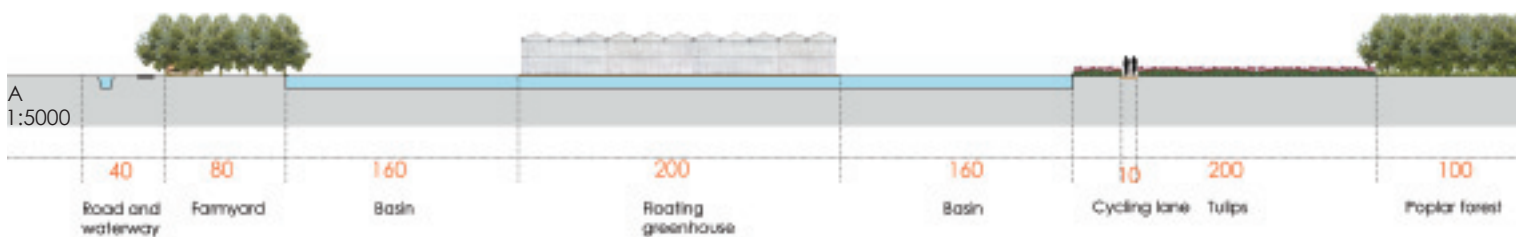
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8.12 Sketching phase

8.4 Design



The final design shown in figure 8.13 is a mix of several models whereby oblique greenhouses serve as an eye catcher for the area. These oblique greenhouses are floating greenhouses: the water functions as a basin and provide fresh irrigation water for the whole area. The water basin is really large: each greenhouse can use 8000 cubic metres per hectare. This means that each company is able to provide in his own water supply (with 2000 cubic metres per hectare, a company provides for 80 per cent in his own water supply) (H+N+S 1993). The rest of the basin can be used for normal water storage which because a large amount of paved surface is constructed. The floating greenhouses are 6,25 hectare each. As Mecanoo performed a design with a floating greenhouse about 4,5 hectares (TNO 2011), it is quite certain that it will be possible to construct this in the future.





8.13 Design greenhouse area

Two network structures

In total, an area of 300 hectares is occupied by new greenhouses. This includes new greenhouses which replace old ones after a few years. In total, a surface of 230 hectares for new greenhouses is constructed. This almost meets the requirements of the municipality (250 hectares near Luttelgeest). Two networks are designed for the area: one for walking and cycling along farm shops, tulip fields, and a small forest and one for the transportation of products and other traffic. In the design of these networks, structuring sounds and smells are very important which is shown in figures 8.16 and 8.17. The tulip fields are owned by the farmers of the greenhouses who cultivate flowers. For them, these fields serve as a stage where they can show their products.



8.14 New network structure



8.15 Location of logistics and farmshops



8.16 Sounds in the area



8.17 Smells in the area



Locations photo montages

Road for cars and trucks

Shared water basin by
different greenhouse owners

Visibility of crops





8.18 Existing situation

Floating greenhouses

Cycling lane

Natural banks covered with reed



8.19 New situation

Floating greenhouses





8.20 Existing situation

Cycling lane / Pedestrian path

Smell of tulips

Sound and smell of forest



8.21 New situation

8.5 Phasing

The greenhouse area will be constructed in several stages, because parts are already occupied by existing greenhouses. Phase I requires the construction of the landscape structure: plantation of trees and tulips. Also the road pattern and one part of the basin should be constructed during phase I in order to provide new greenhouses with water. Empty spaces can already filled up with new greenhouses. Phase II is determined



8.22 Existing situation

by the economic lifetime of a greenhouse which is about twenty years (Agriholland 2012). As soon as existing greenhouses can be replaced, new greenhouses should fit in the new landscape structure. The other part of the water basin can be constructed and some places which were occupied by greenhouses, forest can be sowed.



