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The Users' Socio-Cultural Value of the Dordwijkzone Green Infrastructure Project in Dordrecht, the Netherlands

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Summary

The concept of Ecosystem Services originated in the 1970's and much research have been done to determine the economic value of the services provided to humans by nature. The monetary assessment of the benefits of nature can be used to inform decisions, make trade-offs, make the benefits of nature visible, drive the conservation agenda and be used as an effective way to communicate the value of nature. The Netherlands embraced an Ecosystem Services policy approach and various Municipalities in the Netherlands agreed to work towards the implementation of "The Economics of Ecosystems and Biodiversity" with the use of the TEEB-City Tool. The existing literature, as well as the Dordrecht Municipality, agree that the assessment of the Cultural Ecosystem Services provided by an ecosystem is the most neglected Ecosystem Service and considered difficult to undertake. This results in the omission of Socio-Cultural Value in economic assessments of ecosystems. In this study, a Cultural Ecosystem Services Framework is proposed to clarify concepts and is based on the end result in mind, namely five Socio-Cultural Values to be quantified.

In line with this policy approach, an existing project, the Dordwijkzone Green Infrastructure Project in the city of Dordrecht, was selected for assessment of the Cultural Ecosystem Services to the users. In addition, the quantification of the Socio-Cultural Value of the Dorwijkzone Green Infrastructure Project was undertaken, based on the subjective, self-reported appreciation of the social benefits to the users. Finally, an analysis was undertaken to determine to what extent these two aspects differ between different user groups. Gender was the only socio-demographic aspect included in this research to determine the differences in self-reported benefits and subjective appreciation between groups. The hypothesis that gender has an impact on the Cultural Ecosystem Services with differences in the way that men and women passively or actively use, experience and assign meaning to the Dordwijkzone and the hypothesis that no significant variation exists between men and women in their perceived or assigned Socio-Cultural Value to the Dordwijkzone, were both confirmed.

An evaluation was included to determine to what extent the Dordrecht Municipality achieved the ecosystem functions for which the Dordwijkzone Green Infrastructure was intended in 1999. The findings show that the Municipality was successful in making provision for the "Information Function", but less successful in achieving the "Habitat Function".

Recommendations include the refinement of the Cultural Ecosystem Services framework for conceptual clarity. Further research is suggested to incorporate non-monetary value in existing tools or institutions to make society aware of the value of Ecosystem Services and to serve as a communication tool to inform the evaluations and trade-offs being made in land use and development decisions.

Keywords

Green Infrastructure, Ecosystem Services (ES), Cultural Ecosystem Services (CES), Socio-Cultural Value, Subjective Appreciation of Life, The Economics of Ecosystems and Biodiversity (TEEB)

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Abbreviations

CES	Cultural Ecosystem Services
ES	Ecosystem Services
HAVO	Higher general continued education (“*Hoger Algemeen Voortgezet Onderwijs”)*
HBO	Higher Career Education
IHS	Institute for Housing and Urban Development Studies
MBO	Middle-level applied education (“*Middelbaar beroepsonderwijs*”)
MEA	Millennium Ecosystem Assessment
SCV	Socio-Cultural Value
SOPARC	System for Observing Play and Recreation in Communities
SuDS	Sustainable Urban Drainage System
TEEB	The Economics of Ecosystems and Biodiversity
VMBO	Preparatory middle-level applied education (“*Voorbereidend Middelbaar Beroepsonderwijs*”)
VWO	Preparatory scholarly education (“*Voorbereidend Wetenschappelijk Onderwijs*”)

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Chapter 1: Introduction

1.1. Background

> *"Many people believe that nature provides these services for free and therefore, they are of little or no value. While we do not pay for them, we pay significantly for their loss" (Summers, Smith, et al., 2012, p. 327)*

Human life depends on the goods and services provided by natural ecosystems. People change and consume elements of ecosystems to meet their growing demands for food, water, fuel, fibre and wood (Summers, Smith, et al., 2012, p. 327).

Since the early 2000's a rapid increase in the awareness of global trends such as the pace of urbanization, depleting natural resources and climate change, influenced conservation policy developments globally, with an emphasis on sustainability. This interdependence between humans and nature, was placed on the global agenda with the release of the Millennium Ecosystem Assessment (Reid, Mooney, et al., 2005), which provided a framework for the relationship between Ecosystem Services and human well-being. The Millennium Ecosystem Assessment provided a basic framework for the classification of four types of Ecosystem Services: provisioning services, supporting services, cultural services and regulating services. The assessment of the world's resources was initiated for two reasons: to ensure that the natural resources are not depleted for future generations and to make decision makers and policy makers aware of the benefits of the natural capital to the well-being and needs of people.

Valuation of Ecosystems

The economic valuation of ecosystems has been in use since the 1960's, but this increased in the 1990's. Scientists recognised the benefits of presenting environmental concerns in monetary terms to inform decision making. Such valuations highlighted the costs of the loss of natural ecosystems to society in visible, economic terms. The development of the Ecosystem Service approach has set the stage for monetization and sale of ecosystem functions (Gomez-Baggethun, de Groot, et al., 2010, p. 1215, Costanza, 2000, p. 7).

> "*The issue of valuation is inseparable from the choices and decisions we have to make about ecological systems. Some argue that valuation of ecosystems is either impossible or unwise. One argument is that we should protect ecosystems for moral or aesthetic reasons, and that valuations of ecosystems for this purpose is not needed. But an equally compelling moral argument could be that no one should go hungry. All we have done is to translate the valuation and the choices between different trade-offs into a new scenario, one that in some senses makes the valuation and choices more difficult and less explicit. So, whereas ecosystem valuation is difficult, one choice we do not have is whether or not to do it. Every decision we make, as a society about ecosystems, imply valuations. We can choose to make these valuations explicit or not; with or without information available, with uncertainties or not, but as long as we are forced to make choices we are doing valuation. The valuations are simply the relative weights we give to the various aspects of the decision problem. Society can make better choices about ecosystems if the valuation issue is made as explicit as possible. This means taking advantage of the best information available and developing better ways to make good decisions in the face of these uncertainties*" *(Costanza, 2000, p. 7).*

Management and quantification of natural resources in the Netherlands

In this context of heightened environmental awareness, many attempts have been made to quantify ecosystem services of natural resources after the initial work undertaken by the Millennium Ecosystem Assessment. The monetary valuation of natural resources has been explored by environmentalists (in order to strengthen their conservation agenda), but was greatly influenced by economists, who could now calculate economic values of natural resources (Gomez-Baggethun, de Groot, et al., 2010, p. 1214). Parallel to this growing global awareness, the Netherlands also adapted their policies to conserve their natural resources and improve their resilience to climate change over time. In recent years several initiatives have framed global environmental problems in economic terms and conducted global cost-benefit analysis, such as the Potsdam Initiative – Biological Diversity 2010, from which The Economics of Ecosystems and Biodiversity (TEEB) project stems (Gomez-Baggethun, de Groot, et al., 2010, p. 1214).

In the Netherlands, the "City Agreement: Value of green and blue in the city" (*"City Deal Waarden van groen en blauw in de stad"*) was agreed upon by sixteen major organizations, including CIRIA in the United Kingdom and seven Dutch cities. Dordrecht Municipality is one of the signatories of this three-year agreement (2016 – 2019). The signatories of the deal agreed to maintain and update the TEEB-city tool *("TEEB-stad tool")*, to involve new partners in the agreement and expand the network, to improve and develop the "TEEB-stad tool" and "The Atlas of Natural Capital" *("De Atlas Natuurlijk Kapitaal")* and look for ways to integrate the use of these tools for the realisation of green, quality and liveable cities. TEEB stands for "The Economics of Ecosystems and Biodiversity" and is an international study of the economic meaning and value of biodiversity and ecosystem services. The TEEB-city tool *("TEEB-stad tool")* was developed on instruction from the Ministry of Economic Affairs (Tigelaar, Sandman, et al., 2016, p.2). In 2011 the TEEB program was initiated, which aimed at showing the economic value of Ecosystem Services to government, business and civil society and at supporting the decision-making process for policy-making and large investment projects. In 2014, a two-year follow-up TEEB program was set up by PBL (Netherlands Environmental Assessment Agency), with the objective to test the applicability of the TEEB-approach within ongoing policy processes. In 2016 this programme was completed with the publication of the report "Natural Capital: recognizing its true value" (TEEB, 2017) (Anon., a).

Societal and academic relevance to determine Socio-Cultural Value

The TEEB approach is primarily an economic valuation technique and has limitations to fully capture or accommodate Socio-Cultural Values, therefore an economic valuation has to be supplemented by other non-economic approaches to guide decision making (de Groot, Fisher, et al., 2010, p. 23). A similar economic valuation tool were developed in the United Kingdom. CIRIA was established in 1960 and is a non-profit research and information organisation or association, focused on and responsive to the built environment and construction industries. The BeST (Benefits of SuDS Tool) provides a structure or framework to evaluate the various benefits, often based upon the overall performance of a Sustainable Urban Drainage System (SuDS). Summaries are created under an Ecosystem Services and Triple Bottom Line framework (Horton, Digman, et al., 2016). In this tool, it is also recommended that well-being benefits such as health of people, should only be described in qualitative terms and not be quantified (Horton, Digman, et al., 2016, p. 48).

The Dordrecht Municipality is currently a front runner in exploring co-operation agreements with other stakeholders related to climate change. Dordrecht Municipality is the lead partner in the BEGIN project, "Blue Green Infrastructures through Social

Innovation". The overall objective of BEGIN is to involve stakeholders in a value-based decision-making process, by demonstrating how Blue Green Infrastructure can improve climate resilience at selected, target sites and how to address current implementation obstacles. Six North Sea Region countries form part of this partnership: The Netherlands, Belgium, Germany, United Kingdom, Sweden and Norway (van Herk, S., n.d.). A key principle in Green Infrastructure provision is "learning by doing" and networks such as this creates a platform for learning from each other and sharing innovation (Ahern, J., n.d.).

In the light of the policy direction and approaches in Municipalities in the Netherland and the key role played by the Dordrecht Municipality, the completed Dordwijkzone Green Infrastructure Project was selected for this research. An alternative approach to a monetary valuation is considered in the valuation of the Socio-Cultural Value provided by the completed Dordwijkzone Green Infrastructure Project. In order to quantify the Socio-Cultural Value of the Dordwijkzone to the users, the actual social benefits or Cultural Ecosystem Services of the Dordwijkzone must first be determined. It is recognized that socio-demographic factors such as age, gender and ethnicity may influence the preferences and behaviour of groups or segments of society. To achieve the end result of quantifying the Socio-Cultural Value of the Dordwijkzone, the description of the Cultural Ecosystem Services, that benefit the users, and how it is valued or measured must be made explicit (de Groot, Fisher, et al., 2010). The influence of socio-demographic factors of the users on their use and appreciation of the area, was included in the study, to determine whether the segmentation of users makes a difference in the use, experience, perception and appreciation of an ecosystem.

Overview of Dordrecht

Dordrecht has a total population of approximately 120 000, with 50,3% females and 49,7% males. The incidence of foreigners in Dordrecht is approximately 6,1%. (Barbieri, S., 2015)

The locality of the island of Dordrecht, in a river delta, in close vicinity to the National Park De Biesbosch, highlights the significant location of this city in relation to "natural capital" and contributes greatly to an attractive living environment in the city (Structure Vision Dordrecht 2040: City in the Delta, *Structuurvisie Dordrecht 2040: Stad in de Delta.* 2013, p. 13). The area is known as one of the last freshwater tide areas in Europe. The Biesbosch National Park ("*Nationaal Park De Biesbosch*") forms part of the NL Delta Biesbosch Haringvliet, and was declared as a National Park in 2016 and one of the top four most beautiful nature areas in the Netherlands (np-debiesbosch, 2017) (Anon., b).

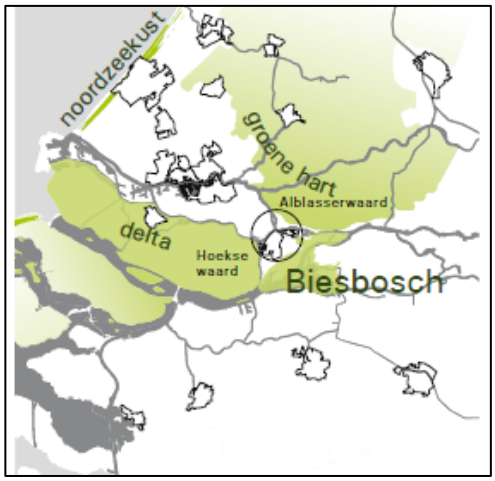

Figure 1: Locality of Dordrecht

Source*:* (Structure Vision Dordrecht 2040: City in the Delta, *Structuurvisie Dordrecht 2040: Stad in de Delta*. 2013, p. 13)

The local policies of the Municipality of Dordrecht also reflect an alignment with the conservation and sustainability agendas. The Urban Ecological Structure Dordrecht Policy Plan 2008 – 2013 ("*Stedelijke Ecologiesche Structuur Dordrecht Beleidsplan 2008 – 2013*") (Mank, Veen, et al., 2008, p. 10), the "Water Plan Dordrecht 2009 – 2015" (prepared in August 2009) and the Structure Vision Dordrecht 2014 ("*Structuurvisie Dordrecht 2040*") (prepared in September 2013) all reflect the strategic location of the Dordwijkzone in the city as a key environmental area to be conserved.

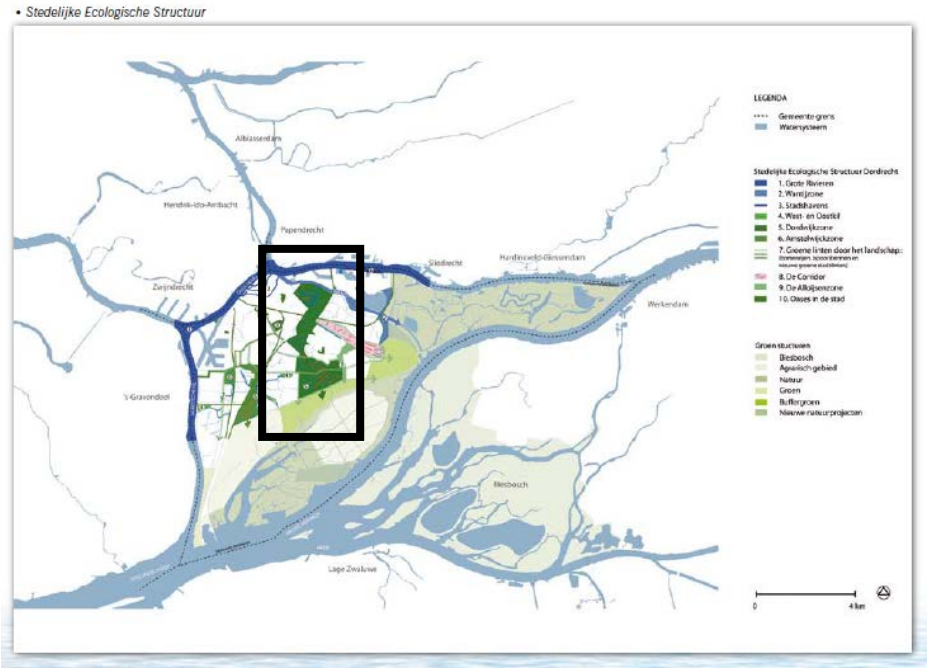

Figure 2: Dordwijkzone indicated in the Dordrecht Water Plan

Source: (Arcadis, 2009, p. 31)

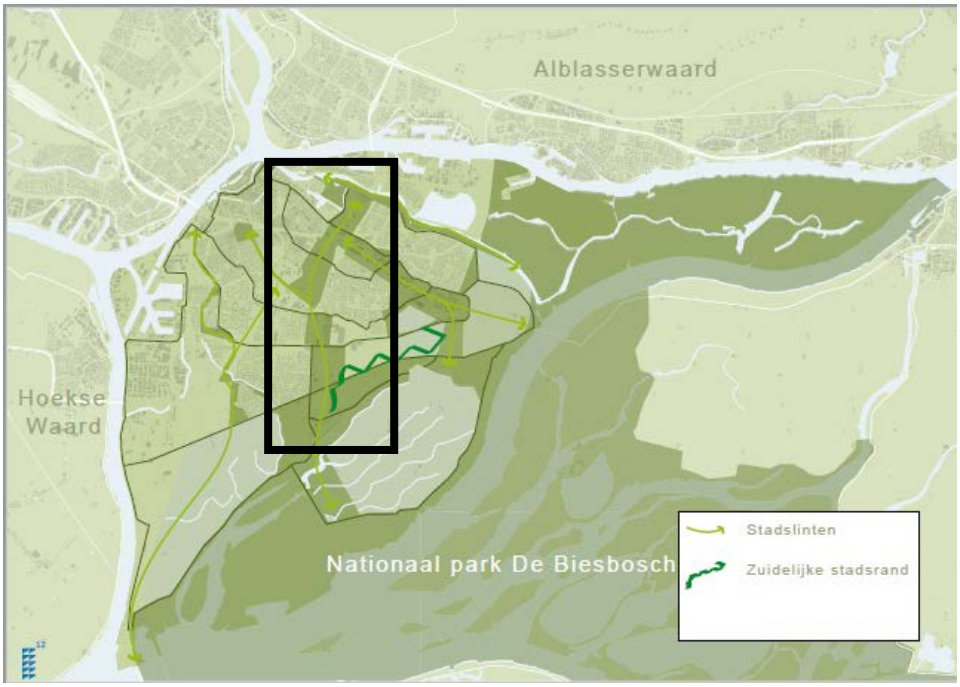

Figure 3: Dordwijkzone indicated as green ribbon ("groen stadslinten")

Source: (Structure Vision Dordrecht 2040: City in the Delta, *Structuurvisie Dordrecht 2040: Stad in de Delta*. 2013, p. 12-13)

Within this physical and policy context, the Dordrecht Municipality has undertaken the Dordwijkzone Green Infrastructure project in the period between 1999 – 2007. A development plan, the Dordwijkzone on the Map *("De Dordwijkzone op de Kaart"),* was approved by the Municipality of Dordrecht in 1999. Initially, the Dordwijkzone project was considered to be a Blue Green Infrastructure Project, but with a closer look at the objectives of the project in 1999, the regulating ecosystem services generally associated with water management was not a key objective of the project and therefore this project is dealt with as a Green Infrastructure Project (van Leeuwen, 1999). The three goals of the Dordwijkzone Green Infrastructure Project are: (1) the recovery of nature in within the city boundaries, (2) the use value as a park and (3) the recognisability of the area. These goals are evaluated in Chapter 4.

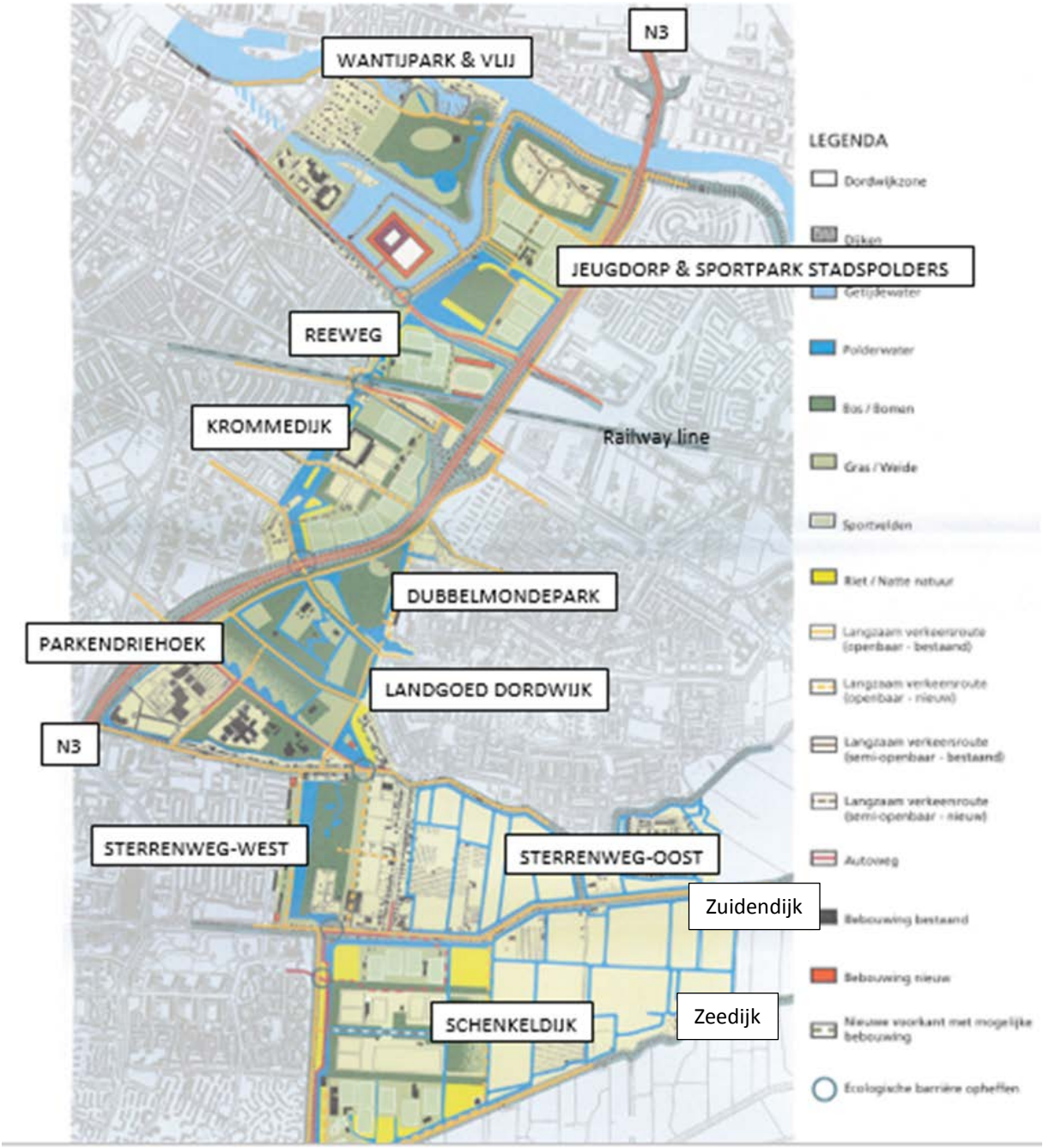

Figure 4*:* Extent of the Dordwijkzone Green Infrastructure Project

Source: (van Leeuwen, 1999)

1.2 Problem Statement

The Dordwijkzone Green Infrastructure Project is considered to be a front runner for the current Blue Green Infrastructure Initiatives in the Netherlands. The Dordrecht Municipality showed boldness and foresight by implementing this project in 1999. The Ecosystem Services approach is used more and more to assess the relationship between humans and nature and will be applied to this Project. In line with the policy direction given by the signing of the City Deal, an Ecosystem Services assessment of this completed project is relevant to the Municipality. No Ecosystem Services assessment of the monetary value in the TEEB tool have been done and the assessment of Cultural Ecosystem Services are considered to be the most neglected Ecosystem Service to assess.

In the literature on Cultural Ecosystem Services, no consistent framework exists to categorize and define frequently used jargon and terminology in this field. The currently used concepts have been analysed and a framework for the categorization of Cultural Ecosystem Services proposed. This framework formed the basis of how the empirical data was collected and made it possible to analyse the quantified benefits to users or different user groups.

Various methodologies have been used to research Cultural Ecosystem Services to find ways to measure non-monetary benefits provided by an ecosystem. These include the use of spatial mapping, interviews, questionnaires with value statements, focus groups and with conflicting views about the quantification of Cultural Ecosystem Services. Elements of some of the methodologies were duplicated in the research strategy for this study (e.g. the use of value statements) and the weaknesses associated with the use of quantitative data considered in the design of the strategy.

It is anticipated that different socio-demographic groups may use and perceive an ecosystem differently. In the process of determining which Cultural Ecosystem Services are benefiting the users of the Dordwijkzone and the subjective appreciation of these benefits, the extent to which gender impacts on these were determined. Visitors to an urban park have different needs and a certain outcome for one group, may not be important for another group, therefore different segments of park users must be identified according to the benefits and preference that they are seeking. Understanding the benefits that the different groups are seeking from a park can assist decision-makers in evaluating potential improvements. In order to deal with different user groups, it is important that parks provide diverse activities and uses (Kemperman and Timmermans, 2006). The understanding of social benefits and the value thereof to different users may influence targeted interventions by decision-makers and will assist in making their choices explicit.

Proxy values are often used in the Ecosystem Services approach to be indicative of the benefits to people. The measurement of Cultural Ecosystem Services and Socio-Cultural Values is more complex than services with visible products that can be assigned a monetary value. The challenge with obtaining a non-monetary valuation, is that the format of the results is not suitable for incorporation into the available Quantification of Ecosystem tools (“TEEB stad tool” as required in the “City Deal”), but it can be considered by policy and decision makers as additional or supplementary information to the economic valuations undertaken for the other Ecosystem Services catered for in the TEEB tool. The challenge was also to present subjective values in a quantitative form, in order to make these invisible benefits, visible.

In hind sight, the study of Cultural Ecosystem Services of the completed Dordwijkzone Project can provide the Municipality with insights of who the beneficiaries of the Dordwijkzone are, since there is a lack of information about the current users of the project area. Likewise, there is a need to know which are the Cultural Ecosystem Services that benefit the users, what are

the Socio-Cultural Values assigned by the users to this investment and whether different socio-demographic groups use and perceive the area differently. Since the study deals with peoples' subjective appreciation of sometimes invisible benefits, the study explored the influence gender has on the use, perceptions and appreciation of male and female users of the Dordwijkzone to determine to what extent the two user groups differ and in which aspects the difference occurs. The results of this study may contribute to their adaptive approach of "learning by doing" in future projects and provide feedback on whether the municipality achieved the intended goals with this project.

1.3 Research Objectives

This study is a response to the policy direction in the Netherlands to assess the value of Ecosystem Services provided in semi-natural infrastructure projects. The monetary quantification of the project is not undertaken, but focus is placed on the quantification of the Cultural Ecosystem Services provided in the completed Dordwijkzone Green Infrastructure Project. In order to be explicit about which Cultural Ecosystem Services are provided, a framework for the categorization of Cultural Ecosystem Services is proposed. This framework enables a comprehensive description of the actively and passively used social benefits to the users. The study also considers previously used methodologies to evaluate Cultural Ecosystem Services. The subjective appreciation of these benefits is quantified and the extent to which the gender of users influences the Cultural Ecosystem Services and Socio-Cultural Value of the Dordwijkzone, in terms of the functions intended by the Municipality are determined. Understanding the benefits that different user groups are seeking from an urban park can assist decision-makers in evaluating potential improvements. The research aims to:

- Explain which Cultural Ecosystem Services contributed to the Socio-Cultural Value of the Dordwijkzone.
- Analyse to what extent gender of the users influence the Socio-Cultural Value of the Dordwijkzone Green Infrastructure Project.
- Evaluate to what extent the ecosystem functions intended by the Municipality for the Dordwijkzone Green Infrastructure Project were achieved.

1.4 Research Question(s)

To what extent does the gender of the users influence the Cultural Ecosystem Services and Socio-Cultural Value of the Dordwijkzone, in terms of the functions intended by the Dordrecht Municipality?

This question was further broken down into:

- Which are the Cultural Ecosystem Services that contributed to the Socio-Cultural Value of the Dordwijkzone Green Infrastructure Project to its users?
- To what extent does gender of the users influence the Socio-Cultural Value of the Dordwijkzone Green Infrastructure Project?
- To what extent were the ecosystem functions, intended by the Municipality for the Dordwijkzone Green Infrastructure Project, achieved?

1.5 Significance of the Study

The study provides an assessment of the Cultural Ecosystem Services and the Socio-Cultural Value associated with the Dordwijkzone Green Infrastructure Project in Dordrecht, the Netherlands, which will provide feedback to the local government and policy makers on the social benefits and value provided to the users or user groups, in this completed project. Different user groups seek different social benefits from the Dordwijkzone and gender was selected to determine the extent to which the Cultural Ecosystem Services and Socio-Cultural Value differ between groups. An awareness of these differences, could inform future improvements, interventions and add value to the adaptive approach of the Municipality.

A large investment was made by the city in the allocation of a portion of land (7,6ha), planning and capital investment in projects over time within this area. Since Dordrecht is the driver of the BEGIN project and part of the "City Deal: Value of blue green in the city" (2016) and agreed to promote the "TEEB-city tool" *("TEEB-stad tool"*), an investigation into the most neglected Ecosystem Service is relevant for the Dordrecht Municipality. The quantification of Ecosystem Services is still new to many Municipalities and any new initiatives, where the Municipality can "learn by doing" could contribute positively to the management of the city. Since Cultural Ecosystem Services are known to be difficult to measure and it does not result in a monetary valuation, such an investigation has not been undertaken before. This information could contribute to the undertaking ("City Deal: Value of blue green in the city") of the Dordrecht Municipality because there is a need to explore new ways of developing, building on, or updating or adding to the existing "TEEB-city tool" information. This could also potentially add value to the role of Dordrecht in their attempts to find creative ways to measure more of the Ecosystem Services in their future Blue Green Infrastructure initiatives.

A survey was selected as the research strategy to collect primary data from the Dordwijkzone users regarding their use, perceptions of the area and their socio-demographic information. "The assessment of trends in human use and of the status of cultural services is one of the most difficult and least accomplished tasks in ecosystem services research" (Schaich, Bieling, et al., 2010, p. 210). The findings will contribute to the Municipality's approach of "learning by doing". The project has been completed and the feedback from the users of the Dordwijkzone will provide insights for other initiatives in the future. It will also contribute to exploring new ways of valuing Ecosystem Services with the "TEEB-city tool" as agreed on in the "City Deal".

Academic literature confirms that the nature of ecosystems and the nature of human values are complex, constantly changing, affected by processes on various scales and are multi-disciplinary in nature (Fisher, Turner, et al., 2009). There is a lack of uniform definitions for concepts and each ecosystem is unique. This study includes a framework for the categorization of Cultural Ecosystem Services and Socio-Cultural Values, which could be further refined in future. The framework proposed and the research strategy were informed by concepts and terminology used in previous studies and considered the research strategies or methodologies used by other researchers to determine Cultural Ecosystem Services and Socio-Cultural Value.

1.6 Scope and Limitations

The extent of the Dordwijkzone Green Infrastructure Project in Dordrecht, stretches from Wantij Park in the north to *"Zeedijk"* in the south and includes an additional 7,5ha that was made available by the Municipality of Dordrecht. The project was implemented between 1999 and 2007 and the research is undertaken after the completion of the project. The Dordwijkzone has been described as a green ribbon (Structuurvisie Dordrecht 2040: Stad in de Delta. 2013,

p. 12-13). Two major urban parks form two focal points within this linear green ribbon, which are connected to each other and to the south of the island with green spaces, cycling and pedestrian paths. These two focal points are the Wantij Park in the north and Landgoed Dordwijk (including Overkamppark and Dubbelmondepark), which is considered to be the heart of the Dordwijkzone, to the south. Existing research on the relationship between green spaces and users from different socio-demographic groups, often refer to parks and not necessarily to Green Infrastructure. Since parks are key elements within Green Infrastructure, or in the case of the Dordwijkzone, the heart and the activity hot spots of the Green Infrastructure, the available literature on parks were considered relevant and included in this study.

The original intent of the Municipality for the Dordwijkzone Green Infrastructure Project included three goals. Therefore, focus will be placed on the Cultural Ecosystem Services provided in the Project and the Socio-Cultural Value by the users within this context of these goals. The cycling in the Dordwijkzone was dealt with as a recreation activity only and was not dealt with as a commuting or transportation function.

The results of this research in Dordrecht cannot be generalized since it is site specific, in a local context and the project is considered for the goals for which it was intended. The categorization of Cultural Ecosystem Services and the methodology used to determine the Socio-Cultural Value proposed in a framework could be applied to other sites or projects. It should also be added that many of the concepts and terminology used in this study are abstract and not generally considered by the sampling group. Fortunately, the respondents in this survey were relatively well educated, which made the understanding of the study possible in Dordrecht, the Netherlands. The majority of respondents in the Dordwijkzone (75,84%) indicated that they completed MBO, HBO or University level education.

No biophysical or economic assessment of the Dordwijkzone is undertaken in this study. A monetary assessment of the economic benefits of the Dordwijkzone Green Infrastructure Project would fall within the scope and intent of the TEEB tool referred to earlier. The quantification of Cultural Ecosystem Services has been proven difficult to undertake, due to the invisible nature thereof. The subjective appreciation of the benefits to the users was quantified into a Socio-Cultural Value of the Dordwijkzone.

The focus of the research is to quantify the Socio-Cultural Value based on the Cultural Ecosystem Services that contributed to the subjective appreciation of the users. Since Cultural Ecosystem Services include experiences, individual meaning assigned by individuals and other psychological processes such as association, memories and emotions, the explanation of differences in the findings will be limited. For the purpose of quantifying the Socio-Cultural Value, focus is placed on making the invisible benefits of the Dordwijkzone area visible rather than trying to explain the differences between individual's perceptions, internal experiences and assigned meaning. Enabling an in-depth explanation is one of the shortcomings of a survey research strategy.

A limitation associated with research done on Cultural Ecosystem Services, where qualitative information of individual perceptions is used, is that verification is made difficult. (Hernandez-Morcillo, Plieninger, et al., 2013, p. 436) Suitable data and appropriate proxy indicators are obstacles in Cultural Ecosystem Services research. (La Rosa, Spyra, et al., 2016) These challenges were overcome in this study, by making use of quantitative information in a survey and Likert scales, as well as making use of subjective appreciation instead of proxy indicators.

Due to the nature (design and scale) of the Dordwijkzone and its intended functions for activities such as walking, running and cycling, many of the potential respondents of the survey

were on the move within the Dordwijkzone and not readily willing to participate. These potential respondents were offered an envelope, including a return address, with the questionnaire, which helped to increase the response rate. This is further addressed in Chapter 3.

In order to establish whether differences exist between different socio-demographic groups related to their use, experience, assigned meaning and appreciation or perception of the Dordwijkzone when determining their Cultural Ecosystem Services and Socio-Cultural Value, segmentation or strata based on age, gender and ethnicity were considered.

