

**Perceived liveability in Selwerd:
Residents' perceptions of
environmental and social factors in
relation to public green areas**



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Abstract

This thesis studies residents' perceptions of liveability in Selwerd, a neighborhood in the city of Groningen, based on environmental and social factors in relation to public green areas. Using qualitative research methods, the thesis studies how residents perceive the effect of public green spaces on environmental quality, perceived liveability, and social cohesion. The findings suggest that the presence of public green spaces is perceived as positive by residents, due to their environmental benefits and effect on health and wellbeing. However, the study indicates residents perceive shortcomings relating to quality, use, and accessibility of public greenery. Therefore, the study suggests an improvement of the quality of public green areas in Selwerd, through enhanced maintenance and the implementation of facilities that cultivate social interactions and activities, contributing to social cohesion. The study offers valuable insights for urban planning and policy on the relationships between public green areas and perceived liveability. Furthermore, it contributes to academic literature on sustainable urban development by describing the interaction between environmental and social factors in relation to public green space. Future research could aim at studying the comparison between the current and future spatial situation in Selwerd in relation to perceived environmental quality and liveability. Moreover, future research could aim to compare the findings between Selwerd and similar urban environments as well as compare the current and future spatial situation in Selwerd.

Keywords: environmental quality, perceived liveability, social cohesion, public green spaces, spatial interventions, qualitative research

Reading guide

This thesis is structured as follows. First, the research problem is described in chapter 1 and the research case of Selwerd neighborhood is introduced, followed by the research aim. This chapter is followed by Chapter 2, the theoretical framework, where relevant academic literature is discussed which is supported by a conceptual model. Hence the research approach is described and justified in Chapter 3, the methodology, along with an hypothesis and ethical considerations. In chapter 4 the data results are analyzed and discussed, after which a conclusion and discussion are drawn in Chapter 5. Limitations and recommendations for further research are provided in Chapter 6. Appendices include survey statements, summaries of in-depth interviews, and visual representations.

Moreover, to allow for more structure within the chapters, environmental factors are first discussed and social factors last. These parts are connected by the middle part, the influence of public green spaces on these concepts. This is in line with the manner the interaction between the concepts is described in the theory and conceptual model.

Chapter 1- Introduction

This thesis aims to study the perceptions of residents on perceived livability in a Dutch neighborhood. According to (Ruth & Franklin, 2014) liveability can be defined by social and environmental factors and the interaction between the two *elements*. Therefore, to determine the liveability of a neighborhood, subjective experiences of both the social and physical aspects of such an area can be studied. (Mouratidis & Yiannakou, 2022). Furthermore, many urban planning policies are based on the assumption that people's behavior and activities are influenced by the physical environment (Dempsey, 2009). In support of this statement, (Pfeiffer and Cloutier, 2016) suggested that urban design that promotes social interaction and safety, together with open public spaces and natural, green spaces contribute to neighborhood satisfaction. According to (Dempsey, 2009), public spaces that are well-designed and are sufficiently green support social activities, mutual trust among residents, feelings of safety, and a sense of community.

Furthermore, urban green spaces provide ecosystem services and help mitigate the negative impacts of heat, pollution, and water nuisance. (Wolch *et al.*, 2014). These negative impacts are aggravated by climate change, caused by the emission of greenhouse gasses into the atmosphere. A changing climate makes urban areas more susceptible to the effects of excessive heat, drought, and extreme weather events. It poses serious threats to urban development and infrastructure (Wamsler *et al.*, 2013). Urban green spaces provide ecosystem services that help mitigate the negative impacts of heat, pollution, and biodiversity loss resulting from climate change. (Wolch *et al.*, 2014).

Moreover, green spaces also improve the perceived liveability of residents of urban areas. Green spaces provide inhabitants of cities with improved general public health, promote physical activity, and have a positive effect on mental well-being (Wolch *et al.*, 2014). Thus, the provision of green space is proven to have an influence on environmental and social factors that determine liveability in urban areas. Studying how green spaces, environmental and social factors are perceived by residents in a neighborhood-scale study area will provide insight into how they interact and how they influence the residents' perceived liveability.