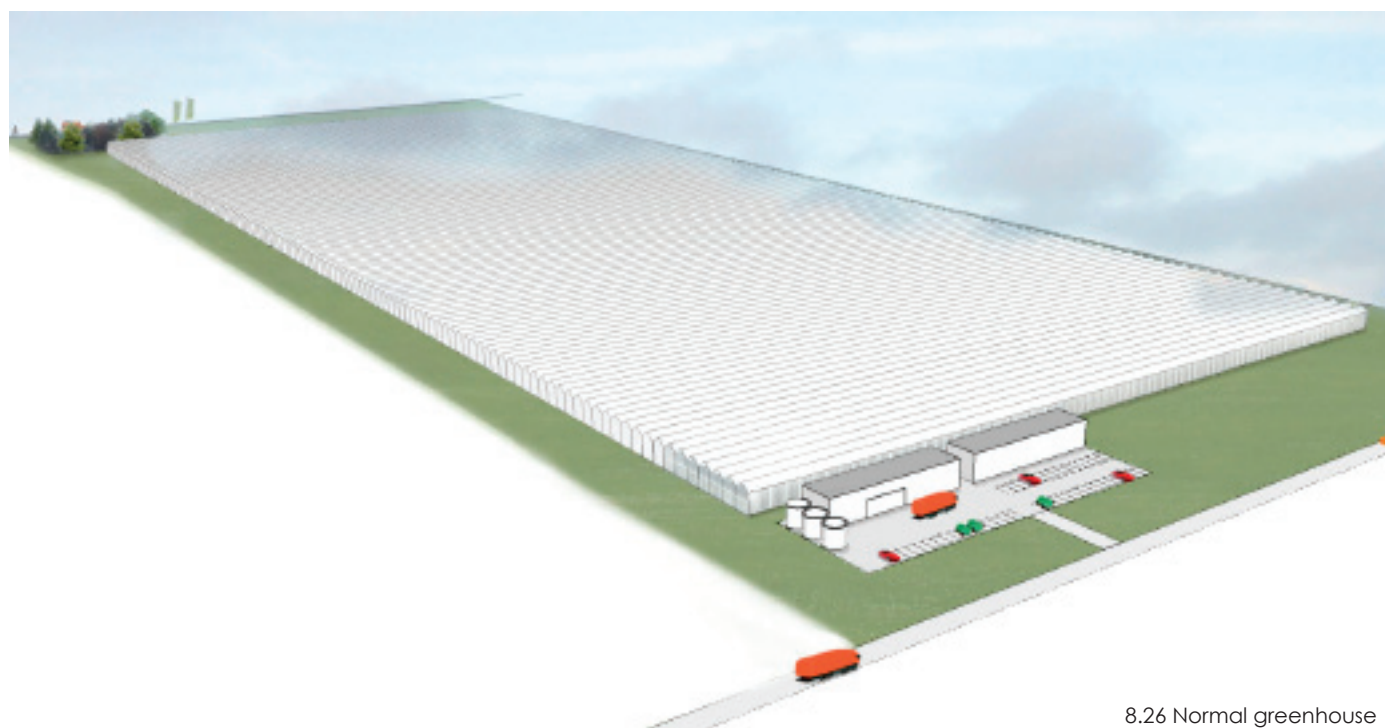
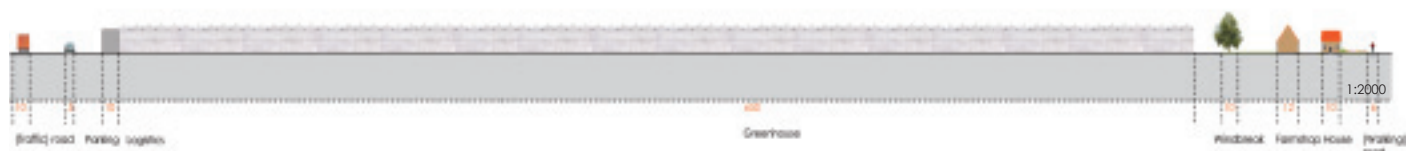
8.23 Phase I