Even though a vast number of children make use of the play equipment, the children's zoo and the "Mushroom" ("*Paddestoel*") kiddies pool within the Wantijpark, all children under the age of 18 were excluded from taking part in the research due to the abstract nature of the concepts used as well as the practical implications to obtain parents' permission to approach their children. Age was eliminated as a socio-demographic group for analysis. During the course of the fieldwork, ethnicity was eliminated due to the low percentage of minority groups observed in the Dordwijkzone. Most of the minority groups approached for participation in the survey, declined to do so and indicated the language barrier as the reason not to participate. Therefore, only the influence of the gender of the users was used in this to establish gender statistical significant differences between the two groups in determining the Cultural Ecosystem Services and the Socio-Cultural Value.

Chapter 2: Literature Review

2.1 Introduction

This chapter will address the existing literature, theories and concepts to form the theoretical foundation for the empirical research to follow. The relationship between the functions of ecosystems, the Ecosystem Services provided, the associated benefits of the Ecosystem Services and the measurement of the value thereof in natural ecosystems, semi-natural ecosystems or Green Infrastructure is addressed in this chapter. Reference is also made to the influence of gender of the users on some of these aspects.

The components of the literature framework were adapted from conceptual frameworks from Haines-Young and Potschin (2010) as well as later work from de Groot et.al. (2010). The four types of Ecosystem Services originated from the Millennium Ecosystem Assessment (Anon., 2005). The framework firstly indicates the broader context of the relationship between the functions and services provided by ecosystems and the benefits enjoyed by humans. The focus area of the study is highlighted within the framework namely the Cultural Ecosystem Services and the Social-Cultural Value, thereby excluding Economic and Ecological benefits and Biophysical and Economic Values.

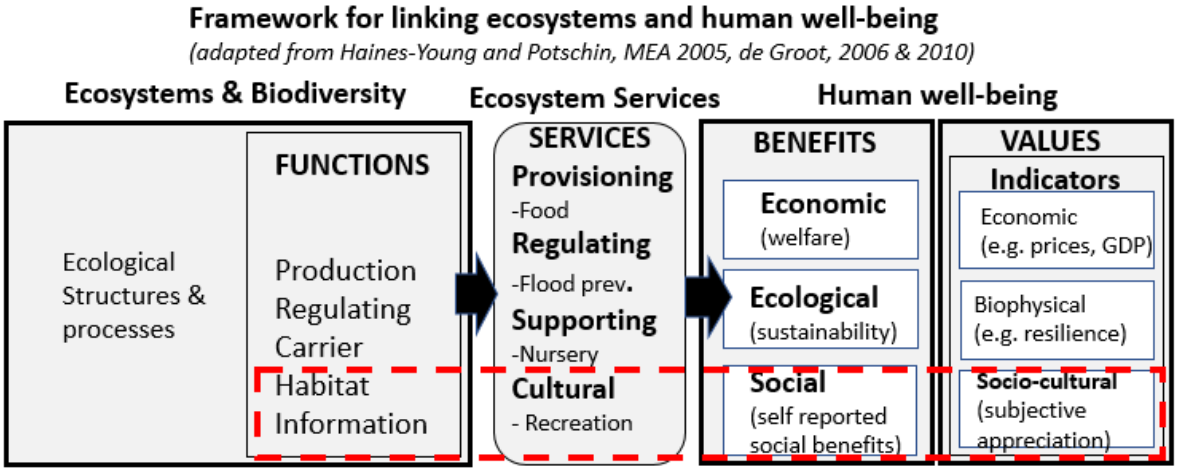

Figure 5: Framework for literature review

Source: (Haines-Young, R. and Potchin, M., 2010, Reid, Mooney, et al., 2005, de Groot, Fisher, et al., 2010)

Figure 5 informed the structure of the literature review. Firstly, the concept of Green Infrastructure is introduced. This is followed with an explanation of the relationship between ecosystem functions, Ecosystem Services and benefits. The relationship between functions, services and benefits of nature or ecosystems is the key debate in literature. Conceptual clarity will be provided in this chapter. This study determined the Socio-Cultural Value of a specific geographical area and the influence of gender of the users thereon, therefore emphasis will be placed on the Cultural Ecosystem Services, social benefits and Socio-Cultural Values.

2.2 Green Infrastructure

The semi-natural ecosystem that comprise the study area is considered to be Green Infrastructure, since it is characterised by interconnections between habitats, an emphasis on connectivity in an urban area, the formation of a green corridor or ribbon and linkages of green areas with built infrastructure.

2.2.1 Definitions of Green Infrastructure

The term “green infrastructure” was first used in a land conservation strategy in Florida in the early 1990’s and placed emphasis on natural systems as critical components of our “infrastructure” (Firehock, K., 2010, p.1).

Green infrastructure includes the natural, semi-natural and man-made networks of multi-functional ecological systems, at different spatial scales, within urban areas. The concept emphasises urban green spaces, their multi-functions and the interconnectedness. Proactively planned, developed, and maintained green infrastructure provides a framework to guide urban development for growth and conservation (Tzoulas, Korpela, et al., 2007, p. 169).

Benedict and McMahon (2006) defines green infrastructure as “a strategically planned and managed network of wilderness, parks, greenways, conservation easements, and working lands with conservation value that supports native species, maintains natural ecological processes, sustains air and water resources, and contributes to the health and quality of life for communities and people”. Hostetlera et. al. (2011) defined green infrastructure as “protected natural open space and corridors adjoining residential yards or sections”. Within green infrastructure planning, key principles of landscape ecology such as the natural drainage networks at various scales with attention to natural processes and an emphasis on connectivity are applied within urban environments (Ahern, J., n.d., p. 267).

For the purposes of this study, green infrastructure is defined as an ecosystem comprising of natural, semi-natural and artificial networks, characterised by interconnections between natural habitats and parks, with an emphasis on connectivity in an urban area to form green corridors, greenways or ribbons and linking urban green spaces and parks, with built infrastructure (Author, 2017).

2.2.2 Green Infrastructure Trends and Principles

The green infrastructure concept evolved from multiple disciplines, such as planning, landscape architecture, ecology and transportation. According to Benedict and McMahon (2006) a number of trends influenced the development of the green infrastructure approach, such as the increasing problems related to urban sprawl, water quality mandates, the protection of endangered species, public health concerns, an increase in property values near green spaces and city improvement initiatives that emphasize the green assets in a city. Green infrastructure operates at a landscape scale and is ideally planned and designed for protection and restoration of multi-functional natural areas, before development begins (Firehock, K., 2010, p. 2).

Green infrastructure is based on landscape ecology principles, which include a strategic approach within the context of the city and the setting of planning goals, for example the restoration or rebuilding of landscapes that were previously fragmented or disturbed. Planning and designing for synergies or providing more benefits than the primary function, for example the greening of infrastructure such as storm water retention. Combined with vegetation options, the liveability of an area can also be improved. Planning for multi-use will optimize the cost effectiveness. An adaptive approach or a “learning by doing approach”, ensures that plans and policies are based on best practice and continually evolving. If experiments can be undertaken in new projects, the potential to learn from it and to build empirical knowledge, while working towards sustainable solutions, is quite profound (Ahern, J., n.d.). Benedict and McMahon (2006) emphasized the involvement of various stakeholders in the process and the importance to recognise the cutting across various jurisdictions and scales in green infrastructure planning.

2.3 Ecosystem Functions

De Groot (2006a) distinguished between ecosystem functions and Ecosystem Services. Ecosystem functions can be described as "the capacity of natural processes and components to provide goods and services that satisfy human needs, directly or indirectly". Once the functions of an ecosystem are identified, can the benefits to humans be evaluated. The following five ecosystem functions categories were identified by him: Firstly, *regulating functions* relate to the capacity of natural and semi- natural ecosystems to regulate and maintain ecological processes. Secondly, *Habitat functions* which contributes to conservation of biodiversity by providing habitats for fauna and flora. Thirdly, *Production functions* is the provision of raw materials from nature which humans use for production such as food and energy. Fourthly, *Information functions* provided by ecosystems offer humans "an essential 'reference function' and contribute to the maintenance of human health by providing opportunities for reflection, spiritual enrichment, cognitive development, re-creation and aesthetic experience" (de Groot, 2006b, p. 178). Lastly, the *Carrier functions* of ecosystems provide space or medium to support human activities, which leads to the gradual transformation or degradation of the ecosystem. The Habitat and Information functions referred to above are relevant to this study since they relate to the key objectives or intent of the relevant green infrastructure project.

In an earlier publication of Chiesura and de Groot (2003) the *Information functions* provided by ecosystems or by natural capital was explained as space for recreation, opportunities for educational and scientific information or observations, signs of history or cultural identity, and source of spiritual experience, religious meaning or inspiration for artistic expression.

These can be compared to the Cultural functions described by Ahern et.al. as set out in the third column below (Ahern, J., n.d., p.269):

Abiotic	**Biotic**	**Cultural**
Surface: groundwater interactions	Habitat for generalist species	Direct experience of natural ecosystems
Soil development process	Habitat for specialist species	Physical recreation
Maintenance of hydrological regime(s)	Species movement routes and corridors	Experience and interpretation of cultural history
Accommodation of disturbance regime(s)	Maintenance of disturbance and successional regimes	Provide a sense of solitude and inspiration
Buffering of nutrient cycling	Biomass production	Opportunities for healthy social interactions
Sequestration of carbon and greenhouse gasses	Provision of genetic reserves	Stimulus of artistic/abstract expression(s)
Modification and buffering of climatic extremes	Support of flora: fauna interactions	Environmental education

Table 1: Key abiotic, biotic and cultural functions of a green urban infrastructure

Source: Ahern, J., n.d., p. 269)

From the above authors, it is clear that they view "functions" differently. De Groot is consistent in his publications in 2003 and 2006, where ecosystem functions are only used when the "opportunities exist" in ecosystems or it is a "source of" or "space for" potential benefits to humans, but no benefits are included in his definitions. Ahern on the other hand includes benefits to human beings in the definition of functions. Some of the functions listed by Ahern is included in the definition of Cultural Ecosystem Services in Section 2.5.

2.4 Ecosystem Services

2.4.1 Background

Ecosystem Services originated in the 1970s, where "functions" provided by nature or ecosystems for the benefit of human beings, were framed as "services" in order to support the conservation agenda. During the 1990s, research increased on Ecosystem Services with a focus on methods to estimate or to determine an economic or monetary value of these services (Gomez-Baggethun, de Groot, et al., 2010, p. 1209).

The "Ecosystem Approach" was adopted by the conference of the parties to the Convention on Biological Diversity (UNEP-CBD) in Nairobi in 2000 and strengthened in 2003 by the Millennium Ecosystem Assessment, which promoted Ecosystem Services on the international policy agenda (Gomez-Baggethun, de Groot, et al., 2010, p. 1214). Over the last three decades, the original intent of conserving biodiversity on the planet was shifted to attempts to commodify Ecosystem Services and create markets.

2.4.2 History of Ecosystem Services

Publications by authors such as Ehrlich and Ehrlich (1981) on ecological concerns in financial terms increased in the 1970's and 1980's and contributed to the development of the concept of Ecosystem Services. In the 1990s, the Beijer Institute's Biodiversity Program and Constanza's (1997) contribution on the value of the global natural capital and Ecosystem Services, the "Ecosystem Approach", the Global Biodiversity Assessment and the Millennium Ecosystem Assessment promoted the mainstreaming of the concept into the international policy arena.

During 1990s to 2000s, an increase in the design of economic instruments took place to create incentives for the protection of the environment, which could be described as a commodification process of "ecological functions" as a "service" with an associated monetary valuation. This has helped to attract political support for conservation and to mainstream Ecosystem Services (Gomez-Baggethun, de Groot, et al., 2010). More recent developments in the field of Ecosystem Services, were the Potsdam Initiative - Biological Diversity 2010 and the Economics of Ecosystem Biodiversity project, which resulted from this initiative (www.teebweg.org).

2.4.3. Functions, Services and Benefits

The MEA simply defined Ecosystem Services as "the benefits ecosystems provide" (Anon., 2005), but difficulties can arise when applying the concept practically (Haines-Young, R. and Potchin, M., 2010, p. 112). Some examples of definitions cited in literature are:

- Ecosystem Services are the conditions and processes trough which natural ecosystems and the species that make them up, sustain and fulfil human life (Daily, 1997).
- Ecosystem Services are the benefits people obtain from ecosystems (Liu, Costanza, et al., 2010).
- Ecosystem Services are defined as the benefits generated by nature that are beneficial to human well-being; physically, mentally and socially (Wallace, 2007).

Considering the nuanced semantics between functions, services and benefits, Fisher et. al., (2009) proposed the following definition: "Ecosystem services are the aspects of ecosystems utilized (actively or passively) to produce human well-being." "The functions or processes become services if there are humans that benefit from them. Without human beneficiaries, they are not services" (Fisher, Turner, et al., 2009, p. 645). The main problem with the Millennium Ecosystem Assessment typology is that it confuses ends with means.

In order to simplify the differences between the functions available from nature, the services it provides and the benefits that people obtain is illustrated in the "production chain" in *Figure 6*.

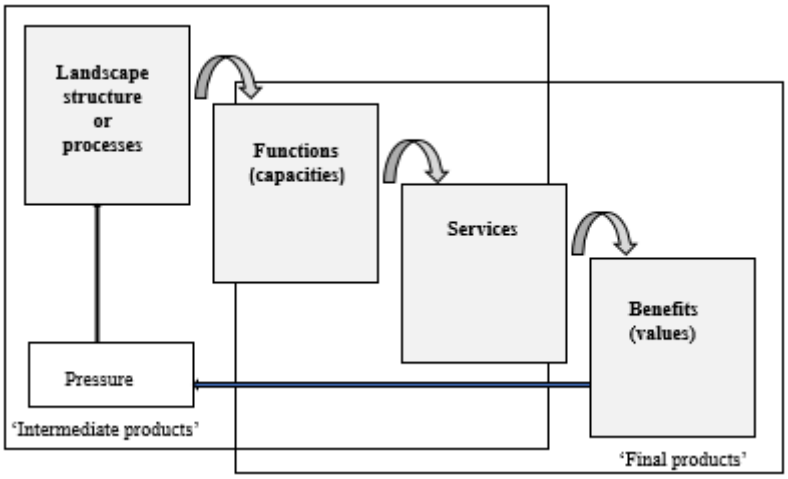

Figure 6: The relationship between functions, services and benefits

Source: (Haines-Young, R. and Potchin, M., 2010, p. 116)

Figure 6 is explained by using an example of a landscape structure with the function of reducing surface water run-off. This is not a fundamental characteristic of the ecosystem, but something that humans find useful. Only if a function is considered a benefit to humans, it is regarded as a service. Function indicate some capacity of a landscape to do something potentially useful to people. The cascade shown in *Figure 6*, highlights that services is determined by the needs of people. A specific benefit to humans must be identified to determine whether it is an ecosystem, which makes it dependant on the context (Haines-Young, R. and Potchin, M., 2010).

2.4.4 Broad types of Ecosystem Services

The UN Millennium Ecosystem Assessment (Anon., 2005) recognised four broad types of Ecosystem Services, namely *Provisioning Ecosystem Services* which relate to the direct use of a resource, *Regulating Ecosystem Services* which are the benefits people obtain from the regulation of ecosystem processes such as flood regulation, *Cultural Ecosystem Services* which are the non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences and *Supporting Ecosystem Services* which underpin the other three types, including soil formation and primary production. Supporting services are different than the other three Ecosystem Services since they do not have a direct benefit to people (Haines-Young, R. and Potchin, M., 2010).

There is still much debate towards reaching conceptual clarity on definitions and classifications for Ecosystem Services, for which no final classification exists (de Groot, Fisher, et al., 2010). This is necessary to avoid the problem of double counting that may arise. The description of a service and how it is valued and measured must be made obvious in studies on Ecosystem Services (de Groot, Fisher, et al., 2010).

2.5 Cultural Ecosystem Services

A separate section is dedicated to Cultural Ecosystem Services for the purposes of this study. This section will provide conceptual clarity and outline the classification of Cultural Ecosystem Services based on existing concepts and terminology referred to in literature.

2.5.1 Classification of Cultural Ecosystem Services

Classification of services becomes important in order to make them quantifiable in a consistent manner (de Groot, Alkemade, et al., 2010, p. 261). The classification of Cultural Ecosystem Services outlined in this section will form the basis or a framework for the quantification of the Socio-Cultural Value of a selected semi-natural ecosystem or Green Infrastructure project.

Cultural Ecosystem Services are the most neglected of the four types of identified Ecosystem Services. This can be attributed to the fact that most of these services provided, have non-monetary values and are mostly invisible or intangible. Very few assessments have been undertaken on Cultural Ecosystem Services in comparison to the other types of Ecosystem Services. This field has been described as "one of the most difficult and least accomplished areas in ecosystem services research" (Hernandez-Morcillo, Plieninger, et al., 2013, p. 435).

Although valuation techniques are available for services such as tourism, many Cultural Ecosystem Services are not suitable for monetary valuation due to their properties of intangibility and the fact that they do not follow patterns of market assumptions. "Assessing the benefits of Cultural Ecosystem Services is a complex and sometimes even controversial issue, as Cultural Ecosystem Services need multidisciplinary outcomes from several disciplines such as ecology, economics and social sciences" (La Rosa, Spyra, et al., 2016, p. 75). The assessment of Cultural Ecosystem Services is different from other Ecosystem Services due to a lack of common terminology, understanding and conceptual clarity, Cultural Ecosystem Services are dependent on an individual's value system and the use of spatial mapping is often not included in assessments. Cultural Ecosystem Services are directly experienced and appreciated by people and cannot be replaced once it has been lost (La Rosa, Spyra, et al., 2016).

Various definitions and concepts associated with Cultural Ecosystem Services from literature, are mentioned below and used in the next section to inform the proposed Cultural Ecosystem Services framework in Section 2.5.2. Two of the sources specifically explored indicators for Cultural Ecosystem Services (La Rosa, Spyra, et al., 2016, Hernandez-Morcillo, Plieninger, et al., 2013). The Millennium Ecosystem Assessment (Anon., 2005) defined CES as "the non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation and aesthetic experiences" (Bryce, Irvine, et al., 2016). Cultural Ecosystem Service include aesthetic, spiritual, educational and recreational services (Anon., 2005). Hernandez-Morcillo et. al. included the following services under their classification of Cultural Ecosystem Services indicator categories, namely recreation and tourism, education and knowledge system, sense of place, cultural heritage and diversity, inspirational services, aesthetic services and religious and spiritual services (Hernandez-Morcillo, Plieninger, et al., 2013, p. 439). La Rosa et al. (2016) also identified categories of Cultural Ecosystem Services, namely social interaction, regional image, eco-tourism, beauty, stewardship, calm, escape and learning (La Rosa, Spyra, et al., 2016). Plieninger et al. (2013) defined eight Cultural Ecosystem Services, namely spiritual services, educational services, inspiration, aesthetic values, social relations, sense of place, cultural heritage values, recreation and ecotourism (Plieningera, Dijks, et al., 2013).

Once again, the nuanced semantics between the concepts of "function", "services" and "benefits" as set out in Figures 5 and 6, is now further complicated with the addition of "values" in the last-mentioned definition. It is also clear from the above definitions that no framework or standardized classification of Cultural Ecosystems are used in literature.

2.5.2 Proposed Framework for the Classification of Cultural Ecosystem Services

Fisher, Turner, et al. (2009) introduced an important component into their definition of Ecosystem Services, namely the active or passive use of an ecosystem service: "Ecosystem services are the aspects of ecosystems utilized (actively or passively) to produce human well-being" (Fisher, Turner, et al., 2009). This distinction between active and passive use is also introduced in the Cultural Ecosystem Classification Framework. The two proposed groups are: Actively Used Cultural Ecosystem Services which relates to the (1) use and (2) experience of an ecosystem. Passively Used Cultural Ecosystem Services relates to the (3) awareness, (4) assigned meaning or (5) having options related to the ecosystem. Having options directly informs the value that people hold to the protection of the environment for others or for future generations. Alternative terminology that can be used to describe the social benefits related to this Cultural Ecosystem Service are: "having choices" "satisfaction", "Stewardship"' "Altruism" related to "Bequest Value", "Moral Value", "Warm Glow Value" or "Option Value", which will be dealt with in Section 2.6.

The two (2) actively and three (3) passively used Cultural Ecosystem Services mentioned above, made a logical alignment with the two (2) Use Values and three (3) Non-Use Values for the quantification of the Socio-Cultural Value of the relevant ecosystem. These five (5) columns form the basis of the proposed Cultural Ecosystem Services framework indicated in *Figure 7*.

The above classification of Ecosystem Services into active and passive services and the five types of Socio-Cultural Values were obtained from existing literature (Fisher, Turner, et al., 2009, Kati and Jari, 2016). In addition to the classification of the Cultural Ecosystem Services, the terminology used to describe the social benefits (CES) within each column also required classification. In order to describe each Cultural Ecosystem Service within the framework, the terminology referred to in literature, was analysed and nine (9) themes emerged.

To be more comprehensive, the terminology used by the respondents in the survey, where respondents were asked to add "other" benefits (CES) from those categories provided in the questionnaire (as part of the multiple option questions), were also included in the nine (9) themes to ensure the consideration of all the available benefits. Initially only seven (7) themes, indicating potential social benefits to humans emerged (aligned with use, experience and symbolic value), but the categories were further developed to enable the consistent quantification of Cultural Ecosystem Services. The framework was informed with the end result in mind, namely to quantify the Socio-Cultural Value of an ecosystem based on the subjective appreciation of the users of an ecosystem for five different Socio-Cultural Values, therefore provision had to be made for Cultural Ecosystem Services aligned to Bequest and Existence Value, to have a comprehensive framework for Cultural Ecosystem Services.

The Nine (9) Themes and the sources of the terminology are indicated in Tables 2 to 10 for ease of reference:

1. The Spiritual Theme includes spiritual, religious inspiration and/or reflection benefits, informed by the sources indicated below:

Categories of CES from various sources	Author	Theme
Spiritual and Religious Values	(La Rosa, et.al. 2016, p. 82)	Spiritual theme
Inspiration	(La Rosa, et.al. 2016, p. 82)	Spiritual theme
Inspirational	(Hernandez-Morcillo et. al. 2013, p. 439)	Spiritual theme
Religious and spiritual	(Hernandez-Morcillo et. al. 2013, p. 439)	Spiritual theme
Spirituality	(Bryce et.al. 2016, p. 260)	Spiritual theme
Inspiration	(Bryce et.al. 2016, p. 260)	Spiritual theme
Spiritual value of the brook	(Kati & Jari, 2016, p. 543)	Spiritual theme
Inspiration for culture, art and design	(De Groot, Alkemade, et.al. 2010, p. 263)	Spiritual theme
Spiritual and religious inspiration	(De Groot, Alkemade, et.al. 2010, p. 263)	Spiritual theme
Inspiration for culture, art and design	(De Groot, Fischer, et.al. 2010, p.21)	Spiritual theme
Spiritual experiences	(De Groot, Fischer, et.al. 2010, p.21)	Spiritual theme

Table 2: Sources of the CES Spiritual Theme

2. The Mental Theme includes mental stimulation, cognitive development, knowledge, information, learning, skills development and/or education benefits, informed by the sources indicated below:

Categories of CES from various sources	Author	Theme
Educational Values	(La Rosa, et.al. 2016, p. 82)	Mental theme
Knowledge Systems	(La Rosa, et.al. 2016, p. 82)	Mental theme
Education and Knowledge Systems	(Hernandez-Morcillo et. al. 2013, p. 439)	Mental theme
Knowledge (learning about nature)	(Bryce et.al. 2016, p. 260)	Mental theme
Developing Skills	(Bryce et.al. 2016, p. 260)	Mental theme
Learning from nature	(Kati & Jari, 2016, p. 543)	Mental theme
Information for cognitive development	(De Groot, Fischer, et.al. 2010, p.21)	Mental theme

Table 3: Sources of the CES Mental Theme

3. The Recreation Theme includes rest, relax, leisure, calm, escape, peace, refreshing, play, fun, freedom, fitness, therapy, health, tourism, ecotourism, sport and other outdoor activities, informed by the sources indicated below:

Categories of CES from various sources	Author	Theme
Recreation and Ecotourism	(La Rosa, et.al. 2016, p. 82)	Recreation theme
Recreation and Ecotourism	(Hernandez-Morcillo et. al. 2013, p. 439)	Recreation theme
Freedom	(Bryce et.al. 2016, p. 260)	Recreation theme
Health	(Bryce et.al. 2016, p. 260)	Recreation theme
Relax in nature	(Kati & Jari, 2016, p. 543)	Recreation theme
Refreshing	(Kati & Jari, 2016, p. 543)	Recreation theme
Spend leisure time	(Kati & Jari, 2016, p. 543)	Recreation theme
Outdoor activities	(Kati & Jari, 2016, p. 543)	Recreation theme
Sport-like activities	(Kati & Jari, 2016, p. 543)	Recreation theme
Important recreation area	(Kati & Jari, 2016, p. 543)	Recreation theme
Useful pedestrian pathways	(Kati & Jari, 2016, p. 543)	Recreation theme
Lawns for recreation use	(Kati & Jari, 2016, p. 543)	Recreation theme
Letting the dog out	(Survey 02, 90 and 94, 2017)	Recreation theme
Cycle through the area (commuting)	(Survey 12 and 87, 2017)	Recreation theme
Enjoy nature and relax	(Survey 17, 2017)	Recreation theme
Rest, quiet and peace time	(Survey 25, 2017)	Recreation theme
Sport	(Survey 43, 2017)	Recreation theme
Rest and Nature	(Survey 44, 2017)	Recreation theme
Sport and gardening	(Survey 49, 2017)	Recreation theme
Therapy	(Survey 57, 2017)	Recreation theme
Cycle to school and football (Commuting)	(Survey 63, 2017)	Recreation theme
Walk the dog	(Survey 85, 2017)	Recreation theme
Running	(Survey 88, 2017)	Recreation theme
Swimming	(Survey 91, 2017)	Recreation theme
Recreational: opportunities for tourism and recreational activities	(De Groot, Alkemade, et.al. 2010, p. 263)	Recreation theme
Opportunities for recreation and tourism	(De Groot, Fischer, et.al. 2010, p.21)	Recreation theme

Table 4: Sources of the CES Recreational Theme

4. The Aesthetic Theme includes aesthetic, beauty, sensory experiences and/or diversity benefits, informed by the sources indicated below:

Categories of CES from various sources	Author	Theme
Aesthetic values	(La Rosa, et.al. 2016, p. 82)	Aesthetic theme
Aesthetic	(Hernandez-Morcillo et. al. 2013, p. 439)	Aesthetic theme
Aesthetics	(Bryce et.al. 2016, p. 260)	Aesthetic theme
Enjoying beautiful trees	(Kati & Jari, 2016, p. 543)	Aesthetic theme
Enjoying beautiful scene	(Kati & Jari, 2016, p. 543)	Aesthetic theme
Watching nature	(Kati & Jari, 2016, p. 543)	Aesthetic theme
Experiencing nature	(Kati & Jari, 2016, p. 543)	Aesthetic theme
Beautiful park trees	(Kati & Jari, 2016, p. 543)	Aesthetic theme
Gorgeous entirety	(Kati & Jari, 2016, p. 543)	Aesthetic theme
Aesthetic: appreciation of natural scenery (other than through deliberate recreational activities)	(De Groot, Alkemade, et.al. 2010, p. 263)	Aesthetic theme
Aesthetic information	(De Groot, Fischer, et.al. 2010, p.21)	Aesthetic theme

Table 5: Sources of the CES Aesthetic Theme

5. The Cultural Theme includes cultural, historical and/or heritage benefits, informed by the sources indicated below:

Categories of CES from various sources	Author	Theme
Cultural heritage	(La Rosa, et.al. 2016, p. 82)	Cultural theme
Cultural Diversity	(La Rosa, et.al. 2016, p. 82)	Cultural theme
Cultural heritage and diversity	(Hernandez-Morcillo et. al. 2013, p. 439)	Cultural theme
Past memorable/transformative experiences	(Bryce et.al. 2016, p. 260)	Cultural theme
Cultural history/cultural heritage	(Kati & Jari, 2016, p. 543)	Cultural theme
Excursion to historical area (Landgoed Dordwijk)	(Survey 28, 2017)	Cultural theme
Cultural heritage and identity: sense of place and belonging	(De Groot, Alkemade, et.al. 2010, p. 263)	Cultural theme

Table 6: Sources of the CES Cultural Theme

6. The Identity Theme includes sense of place and/or identity (individual, place or community), informed by the sources indicated below:

Categories of CES from various sources	Author	Theme
Sense of place	(La Rosa, et.al. 2016, p. 82)	Identity theme
Sense of place	(Hernandez-Morcillo et. al. 2013, p. 439)	Identity theme
Place identity	(Bryce et.al. 2016, p. 260)	Identity theme
Live here	(Survey 53, 2017)	Identity theme

Table 7: Sources of the CES Identity Theme

7. The Social Theme includes social interaction, social relations, social bonds, social integration, get togethers, social events or meetings and cohesion benefits.

Categories of CES from various sources	Author	Theme
Social Relations	(La Rosa, et.al. 2016, p. 82)	Social theme
Social bonds	(Bryce et.al. 2016, p. 260)	Social theme
Picnicking	(Kati & Jari, 2016, p. 543)	Social theme
Social relation	(Kati & Jari, 2016, p. 543)	Social theme
Contact with other dogs (socializing)	(Survey 14, 2017)	Social theme
Use for children mostly	(Survey 62, 2017)	Social theme

Table 8: Sources of the CES Social Theme

8. The Awareness Theme includes benefits related to the awareness of invisible benefits of nature, ecosystems, habitats, fauna and flora.

Categories of CES from various sources	Author	Theme
Connection to nature	(Bryce et.al. 2016, p. 260)	Awareness theme
Enjoying nature	(Kati & Jari, 2016, p. 543)	Awareness theme
Bird feeding	(Kati & Jari, 2016, p. 543)	Awareness theme
Enjoying clean air	(Kati & Jari, 2016, p. 543)	Awareness theme
Reuse of polluted soil	(Kati & Jari, 2016, p. 543)	Awareness theme
Wild nature	(Kati & Jari, 2016, p. 543)	Awareness theme
Bird species	(Kati & Jari, 2016, p. 543)	Awareness theme
Habitats for wildlife animals	(Kati & Jari, 2016, p. 543)	Awareness theme
Wild animals	(Kati & Jari, 2016, p. 543)	Awareness theme
Dragon flies and insect species	(Kati & Jari, 2016, p. 543)	Awareness theme
Ecological/green corridor	(Kati & Jari, 2016, p. 543)	Awareness theme
Vein of the catchment area	(Kati & Jari, 2016, p. 543)	Awareness theme
Important nature area	(Kati & Jari, 2016, p. 543)	Awareness theme
Important natural element	(Kati & Jari, 2016, p. 543)	Awareness theme
Important water element	(Kati & Jari, 2016, p. 543)	Awareness theme
Important green area	(Kati & Jari, 2016, p. 543)	Awareness theme
Important landscape element	(Kati & Jari, 2016, p. 543)	Awareness theme
Important landscape/valley	(Kati & Jari, 2016, p. 543)	Awareness theme
Vegetation for blocking noise	(Kati & Jari, 2016, p. 543)	Awareness theme
Create environment for human	(Kati & Jari, 2016, p. 543)	Awareness theme
The last remnant of natural brook	(Kati & Jari, 2016, p. 543)	Awareness theme
Bird watching	(Survey 68, 2017)	Awareness theme

Table 9: Sources of the CES Awareness Theme

9. The Choice Theme includes benefits or satisfaction related to having choices or options to conserve an ecosystem for others, conservation, protection, stewardship and/or altruism.

Categories of CES from various sources	Author	Theme
Responsibility of care	(Bryce et.al. 2016, p. 260)	Choice theme
Future generations	(Kati & Jari, 2016, p. 543)	Choice theme
For other citizens	(Kati & Jari, 2016, p. 543)	Choice theme
Entire city perspective	(Kati & Jari, 2016, p. 543)	Choice theme
Nature protection in the city	(Kati & Jari, 2016, p. 543)	Choice theme
Duties towards the environment	(Kati & Jari, 2016, p. 543)	Choice theme
Privilege to participate	(Kati & Jari, 2016, p. 543)	Choice theme

Table 10: Sources of the CES Choice Theme

It is important to note that the above themes are only potential services, and can only be classified as Cultural Ecosystem Services if the benefits are used by people, as indicated earlier from literature: “The functions or processes become services if there are humans that benefit from them. Without human beneficiaries, they are not services” (Fisher, Turner, et al., 2009, p. 645). “Ecosystem services are the benefits people obtain from ecosystems” (Liu, Costanza, et al., 2010). Cultural Ecosystem Services are considered to be the social benefits obtained from ecosystems.

The above Cultural Ecosystem Services categories and themes were combined into a framework indicating the relationship between the Cultural Ecosystem Services and the Socio-Cultural Value. The proposed framework could be applied to any urban ecosystem, provided that the respondents in such research or investigation will be able to understand and assess abstract concepts.

In conclusion, the following comprehensive definition of Cultural Ecosystem Services is proposed by the author:

Cultural Ecosystem Services are the social benefits to humans that ecosystems provide. These are obtained through the active use or experience or passive awareness, assigned meaning or having options related to ecosystems, which can be classified into the following categories (Author, 2017):

- Spiritual use, experience and assigned meaning
- Mental use, experience and assigned meaning
- Recreational use and assigned meaning
- Aesthetic experience and assigned meaning
- Cultural use, experience and assigned meaning
- Identity experience and assigned meaning
- Social use, experience and assigned meaning
- Awareness of the benefits of nature, ecosystems, habitats, fauna and flora
- Having options to conserve or protect ecosystems for others.