1.1 Research problem

The city of Groningen is generally described as a liveable, green, and socially attractive city. However, there are areas that lag behind compared to other neighborhoods in terms of

liveability, health, and wellbeing. (Publicaties OIS Groningen, 2018). Selwerd, a neighborhood in Groningen is selected as such an area. According to a report commissioned by the municipality in 2018, Selwerd is an area where above-average, residents experience loneliness, and mental -and physical health issues. Many households live in poverty and suffer from poor social cohesion. (Publicaties OIS Groningen, 2018). Moreover, the provision of green areas, public space, and facilities are named as attractive features. However, the provision of green areas is perceived as a strength but is less appreciated by the residents compared to other parts of the city. (Publicaties OIS Groningen, 2018). Documentation about the reasons for this lack of appreciation is lacking and thus provides an incentive for further study. In the 2018 report, plans for improving the liveability of residents are proposed.

In a 2022 livability analysis conducted by the municipality of Groningen in different neighborhoods in the city of Groningen, among which the neighborhood Selwerd, the residents were again asked to provide strengths and weaknesses of their neighborhood. For the strengths, proximity to amenities and the inner city was most prominent, whereas for the weakness's unemployment, noise, maintenance, and safety were named. (Publicaties OIS Groningen, 2022). Moreover, loneliness and social isolation are named as problems in the 2022 report, impacting social cohesion negatively. (Berg *et al.*, 2024).

Furthermore, what stood out was that the provision of green space was named as a strength as well as a weakness. (Publicaties OIS Groningen, 2022). However, the report does not provide detailed insights regarding why residents experience problems with the provision of green areas or why this contributes to a pleasant living environment. There is a public park in Selwerd and smaller-scale green areas throughout the neighborhood. The author suggests these should be studied on the basis of different factors, such as quality, use, and accessibility, to research the lack of appreciation for green spaces. Factors that determine the level of appreciation for green spaces include quality and distance to green space. (Ekkel & de Vries, 2017). The quality of green spaces and their effect on use is less considered in academic literature. However, high-quality and biodiverse green spaces, as an element of urban landscape design, are helpful in ensuring the well-being of humans. (Ekkel & de Vries, 2017). Quality of green space includes maintenance and availability of facilities and activities which affect the condition of the space. (Lee & Maheswaran, 2010). The condition of the facilities and features determines whether or not people choose to use green spaces. (Lee & Maheswaran, 2010).

Furthermore, ease and convenience of access to green spaces are proven to have an association with physical activity or leisure time physical activity. People with closer proximity

to green spaces are more likely to make use of it. Moreover, the presence of barriers such as roads influences the chances for use of green spaces. (Lee & Maheswaran, 2010). Quality and accessibility of green spaces in Selwerd might contribute to explaining the lack of appreciation and use in Selwerd and are a reason for the study.

Furthermore, it is found that the neighborhood occasionally deals with flooding after periods of heavy rainfall. Infiltration of rainwater into the ground is problematic in some areas due to impermeable surfaces. A climate scan from Hanze University indicates that flooding is indeed a problem in the neighborhood. (Climate scan, 2021). This fact is supported by research from (Costa *et al.*, 2021), who state that impervious surface covers in urban areas reduce the interception, storage, and infiltration capacity of rainwater. There is an indication to assume there are problems with flooding in Selwerd. Studying how residents perceive the extent of this problem contributes to a deeper understanding of the situation and how the residents perceive the relation between environmental factors and their individual perceived liveability.

Figures 1 and 2 indicate problems with surface water run-off. Besides flooding, as a consequence of climate change, average temperatures rise. This means that excessive heat during summer can be problematic for residents. The gap in the data on how the residents of Selwerd perceive temperature in their own neighborhood during warm periods indicates that a study is required. Furthermore, there is a gap in data on how the residents of Selwerd perceive the green spaces in their neighborhood and how they perceive the relationship between green spaces and environmental quality, perceived liveability, and social cohesion. The described gaps in the data in the study area led to the following main research question:

How do the residents of Selwerd perceive environmental quality, perceived livability, and social cohesion in relation to public green areas?

The following secondary questions support the main research question.

1. *How are environmental quality, liveability, and social cohesion perceived by the people in Selwerd?*
2. *How is the current amount and use of public green space perceived by the people in Selwerd?*
3. *How do the people in Selwerd perceive the implementation and modification of public green areas as a means to improve environmental quality, perceived liveability, and social cohesion?*



Figure 1: Problems with surface water run-off. (Hanze University).