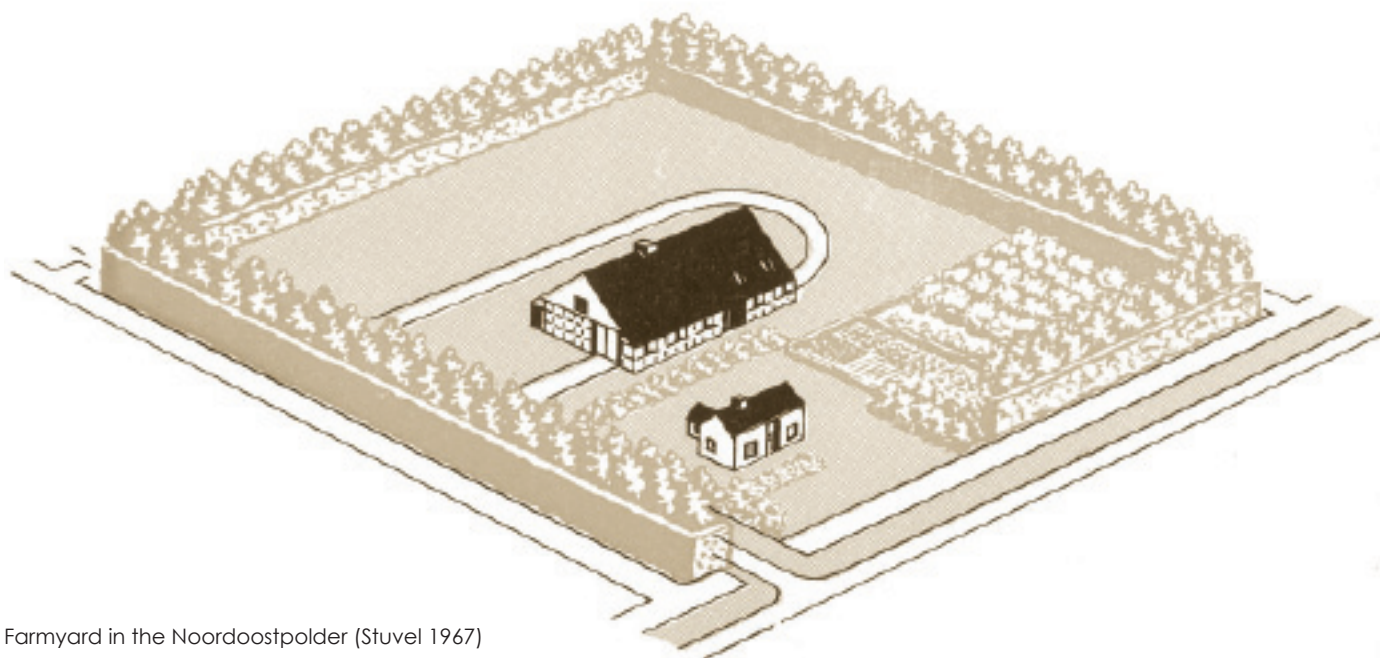
8.24 Phase II

Figure 8.25 and 8.26 provide an overview of a lot with a floating greenhouse, and a lot with a normal greenhouse. These overviews show how farm shop, logistics, offices and parking space are structured on a more detailed level of scale. The farmyards surrounded with windbreaks are used for dwelling and selling of products. Logistics and parking space are placed out of sight either behind windbreaks or on the other side of the greenhouses.





8.26 Normal greenhouse



Farmyard in the Noordoostpolder (Stuvel 1967)

9. CONCLUSION



Farmyard with new recreational function

9. Conclusion

Designed regional landscapes are an important part of the history of Dutch landscape architecture and studying them enhances understanding about the discipline. This thesis has highlighted one designed regional landscape and implied some principles which can be hypothetical applied to other designed landscapes.

Designed regional landscapes contain several stages which are part of their origination. The design layer is the last stage, and just as important to consider as other development stages in landscapes such as natural processes and small interventions made by farmers and builders. However, landscapes are dynamic and change over time, so also the design layer is vulnerable. An approach to determine how to evaluate and redesign designed regional landscapes was clearly missing in literature. The aim of this thesis was to find such an approach where the original design and intended landscape experience is seen as a key solution to guide future developments and can give inspiration for new plans. One case, the Noordoostpolder, was chosen to achieve the specified aim. The Noordoostpolder can be considered as a good example of a designed regional landscape. Nonetheless, developments as changing agriculture, increasing risk of flooding's, and traffic are threaten the state and intended experience of this unique design. To decide how new developments should fit within the existing designed landscape, an evaluation of the original design and the current landscape was required.

9.1 Results

The characteristics of designed regional landscapes

In order to find an evaluative approach, it was necessary to determine the characteristics of designed regional landscapes which shapes the way the Noordoostpolder should be analysed. Designed regional landscapes are:

- Constructed for functional reasons;
- Mostly structured along their network layer;
- Designed by an author and commissioned by a client;
- Designed from a certain vision, a reflection about their appearance which makes design ideas important to study;
- Designed by professional landscapers;
- Designed with the purpose to be beautiful;
- Designed as everyday environments and contain multisensory qualities.