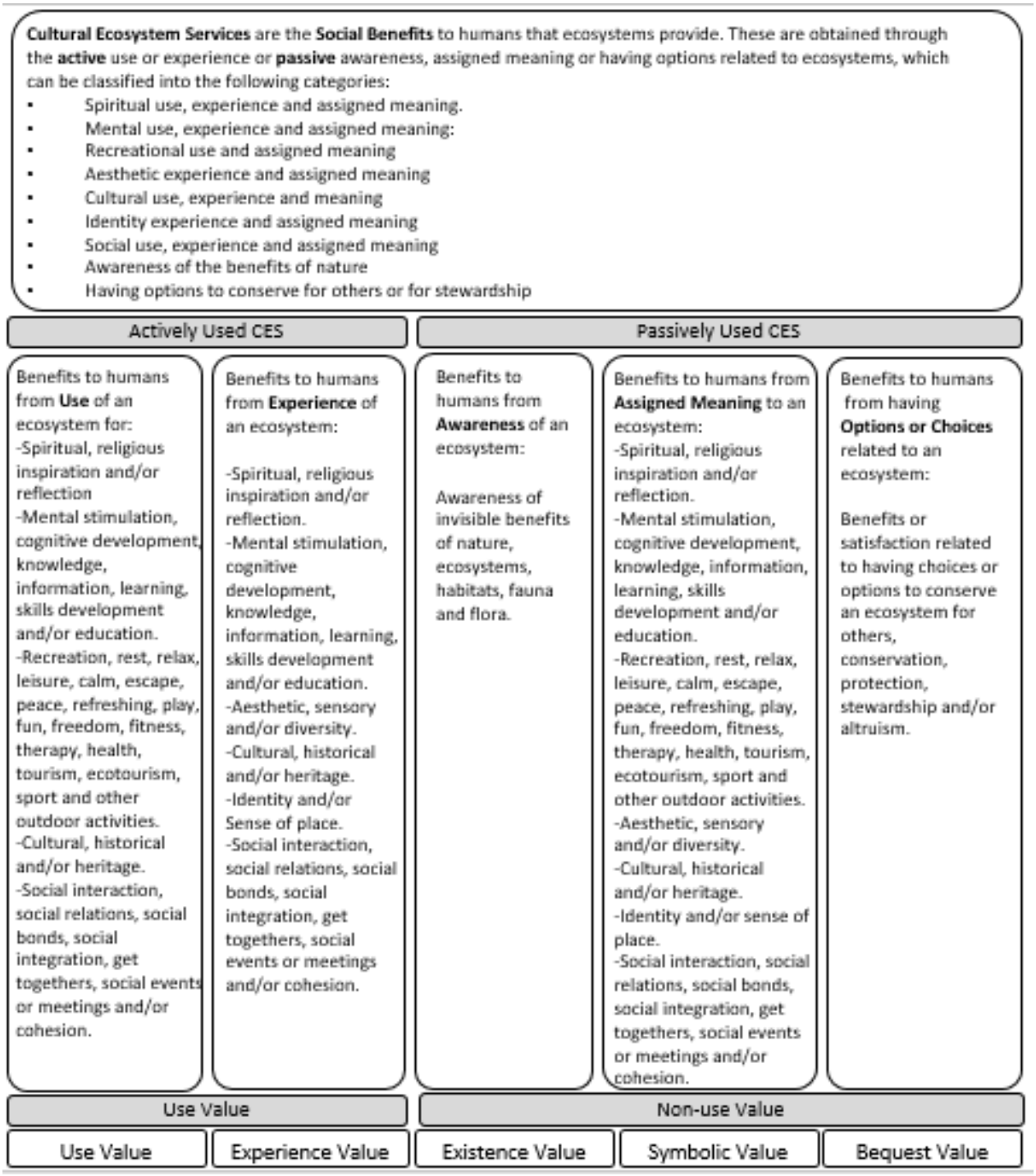

Figure 7: A framework for the classification of Cultural Ecosystem Services

Source: Author, 2017 (based on sources listed in Tables 2 – 10) and (Kati and Jari, 2016)

2.5.3 Methodologies used to determine Cultural Ecosystem Services

Finding a way to assess Cultural Ecosystem Services can provide essential insights for urban planning when making trade-offs in land use and development decisions. The literature indicates a number of different methodologies used to measure and determine Cultural Ecosystem Services at different scales. A brief overview of methodologies is discussed below:

Bryce, Irvine, et.al. (2016) evaluated the benefits to recreational anglers and divers of 151 United Kingdom marine sites, using subjective well-being indicators by making use of subjective, self-reported indicators instead of objective or proxy indicators. A set of fifteen indicator statements were developed to collect empirical data on concepts of well-being, relevant to the recreational use by anglers and divers of marine sites. Participant responses were determined with a 5-point Likert scale (Bryce, Irvine, et al., 2016).

Carrus, Scopelliti, et. al.(2015) also used self-reported benefits to investigate the effects of biodiversity on the well-being of visitors to green areas in four medium-to-large Italian sized cities. A questionnaire was administered to residents of the four cities, which included questions about the of length and frequency of visits and perceived restorativeness of the visit to the green spaces. The structure of the questionnaire included open-ended, multiple choice and Likert type scale questions on experience and uses of the green spaces (Carrus, Scopelliti, et al., 2015).

Bertram and Rehdanz (2015) explored how urban green spaces affects the well-being of the residents of Berlin by using self-reported information on life satisfaction. Two green space measures were used, namely the combination of survey data with spatial GIS data. Self-reported life satisfaction in the survey was used as a proxy for subjective well-being (Bertram and Rehdanz, 2015, p. 141).

Hernandez-Morcillo, Plieninger, et al. (2013) analysed forty-two papers in a qualitative, secondary data analysis, which focused on indicators and methods used in the assessment of Cultural Ecosystem Services. Different methodologies were used to assess Cultural Ecosystem Services trends, including retrospective landscape evaluations, to identify the development of perceptions and the analysis of existing data on tourism investments. Their findings showed that only 23% of the Cultural Ecosystem Services studies were spatially represented on maps, at varying scales from local to global. In these studies, biophysical variables were spatially overlaid with stakeholders' perceptions (Hernandez-Morcillo, Plieninger, et al., 2013).

Plieninger, Dijks et. al. (2013) investigated the perceived Cultural Ecosystem Services by residents of a cultural landscape in Eastern Germany with the use of participatory mapping. The data was collected through structured interviews with 93 persons and GIS mapping analysis and statistical techniques. They concluded that clear, spatial information on Cultural Ecosystem Services, results in useful information for land management policies and strategies.

2.6 The quantification of Ecosystem Services

2.6.1 Quantification of economic values of Ecosystem Services

Ecosystem Services has three areas of value, namely the economic, ecological and socio-cultural domains, which need many indicators to measure their benefits to humans (Watson and Zakri, 2003).

The ecological value relates to the health of an ecosystem. Socio-Cultural Values include the importance people give to the benefits from an ecosystem. Economic literature recognises two broad kinds of values: use values, which are obtained from the direct consumption of natural

resources and non-use value, which relate to the non-consumption use of ecosystems for recreation or aesthetic appreciation. Indirect use values relate to benefits provided by nature to humans, such as erosion prevention and pollination of crops. Non-use value, also referred to as "insurance value" or "glue value" related to the existence of the object. "Option value" is the value we place on keeping the option open to use the ecosystem services in the future, either within our lifetime or for future generations. The sum total of use and non-use values associated with a natural resource is referred to as the Total Economic Value (TEV). In economics, value is always associated with making trade-offs. The reliance on monetary valuation has plagued many ecosystem assessments, by omitting some of the mentioned types of value, which are essential to understand the relationship between people and nature (de Groot, Fisher, et al., 2010, p. 13).

A follow up activity after the Millennium Ecosystem Assessment and a recent development is the "The Economics of Ecosystems and Biodiversity" global initiative which is focused on making the economic value of nature visible and to mainstream the economic value of ecosystem services into all levels of decision-making. In March 2007, environment ministers from the G8+5 countries at a meeting in Potsdam, Germany proposed to initiate a process of determining the global economic benefit of biodiversity. A global study was initiated that same year by the German Federal Ministry for the Environment and the European Commission (Sukhdev, P., n.d.). TEEB is a structured approach to quantify the financial value of ecosystem services and have also been embraced in the Netherlands through the City Deal in 2016.

2.6.2 Socio Cultural Value: The quantification of non-economic value

Kati and Jari (2016) undertook a study to identify Socio-Cultural Values of Ecosystem Services in local blue-green infrastructure planning in Helsinki, Finland. The authors collected data by using narrative research methods. In-depth interviews were used to allow people to address topics in their own words. After the interviews, the interviewees participated in an on-line survey with closed and open-ended questions. They were asked whether they agreed or disagreed with a statement (Kati and Jari, 2016, p. 539). The stakeholders in their study comprised of locals, managers and politicians, who expressed 47 perceived values related to a specific area. They divided the values collected from their stakeholders into Use and Experience, Existence, Symbolic, Bequest and Moral Values. Their findings were reported making use of a classification of Socio-Cultural Values as indicated in *Figure 8* below. This classification of Socio-Cultural Values was adopted for the purposes of the research in the Dordwijkzone Green Infrastructure Project.

In a study by Davidson (2013), he specifically explores whether two of the non-use values are considered to be Ecosystem Services. He refers to "Warm Glow Value" which he describes as the value that is "related to the satisfaction people derive from altruism towards nature" and Existence Value which he describes as being "related to the satisfaction people may derive from the mere knowledge that nature exists and originating in the human need for self-transcendence". The term "Warm Glow Value" is similar in meaning of "Bequest Value" as used by Kati and Jari (2016). For the purposes of this research the classification of Kati and Jari has been adopted.

Use Value – Direct use or psychological involvement with some aspects of the ecosystem	**Non-use value – No direct use or physical involvement with the ecosystem**
Use value – non-consumptive direct use of the brook or the ark such as recreational use	**Existence value** – knowledge that a specific ecosystem aspect or other element exists
Experience value – psychological, aesthetic or other direct response to the environment	**Symbolic value** – abstract meanings that are assigned by the individual or group to the area
	Bequest value – the value is attached to the idea of preserving or maintaining the environment for the benefit of other people or for environmental reasons

Figure 8: The Classification of Socio-Cultural Values

Source: (Kati and Jari, 2016, p. 541) Note of the authors: The classification of socio-cultural values used in the study (adapted from Kumar and Kumar, 2008, More, Averill, et al., 1996)

Socio-Cultural Value can be defined as the subjective appreciation of the social benefits derived from the area by the users. These Socio-Cultural Values are classified and defined as follows:

- Use value can be defined as the non-consumptive direct use of the area.
- Experience value includes the psychological, aesthetic or other direct response to the environment.
- Existence value is attached to the knowledge that a specific ecosystem aspect or other element exists.
- Bequest value can be defined as the value attached to the idea of preserving or maintaining the environment for the benefit of other people or for environmental reasons. Moral value, Option value and Warm Glow value have also been used to describe this value.
- Symbolic value can be defined as the abstract meanings that are assigned by the individual or group to the area.

Williams and Carr explained the Socio-cultural meaning of outdoor recreation places and concluded that “meaning refers to both the cognition and emotions a person or group associates with some place or object” (Williams, D.R., Carr, D.S., 1993, p. 211).

2.6.3 Self-reported Subjective Appreciation

Available studies on Cultural Ecosystem Services highlight the complexity of measuring the social benefits of nature or ecosystems to human beings. Socio-cultural benefits are subjective, invisible and may even be controversial to measure. The use of proxy indicators to measure people’s quality of life, well-being and happiness have been increasing in recent years. Veenhoven (2000, p. 1) proposed a classification of these terms in the Four Qualities of Life and he found that quality of life cannot be measured comprehensively. The same applies to the measuring of Ecosystem Services, which has inherent problems in monetary evaluations and may result in reductionism of the perceived value (La Rosa, Spyra, et al., 2016).

Humans have the ability to evaluate their lives, based on their intuitive affective appraisal and their cognitive evaluation (Veenhoven, 2000, p. 10). When people are asked how they feel about something, they mostly have an opinion. In *Figure 9*, the bottom right quadrant represents “the inner outcomes of life”. “That is the quality in the eye of the beholder. As we deal with conscious humans this quality boils down to subjective appreciation of life. This is commonly referred to by terms such as 'subjective wellbeing', 'life-satisfaction' and 'happiness' in a limited sense of the word” (Reddy, S., 2008, p. 5). “Enduring satisfaction with a part of life is referred to as 'part-satisfaction'” (Reddy, S., 2008, p. 6).

Four qualities of life

	Outer qualities	*Inner qualities*
Life chances	Livability of environment	Life-ability of the person
Life results	Utility of life	Appreciation of life

Figure 9: Four Qualities of Life

Source: (Veenhoven, 2000, p. 4)

Veenhoven (2000) argues that people’s subjective appreciation or appraisal of life can be measured by simply asking them and to focus on how much instead of why. The use of qualitative interviews is limited in this field and research is mostly done by structured interviews or written questionnaires. Questions on appreciation are typically concerned with the present time. Doubts have been raised regarding the interpretation of questions, honesty of answers and the comparability between individuals and across different cultures. However, empirical studies show reasonable validity and reliability. In an earlier study, Veenhoven (1996) explored the validity of self-reported happiness where the criticisms against this include that people generally do not have an opinion about their happiness or secondly that systematic bias is present when determining self-reported happiness. This means that people who are generally dissatisfied with their lives would report falsely that they are content. These distortions are blamed on ego-defence and on social-desirability. In order to establish the validity of people’s responses, clinical studies were undertaken where the results of single direct questions were compared with ratings based on in-depth interviews. The results of the single direct questions were found to be generally not much different from responses in the interviews (Veenhoven, 1996). For the purposes of this study, the subjective, self-reported, part-satisfaction of users’ perception of a green infrastructure project was established.

2.7 Impact of gender on how people relate to Green Infrastructure or parks

As stated earlier, Cultural Ecosystem Services is different from other ecosystem services, since they cannot be replaced once eroded. Their value lies in their presence and availability. Cultural Ecosystem Services offer benefits to citizens whether they are actively used or not. They offer opportunities and choices to citizens in an urban space. Below is an overview of relevant literature of previous studies, highlighting differences or similarities in how men and women relate to Green Infrastructure or parks. Many studies were undertaken to explore how demographic differences between human beings’ impact on the way they relate to green spaces

in urban areas. The literature did not necessarily refer to “Green Infrastructure”, therefore literature on parks were included in the literature review.

Evenson, Jones et.al. (2016) undertook a study in the United States, using the System for Observing Play and Recreation in Communities (SOPARC) to collect information on park users and their physical activity, using momentary time sampling. Their study considered demographic factors such as age and gender. Their research considered demographic differences and intensity of physical activity of park users with which they could inform the promotion of parks and the information could be used to establish appropriate interventions to encourage physical activity of park users. They found that more males visit parks than females and older adults visit parks less than other age groups. The physical activity levels of park users varied greatly across their different studies, especially between the different age groups.

Jorgensen, Ellis et.al. (2012) examined the effect of gender on individuals’ fear of crime in a community park setting. Their results indicate that the gender of an individual may influence fear of crime when recreating alone in a park setting. In another study about fear in public urban spaces, the complexity of expressing different fears at different times, in different behaviour patterns were highlighted. Compared with men, women report higher fear of crime in outdoor public spaces, which may limit their visits to or use of parks (Pain, 2001).

Ho et. al. (2005) investigated how ethnicity and gender are related to preferences for park characteristics, the use of urban parks and the perceived benefits of parks. Women were more likely to rate the importance of certain aspects of a park higher than men, but there was no significant variation in gender differences in the use and perceived benefits of parks.

Jackson and Henderson (1995) concluded that constraints to leisure for women are a function of cultural interpretations of gender and not just biological sex. The traditional roles as nurturer of children and her responsibility towards the household could potentially influences the leisure behaviour of women (Deem, 1986). While men and women vary within a specific ethnic group in terms of their income and education levels, such differences are not reflected in their perceptions of parks or open spaces (Ho, Sasidharan, et al., 2005).

Differences in the use of parks (related to intensity of activity, fear of crime and preferences of park characteristics) and similarities in the perceptions of parks by men and women emerged from the literature review. The use and perceptions of the relevant Green Infrastructure Project by the two gender groups will be evaluated. The hypothesis is therefore that gender will have an impact on the Cultural Ecosystem Services with differences in the way that men and women use, experience or assign value to the Dordwijkzone (passively or actively). Similarities or no significant variation between the two gender groups in their Socio-Cultural Value related to the Dordwijkzone is anticipated. The similarities or differences will be established in this study.

2.8 Conceptual Framework

The conceptual framework was informed by the relationship between ecosystem functions, Cultural Ecosystem Services (social benefits) and the Socio-Cultural Value.

The three intended goals of the Dordrecht Municipality for the Dordwijkzone Green Infrastructure Project (including parks) is indicated in the top block. The grey arrows indicate the “production chain” between the functions, services, benefits and values as indicated in Figure 6 (Haines-Young, R. and Potchin, M., 2010, p. 116).

The conceptual framework reflects the key components and types of Cultural Ecosystem Services (middle block) as set out in the framework in the previous chapter, which comprise of two (2) categories of actively used Cultural Ecosystem Services and three (3) categories of passively used Cultural Ecosystem Services. The Conceptual Framework shows the alignment of the above five (5) Cultural Ecosystem Categories with the five types of Socio-Cultural Value, which is the required end result (bottom block).

The Cultural Ecosystem Services obtained through the active (1) use or (2) experience or passive (3) awareness, (4) assigned meaning or (5) having options related to the relevant semi-natural ecosystem will be determined with the proposed framework.

It is anticipated that different socio-demographic groups may use and perceive an ecosystem differently. In the process of determining which Cultural Ecosystem Services are benefiting the users of the Dordwijkzone and the subjective appreciation of these benefits, the extent to which gender impacts on these, were determined. Visitors to an urban park have different needs and a certain outcome for one group, may not be important for another group, therefore different segments of park users must be identified according to the benefits and preference that they are seeking. Understanding the benefits that the different groups are seeking from a park can assist decision-makers in evaluating potential improvements. In order to deal with different user groups, it is important that parks provide diverse activities and uses (Kemperman and Timmermans, 2006). The independent variable indicated on the left, is the gender of the users. The reasons for eliminating other socio-demographic groups were explained under scope and limitations of the study.

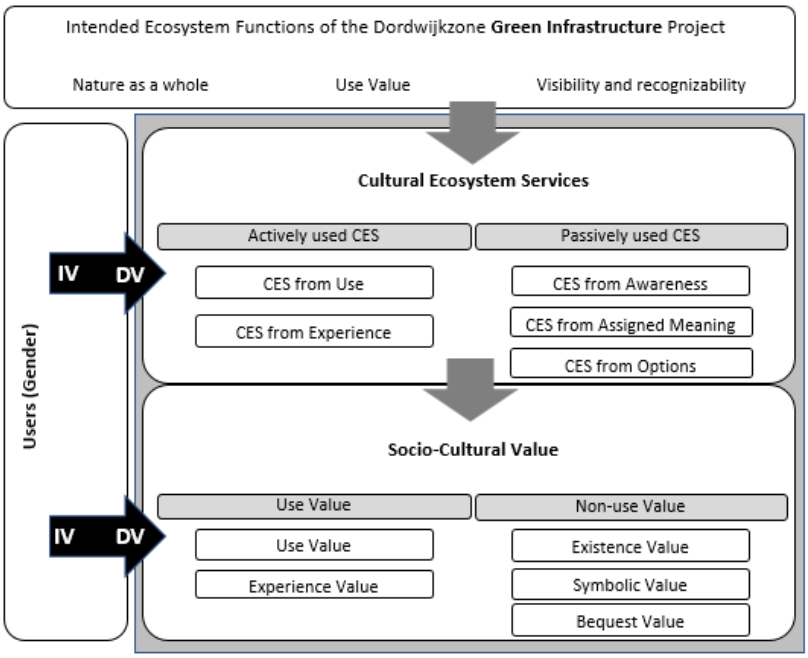

Figure 10: Conceptual Framework

Chapter 3: Research Design and Methods

3.1 Introduction

In order to operationalize the conceptual framework, this chapter describes the research design and methods used to address the research questions.

The literature review provided an overview of previously used concepts, indicators and methodologies in studies on Cultural Ecosystem Services and Socio-Cultural Value. This chapter address the research strategy, methodology followed, the validity and reliability of the collected data in the conducted empirical research.

3.1.1 Research Question(s)

The main research question is: To what extent does the gender of the users influence the Cultural Ecosystem Services and Socio-Cultural Value of the Dordwijkzone, in terms of the functions intended by the Dordrecht Municipality?

To address this research question, the following sub-questions will be addressed:

- Which are the Cultural Ecosystem Services that contributed to the Socio-Cultural Value of the Dordwijkzone Green Infrastructure Project to its users?
- To what extent does the gender of the users influence the Socio-Cultural Value of the Dordwijkzone Green Infrastructure Project?
- To what extent were the ecosystem functions intended by the Municipality for the Dordwijkzone Green Infrastructure Project, achieved?

3.1.2 Definitions of concepts

Ecosystem functions are defined by de Groot (2006b) as “the capacity of natural processes and components to provide goods and services that satisfy human needs, directly or indirectly”. Habitat functions and Information functions are relevant in the Dordwijkzone Green Infrastructure Project. He defined habitat functions as the provision of natural ecosystems and conservation of biodiversity and information functions as opportunities for reflection, spiritual enrichment, cognitive development, recreation and aesthetic experience (de Groot, 2006b).
Cultural Ecosystem Services are the social benefits to humans that ecosystems provide. These are obtained through the active (1) use or (2) experience or passive (3) awareness, (4) assigned meaning or (5) having options related to ecosystems, which can be classified into the following categories (Author, 2017):

- Spiritual use, experience and assigned meaning
- Mental use, experience and assigned meaning
- Recreational use and assigned meaning
- Aesthetic experience and assigned meaning
- Cultural use, experience and meaning
- Identity experience and assigned meaning
- Social use, experience and assigned meaning
- Awareness of the benefits of nature
- Having options to conserve for others or for stewardship

Socio-Cultural Value can be defined as the perceived, subjective appreciation of the social benefits derived from an area. These benefits are classified and defined as follows (Kati and Jari, 2016):

- Use value can be defined as the non-consumptive direct use of the area.
- Experience value can be defined as the psychological, aesthetic or other direct response to the environment.
- Existence value is the value attached to the knowledge that a specific ecosystem aspect or other element exists.
- Bequest value relates to the idea of preserving or maintaining the environment for the benefit of other people or for environmental reasons. “Moral value”, “Option value” and “Warm Glow value” have also been used to describe this value.
- Symbolic value can be defined as the abstract meanings that are assigned by the individual or group to the area.

3.1.3 Operationalization: Variables & Indicators

As part of the research process, concepts and variables identified in the literature review were translated into indicators for field-work and data collection.

CONCEPT	VARIABLES	INDICATORS	DATA TYPE	DATA SOURCE
Intended Ecosystem Functions of the Dordwijkzone Green Infrastructure Project	1. Habitat function: Recovery and connectivity of nature within the city boundaries	Perceived connectivity of natural ecosystem (green areas and water) of the Dordwijkzone.	Quantitative and Qualitative data: Questionnaires with closed-ended questions and a few open-ended questions	Primary data collection through survey & Primary Secondary data from Government Policy Document(s)
	2. Information function: The use value of the area as a park for the city	a) Accessibility of the Dordwijkzone. b) Mode of transport to get to the area c) Frequency of use d) Time of day that users visit the area e) Types of recreation f) **Actively used CES**: - Spiritual and religious inspiration and/or reflection. - Mental stimulation, cognitive development, knowledge and/or educational services - Recreation - Cultural, historical and/or heritage services - Social interaction, relations and/or cohesion	Quantitative and Qualitative data: Questionnaires with closed-ended questions and a few open-ended questions	
	3. Information function: The recognisability of the area	- Perceived recognisability of Dordwijkzone - Perceived visibility of Dordwijkzone	Quantitative and Qualitative data: Questionnaires with closed-ended questions and a few open-ended questions	

Table 11: Operationalization Table (continued)

CONCEPT	VARIABLES	INDICATORS	DATA TYPE	DATA SOURCE
Socio-Cultural Value (DV)	1. Use value	a) Accessibility of Dordwijkzone b) Mode of transport to get to the area c) Frequency of use d) Time of day that they use the place e) Types of recreation **f) Actively used CES:** - Spiritual and religious inspiration and/or reflection. - Mental stimulation, cognitive development, knowledge and/or educational services - Recreation - Cultural, historical and/or heritage services - Social interaction, relations and/or cohesion	Quantitative and Qualitative data: Questionnaires with closed-ended questions and a few open-ended questions	Primary data collection through survey
	2. Experience value	**Actively used CES through experience:** - Spiritual and religious inspiration and/or reflection. - Mental stimulation, cognitive development, knowledge and/or educational services - Aesthetic, sensory and/or diversity benefits - Cultural, historical and heritage services - Sense of place and/or identity - Social interaction, relations and/or cohesion	Quantitative and Qualitative data: Questionnaires with closed-ended questions and a few open-ended questions	Primary data collection through survey
	3. Existence value	**Passively used CES related to options:** - Conservation/ protection - Stewardship/ altruism	Quantitative and Qualitative data: Questionnaires with closed-ended questions and a few open-ended questions	Primary data collection through survey

Table 11: Operationalization Table (continued)

Socio-Cultural Value: Subjective appreciation of the users (DV)	4. Bequest value	**Passively used CES through awareness:** - Invisible benefits of ecosystems. - Awareness of ecosystems in the city.	Quantitative and Qualitative data: Questionnaires with closed-ended questions and a few open-ended questions	Primary data collection through survey
	5. Symbolic value	**Passively used CES through assigned meaning:** - Spiritual and religious inspiration and/or reflection. - Mental stimulation, cognitive development, knowledge and/or educational services - Recreation - Aesthetic, sensory and/or diversity benefits - Cultural, historical and/or heritage services - Sense of place and/or identity - Social interaction, relations and/or cohesion	Quantitative and Qualitative data: Questionnaires with closed-ended questions and a few open-ended questions	Primary data collection through survey
Users (IV)	Gender	Male Female	Quantitative data	Primary data collection through survey

Table 11: Operationalization Table

3.1.4 Research strategy

The first research question of the study addresses the description and explanation of the Cultural Ecosystem Services that informed the Socio-Cultural Value of the Dordwijkzone Green Infrastructure Project. In research question 2, an analysis was done to determine whether there is a significant difference between men and women in the perception or subjective appreciation of the Dordwijkzone. Based on the literature review, differences in the use of the Dordwijkzone between the two gender groups are anticipated and no significant differences in their perceived value of the Dordwijkzone is anticipated. This assumption will be tested in an analysis. The primary aim of research question 2 was to quantify the Socio-Cultural Value of the Dordwijkzone.

This study is an Evaluation Research, which aims to answer evaluative questions regarding the results of an intervention that have been made. In this case the Dordwijkzone Green Infrastructure Project that was implemented by the Dordrecht Municipality in the period between 1999 and 2007. Evaluation Research aims at establishing whether a certain arrangement or intervention has helped to realize specified targets. This is applicable to the

third research sub-question related to the three goals of the Dordwijkzone Green Infrastructure project, which was intended by the Municipality.

In order to answer the three sub-questions, set out above, a quantitative research method was required. The survey strategy "counts and describes" what is out there and therefore survey based research was selected as the most appropriate strategy for this research (Sapsford, 2007). A survey of the users of the Dordwijkzone Green Infrastructure Project in Dordrecht was undertaken.

Reasons for using a survey research strategy

The survey, with the use of questionnaires is a well-known and efficient form of research, with many options for standardization in empirical research (van Thiel, S., 2014). Due to the nature of the topic and the fact that no previous research has been done in Dordrecht on Socio-Cultural Value, the survey was used to collect new data. A large sample was necessary to achieve representation of the users of the study area. The use of the survey made it possible to quantify the users' perceived benefits and quantify their Socio-Cultural Value associated with the Dordwijkzone with the use of a five-point Likert scale. Based on methodologies for empirical research on Cultural Ecosystem Services in the literature chapter, the survey research strategy was selected as the most appropriate method to quantify Socio-Cultural Values with the use of a questionnaire. Asking the users "how much?" they like an aspect, rather than "why?" resulted in self-reported subjective appreciation of the Socio-Cultural Value on a Likert scale to quantify how much (Veenhoven, 2000).

Limitation and challenges in the use of the survey strategy

A criticism against the survey strategy is that in-depth information lies hidden behind the data collected in the survey. The research strategy was specifically chosen to enable the quantification of complex, intangible values by asking respondents to quantify their appreciation or value associated with certain aspects of the Dordwijkzone.

It is a known risk with surveys that respondents do not always answer truthfully or give social desirable answers. Since the researcher was present with the majority of the questionnaires being completed, the need to meet the researcher's expectations could potentially increase the chances of increasing this answering tendency. In order to address this, it was emphasized that the survey was anonymous. In addition, open ended questions were included in the questionnaire to allow respondents to comment in their own words on the subjective, self-reported values assigned. Respondents were asked to quantify their Socio-Cultural Value or appreciation of the Dordwijkzone Green Infrastructure Project.

The questionnaire was lengthy (over 30 questions and took about 20 minutes to complete) and not all potential respondents were willing to participate in a survey whilst visiting the area for recreation, sport, relaxation or other purposes. In addition, many of the activities for which the area was designed for, includes movement activities such as walking, running and cycling. This challenge was overcome with providing the potential respondent with the option to complete the questionnaire in their own time and return the completed questionnaire via slow mail. Envelopes which already included a return address and a postage stamp were handed to the respondents. This strategy has proven to be successful, since 9 out of the 94 responses were returned via slow mail.

An on-line survey to the citizens of Dordrecht was initially considered for the research in cooperation with the Dordrecht Municipality, but was terminated as an option since the next

official Municipal survey would only take place in September 2017, which was too late to make use of this opportunity. Cooperation with the Municipality was necessary to access their database of registered citizens but also to protect the privacy of the information. The survey, including open-ended questions, provided limited potential to provide in-depth explanations of findings.

3.1.5 Data Collection Methods and Sampling

Instrument: Questionnaire

The questionnaire started with a background description, a map of the study area, an introductory section and instructions for the completion of the questionnaire. The order of the questions in the questionnaire was structured logically, according to the three municipal goals and the types of Socio-Cultural Values as indicated in the operationalization table. The questionnaire was translated into both English and Dutch to overcome potential language barriers, which could have affected the response rate.

The questionnaire included value statements to establish applicability to the respondent (van Thiel, S., 2014, p. 77). The use of value statements and self-reported benefits in a questionnaire were also used in previous research on Cultural Ecosystem Services (Bryce, Irvine, et al., 2016, Carrus, Scopelliti, et al., 2015, Bertram and Rehdanz, 2015).

Single choice and multiple-choice questions were used to establish the Cultural Ecosystem Services or social benefits of the Dordwijkzone to its users. The respondents were requested to indicate their subjective, Socio-Cultural Value on a Likert Scale. Provision was made for open ended questions in the questionnaire to allow the respondents to explain in their own words, why they chose a certain value on the Likert scale. The qualitative answers allowed for triangulation and explanation of the values provided on the Likert Scale. The Likert scale included a neutral position, which is not ideal if respondents tend to revert systematically to the vague categories. The processing of the open-ended answers took up more time and made the survey less efficient, especially with a large number of respondents (van Thiel, S., 2014). Because of this, the open-ended questions were kept to a minimum and only used to expand on the five Socio-Cultural Values, supplementing the values indicated on the Likert scale.

Some theoretical jargon was included in the questionnaire due to the nature of the research topic, for example “habitat”, “aesthetics” and “bequest value”. Definitions and explanations were provided in the questionnaire for a better understanding of the concepts by the respondents (van Thiel, S., 2014, p. 79). These terms were simplified by adding descriptive words in brackets such as “natural, green areas”, “beauty and attractiveness” or “moral value”. Similar answer categories were used for the items in the questionnaire and consideration was given to providing the respondents with exhaustive options or have complete ranges within the questions. This was tested in a pilot study to ensure that there were no omissions prior to the roll-out of the survey (van Thiel, S., 2014). Even with the definitions included in the questionnaire, some respondents did ask questions of clarity whilst busy with the questionnaire. One gentleman enquired about the meaning of the term “aesthetic” and a few respondents asked about the meaning of “Moral or Bequest Value”.

The risk of all respondents not being able to interpret or read a map is also acknowledged or identified as a factor that may influence the response rate and the reliability of the responses. The use of the map in the questionnaire was also tested in the pilot study and the extent explained with the initial introduction and engagement with the respondent. The engagement of a respondent included firstly the introduction of the researcher to the potential respondent, a

brief overview of the purpose of the study in Dordrecht and immediate reference to the study area indicated on the map included the questionnaire, pointing out prominent features in the Dordwijkzone (Wantijpark in the north, Landgoed Dordwijk in the middle and Zeedijk as the southern boundary of the zone). The face to face survey allowed for explanation and for questions of clarity, which would not have been the case with an on-line survey.

Sampling

A probability sampling method was used for the collection of the data, which uses a random selection of respondents in the study area for the survey. Simple random sampling is the basic sampling technique where a sample of respondents is selected for study from a larger group (the users of the Dordwijkzone). Each individual is chosen entirely by chance and each member of the population has an equal chance of being included in the sample.

Consideration was given to the extent of the study area as well as the season, weather and time of day in the random selection of respondents. In order to ensure that the different units in the relevant population (users of the Dordwijkzone) had an equal probability of being chosen, the data collection was executed in a specified period of time within the same season (July 2017), the researcher moved from the north of the study area (Control Area 1: North of the N3) to the south (Control Area 2: South of the N3) daily to request users of the study area to participate. It should be noted that the different activities taking place, on a daily basis, in the Dordwijkzone varies from static to dynamic or active. Static users include those users that stay in a single section of the study area for longer periods of time for activities such as watching their small children play on play equipment, visiting the petting zoo, watching their small children swimming, making use of the restaurant, sitting on a bench or fishing. Dynamic or active users include those that are running, cycling, playing football, horse riding, walking (with or without dogs), boating or paddling. The latter group were more difficult to include in the sample since the nature of a survey interrupted their motion or momentum or the activity made it impossible to include them (e.g. boating). Both static and dynamic users were included in the sample. In order to overcome the inconvenience factor to the dynamic users (those in motion), they were requested to still participate by responding to the questionnaire at a time suitable for them. They were handed a questionnaire with an envelope including a return address and a postage stamp. Wherever this option was provided, the potential respondents were generally willing to participate. A total of 9 responses out of the total 94 responses were returned by mail.

It was anticipated that the socio-demographic information of the Dordwijkzone Green Infrastructure users included in the questionnaire would be analysed to determine to what extent demographic differences had an impact on the Socio-Cultural Value of the users. The characteristics that were included in the questionnaire are age, gender, ethnic origin, family composition, education and income levels. The initial intent was to consider a number of groups with demographic differences, such as ethnic origin and gender. It was soon realized that there were very limited respondents from ethnic origins other than the Netherlands and some of those that were approached, declined to participate.

The analysis of two stratified groups would have required a response rate of 120 respondents, which was the initial intended sample size. The total respondents in the survey was 94, which makes it suitable for the analysis of one stratified group based on gender, in the SPSS software. The response rate was therefore 78%.

Stratified sampling refers to a type of sampling method. With stratified sampling, the researcher divides the population into separate groups, called strata (male and female) (van Thiel, S., 2014). A probability sample (often a simple random sample) is drawn from each group. With

the required stratified random sampling for gender, it was ensured that each subgroup within the population receives proper representation. From the 94 respondents, 55 were women and 39 were men.

3.1.6 Data Analysis Methods

The information gathered was analysed with the aid of statistical techniques and software. A large number of variables related to Cultural Ecosystem Services and Socio-Cultural Values were included in the survey to many units of study or respondents. Factual information about the respondents as well as their opinions or attitudes towards the study area were also included. Quantitative data collected through the face to face survey was captured, catalogued and stored using Excel software. For further analyses the data was imported into Statistical Package for Social Sciences (SPSS Version 20) software. A data inspection was undertaken, missing values assigned and the answers coded in a code book.

In order to answer sub-question 1, the Pearson's Chi-Square Test was identified as the most suitable test to determine whether there is a significant relationship between the expected frequencies and the observed frequencies between the two variables (Gender and Cultural Ecosystem Services). The Chi-square test for independence is done with two nominal or categorical variables in a single population to determine significant association between the two variables. The Null hypothesis in a Chi-Square test assumes that a significant relationship exists between the two variables (difference between variables). The alternative hypothesis assumes that no significant relationship between the two variables exists (similarity between variables). If the calculated value of the Chi-Square test is greater than 0,05, the null hypothesis is rejected (no relationship or association exists between the two variables). If the calculated value of the Chi-Square test is smaller than 0,05, the null hypothesis is accepted (significant relationship between the two variables exist). Once the association between the two variables have been determined, the strength of the relationship is verified with the Cramer's V Test. In all identified CES with significance, the results for the Chi-Square Tests and the Cramer's V Tests resulted in the same P value.

The frequencies of the self-reported benefits by men and women were considered for the different Cultural Ecosystem Services. The purpose was to establish whether there is an association between the two variables (Cultural Ecosystem Services and Gender). The Null hypothesis in the Pearson's Chi-square Test assumes that there is no association between the two variables. The Alternative hypothesis assumes that there is an association between the two variables. In the event of the calculated significance value of the Chi-Square test is greater than the table value, the null hypothesis will be rejected. Once a relationship has been established in the Chi-square test, the strength of this relationship is determined with the Cramer's V Test. The Cramer's V was only done for the Cultural Ecosystem Service types where significance association were relevant.

In order to establish the relationship between the Cultural Ecosystem Services or social benefits used by the two groups (men and women), the T-Test was undertaken. The T-Test measures weather the differences found between the scores for the two groups (men and women), are systematic or random. The T-test estimates the chance that the difference found is random based on the standard maximum P value of 5% or 0,05. If $P < 0,05$, the difference observed between men and women and their benefits from Cultural Ecosystem Services are not random, but systematic with a 95% reliability that there is a true or real difference between the groups or whether the differences could be attributed to coincidence. If there is a real difference, the effect is considered to be gender statistically significant. Only if the effect is proven to be statistically significant can the assumption from literature on the supposed relation between the two variables be confirmed or rejected (van Thiel, S., 2014).

In sub question 2, the MANOVA or multivariate ANOVA was used to determine to what extent the gender of the users of the Dordwijkzone affects their Socio-Cultural Value assigned to the area. “Variance Analysis tests whether there are differences in the mean scores of two groups on one variable (ANOVA) or more than one variable (multivariate ANOVA or MANOVA)” (van Thiel, S., 2014, p. 132). In this research, the extent of the difference between the mean scores of the Socio-Cultural Values between men and women was determined. Qualitative answers were collected, translated and captured from the open-ended questions in the questionnaire. This served as a primary data source of limited qualitative information, which was manually analysed and used in the findings. The qualitative answers obtained from the open-ended questions were used for explaining the scores indicated by the respondents and were used for triangulation. Since only two groups were used in the MANOVA test (and not the minimum requirement of three groups), a post hoc test was not possible and the values are reported at this level.

3.1.7 Research limitations and pitfalls

The findings of this study cannot be generalized to other cities in the Netherlands, since it is site specific, with unique semi-natural ecosystem characteristics and took place at a local level. However, the proposed classification of Cultural Ecosystem Services and the methodology could be repeated in any other ecosystem or project.

No monetary values were determined for the Socio-Cultural Value of the Dordwijkzone, but the intent was to quantify the value to provide the policy and decision makers with an indication of how the users of the Dordwijkzone use, experience and value the Municipality’s investment in the city. The findings could be supplementary to the existing drive to use the TEEB-city tool to quantify Ecosystem Services in the Netherlands.

The concepts used in the survey, described intangible and invisible functions, services, benefits or values. Some of the terminology used in the questionnaire might not be appropriate in communities with high levels of illiteracy or without basic, compulsory levels of education (e.g. VMBO, HAVO or VWO). This was not a limitation in the case of Dordrecht.

3.1.8 Reliability and validity

A random sample is generally expected or anticipated to be representative, according to the laws of probability. It is a general practice to compare survey respondents’ age, gender and educational distribution with national averages (van Thiel, S., 2014). If the initial intended strategy of making use of an on-line survey to the citizens of Dordrecht, the population size would have been known and the data collected could have been compared to national averages. But due to the fact that the strategy was changed to a face-to-face survey of only the users of the Dordwijkzone, a situation was created where the population size is unknown and the characteristics of the users would not necessarily reflect national averages. The representativeness of the sample obtained from stratified random sampling, only considered sufficient representation from respondents from both groups.

Statistical data should always be checked to determine if it meets the requirements for the analytical technique to be used, such as the normal distribution or the exclusion of outliers in the analysis. In the case of this research, all the data is nominal or categorical and no normality test was required. Only the most suitable tests were applied to the data to answer the research questions, namely the Pearson’s Chi-square Test, Cramer’s V Test, T-Test and the multivariate ANOVA or MANOVA. The analysis was used as an aid for arriving at an analysis and a result. No cannibalizing of data is applicable (van Thiel, S., 2014).

Sources of interference associated with reliability and validity with surveys are non-response and respondents' answering tendencies. The response rate in the survey has been addressed earlier. Non-response can cause problems with external validity, which refers to the extent to which the results can be generalized to other situations and other people.

The methodology and framework used to determine Cultural Ecosystem Services can be repeated elsewhere. Some answering tendencies that are associated with surveys, are providing social desirable or political correct answers. Clear instructions on how to complete the survey questionnaire was provided and it was emphasized that the survey information will remain anonymous, to allow respondents to give honest answers (van Thiel, S., 2014, p. 84). Internal validity is only relevant in studies that try to establish a causal relationship. It's not relevant in most observational or descriptive studies and will therefore not be addressed. As indicated in the literature review, the use of qualitative interview methods is limited in the field of measuring people's subjective appreciation. Research is mostly done with structured interviews or questionnaires. Doubt has been expressed regarding the value of self-reported appreciation, specifically regarding the interpretation of questions by the respondents, the honesty of answers and comparability of responses individually and across cultures, but existing empirical studies do point to reasonable validity and reliability (Veenhoven, 2000). Since the key focus of the survey is to enable the researcher to quantify the Socio-Cultural Value of the users, the intangibility of the topic is acknowledged in the approach and addressed by the findings of Veenhoven (1996) who already addressed the validity of self-reported appreciation. The findings showed that there was not much difference in outcomes between asking people direct questions about their appreciation versus undertaking in-depth interviews. People are considered to be rational beings, who are capable of evaluating their lives based on both intuitive appraisal and cognitive evaluation (Veenhoven, 2000, p. 10). Based on this, the questionnaire to the users of the Dordwijkzone were designed to ask them to evaluate the value of the Dordwijkzone Green Infrastructure Project on a Likert scale to enable the quantification of the Socio-Cultural Value.

Chapter 4: Research Findings

4.1 Introduction

The chapter include a descriptive section, describing the Dordwijkzone Green Infrastructure Project and its users, and an inferential data analysis section, which will enable the answering of the research questions in Chapter 5.

4.2 Description of the Dordwijkzone Green Infrastructure Project

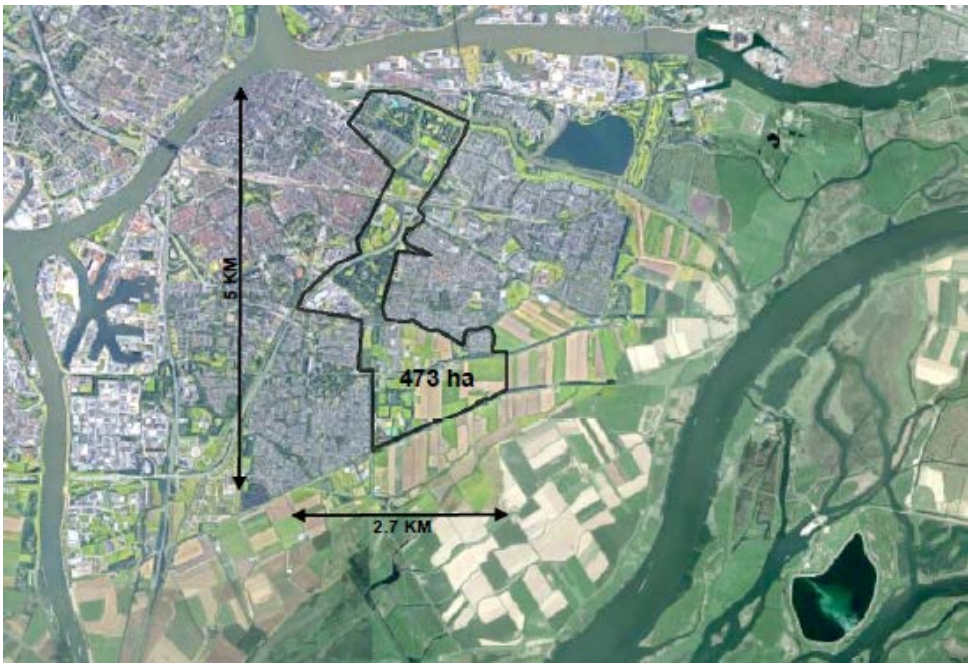

Figure 11: Extent of the Dordwijkzone

Source: (Author, 2017)

De Dordwijkzone stretches from the Wantij in the north to the Zeedijk in the south as indicated in Figure 4. The zone has value as a natural habitat for fauna and flora and provides continuity for nature processes and recreation. The park triangle, formed by the "Landgoed Dordwijk", Dubbelmondepark and Overkamppark, is an important component of the zone due to its size and diverse fauna and flora. This is only place where the whiskered bat (*Myotis mystacinus*) has been spotted. Other unique features of the Dordwijkzone is newly created water features and the old trees in Wantijpark and "Landgoed Dordwijk". The primary elements of the Dordwijkzone can be summarized as habitat and connectivity of nature for animals (bats and mammals).

4.2.1 The objective and goals of the Dordwijkzone Green Infrastructure Project

The objective of the plan was to strengthen the ecological connectivity of the green areas on the island and to create space for people, animals and plants. An integrated and demarcated area, situated within living areas, sport fields, polders, agricultural areas, dykes and roads (Mank, Veen, et al., 2008, p. 32). This objective was divided into the following three goals:

(a) The recovery of nature within the city boundaries

The green spaces in the city were spatially fragmented and were of varying environmental and aesthetic quality. The intent was to connect these green spaces to create one attractive area, by increasing the green and water between existing sport fields for the distribution of more animals and plants in the area. The creation of a transitional area with forest and reeds along water edges or a combination of the two, would also create a linkage to the southern, agricultural area of the island, which should be accessible to all (van Leeuwen, 1999, p. 5). The outside area of the island with its polder landscape has cultural historical value and large-scale farming in this area has economical value for the city (Structure Vision Dordrecht 2040: City in the Delta, *Structuurvisie Dordrecht 2040: Stad in de Delta.* 2013).

(b) The use value of the area as a park for the city

A critical consideration for the development of the park was the accessibility as well as meeting the different recreation needs of the residents, which varied from vibrancy, attractions, sport to a need for silence (van Leeuwen, 1999).

(c) The recognisability of the area

The area had to be clearly recognizable and visible by the citizens. The use of plantings, gullies and dykes were envisaged to achieve this. The development plan provided for the inclusion of an additional 76 000m2 (7,6ha) of public space to the existing green areas. The total extent of the Dordwijkzone, including the public and private land uses within the zone, comprise approximately 473ha as indicated in Figure 11. The development plan of 1999 served as a Master plan with an overall vision for the project, the proposed phasing for implementation and financial consequences of the plan. It was intended to serve as the bridge to operationalize individual projects within the broader vision (van Leeuwen, 1999).

4.2.2 Key elements of the Dordwijkzone

Figure 12 provides an overview of the key elements of the Dordwijkzone. The recreational activity areas in the Wantij Park, with its attractive main access (No. 1), includes the animal petting zoo (No.2), the children's play equipment area (No. 3), the lawn for the Monday night music festivals (No. 4), the Wantij Terrace Restaurant (No. 5) and the "Paddestoel" children's swimming pool (No. 6).

Key intersections within the Dorwijkzone is the Princess Amalia bridge connecting Wantij park with the sports fields (No. 7), the crossing of the primary cycle route over "*Groene Zoom*" (No. 8), the under pass at the railway line (No. 9) and the underpass at the N3 Freeway (No. 10).

The heart of the Dordwijkzone is considered to be Landgoed Dordwijk (No. 11) which is recognizable by the historical buildings. The park triangle includes Landgoed Dordwijk (No. 11), Dubbelmondepark (No. 12) and Overkamppark (No. 13).

Many of the users of the Dordwijkzone are drawn to the area due to existing land uses in the area such as the Old Age Home in Dubbelmonde Park ("*Woonzorgcentrum Dubbelmonde*") (No. 14) and may existing sport facilities within the zone, including football fields, a hockey club and the public swimming pool ("*Foundation Wantijbad Dordrecht*") (No. 15).

The southern boundary of the Dordwijkzone is the "*Zeedijk*" (No. 17). The primary cycle routes through the zone are indicated, even though many secondary routes also exist.

Figure 12: Key elements in the Dordwijkzone

Source: Author, 2017

4.3 Description of the users of the Dordwijkzone

This section will provide a brief overview of the users of the Dordwijkzone.

4.3.1 Gender of the users

In the survey, a total of 55 females and 39 males were randomly selected through probability sampling. Since the population size of the total users of the Dordwijkzone is unknown, the characteristics of the users would not necessarily reflect the city wide or national averages. 58,5% of the respondents were female, whilst 41,5% of the respondents were male. Statistics for Dordrecht in 2015, indicate the two gender groups to be similar in size on the city-wide scale, namely 50,3% females and 49,7% males (Barbieri, S., 2015) as indicated in Chart 1.

4.3.2. Ethnic origin of the users

As stated before, the users of the Dordwijkzone does not reflect the same population characteristics as the city or the national averages. On a city-wide scale, available statistics (refer to Chart 1) indicate that foreigners comprise 6,1% of the population of Dordrecht, whilst in the case of the users of the Dordwijkzone, a higher percentage of foreigners make up the population of users of the area. 11% of the users of the Dordwijkzone reported their ethnic origin from countries other than the Netherlands. Table 12 shows that 89% of the users of the Dordwijkzone have their ethnic origin from the Netherlands.

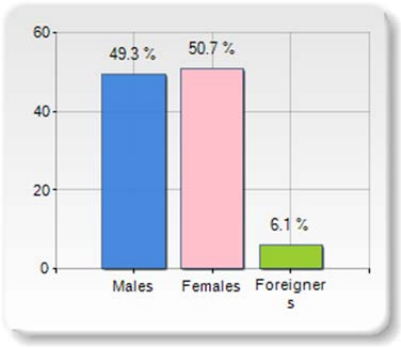

Chart 1: Males, Females and Foreigners Incidence in Dordrecht (Year 2015)

Source: (Barbieri, S., 2015)

Ethnic Origin	Female		Male		Total	
	Count	%	Count	%	Count	%
Netherlands	50	91	34	87	84	89
Netherlands Antilles/Aruba	0	0	1	3	1	1
Turkey	1	2	2	5	3	3
Morocco	0	0	1	3	1	1
Suriname	1	2	0	0	1	1
Western Europe	2	4	0	0	2	2
Other	1	2	1	3	2	2
Total	55	100	39	100	94	100

Table 12: Ethnic origin of users

Source: (Author, 2017)

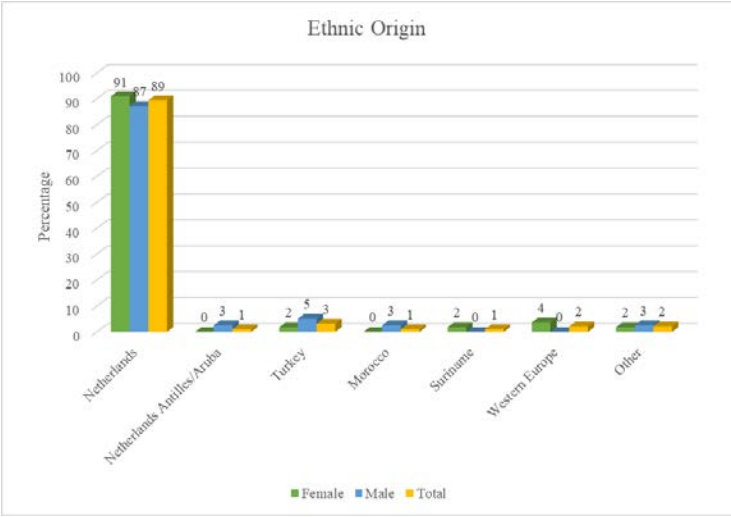

Chart 2: Ethnic origin of users

Source: (Author, 2017)

The majority of the respondents originate from the Netherlands (89%) or 84 of the 94 respondents. The analysis of the influence of ethnic origin on Cultural Ecosystem Services and Socio-Cultural Value in this research was eliminated due to the low percentage of minority groups observed in the Dordwijkzone as well as their unwillingness to participate in the survey.

4.3.3 Education level of the users

Education Level	Female		Male		Total	
	Count	%	Count	%	Count	%
Primary education	1	2	0	0	1	1
Practical vocational education	3	5	3	8	6	7
VMBO	4	7	1	3	5	5
HAVO	6	11	3	8	9	9
VWO	1	2	1	3	2	2
MBO	10	18	8	21	18	20
HBO	21	38	15	39	36	39
University	9	16	7	18	16	17
Total	55	100	38	100	93	100

Table 13: Education level of users

Source: (Author, 2017)

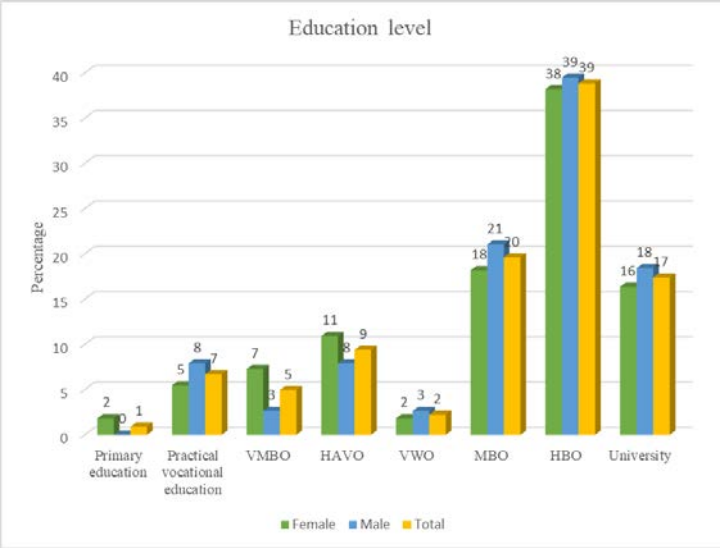

Chart 3: Education level of users

Source: (Author, 2017)

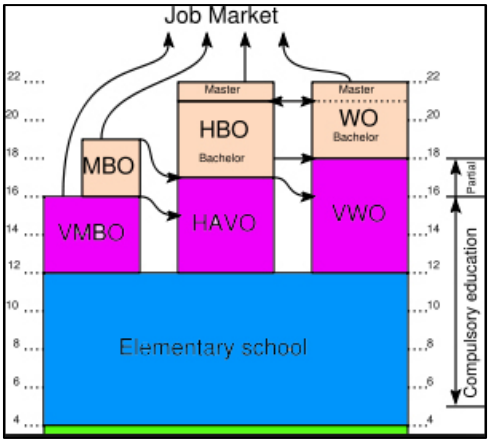

Chart 4: Education system in the Netherlands

Source: (EuroPACE, 2008)

The largest group (39%) of the respondents indicated that they have completed HBO (Higher General Continued Education), 20% indicated that they have completed MBO (Middle-level Applied Education) and 17% indicated that they have completed University level. Therefore, a total of 76% of the respondents are considered to have a relative high level of education. The respondents in the survey, completed the compulsory education for the Netherland (VMBO, HAVO and VWO) or obtained higher qualifications (MBO, HBO and University). Only 8% of respondents in the survey has not completed compulsory education in the Netherlands as illustrated in Chart 4.

The terminology used in this research is considered to be abstract in some instances or not generally considered by the respondents. The education level of the respondents was an important consideration in this research and due to the relatively high education levels of the users of the study area, the survey could be successfully undertaken in Dordrecht. During the process of completing the questionnaires, respondents had the opportunity to ask questions of clarity related to terminology or aspects they do not understand. One gentleman asked the meaning of the word “aesthetic” and on a few occasions the definition of “Bequest and Moral Value” had to be explained to the respondents.

4.3.4 Age distribution of the users

Age distribution	Female		Male		Total	
	Count	%	Count	%	Count	%
young adult	15	27	14	36	29	31
middle age	28	51	19	49	47	50
elderly	12	22	6	15	18	19
Total	55	100	39	100	94	100

Table 14: Age distribution of users

Source: (Author, 2017)

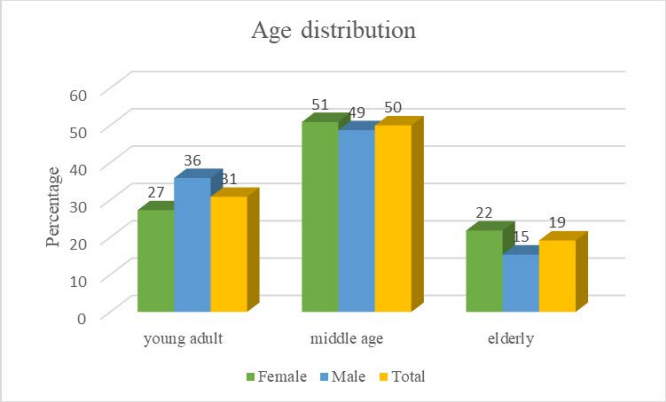

Chart 5: Age distribution of users

Source: (Author, 2017)

The age distribution of the respondents was divided into three groups: Young adults (18 – 35 years old), Middle age (36 – 64 years old) and Elderly (65 and older). All three groups were relatively well represented in the survey. Children under 18 years of age were excluded from the study due to the nature of the topic, which is relatively complex to grasp, as well as the implications to obtain parents' permission to approach children in a public space. As indicated in Table 14, 18 of the 94 respondents are older than 65. The locality of the Old Age Home in Dubbelmonde Park ("*Woonzorgcentrum Dubbelmonde*") could potentially contribute to the amount of elderly people making use of the Dordwijkzone.

4.3.5 Family composition of the users

Children under 18	Female		Male		Total	
	Count	%	Count	%	Count	%
yes	29	53	13	33	42	45
no	26	47	26	67	52	55
Total	55	100	39	100	94	100

Table 15: Family composition of the users

Source: (Author, 2017)

Due to the children under the age of 18 being excluded from the survey, the adult users of the Dordwijkzone were requested to indicate whether they had children under the age of 18. A higher percentage of female users of the Dordwijkzone have children under 18. Details about the children's ages and their use of the Dordwijkzone did not form part of the survey and the scope of the research. Table 15 indicates that 53% of the female users of the park has children under the age of 18 years and 33% of the male users of the park has children under the age of 18 years.

4.3.6 Years the users reside in Dordrecht

In order to address the visibility, the recognisability and the perceived fragmentation of the Dordwijkzone (in sub-question 3), an indication of how well the users know the city and the full extent of the Dordwijkzone, since it is a large area in Dordrecht. Provision was also made for visitors to the city in the survey.

Years in Dordrecht	Female		Male		Total	
	Count	%	Count	%	Count	%
Less than 1 year	0	0	2	5	2	2
1 to 5 years	5	9	3	8	8	9
6 to 10 years	3	5	3	8	6	7
More than 10 years	36	65	29	74	65	71
Visitors	9	16	2	5	11	12
Total	53	96	39	100	92	100

Table 16: Years the users reside in Dordrecht

Source: (Author, 2017)

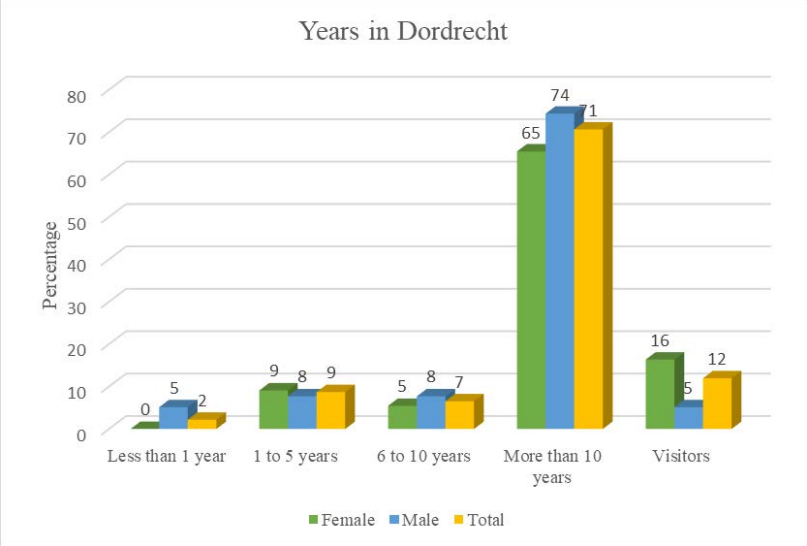

Chart 6: Years the users reside in Dordrecht

Source: (Author, 2017)

Table 16 and Chart 6 indicate that 71% of the users of the park have been living in Dordrecht for more than 10 years and it can be concluded that a large percentage of the respondents in the survey know the city of Dordrecht well. Even though 12% of the respondents have indicated that they are visitors to the city and do not live there, one can also conclude that the Dordwijkzone must be well-known if non-residents visit the area, especially since it does not form part of the historical core of the city, which is where most tourists or visitors would go.

4.3.7 Accessibility of the Dordwijkzone

Figure 13 indicates the locality of the Dordwijkzone in relation to the different Districts of Dordrecht. Most of the users to the Dordwijkzone reside in Districts directly abutting the Dorwijkzone, such as Het Reeland, Stadspolders, Sterrenburg and Dubbeldam as indicated in Table 17. The only exceptions to these, are the users that originate from Centrum and the visitors to the city. From this it can be concluded that proximity to the Dordwijkzone does influence the use thereof. The Dordwijkzone is centrally located within Dordrecht and the direct distances to sections of the Dordwijkzone vary between approximately 1,4km to 2,2km from various parts of the city. The actual travel routes via road and cycle paths were not mapped for the purposes of this study.

District in Dordrecht	Count	%
Centrum (Binnenstad & Noordflank)	14	14.9
Het Reeland	14	14.9
The Tail/Staart	4	4.3
Oud Krispijn	3	3.2
Nieu Krispijn	1	1.1
Stadspolders	19	20.2
Wielwijk	1	1.1
Crabbehof & Zuidhoven	4	4.3
Sterrenburg	9	9.6
Dubbeldam	13	13.8
Visitor	12	12.8
Total	94	100.0

Table 17: Districts in Dordrecht where users originate from

Source: Author, 2017

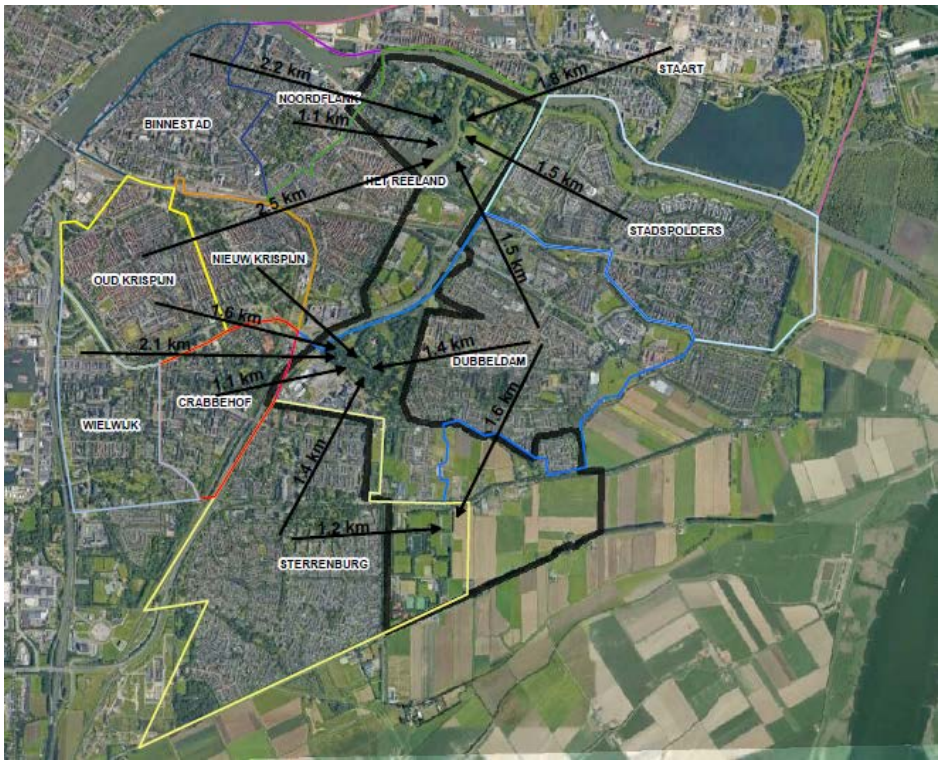

Figure 13: Districts in Dordrecht where users originate from

Source: Author, 2017

4.3.8 The users' mode of transport to get to the area

Mode of Transport	Female		Male		Total	
	Count	%	Count	%	Count	%
walk	15	16	12	13	27	29
run	0	0	3	3	3	3
cycle	26	28	14	15	40	43
public transport	1	1	0	0	1	1
car	12	13	10	11	22	23
horse	1	1	0	0	1	1
Total	55	59	39	41	94	100

Table 18: Users' mode of transport

Source: (Author, 2017)

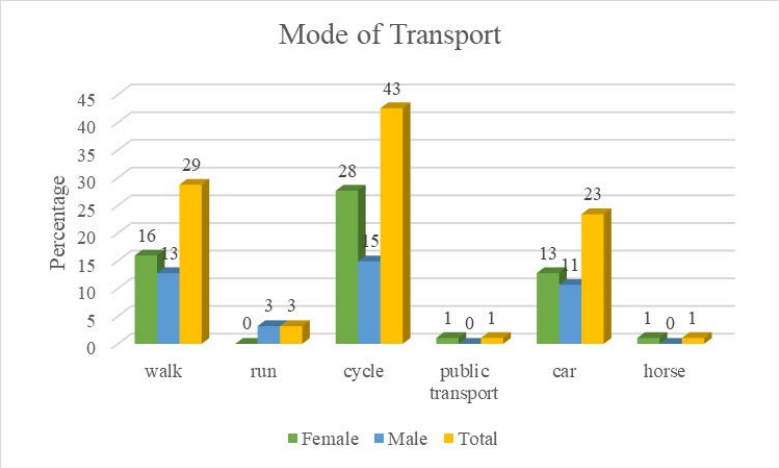

Chart 7: Users' mode of transport

Source: (Author, 2017)

Table 18 and Chart 7 indicate that 43% of the users of the Dordwijkzone visit the area by bicycle. In this study, cycling has been dealt with as a recreational actively and no distinction was made between cycling for recreational purposes or cycling for commuting purposes. The second, most preferred mode of transport to reach the Dordwijkzone is by walking, which comprise 29% of the users and thirdly, is the use of a private car to get there by 23% of the users. Very low numbers are reported for running, public transport and horse riding.