Designed regional landscapes originate from a certain vision and to understand these landscapes it is important to understand this vision i.e. the design intentions. Furthermore, these landscapes have multisensory qualities. To get an insight whether these qualities are interesting, the current landscape should be analysed multisensory.

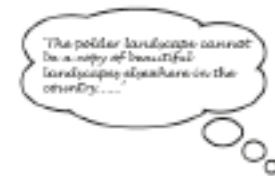
The original design intentions for the Noordoostpolder

The original design intentions can be found by analysing design ideas, design concepts, and design tools. Design ideas were dedicated towards the opinion that the landscape of the Zuiderzeepolders should be contemporary and therefore should differ from other landscapes in the Netherlands. This was achieved by the creation of powerful contrasts of mass and space by planting the of villages, farmyards, and roads. Villages, farmyards, and roads were seen as massive structures which were contrasting with the empty space and straight field pattern of the polder.

The design concept was reflecting to a certain extent the design ideas. The general structure of the Noordoostpolder was directed towards the polder centre. The concept of centre – field - frame is each time repeated for the whole polder, the villages, and the farmyards in order to enhance 'rhythm by repetition' and 'mass by plantation'.

Design tools were used to perform the design concept and consisted of the field pattern, water ways, roads, architecture, and plantation. Although the field pattern was determined by economic considerations, other design tools included aesthetical goals. Roads should not be too long to avoid weariness and boredom, reed banks could accentuate the straight lines of canals and waterways, all the farms should be built in the same architectural style, and plantation was used to enhance contrast.

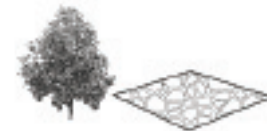
Design ideas



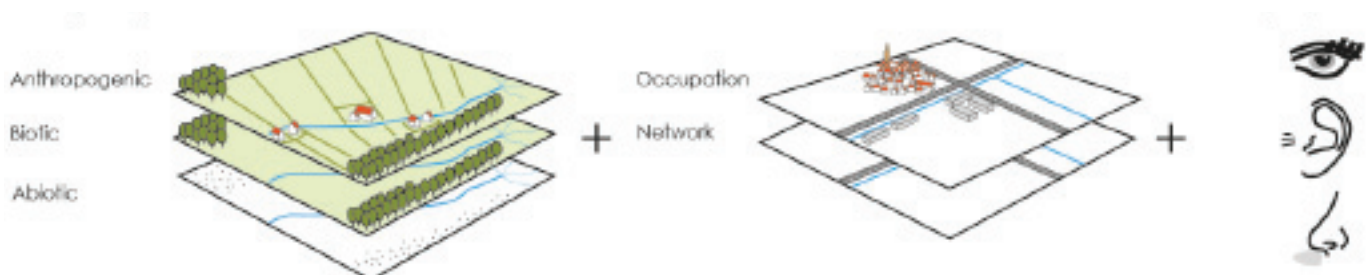
Design concepts



Design tools



9.1 Design intentions



9.2 Current landscape experience

An aesthetical evaluation

A multisensory analysis was required to determine the current landscape experience of the Noordoostpolder. Analysing this polder by ways of sight, sound, and smell provided a good overview of the landscape experience. Afterwards, an aesthetical evaluation is used to compare the appearance and experience described in design intentions to the current landscape experience. The characteristics of designed regional landscapes specify four parameters which are used for evaluation.

Functional



- Designed regional landscapes were in the first place designed for functional purposes. The old cultural landscape was not suitable anymore for large scaled agriculture and was transformed; or new land was reclaimed. Field analysis and reading policy documents gains some insight in functional problems.

The overall structure of the polder still functions. Nevertheless, new water and greenhouses should be implemented to maintain the general function of agriculture. Furthermore, the size of windbreaks should be enlarged to surround new barns.

Aesthetical appealing



- Designed regional landscapes are designed with purpose to be beautiful. Therefore, aesthetical appeal is an important parameter to evaluate such a landscape. A multisensory field analysis and a literature study will define aesthetical appealing elements.

Aesthetical appealing elements in the Noordoostpolder are forests and windbreaks around farmyards. They should be preserved or sometimes even be reinvented; car noises and increase in scale are diminishing these aesthetical appealing experiences.