Photograph 1: The use of horses in the Dordwijkzone

Source: (Author, 14 May 2017)

4.3.9 Frequency of use of the Dordwijkzone

Frequency	Female		Male		Total	
	Count	%	Count	%	Count	%
less than once p.m.	8	9	7	7	15	16
1-10 times p.m.	22	23	15	16	37	39
11-20 times p.m.	11	12	5	5	16	17
21-30 times p.m.	3	3	5	5	8	9
more than 30 times p.m.	11	12	7	7	18	19
Total	55	59	39	41	94	100

Table 19: Frequency of use of the Dordwijkzone

Source: (Author, 2017)

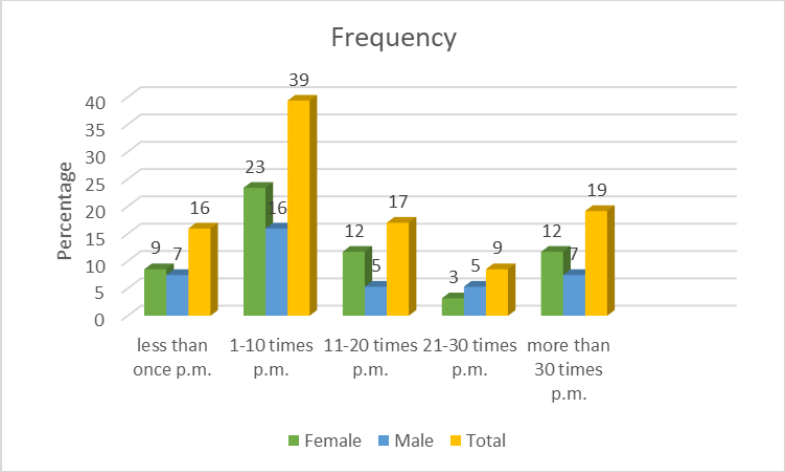

Chart 8: Frequency of use of the Dordwijkzone

Source: (Author, 2017)

Table 19 and Chart 8 indicate that the Dordwijkzone is well utilized. Approximately 28% of all the respondents, use this zone on a daily basis (between 21 and more than 30 times per month). In addition to the extensive reported use of the Dordwijkzone, Table 20 and Chart 9 indicates that 73% of respondents generally do not visit the area alone, but visit the area with others which further confirms the extensive utilization of the Dordwijkzone.

Company	Female		Male		Total	
	Count	%	Count	%	Count	%
Alone	14	15	11	12	25	27
Others	41	44	28	30	69	73
Total	55	59	39	42	94	100

Table 20: Accompanied visits

Source: (Author, 2017)

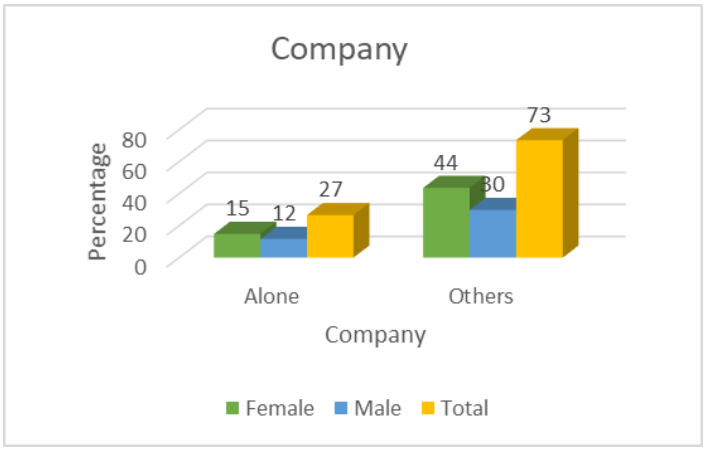

Chart 9: Accompanied visits

Source: (Author, 2017)

4.3.10 Time of day that users visit the area

Time of day	Female		Male		Total	
	Count	%	Count	%	Count	%
mornings	8	9	5	5	13	14
afternoons	33	36	23	25	56	60
evenings	3	3	3	3	6	7
> once a day	11	12	7	8	18	19
Total	55	59	38	41	93	100

Table 21: Time of day

Source: (Author, 2017)

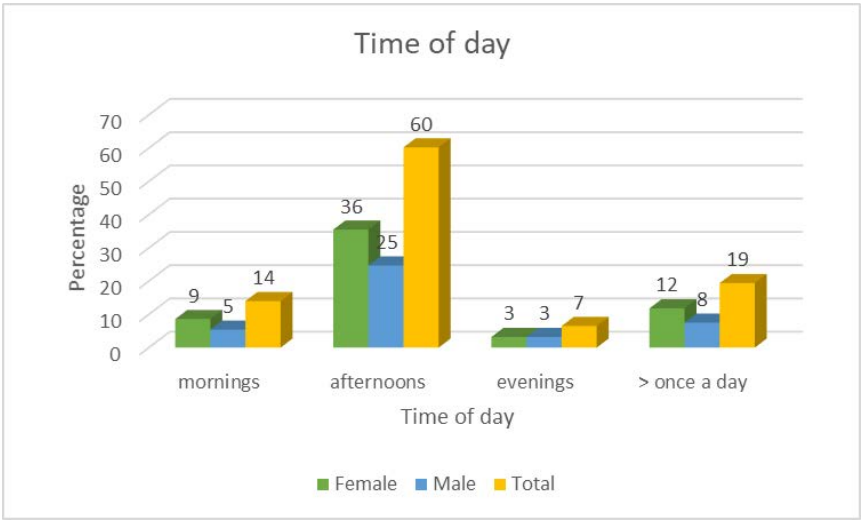

Chart 10: Time of day

Source: (Author, 2017)

Table 21 and Chart 10 indicates that 60% of the users visit the Dordwijkzone during the afternoons. Mornings were defined as 4:00am – 11:59am, afternoons as 12:00pm-17:59pm and evenings as 18:00pm – 3:59am. An additional 19% of the users indicated that they visit the Dordwijkzone more than once a day, which could potentially increase those that visit the area

in the afternoons. Due to the nature of this connected Green Infrastructure, the use of the zone could be a result of the zone being used for commuting by foot or bicycle through the area more than once a day.

4.3.11 Types of recreation

The Recreation Cultural Ecosystem Service of the Dordwijkzone was broken down into types of recreational activities to indicate the social benefits to the users from the direct use of the Dordwijkzone.

Recreation Uses	Female			Male			Total			Analysis		
	Count	Total	%	Count	Total	%	Count	Total	%	Chi-S	Cr V	T-Test
Walking	49,00	55,00	89,09	27,00	38,00	71,05	76,00	93,00	81,72	**0,027**	**0,027**	**0,04**
Horse riding	2,00	52,00	3,85	0,00	39,00	0,00	2,00	91,00	2,20	0,224	n.a.	0,159
Cycling	46,00	55,00	83,64	25,00	39,00	64,10	71,00	94,00	75,53	**0,03**	**0,03**	**0,039**
Water activities	13,00	53,00	24,53	13,00	39,00	33,33	26,00	92,00	28,26	0,354	n.a.	0,359
Sport activities	17,00	54,00	31,48	13,00	39,00	33,33	30,00	93,00	32,26	0,85	n.a.	0,852
Play equipment for children	40,00	55,00	72,73	15,00	38,00	39,47	55,00	93,00	59,14	**0,001**	**0,001**	**0,001**
Social activities: family and fri	33,00	54,00	61,11	19,00	39,00	48,72	52,00	93,00	55,91	0,235	n.a.	0,239
Social activities: new people	14,00	54,00	25,93	11,00	39,00	28,21	25,00	93,00	26,88	0,807	n.a.	0,809

Table 22: Recreation uses of the Dordwijkzone

Source: (Author, 2017)

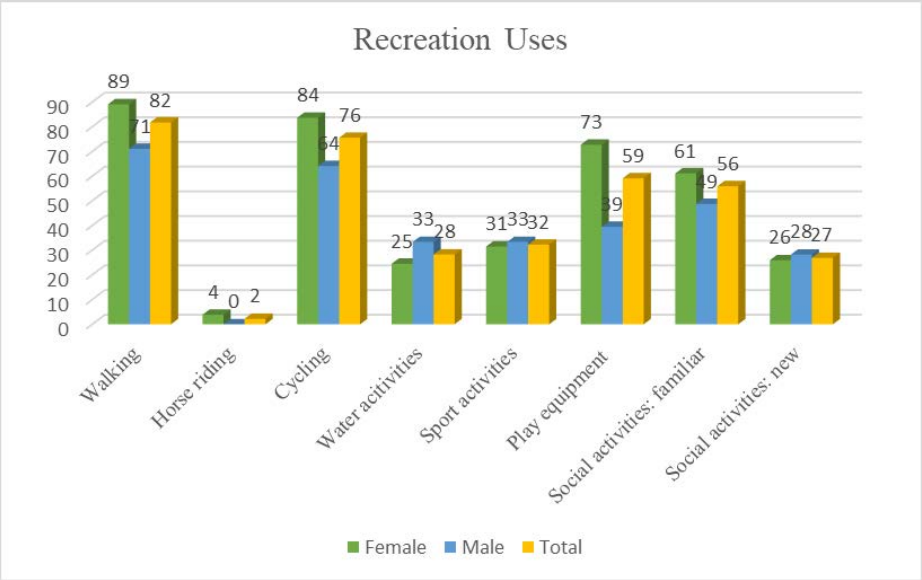

Chart 11: Recreation uses of the Dordwijkzone

Source: (Author, 2017)

Table 22 and Chart 11 indicate the highest reported recreation benefit of the Dordwijkzone as walking (82%). This could be alone, with others or with dogs. The second highest reported recreation benefit is cycling (76%). For the purposes of this study, cycling was dealt with as a recreational activity even though a component of those cycling through the Dordwijkzone could be for commuting purposes. The third highest reported recreation use is for the children's play equipment and the use of the petting zoo. The high percentage of women (73%), opposed

to 39% of men that use play equipment for their children in noteworthy, and points to the role of women as the nurturer of children in this context. Provision was made for two categories of social activities in the survey. Social activities with existing friends and family (indicated as "familiar" in Chart 11) and for social activities to meet or be exposed to new people, which relates more to social benefits related to social integration, social cohesion and community identity, as identified in the Social and Identity Themes in the Cultural Ecosystem Services Framework. Women reported a higher recreational use in all the different types of recreation, except for water activities like fishing and boating and sport activities like football or running.

Photograph 2: Animal petting zoo at Wantij Park

Source: (Author, 14 July 2017)

Photograph 3: The "Paddestoel" (Mushroom) children's swimming pool at Wantij Park

Source: (Author, 9 July 2017)

There are three activities in the Dordwijkzone which are designed for small children, namely the play equipment, the petting zoo and the Mushroom ("*Paddestoel*") children's swimming pool in the Wantij Park. During informal discussions with the respondents during the fieldwork, the parents at the children's pool indicated that the Mushroom fountain at the children's pool automatically gets switched on by the Municipality when the outside temperature reaches 24 degrees Celsius. Clean water is used and access to the pool is free, which make it a popular area in the Dordwijkzone.

4.4 Inferential Data Analysis

4.4.1 Cultural Ecosystem Services of the Dordwijkzone

The purpose of this section is to show which Cultural Ecosystem Services were reported by the users as providing them with benefits. The Cultural Ecosystem Services determined in this section, was based on the classification of Cultural Ecosystem Services set out in the proposed Cultural Ecosystem Services framework in the Chapter 2. This analysis considered "how much?" the area is used by the users and not "why?" (Veenhoven, 2000). Therefore, the differences between men and women in their use of the Dordwijkzone will not be explained. The Cultural Ecosystem Services Framework was translated into 22 indicators to determine the relevant Cultural Ecosystem Services that benefit the users of the Dordwijkzone. Table 23 indicates how much of the users are benefitting from the available Cultural Ecosystem Services identified through the use, experience, awareness, assigned meaning and having options related to the Dordwijkzone.

Cultural Ecosystem Services from Use	**Female**			**Male**			**Total**			**Analysis**		
	Count	**Total**	**%**	**Count**	**Total**	**%**	**Count**	**Total**	**%**	**Chi-S**	**Cr V**	**T-Test**
Spiritual use	8,00	53,00	15,09	8,00	37,00	21,62	16,00	90,00	17,78	0,594	n.a.	0,598
Mental use	7,00	53,00	13,21	11,00	37,00	29,73	18,00	90,00	20,00	0,057	n.a.	0,073
Recreation Use	51,00	53,00	96,23	33,00	37,00	89,19	84,00	90,00	93,33	0,362	n.a.	0,368
Cultural Use	20,00	53,00	37,74	6,00	37,00	16,22	26,00	90,00	28,89	**0,026**	**0,026**	**0,020**
Social Use	32,00	53,00	60,38	13,00	37,00	35,14	45,00	90,00	50,00	**0,018**	**0,018**	**0,018**
Cultural Ecosystem Services from Experience	**Female**			**Male**			**Total**			**Analysis**		
	Count	**Total**	**%**	**Count**	**Total**	**%**	**Count**	**Total**	**%**	**Chi-S**	**Cr V**	**T-Test**
Spiritual experience	11,00	54,00	20,37	9,00	39,00	23,08	20,00	93,00	21,51	0,754	n.a.	0,757
Mental experience	13,00	53,00	24,53	12,00	39,00	30,77	25,00	92,00	27,17	0,506	n.a.	0,511
Aesthetic experience	45,00	55,00	81,82	24,00	39,00	61,54	69,00	94,00	73,40	**0,028**	**0,028**	**0,036**
Cultural experience	32,00	53,00	60,38	10,00	38,00	26,32	42,00	91,00	46,15	**0,001**	**0,001**	**0,001**
Identity experience	25,00	54,00	46,30	13,00	38,00	34,21	38,00	92,00	41,30	0,246	n.a.	0,248
Social experience	30,00	55,00	54,55	18,00	39,00	46,15	48,00	94,00	51,06	0,423	n.a.	0,428
Cultural Ecosystem Services from Awareness	**Female**			**Male**			**Total**			**Analysis**		
	Count	**Total**	**%**	**Count**	**Total**	**%**	**Count**	**Total**	**%**	**Chi-S**	**Cr V**	**T-Test**
Awareness: habitats	49,00	55,00	89,09	36,00	39,00	92,31	85,00	94,00	90,43	0,602	n.a.	0,606
Awareness: invisible benefits	32,00	54,00	59,26	20,00	38,00	52,63	52,00	92,00	56,52	0,528	n.a.	0,533
Cultural Ecosystem Services from Assigned Meaning	**Female**			**Male**			**Total**			**Analysis**		
	Count	**Total**	**%**	**Count**	**Total**	**%**	**Count**	**Total**	**%**	**Chi-S**	**Cr V**	**T-Test**
Assigned spiritual meaning	10,00	55,00	18,18	7,00	39,00	17,95	17,00	94,00	18,09	0,977	n.a.	0,977
Assigned mental meaning	18,00	55,00	32,73	10,00	39,00	25,64	28,00	94,00	29,79	0,459	n.a.	0,465
Assigned recreation meaning	51,00	54,00	94,44	33,00	39,00	84,62	84,00	93,00	90,32	0,114	n.a.	0,144
Assigned aesthetic meaning	42,00	55,00	76,36	26,00	39,00	66,67	68,00	94,00	72,34	0,3	n.a.	0,315
Assigned cultural meaning	30,00	55,00	54,55	12,00	39,00	30,77	42,00	94,00	44,68	**0,022**	**0,022**	**0,021**
Assigned identity meaning	25,00	55,00	45,45	15,00	39,00	38,46	40,00	94,00	42,55	0,499	n.a.	0,505
Assigned social meaning	20,00	55,00	36,36	12,00	39,00	30,77	32,00	94,00	34,04	0,573	n.a.	0,578
Cultural Ecosystem Services from having Options	**Female**			**Male**			**Total**			**Analysis**		
	Count	**Total**	**%**	**Count**	**Total**	**%**	**Count**	**Total**	**%**	**Chi-S**	**Cr V**	**T-Test**
Conservation for others	54,00	55,00	98,18	37,00	39,00	94,87	91,00	94,00	96,81	0,368	n.a.	0,374
Stewardship/Altruism	34,00	55,00	61,82	20,00	39,00	51,28	54,00	94,00	57,45	0,309	n.a.	0,314

Table 23: The Cultural Ecosystem Services of the Dordwijkzone

Source: (Author, 2017)

Chart 12 indicates the quantity of the users actively or passively benefit from the Cultural Ecosystem Services, provided by the Dordwijkzone. This information is based on the self-reported social benefits by the users of the Dordwijkzone. The benefits were determined, based on the Cultural Ecosystem Services framework and included a total of twenty-two (22) Cultural Ecosystem Services or self-reported social benefits. The chart shows the highest to the lowest self-reported social benefits by the users, to give an overview of the most and least used Cultural Ecosystem Services at a glance.

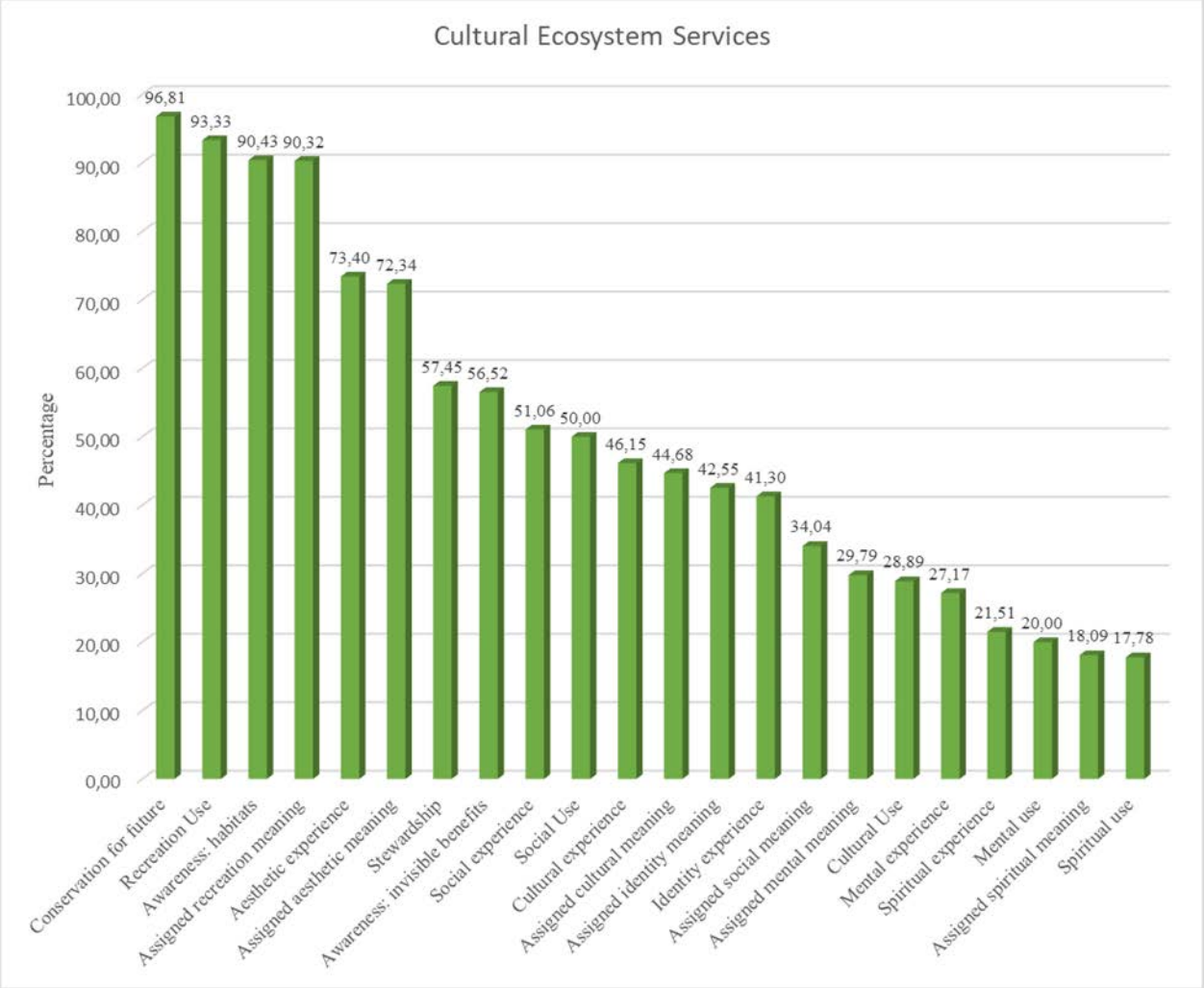

Chart 12: The Users' self-reported Cultural Ecosystem Services obtained from the Dordwijkzone

Source: (Author, 2017)

Chart 12 shows the most to the least used Cultural Ecosystem Services of the Dordwijkzone, based on the self-reported benefits by the users. The Cultural Ecosystem Service most used in the Dordwijkzone, is the option to conserve the Dordwijkzone for the benefit of others or future generations. 96,81% of users of the Dordwijkzone reported this is a benefit obtained from the area.

The second most used Cultural Ecosystem Service in the Dordwijzone is the recreational use of the area. 93,33% of the users reported this as a social benefit obtained from the area.

The third highest, most used, self-reported social benefit to the users (90,43%) is derived from the awareness that habitats, fauna and flora exist in the city, with its associated invisible or indirect benefits.

The users (90,32%) also reported benefits obtained from their assigned recreation meaning to the Dordwijkzone. From the top five (5) self-reported benefits by the users, only one Cultural Ecosystem Service is actively used. The other four (4) Cultural Ecosystem Services mentioned are all passively used and invisible to decision makers and policy makers.

The users reported very low use of the benefits from the Dordwijkzone for Cultural Ecosystem Services obtained through spiritual (including spiritual, religious inspiration and/or reflection benefits) or mental (including mental stimulation, cognitive development, knowledge, information, learning, skills development and/or education benefits) use, experience or assigned meaning.

4.4.2 Influence of gender of the users on the CES

In addition to determining the Cultural Ecosystem Services benefitting the users of the Dordwijkzone in total, the results for the two gender groups are also shown individually in Table 23. The inferential data analysis was undertaken to determine whether there are differences between the two gender groups in the way they use, experience and assign meaning to the Dordwijkzone. The Cultural Ecosystem Services which were identified as being gender statistically significant are indicated in bold in the last column under the T-Test results of Table 23.

The results of the T-Test highlight the Cultural Ecosystem Services that show a significant difference between the self-reported benefits by men and women and confirmed that there is a difference between men and women in the way that they use, experience and assign meaning to the Dordwijkzone in five (5) of the Cultural Ecosystem Services (Jorgensen, Ellis, et al., 2012, Evenson, Jones, et al., 2016, Ho, Sasidharan, et al., 2005).

Women reported greater social benefits in the following five (5) Cultural Ecosystem Services out of the possible twenty-two (22) Cultural Ecosystem Services included in the framework: Cultural Use, Social Use, Aesthetic Experience, Cultural Experience and Assigned Cultural Meaning. These five (5) Cultural Ecosystem Services are considered to be gender statistically significant. An explanation of why women would report greater social benefits from social use, aesthetic experiences and the Cultural Ecosystem Services related to the cultural theme, does not form part of the scope of this study.

The hypothesis that gender has an impact on the Cultural Ecosystem Services with differences in the way that men and women use, experience and assign meaning to the Dordwijkzone (passively or actively) is therefore confirmed.

4.4.3 Socio-Cultural Value of the Dordwijkzone

Based on the proposed categories of Socio-Cultural Value as adopted from Kati and Jari (2016), the users of the Dordwijkzone were asked to indicate their subjective appreciation of or value assigned to the types of Socio-Cultural Values set out below. Likert scales with values from 1 (very low value) to 5 (very high value) were provided to the users to enable the quantification. The mean scores of the gender groups and the total users were determined, which resulted in the non-monetary quantification of the Socio-Cultural Value of the Dordwijkzone. The mean values indicated in Table 24 show a normal distribution, with no extremes.

Gender	Socio-Cultural Value	Value	Description of the value
Female	Experience Value	3.67	Neutral to high experience value
	Use Value	3.81	Neutral to high use value
	Bequest Value	3.78	Neutral to high bequest value
	Existence Value	4.07	High to very high existence value
	Symbolic Value	3.72	Neutral to high symbolic value
Male	Experience Value	3.54	Neutral to high experience value
	Use Value	3.67	Neutral to high use value
	Bequest Value	3.67	Neutral to high bequest value
	Existence Value	3.92	Neutral to high existence value
	Symbolic Value	3.13	Neutral to high symbolic value
Total	Experience Value	3.60	Neutral to high experience value
	Use Value	3.74	Neutral to high use value
	Bequest Value	3.72	Neutral to high bequest value
	Existence Value	3.99	Neutral to high existence value
	Symbolic Value	3.42	Neutral to high symbolic value

Table 24: The Socio-Cultural Value of the Dordwijkzone

Source: (Author, 2017)

4.4.4 Influence of gender of the users on the Socio-Cultural Value

In order to determine to what extent gender of the users influences the Socio-Cultural Value of the Dordwijkzone Green Infrastructure Project, the results of a MANOVA variance analysis is indicated Table 25. The results show that there is no significant difference between men and women for four (4) of the five (5) types of Socio-Cultural Values. Only with the Symbolic Value, a significant difference was found between the mean scores of the two gender groups, with a mean value of 3.13 for men and 3.72 for women. The hypothesis that similarities or no significant variation between the two gender groups in their Socio-Cultural Value related to the Dordwijkzone is therefore also confirmed.

ANOVA						
Socio-Cultural Value		Sum of Squares	df	Mean Square	F	Sig.
Use Value	Between Groups	.470	1	.470	.524	.471
	Within Groups	80.780	90	.898		
	Total	81.250	91			
Experience value	Between Groups	.372	1	.372	.549	.461
	Within Groups	61.692	91	.678		
	Total	62.065	92			
Bequest Value	Between Groups	.303	1	.303	.331	.566
	Within Groups	84.048	92	.914		
	Total	84.351	93			
Existence Value	Between Groups	.517	1	.517	.805	.372
	Within Groups	58.472	91	.643		
	Total	58.989	92			
Symbolic Value	Between Groups	7.990	1	7.990	9.182	**.003**
	Within Groups	79.192	91	.870		
	Total	87.183	92			

Table 25: Results of the Variance Analysis

Source: (Author, 2017)

In order to explain why men valued the Symbolic Value of the Dordwijkzone lower than women, reference is made to some explanatory comments from the qualitative data obtained from the open-ended questions in the survey.

The women explained their subjective Symbolic Value in their own words by referring to memories of the past, emotions and social interaction (for themselves and children):

"The area stands for values of my youth. I was raised here" (Survey 02, 2017).
"It forms part of my background and youth" (Survey 10, 2017.)
"High value for green and historical element" (Survey 12, 2017).
"I come here to visit my friend. Children playing" (Survey 13, 2017).
"This area makes me proud of Dordrecht" (Survey 17, 2017).
"I was born and raised here and I am used to the area" (Survey 18, 2017).
"Good environment to relax and play with other children" (Survey 31, 2017).
"The historical perspective is important" (Survey 35, 2017).

The males did not refer to memories of the past, emotions or social interactions (for themselves and children). Their comments relate mostly to practical and functional matters:

"Not much symbolic value but the football fields are important to me" (Survey 63, 2017).
"Don't see any symbolic value" (Survey 66, 2017).
"More maintenance is needed in the recreation areas" (Survey 79, 2017).
"The area is important to me but can be improved" (Survey 86, 2017).
"The zone is not recognizable for me" (Survey 87, 2017).

Symbolic Value was defined by Kati & Jari (2016) as the abstract meanings that are assigned by the individual or group to the area. From the comments of both the groups it appears that women generally commented on abstract, invisible and intangible matters such as memories and emotions, whilst the men generally commented on practical matters such as visible improvement, maintenance or recognizability.

4.5 Findings on the Ecosystem Functions intended by the Municipality

As indicated in Section 2.3, De Groot (2006b) distinguished between Ecosystem Functions and Ecosystem Services. He defined Ecosystem Functions as "the capacity of natural processes and components to provide goods and services that satisfy human needs, directly or indirectly" (de Groot, 2006b, p. 176). He referred to five different Ecosystem Functions but only two are applicable to the Dordwijkzone Green Infrastructure Project. They are the Habitat function which is the provision of natural ecosystems and conservation of biodiversity; and the Information functions which are opportunities for reflection, spiritual enrichment, cognitive development, recreation, aesthetic experience and to serve as a reference function. The role of the Dordwijkzone in the city for commuting has not been included and the cycling through the Dordwijkzone was included under the recreation use or Information Function of the area, therefor the Carrier Function of the Dordwijkzone is not addressed separately. It should also be noted that commuting was not highlighted by the Municipality in their goals for the Dordwijkzone Project. Carrier Functions of ecosystems provide space or medium to support human activities, which leads to the gradual transformation or degradation of the ecosystem (de Groot, 2006b). The construction of cycle lanes and bridges inside the Dordwijkzone, to accommodate the movement of citizens through the zone, could be classified as a Carrier Function, if it was separated from the recreation use and Information Function.

4.5.1 Habitat Function: The recovery of nature to create a connected whole

In order to evaluate this intended Habitat Ecosystem Function of the Municipality, quantitative and qualitative input from the users was referred to as well as observations and photos.

In a simple question, making use of statements, respondents were asked whether they perceive the natural ecosystem (green areas and water) to be connected or fragmented in the city. The majority (60,6%) of the users of this zone perceive it to be fragmented, whilst 38,3% of the respondents considered the natural ecosystem to be connected as indicated in Table 26.

Connected Whole				
	Frequency	Percent	Valid Percent	Cumulative Percent
Connected	36	38.3	38.3	38.3
Fragmented	57	60.6	60.6	98.9
Don't know	1	1.1	1.1	100.0
Total	94	100.0	100.0	

Table 26: Perceived fragmentation of the Dordwijkzone

Source: (Author, 2017)

Even though the cycle lanes and pedestrian routes are connected across natural ecosystems with bridges, key visible and structural elements that cause fragmentation in the continuity of the natural ecosystems of the Dordwijkzone, is the railway line and the N3 freeway ("*Randweg*"). The built infrastructure or grey infrastructure are well designed, maintained and continuous. The intent of the Municipality, however was to enable a connected whole for the natural ecosystem (green and water). From the observations on-site, the Dordwijkzone has large parks, which forms attractive, individual habitats for fauna and flora, but the entire Dordwijkzone is fragmented. The most visible and most invasive barriers for the movement of fauna and flora is the N3 Freeway and the Railway line. Photographs 6 and 7 indicate that both these built elements have "grey infrastructure" connections for people but no natural connections are provided for the movement of animals underneath the N3 Freeway or the railway line. Smaller, lower impact bridges across natural areas such as the bridges shown in Photographs 4 and 5 are less invasive to the natural movement of animals, water and birds in these examples.

Photograph 4: Connecting bridge for cyclists and pedestrians near Twintighoevenweg

Source: (Author, 14 May 2017)

Photograph 5: Princess Amalia bridge connecting Wantij park with the sports fields

Source: (Author, 14 May 2017)

Photograph 6: Fragmentation of Green Infrastructure with a visual and physical barrier caused by the railway line

Source: (Author, 14 May 2017)

Photograph 7: Fragmentation of Green Infrastructure with a visual and physical barrier caused by the N3 freeway

(Source: Author, 14 May 2017)

4.5.2 Information Function: Use Value of the Dordwijkzone as a park for the city

Table 27 and Chart 13 indicate the Cultural Ecosystem Services (self-reported social benefits) for the Use of the Dordwijkzone.

Cultural Ecosystem Services from Use	Female			Male			Total			Analysis		
	Count	Total	%	Count	Total	%	Count	Total	%	Chi-S	Cr V	T-Test
Spiritual use	8,00	53,00	15,09	8,00	37,00	21,62	16,00	90,00	17,78	0,594	n.a.	0,598
Mental use	7,00	53,00	13,21	11,00	37,00	29,73	18,00	90,00	20,00	0,057	n.a.	0,073
Recreation Use	51,00	53,00	96,23	33,00	37,00	89,19	84,00	90,00	93,33	0,362	n.a.	0,368
Cultural Use	20,00	53,00	37,74	6,00	37,00	16,22	26,00	90,00	28,89	**0,026**	**0,026**	**0,020**
Social Use	32,00	53,00	60,38	13,00	37,00	35,14	45,00	90,00	50,00	**0,018**	**0,018**	**0,018**

Table 27: CES from the Use of the Dordwijkzone

Source: (Author, 2017)

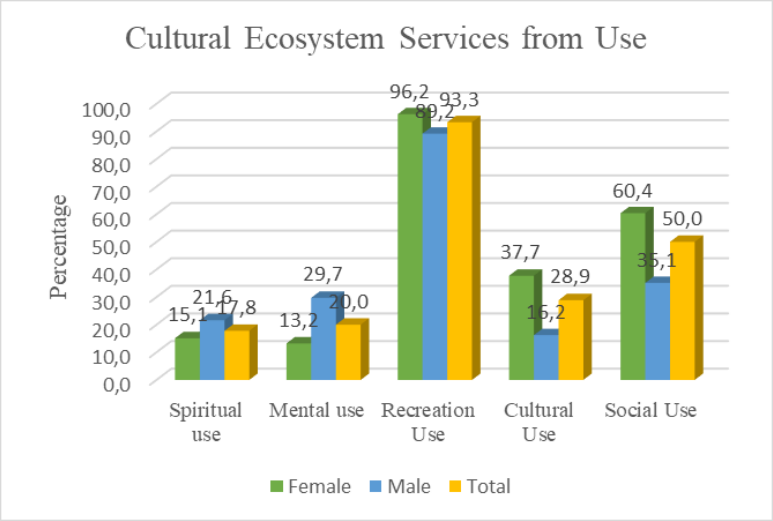

Chart 13: CES from the Use of the Dordwijkzone

Source: (Author, 2017)

From the self-reported social benefits to the users or the actively used Cultural Ecosystem Services, recreation (93,3%), social use (50%) and cultural use (28,9%) of the Dordwijkzone are the highest. 93% of all respondents indicated that recreation is a primary use of this area, which indicates that the Municipality was successful in the goal to improve the use value of the park in the city to meet the different recreation needs of the residents of Dordrecht.

The results of the T-test show that men's and women's use of the park is similar in all respects, except for the Cultural Use and the Social Use. Even though Spiritual and Mental Use were reported as the least used Cultural Ecosystem Services, but in this instance men reported a higher Mental and Spiritual Use of the Dordwijkzone than the women. Men generally did not refer to emotions or memories in assessing their Symbolic Value of the Dordwijkzone.

As indicated in Table 24, the Socio-Cultural Value attached to the Use Value for the two groups (mean values on Likert scale) are 3,81 for females and 3,67 for men. Both groups reported a Neutral to High Use Value (below 4 on the Likert scale) for their subjective appreciation of the Use Value of the Dordwijkzone. The results of the MANOVA test indicated in Table 24 confirmed that these values are not gender statistically significant. In other words, both gender groups have a similar perception of the Use Value of the area (P = 0,471).

4.5.3 Information Function: Recognizability and visibility of the Dordwijkzone

From the primary data collected, 56,4% of the users indicated that they have seen and know the full extent of the entire Dordwijkzone and consider it to be visible and recognizable. Table 28 and 29 indicate that the same percentage of users reported the Dordwijkzone to be recognizable and visible. Some of the respondents confirmed their knowledge of the area by describing the nature, location and accessibility of the Dordwijkzone within Dordrecht. These are some of the comments from the users of the area related to the recognizability and visibility of the Dordwijkzone:

"*Wantijpark and Dordwijk has surprising areas but are separated by unattractive areas" (Survey 51, 2017).*

"The area is diverse and centrally located" (Survey 68, 2017).

"No good connections with neighbourhoods" (Survey 87, 2017).

"I use the area often even I don't live here" (Survey 35, 2017).

"Awareness is important to explore. Make it more known" (Survey 35, 2017).

"Green oasis in the city" (Survey 44, 2017).

Recognizability				
	Frequency	Percent	Valid Percent	Cumulative Percent
Whole	53	56.4	56.4	56.4
Section	41	43.6	43.6	100.0
Total	94	100.0	100.0	

Table 28: The recognisability of the whole Dordwijkzone to the users

Source: (Author, 2017)

Visibility				
	Frequency	Percent	Valid Percent	Cumulative Percent
Whole	53	56.4	56.4	56.4
Section	41	43.6	43.6	100.0
Total	94	100.0	100.0	

Table 29: The visibility of the whole Dordwijkzone to the users

Source: (Author, 2017)

From observations within the zone, the planting of trees along the dykes and the boundaries of the zone, creates a visual indication of the extent of the space. Photograph 8 indicates the planting of trees along the edges, boundaries and dykes forming part of the Dordwijkzone.

Photograph 8: Visible boundaries created with trees at "Groenezoom" (Green Edge) and "Noordendijk (Northern Dyke)

Source: (Author, 14 May 2017)

Key elements within the zone are better known due to their visible features such as the entrance gate at Wantij Park or the historical buildings at "Landgoed Dordwijk" indicated in Photograph 9a and 9b.

It is concluded from the input from the users of the park, their comments and own observations, that the Dordwijkzone is visible and recognizable and that the Municipality has been successful in this goal of the project.

Photograph 9: Visible features and key elements in the Dordwijkzone: Entrance to Wantij Park (9a) and the historical buildings at Landgoed Dordwijk (9b)

Source: (Author, 14 May 2017)

4.6 Dis-benefits of the Dordwijkzone Green Infrastructure Project

Even though this section is not related to a sub-question of the research, it is included to add value for decision and policy makers. The reported dis-benefits can be considered, learned from and serve as feedback from the users in the event of interventions or improvements being made to increase the Socio-Cultural Value of the Dordwijkzone to the users. Some of the reported dis-benefits relate to design or locality, which would be difficult to change, but some of the operational matters related to maintenance, safety and waste management have potential for improvement. The following were the dis-benefits reported by the users of the Dordwijkzone:

Design:

"Park St Stevenshof could have been be better laid out from the perspective of the Dordwijkzone. Because of this the relationship between areas became smaller, but one has to compromise" (Survey 85, 2017).

"No good connections with neighbourhoods" (Survey 87, 2017).

Accessibility:

"Pity that Landgoed Dordwijk is not accessible to the public" (Survey 16, 2017).

"We love the daily water at the Mushroom children's pool ("Paddestoel"). It is free" (Survey 45, 2017).

Maintenance:

"Does not get maintained" (Survey 79, 2017).

"Bad maintenance with no knowledge about nature" (Survey 90, 2017).

"Much trees were removed with the widening of the road" (Survey 38, 2017).

"No more garden men in Sterrenburg to do maintenance" (Survey 60, 2017).

Dogs:

"Not cleaning up dogs' mess is a nuisance" (Survey 61, 2017).

"Dogs without leashes disturbs the birds" (Survey 68, 2017).

"Dog faeces is a big problem" (Survey 15, 2017).

"Barking dogs when you walk" (Survey 32, 2017).

Pollution:

"All the football fields are next to the freeway and that is not healthy" (Survey 63, 2017).

"Chemical pollution from factory at Dupont" (Survey 02, 2017).

"Trains cause toxic fumes and should rather run via the Betuwe line" (Survey 04, 2017).

"Risk of chemicals released into the water from Dupont Chemical Factory" (Survey 08, 2017).

Noise: Photograph 10 indicates the preparation of the stage for the Monday concerts.

"Noise from the Freeway (N3)" (Survey 53, 2017).

"The concerts every Monday nights is a nuisance" (Survey 36, 2017).

"Noisy when concerts taking place" (Survey 66, 2017).

"Sometimes people are noisy" (Survey 15, 2017).

"Sometimes noise from the festivals is a disturbance" (Survey 32, 2017).

Photograph 10: Preparing for the Monday night music festival

Source: (Author, 10 July 2017)

Photograph 11: Last remaining accessible fishing areas in Dubbeldam

Source: (Author, 13 July 2017)

Traffic and Transportation:

"Heavy traffic and schools" (Survey 78, 2017).

"*Noisy scooters and speeding"* (Survey 94, 2017).

Safety:

"I will not walk alone in the evenings" (Survey 44, 2017).

"Chances for negative social hang out places" (Survey 69, 2017).

"Increase in homeless people" (Survey 91, 2017).

"Some quiet places I won't visit after 20:00 in the evening" (Survey 17, 2017).

Waste Management:

"Litter, no respect for the earth and ignorance" (Survey 57, 2017).

"More information is needed on the processing of waste and the impact on the environment" (Survey 77, 2017).

"Sometime there are litter, tins and glass in the play area" (Survey 31, 2017).

Fishing: Photograph 11 indicates the last remaining fishing areas in Dubbeldam.

"The reeds prevent fishing. No more place left for fishermen to fish. Maintenance of reeds make fishing impossible" (Survey 60, 2017).

Chapter 5: Conclusions and recommendations

This chapter includes conclusive remarks and answers to the research questions. The chapter will also reflect on lessons learned and provide suggestions for further research.

5.1 Answers to the research questions

The research determined the Cultural Ecosystem Services that contributed to the Socio-Cultural Value of the Dordwijkzone. Suggestions have been made to only describe benefits related to social well-being in qualitative terms and not to be quantified (Horton, Digman, et al., 2016, p. 48). Research about Cultural Ecosystem Services have also been described as the most neglected Ecosystem Service (Hernandez-Morcillo, Plieninger, et al., 2013, p. 435). The identification and description of the Cultural Ecosystem Services has to be explicit, before the Socio-Cultural Value can be determined.

A non-monetary valuation or quantification of the Socio-Cultural Value of the subjective appreciation of the users of the Dordwijkzone have been undertaken. The users were asked to report on their subjective appreciation of the Dordwijkzone instead of using proxy indicators to quantify the value (Veenhoven, 2000).

Since the Dordwijkzone is such a large area in Dordrecht and caters for the needs and preferences of all the citizens of Dordrecht, consideration was given to different socio-demographic groups within the city to understand their different needs or preferences. The study investigated the influence of one socio-demographic characteristic of users of the Dordwijkzone, namely gender. This was done to establish to what extent the two user groups differ in their use, experience, assigned value, perceptions and appreciation of the Dordwijkzone.

Finally, the original intent of the Municipality for the Dordwijkzone, when the project was initiated in 1999, was considered and evaluated.

5.1.1 Answer to Sub-question 1

Which are the Cultural Ecosystem Services that contributed to the Socio-Cultural Value of the Dordwijkzone Green Infrastructure Project to its users?

A Cultural Ecosystem Framework was designed with the end result in mind. The end result is the five (5) types of Socio-Cultural Values, which are quantified in this study (Kati and Jari, 2016). The available literature indicated that no conceptual clarity or final classification exists related to the terminology and concepts used in research on Cultural Ecosystem Services (de Groot, Fisher, et al., 2010). This could result in double counting of benefits of nature to humans, if the classification is not explicit (de Groot, Fisher, et al., 2010). To overcome this challenge for the research, the concepts used in the literature as well as new concepts that emerged from the survey in the Dordwijkzone were classified into nine (9) themes, which informed the Cultural Ecosystem Framework proposed in Chapter 2.

The Framework comprised of twenty-two (22) actively and passively Cultural Ecosystem Services that were evaluated in the study. The Cultural Ecosystem Services in the framework include both visible and invisible benefits to the users. The results of the survey made it possible to identify and present the most used, self-reported social benefits to the users, in order

from the most used to the least used Cultural Ecosystem Services obtained from the Dordwijkzone (Refer to Chart 12).

It is interesting to note that from the top five (5) most used Cultural Ecosystem Services, only one (1), namely recreation use is a visible social benefit to the users. The least used Cultural Ecosystem Services of the Dordwijkzone are obtained through Spiritual (including spiritual, religious inspiration and/or reflection benefits) or Mental (including mental stimulation, cognitive development, knowledge, information, learning, skills development and/or education benefits) use, experience or assigned meaning.

The hypothesis formulated in this study is that gender of users will have an influence on the Cultural Ecosystem Services, with differences in the way that men and women passively or actively use, experience or assign value to the Dordwijkzone. Women reported greater social benefits in the following five (5) Cultural Ecosystem Services out of the possible twenty-two (22) Cultural Ecosystem Services included in the framework: Cultural Use, Social Use, Aesthetic Experience, Cultural Experience and Assigned Cultural Meaning. These five (5) Cultural Ecosystem Services are considered to be gender statistically significant.

The hypothesis that gender has an impact on the Cultural Ecosystem Services with differences in the way that men and women passively or actively use, experience and assign meaning to the Dordwijkzone is therefore confirmed.

5.1.2 Answer to Sub-question 2

To what extent does the gender of the users influence the Socio-Cultural Value of the Dordwijkzone Green Infrastructure Project?

Respondents were asked to report their subjective appreciation of the Dordwijkzone related to five (5) identified Socio Cultural Values as defined by Kati and Jari (2016). This approach showed that a non-monetary valuation is possible. All five the Socio-Cultural Values that were quantified resulted in a normal distribution of data with no extremes. The Socio-Cultural Values for the users varied between 3,42 to 3,99 on a Likert scale as indicated in Table 24, which translates into a medium to high Socio-Cultural Value.

When the Socio-Cultural Values assigned by the two user groups were analysed, it was found that four (4) out of the five (5) Socio-Cultural Values are not gender statistically significant, which means that men and women perceived or assigned similar Socio-Cultural Value to the Dordwijkzone. Only one (1) of the Socio-Cultural Values, the Symbolic Value, showed a significant difference between men and women.

From the qualitative comments of both the user groups related to their Symbolic Value, women generally commented on abstract, invisible and intangible matters such as memories and emotions, whilst the men generally commented on practical matters such as visible improvement, maintenance or recognizability. The hypothesis that no significant variation exists between men and women in their perceived or assigned Socio-Cultural Value to the Dordwijkzone, is therefore confirmed.

5.1 3 Answer to Sub-question 3

To what extent were the ecosystem functions intended by the Municipality for the Dordwijkzone Green Infrastructure Project, achieved?

The Dordrecht Municipality had three goals for the Dordwijkzone Green Infrastructure Project:

Goal 1: The recovery of nature to create a connected whole

Only 38% of the respondents perceive the Dordwijkzone to be a connected whole, whilst more than 60% of the respondents perceive the area to be fragmented as indicated in Table 26. The most visible and most invasive barriers for natural processes are the N3 Freeway and the Railway line. The Municipality has not been successful in making the natural ecosystem of the Dordwijkzone a connected whole with the implementation of the Dordwijkzone Green Infrastructure Project.

Goal 2: Use Value of the Dordwijkzone as a park for the city

From the self-reported, actively used Cultural Ecosystem Services, recreation (93,3%), social use (50%) and cultural use (28,9%) of the Dordwijkzone are the highest reported social benefits to the users. 93% of all respondents indicated that recreation is a primary use of this area, which indicates that the Municipality was successful in the goal to improve the use value of the park in the city to meet the different recreation needs of the residents of Dordrecht.

Both gender groups reported a Neutral to High Use Value (below 4 on the Likert scale) for their subjective appreciation of the Use Value of the Dordwijkzone. The results of the MANOVA test indicated in Table 25, confirmed that these values are not gender statistically significant. In other words, both gender groups have a similar perception of the Use Value of the area.

Goal 3: Recognizability and visibility of the Dordwijkzone

Table 28 and 29 indicated that the same percentage of users (56,4%) reported that they have seen and know the full extent of the entire Dordwijkzone. The Municipality has been successful in making the Dordwijkzone recognizable and visible.

It is concluded that the Municipality has not been successful in achieving Goal 1 (Habitat Function), but that they were successful in achieving Goals 2 and 3 (Information Functions).

5.1.4 Answer to the main research question

To what extent does gender of the users influence the Cultural Ecosystem Services and Socio-Cultural Value of the Dordwijkzone in terms of the functions intended by the Dordrecht Municipality?

The study anticipated that different socio-demographic groups may use and perceive an ecosystem differently. In the process of determining which Cultural Ecosystem Services are benefiting the users of the Dordwijkzone and the subjective appreciation of these benefits, the extent to which gender impacts on these were determined. Visitors to an urban park have different needs and a certain outcome for one group, may not be important for another group, therefore different segments of park users should ideally be identified according to the benefits and preference that they are seeking. Understanding the benefits that the different groups are seeking from a park can assist decision-makers in evaluating potential improvements. In order to deal with different user groups, it is important that parks provide diverse activities and uses

(Kemperman and Timmermans, 2006). The understanding of social benefits and the value thereof to different users may influence targeted interventions by decision-makers and will assist in taking informed decisions.

This study found that men and women differ in five (5) out of the possible twenty-two (22) identified Cultural Ecosystem Services which have been identified in the Cultural Ecosystem Services Framework. Women reported higher social benefits obtained from the Dordwijkzone than men in the five (5) gender statistically significant Cultural Ecosystem Services. The five identified Cultural Ecosystem Services are: Cultural Use, Social Use, Aesthetic Experience, Cultural Experience and Assigned Cultural Meaning.

When the Socio-Cultural Values assigned by the two user groups were analysed, it was found that four (4) out of the five (5) Socio-Cultural Values are not gender statistically significant, which means that men and women perceived or assigned similar Socio-Cultural Value to the Dordwijkzone. Only one (1) of the Socio-Cultural Values, the Symbolic Value, showed a significant difference between men and women.

The hypothesis that gender has an impact on the Cultural Ecosystem Services with differences in the way that men and women passively or actively use, experience and assign meaning to the Dordwijkzone and the hypothesis that no significant variation exists between men and women in their perceived or assigned Socio-Cultural Value to the Dordwijkzone, is therefore both confirmed.
In the evaluation of Ecosystem functions, intended by the Municipality, it was found that the Municipality was not successful in achieving success in reinstating the Habitat function in creating a natural connected whole, but that they were more successful in achieving the Information functions related to the recreation and recognizability of the Dordwijkzone (de Groot, 2006b).

5.2 Contribution of the Research

The research proposed a way to assess Cultural Ecosystem Services to provide essential insights for urban planning, with specific reference to taking land use decisions and urban development decisions. By understanding the social benefits used by the citizens as a whole or by different socio-demographic groups within a city, and the value that they attach to a certain element in the city, has the potential to inform and guide decision-making related to land uses and development. By giving attention to the most neglected Ecosystem Service, this study proposed a framework for the classification of Cultural Ecosystem Services to determine actively and passively used social benefits in a semi-natural ecosystem. Nine themes were suggested to group related concepts together towards greater conceptual clarity. Self-reported benefits included visible and invisible benefits to the users of the Dordwijkzone.

This research is building on limited Socio-Cultural Value research. Non-monetary values were established for the Socio-Cultural Value of the Dordwijkzone based on the subjective appreciation of the users of the Dordwijkzone.

This study is considered to be relevant for the policy direction that the Netherlands has embarked on with the City Deal Agreement to actively embrace the Ecosystem Services approach and the implementation of the TEEB-city tool. A weakness of the tool is that adequate provision is not made to accommodate Socio-Cultural Value. The methodology used in this research can be duplicated or built upon in other projects to address this gap.

This study could also potentially add value to the role of Dordrecht in the BEGIN initiative and their attempts to find creative ways to measure Ecosystem Services in their future Blue Green Infrastructure initiatives or add value to their adaptive approach in “learning by doing”.

5.3 Lessons learnt

The research is a subjective approach of people’s perceptions and values related to the benefits that nature provides in urban areas. This study shows that concepts can be clarified or explicitly stated, that invisible and passively used benefits can be determined and the Socio-Cultural Value can be quantified. Limitations regarding the multi-disciplinary nature of Ecosystem Services, the consideration of scale in an Ecosystem Services Assessment and the constantly changing nature of cities should be recognized in the design of the research strategy.

5.4 Recommendation

It is recommended that the Dordrecht Municipality take note of the actively and passively used social benefits derived from the Dordwijkzone by the users. Some invisible benefits were made visible, for example the option to conserve an ecosystem for others or future generations (satisfaction from “Warm Glow” which informed the Bequest Socio-Cultural Value) was the highest reported social benefit from all users, even higher than the direct recreation use. The available assessment of the Cultural Ecosystem Services and Socio-Cultural Value of the Dordwijkzone “*can help to raise awareness of the importance of ecosystem services to society and serve as a powerful and essential communication tool to inform better, more balanced decisions regarding trade-offs*” (Costanza, 2014, p. 157).

It is further recommended that the Municipality take note of the dis-benefits reported by the users of the Dordwijkzone. Some comments were made about the design or the locality of the area in relation to the freeway which cannot be changed easily, but a few minor interventions related to daily operational matters of the Municipality could improve the service delivery to the users of a very large, intensively utilized area in Dordrecht, for example a small intervention in the way the reeds are maintained along the water courses to enable more fishing opportunities in the area. Small operational interventions could result in an increase in the Cultural Ecosystem Services provided by the Dordwijkzone as well as the Socio-Cultural Value of the area.

The proposed Cultural Ecosystem Framework and methodology used, can be applied to other projects in the Netherlands and even more efficiently if the relevant Municipality make use of on-line surveys with their citizens’ registration information. This will allow all the citizens to be reached for projects with a city-wide impact, instead of limiting the investigation to the users of an area, as in the case of this research.

5.5 Scope for further research

The proposed Cultural Ecosystem Framework and the themes that informed the Cultural Ecosystem Services, could be further developed and refined. The Ecosystem Services approach overlaps on different disciplines such as urban planning, transportation planning, landscape architecture, sociology and psychology. In this study, psychological explanations for the different behavior of men and women were excluded in determining the Cultural Ecosystem Services. In addition, a separation between the recreational use and the commuting use of the bicycle in Dordrecht was not included in the research strategy. Future assessments of Cultural

Ecosystem Services should consider the implications of including or excluding multi-disciplinary elements in the research, on the required outcome.

The use of the Likert scales to determine subjective appreciation is considered to be a simple and user-friendly method to quantify Socio-Cultural Value. Further research can be done to consider the use of more sophisticated indexes or weighting of reported benefits and values, which are designed for compatibility with existing Ecosystem Services Tools such as TEEB and CIRIA and made more visible to decision-makers. "*We need new, common asset institutions to better take these values into account*" (Costanza, 2014, p. 152). Even though Costanza was referring to Ecosystem Service assessments on a global level, this also applies to Ecosystem Service assessments at smaller scales.

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Survey list

Survey 02, (2017) Fieldwork in Dordrecht

Survey 04, (2017) Fieldwork in Dordrecht

Survey 08, (2017) Fieldwork in Dordrecht

Survey 10, (2017) Fieldwork in Dordrecht

Survey 12, (2017) Fieldwork in Dordrecht

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Annex 1: Questionnaire (English)

A SURVEY ON THE SOCIO-CULTURAL VALUE OF THE DORDWIJKZONE GREEN INFRASTRUCTURE PROJECT IN DORDRECHT, NETHERLANDS

Dear Sir/Madam,

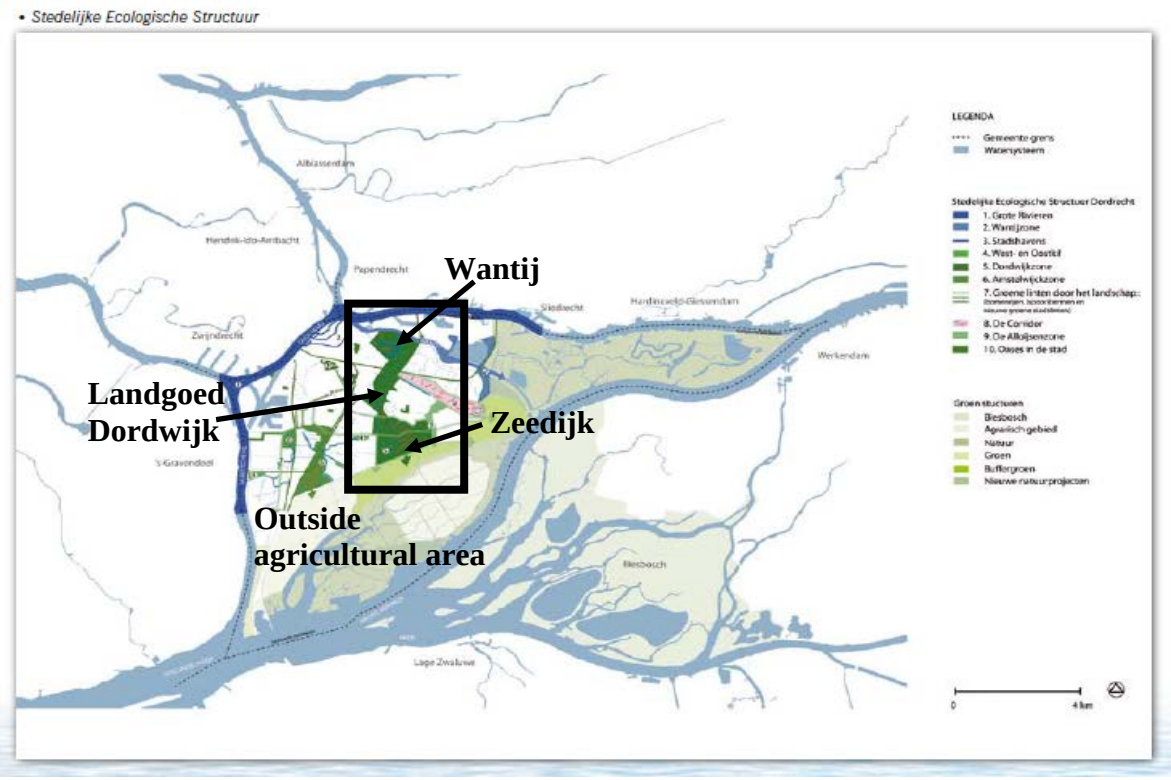
I am Erna van Zyl, a registered student in the MSc course in Urban Management and Development at the Institute for Housing and Urban Development Studies, Erasmus University Rotterdam. As a requirement for my thesis project, I am undertaking research in the City of Dordrecht through a survey.

Please complete all the questions in the questionnaire. The questionnaire will take approximately 15 to 20 minutes to complete. In general, the research is about establishing the perceptions of the users of the Dordwijkzone. Only adults of 18 years and older will be requested to participate. This is not a test. There is no right or wrong answers. I would like to establish your opinion.

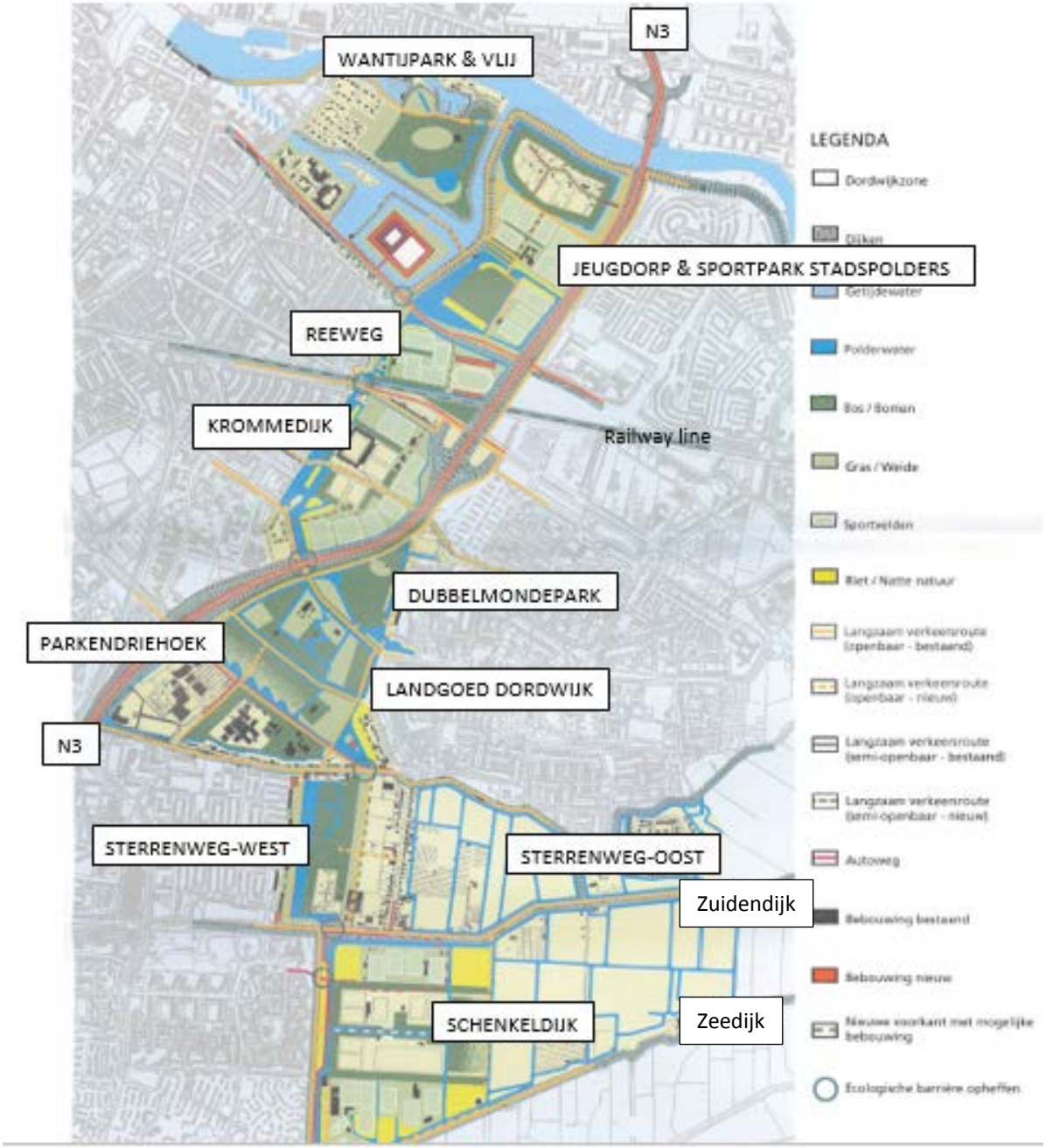
The Dordwijkzone stretches from Wantij to Zeedijk, with the "Landgoed Dordwijk" as the centre. The Municipality of Dordrecht implemented this large-scale Green Infrastructure project during 1999 – 2007. The overall development plan for the project included the provision of an additional 76 000m2 (7,6ha) of public space to the existing green areas in the city. The Municipality intended to provide a connected, recognizable green space primarily for recreational use.

Please be assured that all information you provided in the questionnaire will be confidential and will be used for academic purposes only.

Below please find two maps of the study area for the purposes of this survey:



MAP 1: THE LOCALITY OF THE DORDWIJKZONE IN DORDRECHT



MAP 2: THE EXTENT OF THE DORDWIJKZONE IN DORDRECHT

<u>For official use only:</u>

Date of survey: _____
Time of day: _____
Locality/Control number: _____

QUESTIONNAIRE

PART 1:	**Objectives of the Dordwijkzone project**
Objective 1:	**The recognisability and visibility of the Dordwijkzone**

1. Please choose one option that describes your perception of the recognisability of the Dordwijkzone:

	"I know and recognize the whole Dordwijkzone"
	"I am aware of the Dordwijkzone, but only recognize certain section(s) of the area"

2. Please choose one option that describes your perception of the visibility of the Dordwijkzone:

	"I have seen the whole Dordwijkzone"
	"I have seen certain section(s) of the Dordwijkzone"

Objective 2:	**The recovery of nature within the city boundaries**

3. Please choose one option that describes your perception of the fragmentation or connectivity of the natural ecosystems (green areas and water) of the Dordwijkzone:

	"I perceive the natural ecosystems (green areas and water) in the Dordwijkzone to be a connected and continuous in the city"
	"I perceive the natural ecosystems (green areas and water) in the Dordwijkzone to be fragmented"

Objective 3:	**The use value of the area as a park for the city**

4. Please choose one option that describes how you most often get to the Dordwijkzone:

	"I mostly walk to visit the Dordwijkzone"
	"I mostly run to visit the Dordwijkzone"
	"I mostly cycle to visit the Dordwijkzone"
	"I mostly use public transport to visit the Dordwijkzone"
	"I mostly use a car to visit the Dordwijkzone"
	"I mostly visit the Dordwijkzone by horse"

5. Please choose one option that describes your frequency of use of the Dordwijkzone:

	"I seldom visit the Dordwijkzone" (Less than once a month)
	"I visit the Dordwijkzone between 1 – 10 times per month"
	"I visit the Dordwijkzone between 11 – 20 times per month"
	"I visit the Dordwijkzone between 21 – 30 times per month"
	"I visit the Dordwijkzone more than 30 times per month"

6. Please choose one option that describes best the time of day that you mostly use the Dordwijkzone:

	"I visit the Dordwijkzone mostly in the mornings" (4:00AM – 11:59AM)
	"I visit the Dordwijkzone mostly in the afternoons" (12:00PM – 17:59PM)
	"I visit the Dordwijkzone mostly in the evenings" (18:00PM – 3:59AM)
	"I visit the Dordwijkzone more than once a day"

7. Please choose one option: Do you usually visit the Dordwijkzone alone or together with others?

	Alone
	Together with others

8. Please indicate whether the following statement regarding the USES of the Dordwijkzone apply to you. Please select "yes" or "no".

YES	NO	USES
		"I use the Dordwijkzone for spiritual or religious inspiration and reflection activities"
		"I use the Dordwijkzone for mental stimulation, cognitive development, knowledge, information, reference and educational services/benefits such as research or excursions"
		"I use the Dordwijkzone for recreation"
		"I visit places in the Dorwijkzone for cultural, historical and/or heritage reasons"
		"I visit the Dordwijkzone to establish or strengthen social relations and for social interaction"
		Other (please specify)

9. Please indicate whether the following RECREATIONAL USES of the Dordwijkzone apply to you. Please select "yes" or "no".

YES	NO	RECREATIONAL USES
		Walking
		Horse riding
		Cycling
		Water activities (fishing, paddling, sailing, boating)
		Formal or informal sport activities (e.g. soccer, tennis, running, etc.)
		Play equipment or petting zoo for children
		Socializing, meetings, gatherings, events or bonding with friends and/or family.
		Socializing with new people
		Other uses (*please specify*) _____

10. On a scale of 1 – 5 how would you rate your personal USE VALUE of the Dordwijkzone? *"Use value means your personal value or appreciation attached to the non-consumptive direct use of the Dordwijkzone as indicated in Questions 8 and 9 above".*

1	2	3	4	5
Very low use value	Low use value	Neutral	High use value	Very high use value

11. Briefly explain the score you chose in Question 10 in your own words:

_____

_____

_____

PART 2:	**Other Socio-cultural values of the Dordwijkzone project**
2.1	**Experience Value**

12. On a **scale of 1 – 5** how would you rate the AESTHETIC VALUE of the Dordwijkzone area to you personally? "*Aesthetic value is defined as your personal appreciation of the beauty or attractiveness of the area*."

1	2	3	4	5
Very un-attractive	Un-attractive	Neutral	Attractive	Very attractive

13. Please explain the score you chose in Question 12 in your own words:

_____

_____

_____

14. Please indicate whether the following statements regarding EXPERIENCE(S) of the Dordwijkzone apply to you. Please select "yes" or "no".

YES	**NO**	**EXPERIENCES**
		"I experience spiritual or religious inspiration and reflection in the Dordwijkzone"
		"I feel mentally stimulated (*cognitive development benefits such as knowledge, learning, information*). I use the Dordwijkzone for a reference function or landmark."
		"I experience diversity, beauty, aesthetic or sensory benefits (*see, hear and smell*) in the Dordwijkzone"
		"I experience cultural, historical and heritage awareness in the Dordwijkzone"
		"I experience a sense of place and identity (*individual or community*) in the Dordwijkzone"
		"I experience social benefits, strengthened social relations, interaction and cohesion in the Dordwijkzone"
		"I am not aware of any experiences in the Dordwijkzone"
		Other experiences (please specify)

15. On a scale of 1 – 5 how would you rate your personal EXPERIENCE VALUE of the Dordwijkzone area? *"Experience value is defined as your personal value or appreciation as a direct response from experiencing the Dordwijkzone as indicated in Question 14 above".*

1	2	3	4	5
Very low experience value	Low experience value	Neutral	High experience value	Very high experience value

16. Please explain the score you chose in Question 15 in your own words:

_____

_____

_____

2.2 Bequest/Moral Value

"*Bequest/moral value is attached to the idea of preserving or maintaining the environment for the benefit of other people or for environmental reasons*."

17. Please indicate whether the following statements regarding the protection of the Dordwijkzone apply to you. Please select "yes" or "no".

YES	NO	BEQUEST VALUE
		"It is important to protect the Dordwijkzone for future generations"
		"It is important to protect or conserve the Dordwijkzone"
		"I have a duty or responsibility to protect the Dordwijkzone"
		"It is the responsibility of the Municipality to protect the Dordwijkzone"

18. On a scale of 1 – 5 how would you rate your personal BEQUEST VALUE of the Dordwijkzone? (*refer to your answers in Question 17 above*)

1	2	3	4	5
Very low bequest value	Low bequest value	Neutral	High bequest value	Very high bequest value

19. Please explain the score you chose in Question 18 in your own words:

_____

_____

_____

2.3 Existence Value:

"Existence value can be defined as the knowledge that a specific ecosystem aspect or other element exists".

"Habitat means the natural home or environment of an animal, plant, or other organism".