Unique



- Landscape elements which can be considered as unique have to be preserved. To define unique elements, a comparison should be made to other landscapes which appear to be quite similar. To maintain and even enhance unique elements in the Noordoostpolder, new developments should be taking place within the concentric structure and the original field pattern, without damaging Schokland and Urk.

Missed opportunities



- Designed landscapes are different in the sense that they could have been different. Their main goals can be wrong or their design tools which are used to achieve these goals can be wrong. Therefore, the fourth parameter consists of the missed opportunities of the original design. A thoroughly field analysis can identify missed opportunities in the original design.

Place for ecology, connections to the dike, and accesses to walk and cycle in the countryside can be seen as missed opportunities of the original design of the Noordoostpolder.

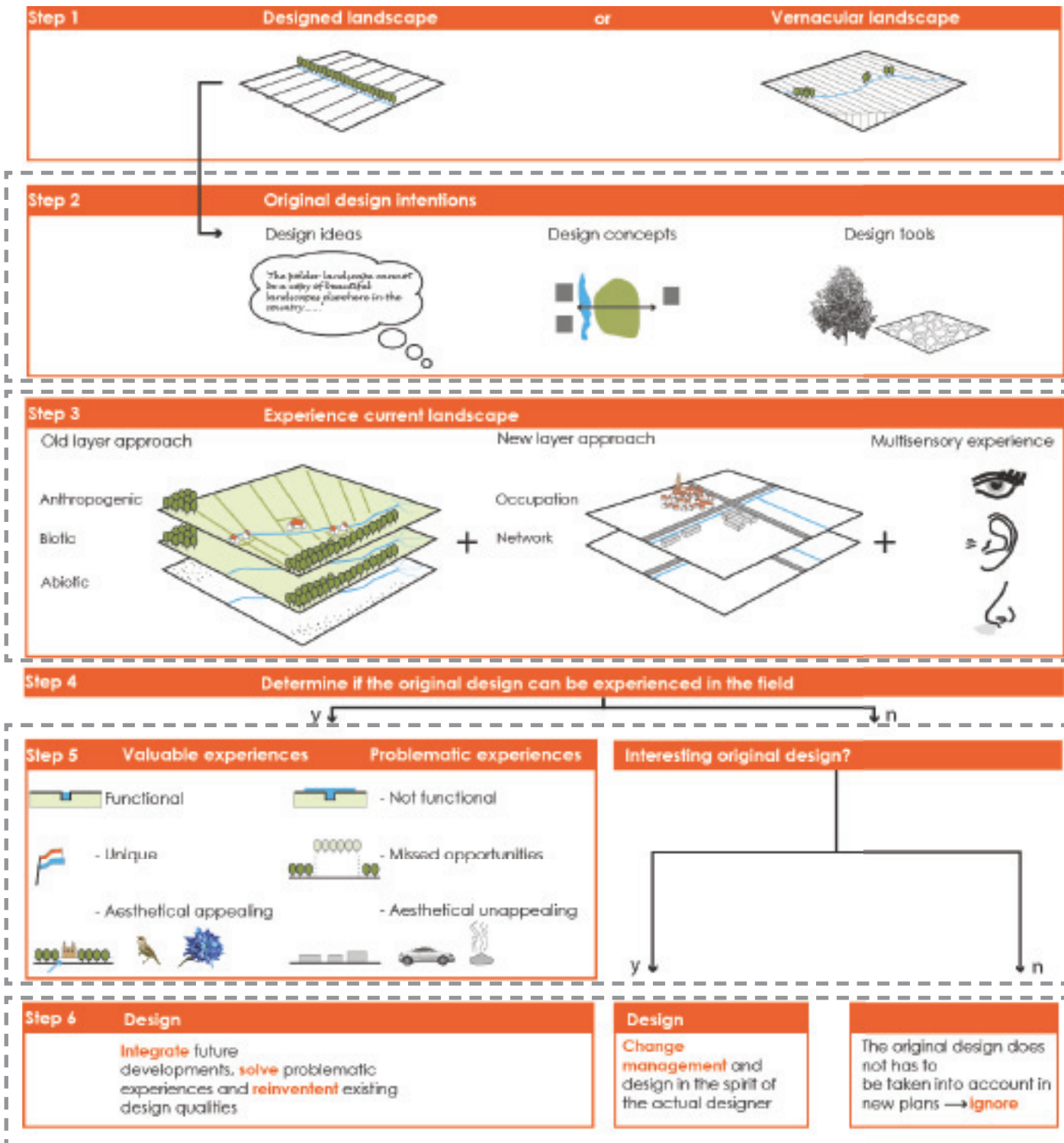
9.3 Aesthetical evaluation

Guiding future developments with the original design in mind

Future developments can be considered as motive to restore original experiences which are lost in the contemporary landscape. Two concrete design tasks for the Noordoostpolder were chosen in order to maintain a well-functioning landscape and prevent the loss of the main agricultural function. The design analysis and aesthetical evaluation identified landscape values and nice landscape experiences which can guide the appearance of those two designs. These designs serve as example for other future developments in the Noordoostpolder and should therefore use the same approach:

- The original design characteristics of the area should be used as input and inspiration to structure new developments;
- Aesthetical appealing elements should be restored or reinvented to enhance the multisensory experience of the area;
- A new network structure which is separated from the car is necessary in every place in the Noordoostpolder to experience the area without car noises and smells.