20. Please indicate whether the following statements regarding the EXISTENCE VALUE of the Dordwijkzone apply to you. Please select "yes" or "no".

YES	NO	EXISTENCE VALUE
		"It is important to know that nature or natural habitats exist in the city even if it is never used or experienced"
		"The Dordwijkzone has invisible benefits to me"
		"The trees in the city benefit my daily life"
		"Animals and insects are important for my daily life"
		"There is no need for nature or natural habitats to exist in the city"

21. On a scale of 1 – 5 how would you rate the importance of the EXISTENCE VALUE of the Dordwijkzone area? (*refer to your answers in Question 20 above*)

1	2	3	4	5
Very low existence value	Low existence value	Neutral	High existence value	Very high existence value

22. Please explain the score you chose in Question 21 in your own words:

_____

_____

_____

2.4 Symbolic Value:
"Symbolic value means that abstract meanings were assigned by the individual".

23. Please indicate whether the following statements regarding the SYMBOLIC VALUE of the Dordwijkzone apply to you. Please select "yes" or "no".

YES	NO	SYMBOLIC VALUE
		"The Dordwijkzone has an abstract spiritual, religious or inspiration meaning to me"
		"The Dordwijkzone has an abstract mental stimulation meaning to me (e.g. information, knowledge, cognitive development, learning or a reference function)."
		"The Dordwijkzone has an abstract recreation meaning to me (e.g. play, fun, freedom, relax)"
		"The Dordwijkzone has an abstract aesthetic meaning to me (e.g. beauty or attractiveness)"
		"The Dordwijkzone has an abstract cultural, historical and/or heritage meaning to me"
		"The Dordwijkzone has an abstract identity meaning to me (e.g. sense of place, community or individual identity"
		"The Dordwijkzone has an abstract social meaning to me (e.g. a symbol of get togethers, events, meetings)"
		"The Dordwijkzone has no symbolic meaning to me."

24. On a scale of 1 – 5 how would you rate your personal SYMBOLIC VALUE of the Dordwijkzone area? (refer to your answers in Question 23 above)

1	2	3	4	5
Very low symbolic value	Low symbolic value	Neutral	High symbolic value	Very high symbolic value

25. Please explain the score you chose in Question 24 in your own words:

_____

_____

_____

PART 3: DIS-BENEFITS OF THE DORDWIJKZONE

26. Please indicate any DIS-BENEFITS OR NEGATIVE IMPACTS of the Dordwijkzone area on you personally? (e.g. Do you have any comments about the safety in the Dordwijkzone, noise or other perceived negative impacts?)

_____
_____
_____

PART 4: BACKGROUND INFORMATION

27. How old are you? _____ years

28. Please choose one option: What is your gender?

	Male
	Female

29. Please choose one option: In which District in Dordrecht do you reside?

	Downtown (including the neighbourhoods of Downtown, 19th Century Peel, North Flank
	Reeland (including the neighbourhoods of Transvaalbuurt, Indian neighbourhood, Vogelbuurt, Land of Falcon
	The Tail/Staart (including the neighbourhoods of Noorderkwartier, Merwede polder)
	Former Krispijn (including the neighbourhoods of Van Gogh near / Composer Neighbourhood)
	New Krispijn (including the neighbourhoods of Bloemenbuurt, Orange Area)
	Stadspolders (including the neighbourhoods of Oudelandshoek, Stadspolder, Vissershoek)
	Wielwijk (including the neighbourhoods of Seaport Lane, Dordrecht Wood)
	Crabbehof - Zuidhoven
	Sterrenburg (including the neighbourhoods of Sterrenburg 1, 2 and 3)
	Dubbeldam (including the neighbourhoods of Small Dubbeldam, Vissersdijk, The Courts)
	Other (including Kop van 't Land, Tweede Tol, Wieldrecht, Willemsdorp, Zuidpolder)
	None of the above. I am a visitor to Dordrecht.

30. Please choose one option: Which ethnic group do you originate from? Ethnicity is defined as *someone's cultural background or where they originate from.*

	Netherlands
	Netherlands Antilles/Aruba
	Suriname
	Turkey
	Morocco
	Cape Verde
	Western European Country
	Eastern European Country
	Other Country (please specify)

31. Please choose one option: Which of the following best describes your household income bracket?

	Less than minimum income (< 1500 per month)
	Between minimum and average income (1500 to 2500 per month)
	More than an average income (2500 per month)

32. Please choose one option: What is your highest educational attainment?

	Primary education
	Practical/vocational education
	VMBO
	HAVO
	VWO
	MBO
	HBO
	University
	Other (please specify)

33. Please choose one option: Do you have children under 18?

	Yes	If Yes, how many children under 18:	
	No		

34. Please choose one option: Do you have a private garden?

	Yes
	No

35. Please choose one option: Do you have pet(s)?

	Yes	If Yes, please specify:	
	No		

36. Please choose one option: How many years have you been living in Dordrecht?

	Less than 1 year
	1 to 5 years
	6 to 10 years
	More than 10 years
	None of the above. I am a visitor to Dordrecht.

Thank you very much for your participation in the survey.

Annex 2: Questionnaire (Dutch)

EEN ENQUÊTE OVER DE SOCIAAL-CULTURELE WAARDE VAN DE DORDWIJKZONE GROENE INFRASTRUCTUUR PROJECT IN DORDRECHT

Beste meneer/mevrouw,

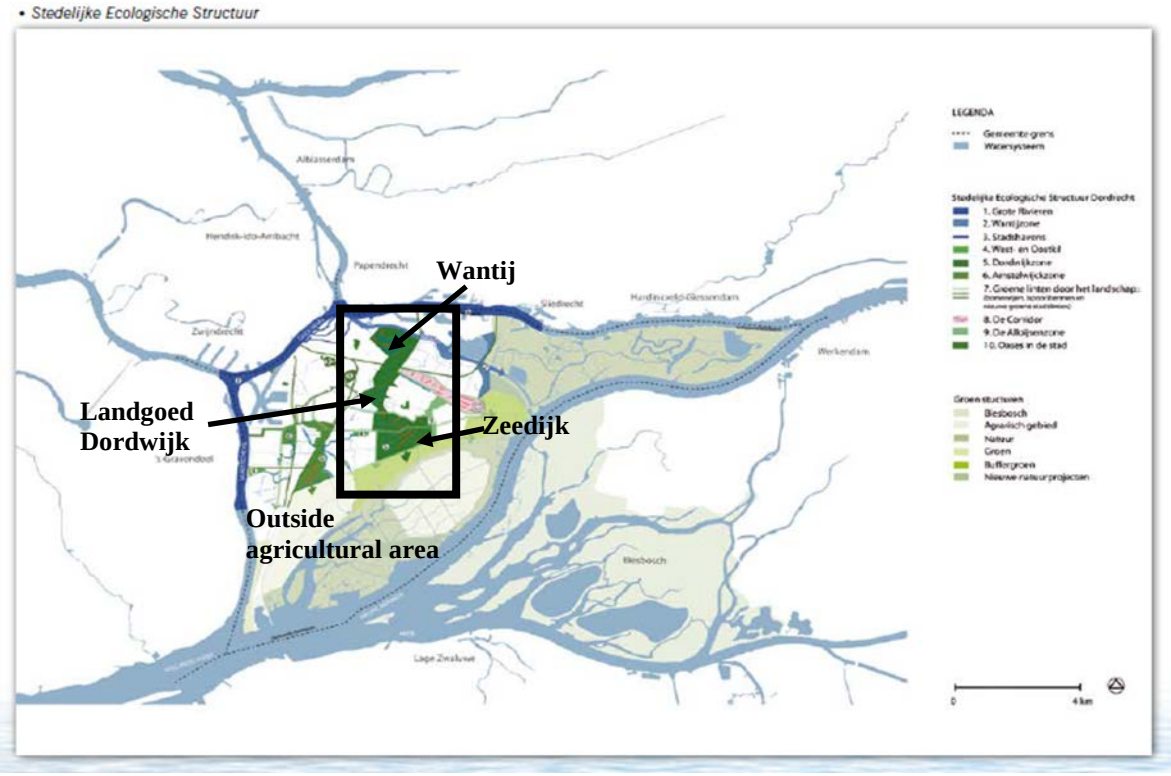
Ik ben Erna van Zyl, een geregistreerde student in de MSc-cursus in stedelijk beheer en ontwikkeling aan het Institute for Housing and Urban Development Studies, Erasmus Universiteit Rotterdam. Als een vereiste voor mijn thesis project, ben ik bezig met onderzoek in de stad Dordrecht via een enquête.

Gelieve alle vragen in de vragenlijst in te vullen. De enquete zal ongeveer 15 tot 20 minuten duren. Dit is een onderzoek naar de percepties van de gebruikers van de Dordwijkzone. Alleen volwassenen van 18 jaar en ouder zal worden gevraagd om deel te nemen. Dit is geen toets. Er zijn geen verkeerde of juiste antwoorden. Ik wil weten wat uw eigen mening is.

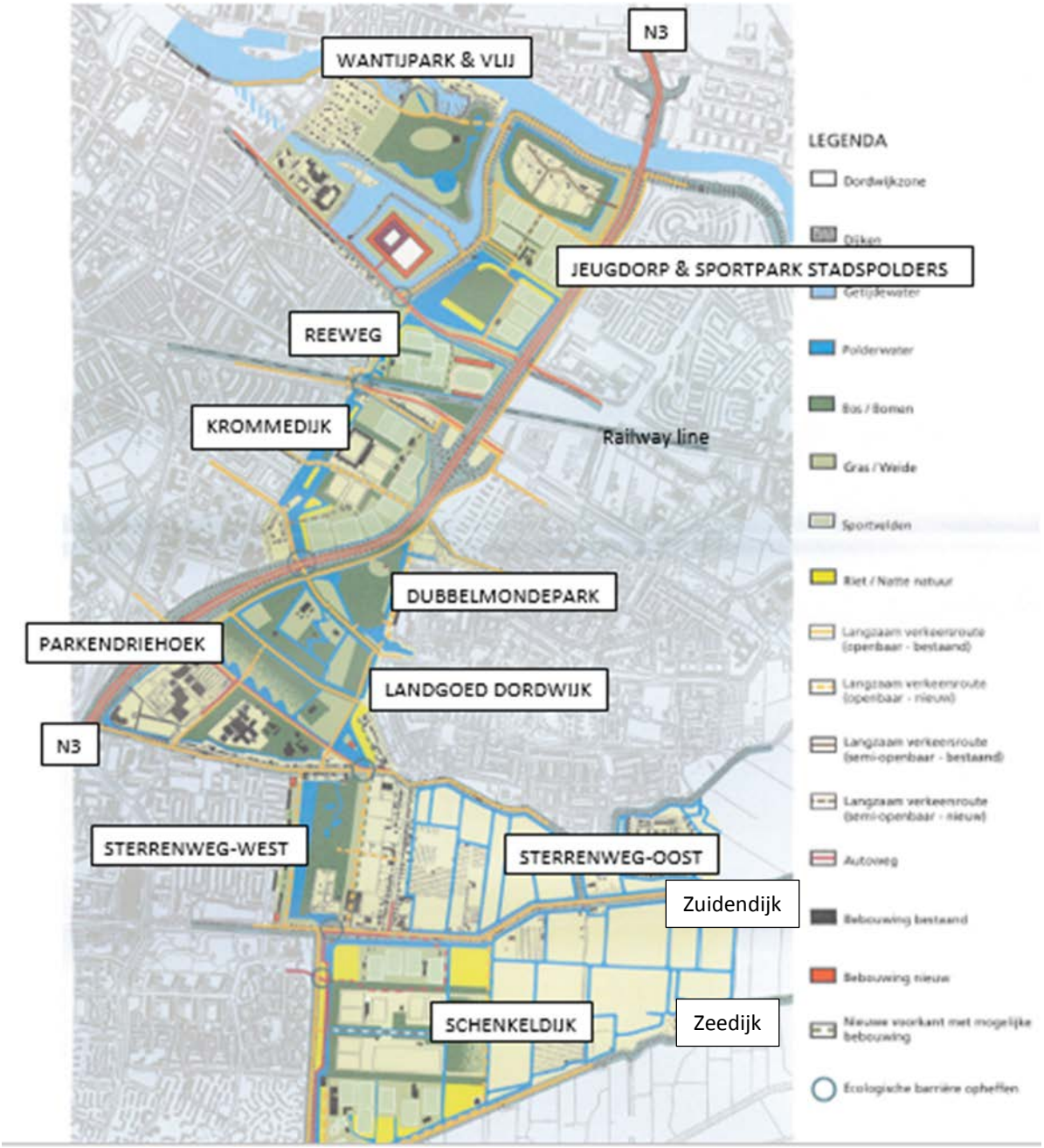
De Dordwijkzone strekt zich uit van Wantij tot de Zeedijk, met de "Landgoed Dordwijk" in het midden. De gemeente Dordrecht heeft dit grootschalige project groene infrastructuur in 1999 – 2007 uitgevoerd. Het algehele ontwikkelingsplan voor het project omvat ook een aanvullende 76 000m 2 (7, 6ha) van openbare ruimte voor de stad. De doelstelling van de gemeente Dordrecht in 1999 was om van de Dordwijkzone een recreatie gebied te maken dat herkenbaar is als één geheel.

Alle informatie die u in de vragenlijst verstrekt zullen vertrouwelijk worden gebruikt uitsluitend voor academische doeleinden.

Hieronder vindt u twee kaarten van het studiegebied ten behoeve van dit onderzoek:



KAART 1: DE PLAATS VAN DE DORDWIJKZONE IN DORDRECHT



KAART 2: DE OMVANG VAN DE DORDWIJKZONE IN DORDRECHT

<u>Voor officieel gebruik alleen:</u>
Datum van onderzoek: _____
Moment van de dag: _____
Plaats/Control number: _____

VRAGENLIJST

DEEL 1: Doelstellingen van het project Dordwijkzone
Doelstelling 1: De herkenbaarheid en zichtbaarheid van de Dordwijkzone

1. Kies één optie die uw waarneming van de herkenbaarheid van de Dordwijkzone beschrijft:

	"Ik ken en herken van de hele Dordwijkzone"
	"Ik ben me bewust van de Dordwijkzone, maar herken alleen bepaalde sectie (s) van de ruimte"

2. Kies één optie die uw waarneming van de zichtbaarheid van de Dordwijkzone beschrijft:

	"Ik ben al in de de hele Dordwijkzone geweest"
	"Ik ben alleen in bepaalde sectie (s) van de Dordwijkzone geweest"

Doelstelling 2: Het herstel van de natuur binnen de stadsgrenzen

3. Kies één optie die je waarneming van de versnippering of connectiviteit van de natuurlijke ecosystemen (groene gebieden en water) van de Dordwijkzone beschrijft:

	"Ik ervaar de natuurlijke ecosystemen (groene gebieden en water) in de Dordwijkzone als één geheel in de stad"
	"Ik ervaar de natuurlijke ecosystemen (groene gebieden en water) in de Dordwijkzone als een versnipperd gebied"

Doelstelling 3: De gebruikswaarde van het gebied als een park voor de stad

4. Kies één optie die beschrijft hoe u meestal naar de Dordwijkzone gaat:

	"Ik loop meestal voor een bezoek aan de Dordwijkzone"
	"Ik ren meestal naar de Dordwijkzone (hardlopen)"
	"Ik fiets meestal voor een bezoek aan de Dordwijkzone"
	"Ik gebruik meestal openbaar vervoer voor een bezoek aan de Dordwijkzone"
	"Ik gebruik meestal een auto voor een bezoek aan de Dordwijkzone"
	"Meestal bezoek ik de Dordwijkzone te paard"

5. Kies één optie die overeenkomt met de frequentie van het gebruik van de Dordwijkzone:

	"Ik bezoek zelden de Dordwijkzone" (minder dan eenmaal per maand)
	"Ik bezoek de Dordwijkzone tussen 1-10 keer per maand"
	"Ik bezoek de Dordwijkzone tussen 11-20 keer per maand"
	"Ik bezoek de Dordwijkzone tussen 21-30 keer per maand"
	"Ik bezoek de Dordwijkzone meer dan 30 keer per maand"

6. Kies één optie die het beste de tijd van de dag beschrijft dat u meestal de Dordwijkzone gebruikt:

	"Ik bezoek de Dordwijkzone meestal in de ochtenduren" (4:00 AM-11:59 AM)
	"Ik bezoek de Dordwijkzone meestal in de middag" (12:00 uur-17:59 PM)
	"Ik bezoek de Dordwijkzone meestal in de avonduren" (18:00 uur – 3:59 AM)
	"Ik bezoek de Dordwijkzone meer dan eenmaal per dag"

7. Kies één optie: Bezoekt u de Dordwijkzone meestal alleen, of samen met anderen?

	Alleen
	Samen met anderen

8. Gelieve aan te geven wat van toepassing is met betrekking tot uw gebruik van de Dordwijkzone. Selecteer “ja” of “nee”.

JA	**NEE**	**GEBRUIK**
		"Ik gebruik de Dordwijkzone voor spirituele, geestelijke of religieuze inspiratie en bezinnings activiteiten"
		"Ik gebruik de Dordwijkzone voor de mentale stimulatie, cognitieve ontwikkeling, kennis, informatie, verwijzing en onderwijskundige diensten/voordelen zoals onderzoek of excursies"
		"Ik gebruik de Dordwijkzone voor recreatie"
		"Ik bezoek plaatsen in de Dorwijkzone voor culturele, historische en/of erfgoed redenen"
		"Ik bezoek de Dordwijkzone als ek wilt vaststellen of het versterken van sociale relaties en voor sociale interactie"
		Andere (gelieve te specifiëren)

9. Gelieve aan te geven wat van toepassing is met betrekking tot uw recreatief gebruik van de Dordwijkzone. Welke activiteiten doet u in de Dordwijkzone? Selecteer “ja” of “nee”.

JA	**NEE**	**RECREATIEF GEBRUIK**
		Wandelen
		Paardrijden
		Fietsen
		Wateractiviteiten (visserij, peddelen, zeilen, varen enz.)
		Sportactiviteiten (bijvoorbeeld voetbal, tennis, running, enz.)
		Speeltoestellen of kinderboerderij voor kinderen
		Sociale activiteiten, vergaderingen, bijeenkomsten, evenementen of binding met vrienden en/of familie (inclusief picknick of bezoek aan restaurant)
		Social activiteiten met nieuwe mensen
		Ander gebruik (*gelieve te specifiëren*) _____

10. Op een schaal van 1-5 hoe beoordeelt u uw persoonlijke Gebruikswaarde van de Dordwijkzone? "Wat betekent de Dordwijkzone voor u zoals aangegeven in bovenstaande vragen 8 en 9".

1	2	3	4	5
Zeer lage gebruikswaarde	Lage gebruikswaarde	Neutraal	Hoge gebruikswaarde	Zeer hoge gebruikswaarde

11. Kunt u in uw eigen woorden uw antwoord op vraag 10 verder toelichten? :

_____

_____

_____

DEEL 2: Andere sociaal-culturele waarden van het project Dordwijkzone

2.1 Beleving

12. Op een schaal van 1-5 hoe beoordeelt u de Esthetische waarde van het Dordwijkzone voor u persoonlijk? "Esthetische waarde wordt gedefinieerd als uw persoonlijke waardering van de schoonheid of de aantrekkelijkheid van het gebied."

1	2	3	4	5
Zeer on-aantrekkelijk	On-aantrekkelijk	Neutraal	Aantrekkelijk	Zeer aantrekkelijk

13. Kunt u in uw eigen woorden uw antwoord op vraag 12 verder toelichten?:

_____

_____

_____

14. Gelieve aan te geven of de volgende stellingen met betrekking tot de ervaring/beleving van de Dordwijkzone op u van toepassing is. Selecteer “ja” of “nee”.

JA	**NEE**	**Hoe ervaart u dit gebied?**
		"Ik ervaar spirituele, geestelijk of religieuze inspiratie en bezinning in de Dordwijkzone"
		"Ik voel me mentaal gestimuleerd (*cognitieve ontwikkeling voordelen zoals kennis, leren, informatie*). Ik gebruik de Dordwijkzone voor een referentie-functie of de landmark."
		"Ik ervaar diversiteit, schoonheid, esthetische of sensorische voordelen (*zien, horen en ruiken*) in de Dordwijkzone"
		"Ik ervaar de culturele, historische en erfgoed bewustzijn in de Dordwijkzone"
		"Ik ervaar een gevoel van plaats en identiteit (*individu of Gemeenschap*) in de Dordwijkzone"
		"Ik ervaar sociale voordelen, versterkte sociale relaties, interactie en cohesie in de Dordwijkzone"
		"Ik ben me niet bewust van enige ervaringen in de Dordwijkzone"
		Andere ervaringen (gelieve te specifiëren)

15. Op een schaal van 1-5 hoe beoordeelt u uw persoonlijke beleving van het Dordwijkzone-gebied zoals aangegeven in vraag 14 hierboven".

1	2	3	4	5
Zeer lage ervarings waarde	Lage ervarings waarde	Neutraal	Hoge ervarings waarde	Zeer hoge ervarings waarde

16. Kunt u in uw eigen woorden uw antwoord op vraag 15 verder toelichten?:

_____
_____
_____

2.2 Morele waarde

"*Morele waarde is gekoppeld aan het idee van behoud van het milieu ten behoeve van anderen of om milieuredenen*."

17. Gelieve aan te geven of de volgende verklaringen met betrekking tot de bescherming van de Dordwijkzone op u van toepassing zijn. Selecteer "ja" of "nee".

JA	NEE	MORELE WAARDE
		"Het is belangrijk om de Dordwijkzone voor toekomstige generaties te behouden"
		"Het is belangrijk om de Dordwijkzone te beschermen of in stand te houden"
		"Ik heb een plicht of verantwoordelijkheid om de Dordwijkzone te helpen beschermen "
		"Het is de verantwoordelijkheid van de gemeente om de Dordwijkzone te beschermen "

18. Op een schaal van 1-5 hoe beoordeelt u uw persoonlijke morele waarde van de Dordwijkzone? (verwijzen naar uw antwoorden in Vraag 17 boven)

1	2	3	4	5
Zeer lage waarde	Lage waarde	Neutraal	Hoge waarde	Zeer hoge waarde

19. Kunt u in uw eigen woorden uw antwoord op vraag 18 verder toelichten?:

_____
_____
_____

2.3 Bestaanswaarde:

"Bestaanswaarde kan worden gedefinieerd als de kennis dat een specifiek ecosysteem of ander natuurlijk element bevat".
"Habitat: het natuurlijke milieu van een dier, plant of ander organisme".

20. Gelieve aan te geven of de volgende verklaringen met betrekking tot de waarde van het bestaan van de Dordwijkzone op u van toepassing zijn. Selecteer "ja" of "nee".

JA	NEE	WAARDE VAN HET BESTAAN
		"Het is belangrijk om te weten dat er natuurlijke habitats in de stad bestaan zelfs als het nooit wordt gebruikt of ervaren"
		"De Dordwijkzone heeft onzichtbare voordelen voor mij"
		"De bomen in de stad zijn belangrijk in mijn dagelijkse leven"
		"Dieren en insecten zijn belangrijk in mijn dagelijks leven"
		"Er is geen behoefte voor natuur of natuurlijke habitats in de stad"

21. Op een schaal van 1-5 hoe beoordeelt u het belang van de waarde van het bestaan van de Dordwijkzone? (verwijzen naar uw antwoorden in Vraag 20 boven)

1	2	3	4	5
Zeer lage bestaan waarde	Lage bestaan waarde	Neutraal	Hoge bestaan waarde	Zeer hoge bestaan waarde

22. Kunt u in uw eigen woorden uw antwoord op vraag 21 verder toelichten?:

_____
_____
_____

2.4 Symbolische waarde:
"Symbolische waarde betekent dat de abstracte betekenis door het individu toegewezen waren".

23. Gelieve aan te geven of de volgende verklaringen met betrekking tot de Symbolische waarde van de Dordwijkzone op u van toepassing. Selecteer "ja" of "nee".

JA	NEE	SYMBOLISCHE WAARDE
		"De Dordwijkzone heeft een abstracte geestelijke, religieuze of inspiratie betekenis voor mij"
		"De Dordwijkzone heeft de betekenis van een abstracte mentale stimulatie voor mij (zoals informatie, kennis, cognitieve ontwikkeling, leren of een referentie-functie)."
		"De Dordwijkzone heeft een abstracte recreatie betekenis voor mij (bijvoorbeeld spelen, plezier, vrijheid, ontspannen)"
		"De Dordwijkzone heeft een abstracte esthetische betekenis voor mij (bijvoorbeeld schoonheid of aantrekkelijkheid)"
		"De Dordwijkzone heeft een abstract culturele, historische en/of erfgoed betekenis voor mij"
		"De Dordwijkzone heeft een betekenis van abstracte identiteit voor mij (b.v. gevoel van plaats, de gemeenschap of individuele identiteit"
		"De Dordwijkzone heeft een abstracte sociale betekenis voor mij (bijvoorbeeld een symbool van bijeenkomsten, evenementen, vergaderingen)"
		"De Dordwijkzone heeft geen symbolische betekenis voor mij."

24. Op een schaal van 1-5 hoe beoordeelt u uw persoonlijke Symbolische waarde van het Dordwijkzone-gebied? (verwijzen naar uw antwoorden in Vraag 23 boven)

1	2	3	4	5
Zeer lage symbolische waarde	Lage symbolische waarde	Neutraal	Hoge symbolische waarde	Zeer hoge symbolische waarde

25. Kunt u in uw eigen woorden uw antwoord op vraag 24 verder toelichten?:

_____
_____
_____

DEEL 3: NADELEN VAN DE DORDWIJKZONE

26. Geef eventuele nadelen of negatieve effecten van het Dordwijkzone gebied op u persoonlijk? (bijvoorbeeld heb je eventuele opmerkingen over de veiligheid in de Dordwijkzone, ruis of andere waargenomen negatieve gevolgen?)

_____
_____
_____

DEEL 4: ACHTERGRONDINFORMATIE

27. Hoe oud ben je? _____ jaar

28. Kies één optie: wat is uw geslacht?

	Man
	Vrouw

29. Kies één optie : In welk District Dordrecht woont u?

	Centrum (met inbegrip van de buurten van de noordflank van de binnenstad, 19e eeuw de Peel,
	Reeland (met inbegrip van de buurten van Transvaalbuurt, Indische buurt, Vogelbuurt, Land van Valk
	De Staart (met inbegrip van de buurten van Noorderkwartier, Merwede polder)
	Oud Krispijn (met inbegrip van de buurten van Van Gogh in de buurt van / componist buurt)
	Nieuw Krispijn (met inbegrip van de buurten van de Bloemenbuurt, oranje gebied)
	Stadspolders (met inbegrip van de buurten van Oudelandshoek, Stadspolder, Vissershoek)
	Wielwijk (met inbegrip van de buurten van Seaport Lane, Dordrecht hout)
	Crabbehof - Zuidhoven
	Sterrenburg (met inbegrip van de buurten van Sterrenburg 1, 2 en 3)
	Dubbeldam (met inbegrip van de buurten van kleine Dubbeldam, Vissersdijk, de rechtbanken)
	Andere (inclusief Kop van 't Land, Tweede Tol, Wieldrecht, Willemsdorp, Zuidpolder)
	Geen van de bovenstaande opties. Ik ben een bezoeker/toerist van Dordrecht.

30. Kies één optie: welke etnische groep komt u vandaan? *Etnische afkomst wordt gedefinieerd als iemands culturele achtergrond of waar zij vandaan komt.*

	Nederland
	Nederlandse Antillen/Aruba
	Suriname
	Turkije
	Marokko
	Kaapverdië
	West-Europees land
	Oost-Europees land
	Ander land (gelieve te specifiëren)

31. Kies één optie: die uw gezinsinkomen beschrijft?

	Minder dan minimuminkomen (< 1500 per maand)
	Tussen de minimale en gemiddelde inkomen (1500 tot 2500 per maand)
	Meer dan een gemiddeld inkomen (2500 per maand)

32. Kies één optie: wat is uw hoogste opleidingsniveau?

	Primair onderwijs
	Praktische/beroepsonderwijs
	VMBO
	HAVO
	VWO
	MBO
	HBO
	Universiteit
	Andere (gelieve te specifiëren)

33. Kies één optie: hebt u kinderen jonger dan 18 jaar?

	Ja	Zo ja, hoeveel kinderen jonger dan 18 jaar:	
	Nee		

34. Kies één optie: heb je een eigen tuin?

	Ja
	Nee

35. Kies één optie: heb je huisdieren?

	Ja	Zo ja, gelieve te specificeren:	
	Nee		

36. Kies één optie: hoeveel jaar woont u in Dordrecht?

	Minder dan 1 jaar
	1 tot en met 5 jaar
	6 tot 10 jaar
	Meer dan 10 jaar
	Geen van de bovenstaande opties. Ik ben een bezoeker/toerist van Dordrecht.

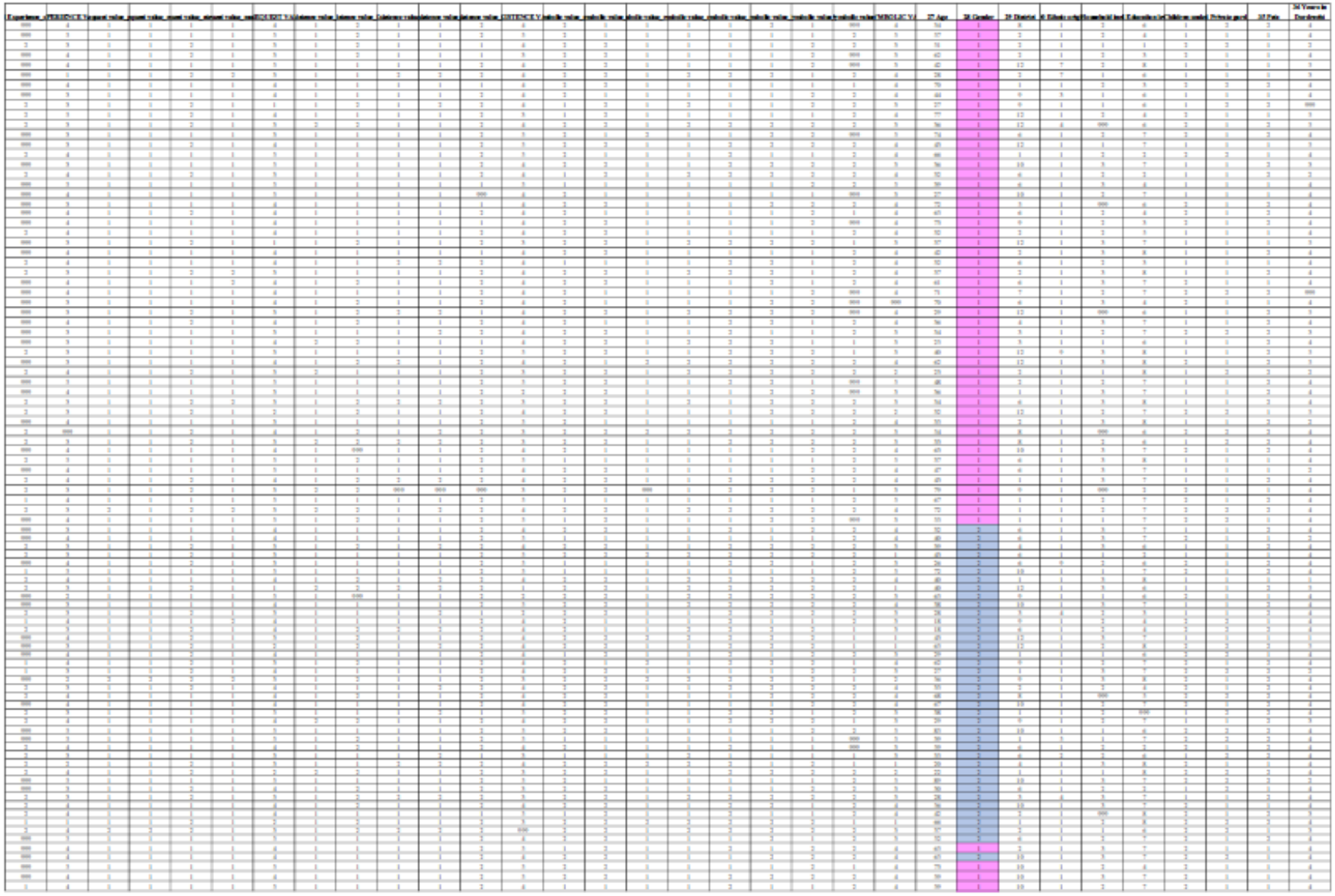
Hartelijk dank voor uw deelname aan de enquête.