Finally, an approach was formulated which implies an evaluation for designed regional landscapes. This evaluation consists of a few steps (see figure 9.4). First, there should be found out if the landscape in case is designed. The second step is to study the original design to specify the intended aesthetical appearance and experience. In order to determine if the goal of aesthetical appealing is achieved, the current landscape should be analysed multisensory. When it turns out that the original design cannot be experienced in the field, the designer can either choose to ignore the original design or to integrate interesting original intentions and design ideas in a new design. Otherwise, other parameters as functional, unique, and missed opportunities which are derived from the case for this thesis, the Noordoostpolder, should be used to evaluate whether the landscape still works. These parameters will give input for a redesign of the site. How such a designed regional landscape should be redesigned differs for each landscape because the content of design intentions and the character of the designed regional landscape itself cannot be generalized.



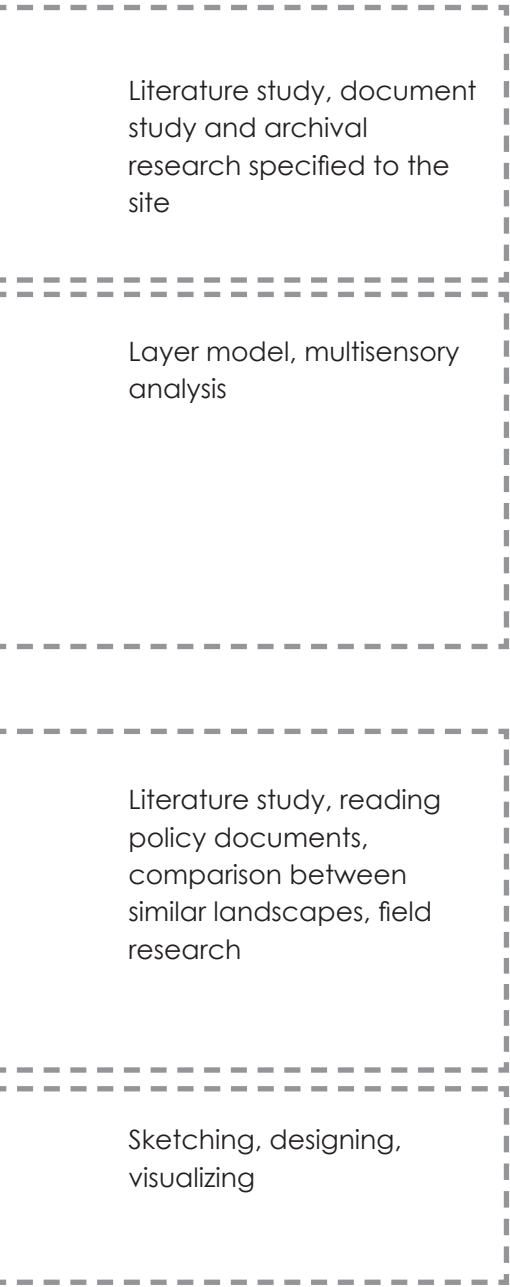
9.4 An approach for designed regional landscapes

9.2 Recommendations

As one case is used for this thesis, it is impossible to give a set approach which can be applied to designed regional landscapes in general. Nonetheless, the given framework can be used as a guide for further research. Other cases will prove if the proposed approach is also applicable to other designed regional landscapes. It would be very interesting to choose a land consolidation project as this type of designed landscape is not designed from scratch, but formed out of the vernacular landscape. It may turn out then that more parameters -apart from aesthetical appealing, functional, unique, and missed opportunities- are necessary to evaluate designed landscapes. Furthermore, in other cases it may not be easy to find out the original design intentions and then it could be challenging to apply the approach.