Annex 3: Code Book

Question number	Variable	Description	Value
None	Respondent/case	Respondent number	001, 002 etc.
None	Control number/zone	Locality in study area	1 = North, 2 = South
1	1 Recognisability	Recognisability	1 = Whole, 2 = Section, 999 = missing answer
2	2 Visibility	Visibility	1 = Whole, 2 = Section, 999 = missing answer
3	3 Connectivity	Connectivity	1 = Connected, 2 = Fragmented, 3= don't know the whole area, 999 = missing answer
4	4 Mode of transport	Mode of transport	1 = walk, 2 = run, 3 = cycle, 4 = public transport, 5 = car, 6 = horse, 999 = missing answer
5	5 Frequency	Frequency	1= Less than once a month, 2 = 1-10 times per monthe, 3 = 11 - 20 times per month, 4 = 21-30 times per month, 5 = more than 30 times per month, 999 = missing answer
6	6 Time of day	Time of day	1 = mornings, 2 = afternoons, 3 = evenings, 4 = more than once a day, 999 = missing answer
7	7 Company	Company	1 = alone, 2 = with others, 999 = missing answer
8.1	8.1 Use_spiritual	Spiritual	1 = Yes, 2 = No, 999 = missing answer
8.2	8.2 Use-mental	Mental	1 = Yes, 2 = No, 999 = missing answer
8.3	8.3 Use_recreation	Recreation	1 = Yes, 2 = No, 999 = missing answer
8.4	8.4 Use_cultural	Cultural/heritage	1 = Yes, 2 = No, 999 = missing answer
8.5	8.5 Use_social	Social	1 = Yes, 2 = No, 999 = missing answer
8.6	8.6 Use_other	Other	1 = Yes, 2 = No, 999 = missing answer
9.1	9.1 Recreation_walk	Walking	1 = Yes, 2 = No, 999 = missing answer
9.2	9.2 Recreation_horse	Horse riding	1 = Yes, 2 = No, 999 = missing answer
9.3	9.3 Recreation_cycle	Cycling	1 = Yes, 2 = No, 999 = missing answer
9.4	9.4 Recreation_water	Water activities	1 = Yes, 2 = No, 999 = missing answer
9.5	9.5 Recreation_sport	Sport	1 = Yes, 2 = No, 999 = missing answer
9.6	9.6 Recreation_equipment	Play equipment/zoo	1 = Yes, 2 = No, 999 = missing answer
9.7	9.7 Recreation_socialf	Social family/friends	1 = Yes, 2 = No, 999 = missing answer
9.8	9.8 Recreation_socialn	Social new people	1 = Yes, 2 = No, 999 = missing answer
9.9	9.10 Recreation_other	**Other**	1 = Yes, 2 = No, 999 = missing answer
10	10 USE VALUE	Use value on a scale of 1 to 5	1 = Very low value, 2 = Low value, 3 = Neutral, 4 = High value, 5 = Very high value
12	12 AESTHETIC VALUE	Aesthetic value on a scale of 1 to 5	1= Very unattractive, 2 = Unattractive, 3 = Neutral, 4 = Attractive, 5= Very attractive
14.1	14.1 Experience_spiritual	Spiritual	1 = Yes, 2 = No, 999 = missing answer
14.2	14.2 Experience_mental	Mental	1 = Yes, 2 = No, 999 = missing answer
14.3	14.3 Experience_aesthetic	Aesthetic/Sensory	1 = Yes, 2 = No, 999 = missing answer
14.4	14.4 Experience_cultural	Cultural/heritage	1 = Yes, 2 = No, 999 = missing answer
14.5	14. 5 Experience_identity	Identity/Sense of place	1 = Yes, 2 = No, 999 = missing answer
14.6	14.6 Experience_social	Social benefits	1 = Yes, 2 = No, 999 = missing answer
14.7	14.7 Experience_none	None	1 = Yes, 2 = No, 999 = missing answer
14.8	14.8 Experience_other	**Other**	1 = Yes, 2 = No, 999 = missing answer
15	15 EXPERIENCE VALUE	Experience value on a scale of 1 to 5	1 = Very low value, 2 = Low value, 3 = Neutral, 4 = High value, 5 = Very high value

17.1	17.1 Bequest value_protect	Protect for future generations	1 = Yes, 2 = No, 999 = missing answer
17.2	17.2 Bequest value_conserve	Conserve for future generations	1 = Yes, 2 = No, 999 = missing answer
17.3	17.3 Bequest value_stewardship	Respondent's responsibiity	1 = Yes, 2 = No, 999 = missing answer
17.4	17.4 Bequest value_municipality	Municipality's responsibility	1 = Yes, 2 = No, 999 = missing answer
18	18 BEQUEST VALUE	Bequest value on a scale of 1 to 5	1 = Very low value, 2 = Low value, 3 = Neutral, 4 = High value, 5 = Very high value
20.1	20.1 Existence value_habitat	Natural habitat important	1 = Yes, 2 = No, 999 = missing answer
20.2	20.2 Existence value_invisible	Invisible benefits	1 = Yes, 2 = No, 999 = missing answer
20.3	20.3 Existence value_trees	Trees	1 = Yes, 2 = No, 999 = missing answer
20.4	20.4 Existence value_insects	Animals and insects	1 = Yes, 2 = No, 999 = missing answer
20.5	20.5 Existence value_no need	No need for nature	1 = Yes, 2 = No, 999 = missing answer
21	21 EXISTENCE VALUE	Existence value on a scale of 1 to 5	1 = Very low value, 2 = Low value, 3 = Neutral, 4 = High value, 5 = Very high value
23.1	23.1 Symbolic value_spiritual	Spiritual	1 = Yes, 2 = No, 999 = missing answer
23.2	23.2 Symbolic value_mental	Mental	1 = Yes, 2 = No, 999 = missing answer
23.3	23.3 Symbolic value_recreation	Recreation	1 = Yes, 2 = No, 999 = missing answer
23.4	23.4 Symbolic value_aesthetic	Aesthetic/Sensory	1 = Yes, 2 = No, 999 = missing answer
23.5	23.5 Symbolic value_cultural	Cultural/heritage	1 = Yes, 2 = No, 999 = missing answer
23.6	23.6 Symbolic value_identity	Identity/Sense of place	1 = Yes, 2 = No, 999 = missing answer
23.7	23.7 Symbolic value_social	Social benefits	1 = Yes, 2 = No, 999 = missing answer
23.8	23.8 Symbolic value_none	None	1 = Yes, 2 = No, 999 = missing answer
24	24 SYMBOLIC VALUE	Symbolic value on a scale of 1 to 5	1 = Very low value, 2 = Low value, 3 = Neutral, 4 = High value, 5 = Very high value
27	Age	Age in years	18 and older, 999 = missing answer
28	Gender	Respondent's sex	1 = Female, 2 = Male, 999 = missing answer
29	District	District residing	1 = Centrum, 2 = Reeland, 3 = The Tail, 4 = Oud Krispijn, 5 = Nieu Krispijn, 6 = Stadspolders, 7 = Wielwijk, 8 = Crabbehof, 9 = Sterrenburg, 10 = Dubbeldam, 11 = Other, 12 = visitor, 999 = missing answer
30	Ethnic origin	Ethnic origin	1 = Nederlands, 2 = Netherlands Antilles/Aruba, 3 = Suriname, 4 = Turkey, 5 = Morocco, 6 = Cape Verde, 7 = Western Europe, 8 = Easter Europe, 9 = Other, 999 = missing answer
31	Household income	Household income	1 = Less than minimum, 2 = Between minimum and average, 3 = More than average, 999 = missing answer
32	Education level	Education level	1 = Primary education, 2 = Practical vocational education, 3 = VMBO, 4 = HAVO, 5 = VWO, 6 = MBO, 7 = HBO, 8 - University, 9 = Other, 999 = missing answer
33	Children under 18	Children under 18	1 = Yes, 2 = No, 999 = missing answer
34	Private garder	Private garden	1 = Yes, 2 = No, 999 = missing answer
35	Pets	Pets	1 = Yes, 2 = No, 999 = missing answer
36	Years in Dordrecht	Years in Dordrecht	1 = Less than a year, 2 = 1 to 5 years, 3 = 6 to 10 years, 4 = More than 10 years, 5 = Visitor, 999 = missing answer

Annex 4: Survey database



Annex 5: Qualitative responses

Responden	Gende	Questi	Key word	Quote
002	1	11	Use Value	I enjoy every day in this zone. Walk dog daily. Park has festivals and music.
002	1	13	Aesthetic value	Beautiful park. Waterpartyden, vyvers
002	1	16	Experience value	Nature inspires me. Many kinds of birds.
002	1	19	Bequest value	Municipality and citizens responsible for maintenance and cleanliness.
002	1	22	Existence value	Nature is the lungs of the city. Important to have enough green in the city.
002	1	25	Symbolic value	The area stands for values from my youth. Was raised here.
002	1	26	Dis-benefits	Noise from the Randweg. Chemical pollution from factory at Dupont.
003	1	11	Use Value	Everything is reachable
003	1	13	Aesthetic value	Much green, much activities and shops.
003	1	16	Experience value	Living area
003	1	19	Bequest value	Area is liveable
003	1	22	Existence value	Green and animals are important
003	1	25	Symbolic value	As stated before
003	1	26	Dis-benefits	More police needed in the Centrum and Vogelbuurt
004	1	11	Use Value	Use this area when shopping, walking dog and cycling.
004	1	13	Aesthetic value	Pleasant environment. Restful.
004	1	16	Experience value	Nice/good environment.
004	1	19	Bequest value	none
004	1	22	Existence value	none
004	1	25	Symbolic value	none
004	1	26	Dis-benefits	Trains cause toxic fumes and should rather run via the Betuwe line.
005	1	11	Use Value	Use it to get children close to nature and keep them healthy through exercise.
005	1	13	Aesthetic value	Meandering paths and waterways. Setting of cafes with great views.
005	1	16	Experience value	Quiet and serene area to relax and enjoy nature.
005	1	19	Bequest value	Areas like these need to be preserved to give quality of life and to give areas free from development.
005	1	22	Existence value	It is important to provide an area for nature to co-exist with city life.
005	1	25	Symbolic value	Do not understand symbolic value.
006	1	11	Use Value	none
006	1	13	Aesthetic value	I don't have time for beauty and attractiveness.
006	1	16	Experience value	I don't have many experiences at Dortse zone
006	1	19	Bequest value	For me Dordwijkzone is very poor protected
006	1	22	Existence value	Important to have much nature in this city. Nice for children.
006	1	25	Symbolic value	It is a very nice place to live with children.
007	1	11	Use Value	I live in this zone
007	1	13	Aesthetic value	Lots of green
007	1	16	Experience value	Fyne leefomgewing
007	1	19	Bequest value	We must protect our moral value
007	1	22	Existence value	I have a good life in the area
007	1	25	Symbolic value	Good symbolic value
007	1	26	Dis-benefits	I have no negative experiences
008	1	11	Use Value	Cycle lanes are well organized and maintained. Need for skateboarding.

008	1	13	Aesthetic value	Very beautiful. Park should be better maintained.
008	1	16	Experience value	Well maintained nature.
008	1	19	Bequest value	Important to retain nature and recreation area for all.
008	1	22	Existence value	Insects are important, but annoying.
008	1	25	Symbolic value	Neutral
008	1	26	Dis-benefits	Risk of chemicals released into the water from Dupont Chemical Factory.
009	1	11	Use Value	Walk short distances with children. To be outside.
009	1	13	Aesthetic value	Some area of the zone draw my attention. I enjoy walking along the fields where it is peaceful.
009	1	16	Experience value	none
009	1	19	Bequest value	I don't care
009	1	22	Existence value	It is important that the choice exists.
009	1	25	Symbolic value	none
009	1	26	Dis-benefits	Limited areas for children to play.
010	1	11	Use Value	I grew up here. Used the swimming pool when I was young.
010	1	13	Aesthetic value	Very old park established in the 30's to provide work for unemployed.
010	1	16	Experience value	Very calm and quiet. Good memories.
010	1	19	Bequest value	Heritage to be preserved.
010	1	22	Existence value	Expensive to be maintained. Depends on ability of the Municipality to maintain it.
010	1	25	Symbolic value	Forms part of my background and youth.
010	1	26	Dis-benefits	Limited.
012	1	11	Use Value	Use the area for commuting
012	1	13	Aesthetic value	none
012	1	16	Experience value	none
012	1	19	Bequest value	Green is good for oxygen in the city
012	1	22	Existence value	High value for the environment
012	1	25	Symbolic value	High value for green and historical element
013	1	11	Use Value	My friend lives in the zone
013	1	13	Aesthetic value	Park is nice
013	1	16	Experience value	Green is important in a city
013	1	19	Bequest value	none
013	1	22	Existence value	none
013	1	25	Symbolic value	I come here to visit my friend. Children playing
014	1	11	Use Value	Swimming pool for children and the farm animals are used.
014	1	13	Aesthetic value	Green, freedom and relaxation.
014	1	16	Experience value	none
014	1	19	Bequest value	All citizens to carry responsibility.
014	1	22	Existence value	Nature is necessary for survival of people. No nature. No people.
014	1	25	Symbolic value	none
015	1	11	Use Value	Green environment gives me rest and feeling of relaxation. Nice to let children play.
015	1	13	Aesthetic value	I like the green area and the play areas especially if it is well maintained. The area is attractive if it is clean and free from dog faeces.
015	1	16	Experience value	Fresh air, play and relaxation is my priorities.
015	1	19	Bequest value	This is the green heart of the city and important for well-being. Responsibility of all to keep it clean. Unfortunately, Municipality has to clean up the mess.

015	1	22	Existence value	Green is important for the climate in the city and for health reasons. Fauna is important for the ecosystem.
015	1	25	Symbolic value	The beauty and playing are important to me.
015	1	26	Dis-benefits	Sometimes people are noisy and dog faeces is a big problem.
016	1	11	Use Value	The "Mushroom" swimming pool and walking the dog at Wantijpark. Swimming and sailing at Biesbosch.
016	1	13	Aesthetic value	Environment at Wantijpark and Landgoed Dordwijk is attractive. Pity that Landgoed is not public.
016	1	16	Experience value	Same as previous.
016	1	19	Bequest value	Green is very important for people and animals, especially for relaxation and recreation.
016	1	22	Existence value	See above.
016	1	25	Symbolic value	none
017	1	11	Use Value	I enjoy nature, the walking and cycling possibilities and the areas where dogs can walk freely. This area improves my enjoyment of living in Dordrecht greatly and show this area to guests from outside the area.
017	1	13	Aesthetic value	Much green and water that is being maintained. Wonderful for children and encourages social contact.
017	1	16	Experience value	I often use this area in summer and winter.
017	1	19	Bequest value	Important that youth learns the value and respect for nature. Social integration between locals and foreigners advanced
017	1	22	Existence value	Very special places in the city but not very well known by all.
017	1	25	Symbolic value	This area makes me proud of Dordrecht
017	1	26	Dis-benefits	Some quiet places I won't visit after 20:00 in the evening.
018	1	11	Use Value	Dordrecht is clean with many free things to do
018	1	13	Aesthetic value	Same as previous.
018	1	16	Experience value	Play possibilities for children and festivals and they are free.
018	1	19	Bequest value	I feel it is my responsibility to keep the city as it is or even make it better.
018	1	22	Existence value	We must take all precautions to ensure that the area remains and keep it neat
018	1	25	Symbolic value	I was born and raised here and used to the area.
018	1	26	Dis-benefits	Homeless people in the Central part of the city
019	1	11	Use Value	I stay in the area
019	1	13	Aesthetic value	Much green and rest
019	1	16	Experience value	I'm used to it. Lived here all my life.
019	1	19	Bequest value	Must not be lost.
019	1	22	Existence value	Nature must remain in the area
019	1	25	Symbolic value	Live, work and recreation.
020	1	11	Use Value	I live in this zone
020	1	13	Aesthetic value	All seasons are beautiful
020	1	16	Experience value	Beautiful green area. Something for everyone.
020	1	19	Bequest value	None
020	1	22	Existence value	It is important to live in a green area.
020	1	25	Symbolic value	We cannot go without it.
021	1	11	Use Value	Walking and cycling
021	1	13	Aesthetic value	Much green, many possibilities with diverse routes.
021	1	16	Experience value	Feel at home
021	1	19	Bequest value	follow rules and don't litter.
021	1	22	Existence value	Important for relaxation and recreation.

021	1	25	Symbolic value	none
022	1	11	Use Value	Children can play outside
022	1	13	Aesthetic value	none
022	1	16	Experience value	none
022	1	19	Bequest value	none
022	1	22	Existence value	none
022	1	25	Symbolic value	none
023	1	11	Use Value	Accessible
024	1	13	Aesthetic value	Keeps getting better
026	1	11	Use Value	It is nice but nothing special
026	1	13	Aesthetic value	Nice green
026	1	16	Experience value	It is nice but nothing special
026	1	19	Bequest value	To appreciate this in a city like Dordrecht
026	1	22	Existence value	Good to use it for recreation
026	1	25	Symbolic value	Good that it is there
027	1	11	Use Value	Nice place to be and nice things organized
027	1	13	Aesthetic value	Nice place
027	1	16	Experience value	Fine culture
027	1	19	Bequest value	It is important for us all
027	1	22	Existence value	nature is important
027	1	25	Symbolic value	I love it. It is a fine place to be.
028	1	11	Use Value	Walking and cycling in nature relaxes me
028	1	13	Aesthetic value	I like flowers, plants, trees and birds
028	1	16	Experience value	I enjoy to be outside in nature
028	1	19	Bequest value	In general I am very aware of our responsibility towards the environment
028	1	22	Existence value	This is an important connection.
029	1	13	Aesthetic value	Lovely nature and play opportunities for grandchildren
029	1	22	Existence value	Natural habitat in a city has great value, without which it will be an unbearable situation
030	1	11	Use Value	I seldom come here
030	1	19	Bequest value	Nice playing area for children. Municipality responsible to maintain.
030	1	22	Existence value	A piece of nature close to the city is attractive
030	1	25	Symbolic value	Nice recreation area for the children
031	1	11	Use Value	Necessary for children to play safely outside
031	1	13	Aesthetic value	Trees and birds are great to "get out of the city"
031	1	16	Experience value	Meeting place for my child's friends. Nice to sit outside.
031	1	19	Bequest value	The Municipality must keep it up but litter and behaviour I look after myself
031	1	22	Existence value	People need nature to re-charge and be calm.
031	1	25	Symbolic value	The park is good environment to relax and play with other children
031	1	26	Dis-benefits	Sometime there are litter, tins and glass in the play area.
032	1	11	Use Value	Close to my house, accessible, for recreation and enjoyment of nature
032	1	13	Aesthetic value	Park and water attractive. Motor way makes it less attractive
032	1	16	Experience value	Time to rest and get quiet. Culture and history I see less of.
032	1	19	Bequest value	Own responsibility to take care of nature, to maintain and follow the rules.

032	1	22	Existence value	Important to have space in a city for green, relaxation, silence and socializing
032	1	25	Symbolic value	Important to enjoy nature
032	1	26	Dis-benefits	Sometimes noise from the festivals is a disturbance and dog faeces and barking dogs when you walk
033	1	11	Use Value	Great place for children
033	1	13	Aesthetic value	Attractive environment and enough to do
033	1	16	Experience value	I come her for the rest and pleasure of the children
033	1	19	Bequest value	Everyone must contribute to the environment
033	1	22	Existence value	nature is important for everyone
033	1	25	Symbolic value	I come to the annual events
034	1	11	Use Value	I love too far away to use it often. I am a visitor.
034	1	13	Aesthetic value	Green zone in a city is always beautiful
034	1	26	Dis-benefits	Noise from the high way
035	1	11	Use Value	I use the area often even I don't live here.
035	1	13	Aesthetic value	Beautiful old city, enough green and relaxation facilities
035	1	16	Experience value	Beautiful area to explore and be active.
035	1	19	Bequest value	Area has lot to explore
035	1	22	Existence value	Awareness important to explore. Make it more known.
035	1	25	Symbolic value	Historic perspective important
036	1	11	Use Value	We have no garden so playing outside is essential for children
036	1	19	Bequest value	It is important for children to experience green and to learn to keep it clean
036	1	25	Symbolic value	I give little symbolic value to constructed nature
036	1	26	Dis-benefits	The concerts every Monday nights is a nuisance
037	1	11	Use Value	The Dordwijkzone is important to keep physical and social balance
038	1	11	Use Value	many activities for young family
038	1	13	Aesthetic value	Much green and nature
038	1	16	Experience value	Much festivals are organized and the historic elements of Dordrecht is maintained by the Municipality
038	1	19	Bequest value	Much litter and dust bins are overflowing.
038	1	22	Existence value	Much trees were removed with the widening of the road
038	1	25	Symbolic value	Feel safe
041	1	11	Use Value	I limit myself to use of Wantijpark
041	1	13	Aesthetic value	Attractive green provision
041	1	22	Existence value	Very important for quality of life
044	1	11	Use Value	The area is a resting place. Quiet in the evenings.
044	1	13	Experience value	The area is for all: big and small.
044	1	16	Experience value	We enjoy to be here
044	1	19	Bequest value	We must do our best to maintain the area and not to damage it
044	1	22	Existence value	Green oasis in the city.
044	1	25	Symbolic value	We feel at home here
044	1	26	Dis-benefits	I will not walk alone in the evenings
045	1	11	Use Value	We love the daily water at the "Paddestoel" kiddies pool. It is free. Original Dubbeldammers stay near Old Age Home.
046	1	11	Use Value	It is a nice area to do nice things
046	1	13	Experience value	I enjoy nature especially
046	1	19	Bequest value	If we want a beautiful Dordrecht both the Municipality and ourselves must protect the area
047	1	11	Use Value	Much recreational opportunities
047	1	13	Aesthetic value	Attractive area and nature.
047	1	16	Experience value	Nice area to be
047	1	19	Bequest value	Attractive area
047	1	22	Existence value	Attractive area and nature.

047	1	25	Symbolic value	Good recreation area
048	1	11	Use Value	Attractive walking and cycling paths
048	1	13	Aesthetic value	Attractive plants and trees
049	1	11	Use Value	Gardens at Vlijpark, social contact, sport, cycling and receiving friends.
049	1	13	Aesthetic value	The birds, air, water, plants, openness, rest makes this a paradise close to the busy city.
049	1	16	Experience value	The area relaxes me, gives me rest and makes me creative. Good to experience the flowers and animals.
049	1	19	Bequest value	Increased paving in the city gardens. Work the earth and make suitable for water retention.
049	1	22	Existence value	Without insects, no life. Without green, no oxygen. Without flowers now colour and smell/scent.
049	1	25	Symbolic value	Love for and enjoyment of nature
051	1	11	Use Value	The area is too small
051	1	13	Aesthetic value	Wantijpark and Dordwijk has surprising areas but are separated by unattractive areas.
051	1	22	Existence value	Cannot go without green lungs.
052	2	11	Use Value	The Dordwijkzone is for me and my family a place to relax. I'm also thinking of walking, cycling and the festivals in the Wantij.
052	2	13	Aesthetic value	I experience the Dordwijkzone as an attractive and clean area
052	2	16	Experience value	I find the surroundings attractive and enjoy to walk, cycle and run here
052	2	19	Bequest value	It is important to deposit all paper and plastic in the dust bins.
052	2	22	Existence value	I am happy that there is much green in the city
052	2	25	Symbolic value	Provide relaxation
053	2	11	Use Value	Area with combination of nature and facilities is invaluable/irreplaceable to Dordrecht
053	2	13	Aesthetic value	Unique area of great value
053	2	16	Experience value	I live here
053	2	19	Bequest value	Area is well taken care of
053	2	22	Existence value	Men cannot live without green
053	2	25	Symbolic value	Historical/cultural symbol
053	2	26	Dis-benefits	The Freeway (N3)
054	2	11	Use Value	Nice park for children with play equipment and pool
054	2	13	Aesthetic value	Wantijpark is attractive
054	2	22	Existence value	Good to have nature in the city
055	2	13	Aesthetic value	The area is laid out.
055	2	22	Existence value	The green area must not be built upon. We must pay less municipal tax if not maintained.
057	2	11	Use Value	Nature Education value is high, but no political interest.
057	2	13	Aesthetic value	As a photographer I always look for beauty - I write with light.
057	2	16	Experience value	To improve my own spirituality as well encourage others to do the same, within the Dordwijkzone.
057	2	19	Bequest value	Nature is the habitat of humans, but not all realize this.
057	2	22	Existence value	I cannot go without nature in the Dordwijkzone
057	2	26	Dis-benefits	Litter, no respect for the earth and ignorance.

058	2	11	Use Value	I still want to explore more of the Dordwijkzone
058	2	16	Experience value	Much to do
059	2	11	Use Value	This is our first visit
059	2	13	Aesthetic value	It is green and nice provision for children
059	2	16	Experience value	We coincidentally came here
059	2	19	Bequest value	We are not from here
059	2	22	Existence value	We are not from Dordrecht
060	2	22	Existence value	The Municipality has no appreciation for nature
060	2	26	Dis-benefits	The reeds prevents fishing. No more place left for fishermen to fish. Maintenance of reeds make fishing impossible. No more garden men in Sterrenburg.
061	2	11	Use Value	Important to have green areas in the city
061	2	26	Dis-benefits	Not cleaning up dogs' mess is a nuisance
062	2	11	Use Value	We mostly come for the farm animals and the kids play area
062	2	19	Bequest value	A lot of people do apparently care.
062	2	22	Existence value	people don't care
062	2	26	Dis-benefits	Mess everywhere must be cleaned
063	2	11	Use Value	Play football in the area. Sometimes the fields are full.
063	2	13	Aesthetic value	The park is neat and well maintained
063	2	16	Experience value	It is relaxing, easily accessible and enjoy the football club.
063	2	19	Bequest value	It is effort to keep it clean and use the dust bins.
063	2	22	Existence value	There are cities where animals cannot live. It is important to protect their living environment. Animals and insects are important for the environment.
063	2	25	Symbolic value	Not much symbolic value but the football fields are important to me
063	2	26	Dis-benefits	All the football fields are next to the free way and that is not healthy
064	2	11	Use Value	The football field falls within the Dordwijkzone and therefore I have much use value of it
064	2	13	Aesthetic value	I don’t keep myself occupied with this.
064	2	16	Experience value	I often come to here to play football or be with friends
064	2	19	Bequest value	It is important that the area of Dordrecht is not dirty/degraded (vervuilt)
064	2	22	Existence value	nature is important because without it less people would come to Dordrecht
064	2	26	Dis-benefits	De hangjongelen zijn vaak het probleem
065	2	11	Use Value	My main focus is on social interaction primarily, environment use value is secondary
065	2	13	Aesthetic value	Historical buildings and play zones for kids
065	2	16	Experience value	Nice blend of waterways, architecture and cultural experiences
065	2	19	Bequest value	Not really part of the area
066	2	11	Use Value	Nice area to relax
066	2	13	Aesthetic value	Very nice area in busy environment
066	2	19	Bequest value	Don’t live in Dordrecht
066	2	22	Existence value	important to get the message of sustainability widely spread
066	2	25	Symbolic value	Don’t see any symbolic value
066	2	26	Dis-benefits	Noisy when concerts taking place
067	2	11	Use Value	Accessible for all
067	2	13	Aesthetic value	In my opinion the Dordwijkzone is maintained too little. It could be more attractive.

067	2	16	Experience value	Attractive, peaceful environment
067	2	19	Bequest value	Important to consider nature
067	2	22	Existence value	The existence of the Dordwijkzone in connection with the city is important. Enough space and attention for nature.
068	2	11	Use Value	The area is rich in birdlife and plants and water, which is attractive
068	2	13	Aesthetic value	Calm, diverse nature
068	2	16	Experience value	Rest and nature. Attractive Landgoed.
068	2	22	Existence value	Diverse and centrally located.
068	2	26	Dis-benefits	Dogs without leashes disturbs the birds.
069	2	11	Use Value	Not great. Amersfoort/poort is more attractive.
069	2	26	Dis-benefits	Chances for negative social hang out places.
070	2	11	Use Value	Only use this area to cycle through
072	2	11	Use Value	Rest in the city
072	2	16	Experience value	Calm environment
073	2	11	Use Value	It is an attractive area for enjoyable walking.
073	2	19	Bequest value	Preservation of green in the city is important
073	2	25	Symbolic value	History and environment/nature is important
073	2	26	Dis-benefits	It is a pity that the N3 is located so close to the area
074	2	11	Use Value	I enjoy to be outdoors and to socialize with friends.
074	2	13	Aesthetic value	Children learn about names of fauna and flora
074	2	19	Bequest value	Important for future generations to also enjoy the fauna and flora
076	2	11	Use Value	An attractive, cultural area
077	2	11	Use Value	To escape from daily life
077	2	13	Aesthetic value	The diversity of nature
077	2	16	Experience value	It is accessible and I find my rest.
077	2	19	Bequest value	It is important to be involved with/connected to nature. Getting detached from nature leads to decline in well-being.
077	2	22	Existence value	It is of utmost important, we are nature and a living organism within.
077	2	25	Symbolic value	I am reminded that we are not alone. We must value and recognize nature. We need nature.
077	2	26	Dis-benefits	More information is needed on the processing of waste and the impact on the environment
078	2	11	Use Value	Used to an area for fishing and cycling.
078	2	13	Aesthetic value	Much green and cycling opportunities
078	2	16	Experience value	Peaceful/rest
078	2	19	Bequest value	Important to retain nature for rest and recreation
078	2	22	Existence value	It is important to have places of rest in the city such as parks
078	2	26	Dis-benefits	Heavy traffic and schools
079	2	11	Use Value	Ideal for walking and fishing
079	2	13	Aesthetic value	For resting
079	2	16	Experience value	Some areas are very attractive and others not so attractive
079	2	19	Bequest value	Not so important
079	2	22	Existence value	Important to retain nature and maintain for the future
079	2	25	Symbolic value	More maintenance in the recreation areas
079	2	26	Dis-benefits	Does not get maintained
081	2	11	Use Value	never thought about it
081	2	13	Aesthetic value	It is an attractive whole including green, birds and water.

081	2	16	Experience value	I recently started running and enjoy the experience.
082	2	11	Use Value	Nature is exercise for old people - I'm almost 90 years old
082	2	13	Aesthetic value	Dubbeldam is unique town within Dordrecht. The character of calmness was retained since it was introduced into Dordrecht in 1970.
082	2	16	Experience value	The location is central
082	2	19	Bequest value	The Municipality maintains it well
082	2	25	Symbolic value	It is magical in all four seasons. The rows of tree plantations are very special to me.
082	2	26	Dis-benefits	Noise from the N3
083	2	11	Use Value	Ideal park
083	2	13	Aesthetic value	Beautiful park and nature area
084	2	11	Use Value	Municipality can better keep the youth busy
084	2	16	Experience value	I visit the Wantijpark only for the children
084	2	26	Dis-benefits	It is safe enough
085	2	11	Use Value	Ideal to let the dog out. Beautiful green zone.
085	2	13	Aesthetic value	Nature is attractive. Other parks in the area.
085	2	16	Experience value	Especially with dogs you meet many other people
085	2	19	Bequest value	All the green spaces in Dordrecht must be conserved to retain the liveability in the city
085	2	22	Existence value	I don't think there is a need to make the Dordwijkzone smaller. Ik verwacht dat er geen aanpassing zullen komen aan de DWZ. Politiek nie haalbaar.
085	2	25	Symbolic value	DWZ is a green lung and important for liveability
085	2	26	Dis-benefits	Park St Stevenshof could have been be better presented/created/laid out from the perspective of the DWZ. Because of this the relationship between areas became smaller, but one has to compromise.
086	2	11	Use Value	Attractive piece of green
086	2	13	Aesthetic value	It appears good
086	2	16	Experience value	Attractive area for a long walk or a short cycle
086	2	19	Bequest value	Conservation is essential for sustaining humans (behoud)
086	2	22	Existence value	Nature in the city is important for relaxation, nature conservation and CO2 reduction
086	2	25	Symbolic value	The area is important to me but can be improved
086	2	26	Dis-benefits	Noise from the N3 (Randweg)
087	2	11	Use Value	Incidental visits to some locations within the zone
087	2	13	Aesthetic value	The area in not recognizable. No connection roads. (Een N2 structuur is geheel niet aanwesig)
087	2	16	Experience value	The Dordwijkzone is not recognizable
087	2	19	Bequest value	I hardly use the area. It is not recognizable
087	2	22	Existence value	The area must be better unlocked and made recognizable for citizens and other users. Green spaces must be clustered from the East to the West in this area.
087	2	25	Symbolic value	The zone is not recognizable for me
087	2	26	Dis-benefits	No good connections with neighbourhoods
088	2	11	Use Value	Peaceful running
088	2	16	Experience value	To slow down/rest
088	2	22	Existence value	for the health of all
089	2	11	Use Value	I walk with a club
089	2	13	Aesthetic value	Some areas are very attractive and others not so attractive

089	2	16	Experience value	All can participate in walking and do their own thing/in their own way
089	2	19	Bequest value	All contribute a little piece
089	2	22	Existence value	Address poison from Duport
090	1	13	Aesthetic value	The individual sections are attractive but I do not perceive this area as a whole.
090	1	16	Experience value	I enjoy all seasons, the sound of birds, water birds and vegetation.
090	1	19	Bequest value	Nature must remain in tact as far as possible, without the value of the area decreasing.
090	1	22	Existence value	If nature is sacrificed we will have no food left on the long term
090	1	25	Symbolic value	I visit the area daily and appreciate the area.
090	1	26	Dis-benefits	Bad maintenance with no knowledge about nature.
091	2	11	Use Value	I walk my dog twice daily in Overkamppark and Wantijpark. My dog swims in the Wantij.
091	2	13	Aesthetic value	Overkamppark and Wantij park has attractive vegetation
091	2	16	Experience value	Experience rest and beauty
091	2	22	Existence value	Need for nature
091	2	25	Symbolic value	Important to divide nature in a city well and must be accessible
091	2	26	Dis-benefits	Increase in homeless people
092	1	11	Use Value	I walk our dog twice a day in the Dordwijkzone
092	1	13	Aesthetic value	Varied landscape with many birds, plants and trees. Every season beautiful.
092	1	16	Experience value	I experience rest and beauty
092	1	19	Bequest value	The park must stay. It has heritage value. We must be stingy with our green.
092	1	22	Existence value	Green must remain in city. It is important for liveability. More green and less asphalt.
094	1	11	Use Value	Experiencing nature in its highest form. Get answers on life questions. Benefits for all. Have a dog.
094	1	13	Aesthetic value	Much variation in plants and trees. Beautiful change in seasons.
094	1	19	Bequest value	One must retain nature as much as possible for self realization, realization where you come from and how everything fits together.
094	1	25	Symbolic value	Nature is there to enjoy but also to teach life lessons. All phenomenon leads you back to the source of life.
094	1	26	Dis-benefits	Noisy scooters and speeding.

Annex 6: Fieldwork time schedule

Programme for fieldwork	MONTHS	Jun-17				Jul-17				Aug-17				Sep-17			
	Weeks	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Activities	**Dates**																
Design Questionnaire	6 - 15 Jun 2017																
"GO" Decision to undertake fieldwork & circulate to Municipality	21-Jun-17																
SPSS workshop and add Socio-Demographic group to topic	21 Jun - 5 Jul 2017																
Change strategy for survey from on-line to face-to-face	04-Jul-17																
Translate questionnaire to Dutch	05-07 Jul 2017																
Pilot survey and fieldwork in Dordrecht	8 - 17 Jul 2017																
Capture, inspect, clean and analyze data with SPSS & fix literature	18 Jul - 20 Aug 2017																
Drafting Findings and conclusions	21 Aug - 7 Sept 2017																
First submission date on 7 September 2017	7 Sept 2017																

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