Another recommendation for further research concerns designing with sound and smell: something that is not performed many times. Analysing sounds and smells is really necessary to determine the whole landscape experience and the case Noordoostpolder has shown that such an analysis can contribute to valuable conclusions about the changing landscape experience through time. However, specific information about designing with sounds and smells is missing. Avoiding unwanted sounds and smells is possible by means of zoning, but implementing wanted sounds and smells is more difficult to achieve. Especially smells are really hard to integrate in a design because odours are temporarily and transitory. Research by designing in the field can show the value of sounds and smell in landscape design.

As the design conclusions can only be applied to the Noordoostpolder, a specific recommendation for this designed regional landscape is that the concentric structure accentuated by plantation to enhance rhythm and scale in the polder and the small scaled field pattern, is normative for new developments. Furthermore, a whole new network layer should be add to experience the landscape as it was meant.





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Old consort in the surroundings of Tollenbeek

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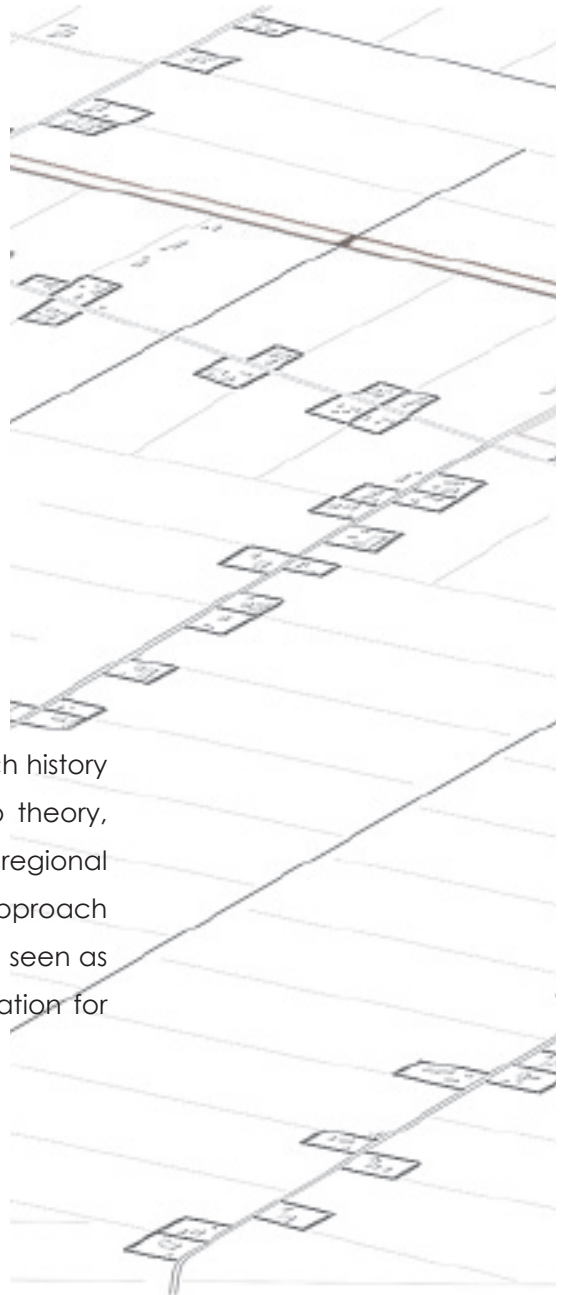
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Designed regional landscapes are an important part of the Dutch history of landscape architecture. History is not just the past, but also theory, criticism and interpretation. This thesis focuses on the designed regional landscape of the Noordoostpolder and attempts to find an approach where the original design and intended landscape experience is seen as key solution to guide future developments and can give inspiration for new plans