Figure 2: Problems with excess water. (FocusGroningen)

Studying this area provides opportunity to contribute to academic literature, by studying how neighborhood residents' perceptions of liveability on the basis of environmental and social factors in Selwerd relate to public green areas. Furthermore, it addresses the societal relevance of studying how liveable environments are created for residents by studying how residents perceive the relationship between public green areas and environmental quality, perceived liveability, and social cohesion in their own living environment. Moreover, these insights can be used to propose solutions for residents and study how these are perceived in order to make suggestions for improvements.

1.2 Research aim

This thesis aims to study how residents perceive the environmental quality, perceived liveability, and social cohesion in relation to public green areas in Selwerd. The perception of residents is required to determine whether quantity, quality of, and accessibility to green spaces affect the way residents use such spaces. Moreover, the perception of residents will provide insight into the relationship between green spaces, perceived liveability, and social cohesion in Selwerd. The concepts are studied on the basis of people's perception of their own neighborhood. The research approach is elaborated on in Chapter 4.

Surveys are used as a means to gain insight into resident's perceptions of environmental quality, perceived liveability, and social cohesion in relation to public green space. These are used to require the initial, necessary data upon which conclusions are drawn and suggestions for improvements are made. After completion of the surveys, the in-depth interviews were performed. This sequence of data collection was chosen so that the author has enough information and knowledge of the situation, prior to having the in-depth interviews with residents. The in-depth interviews provide more specific and detailed data about the perception of residents and serve as support for the surveys. Hence, the outcomes of the in-depth interviews are also used to draw conclusions and make recommendations for improvements.

Chapter 2 - Theoretical framework

In this theoretical framework, relevant literature is discussed. A distinction is made between environmental and social determinants for perceived liveability, after which the influence of green spaces is considered. Chapter 2.1 includes a conceptual model which describes the interaction between different concepts.

Environmental factors and liveability

Liveability refers to environmental conditions that contribute to human well-being, as well as individual characteristics (Namazi-Rad *et al.*, 2012). Asking people how they value such conditions contributes to providing a depiction of how they perceive their living environment, hence their perceived liveability (Namazi-Rad *et al.*, 2012). Climate change puts pressure on environmental conditions that influence perceived liveability. Climate change causes extreme weather events and rising temperatures, which in turn can cause flooding and excessive heat during warm periods. These phenomena cause adverse impacts on urban areas, infrastructure,

and urban development. Moreover, these affect liveability in urban areas negatively (Wamsler et al., 2013). Studying the perceptions of people on these changing conditions in their own living environment contributes to understanding the relationship with their own perceived liveability.

Social factors and liveability

Furthermore, social cohesion serves as an indicator of the perceived liveability in urban areas. Social cohesion can be defined as shared norms and values, positive interactions, and relationships between individual people (Wan et al., 2021). Factors influencing social cohesion include social participation, the physical environment, liveability, safety, health, and economy. (van Dedem et al., 2021). Higher neighborhood social cohesion leads to higher levels of wellbeing. (Cramm et al., 2012). Therefore, neighborhood social cohesion is significantly associated with the well-being of people. (Cramm et al., 2012). Studying the perceptions of people on the social relations within their own living environment contributes to understanding the relationship with their perceived liveability.

The influence of green areas

An important role of urban greenery is the impact on the reduction of air temperature. (Djekic et al., 2018). This is due to the fact that green space heats less than paved surfaces and shade provided by trees (Djekic et al., 2018). This connects to the changing environmental conditions, such as temperature, mentioned above. Installing a sufficient amount of greenery in urban areas is thus needed to mitigate the heat island effect, the phenomenon that temperatures in built-up urban areas are higher than the areas outside of it. The results of (Djekic et al., 2018) are in line with those of (Apostolopoulou & Tsoka., 2021), who state that urban greenery improves the outdoor thermal environment as well as human thermal comfort (Apostolopoulou & Tsoka., 2021).

According to (Tóth et al., 2015), urban greenery improves the microclimate, reduces noise, dustiness, the heat-island effect, and helps to manage stormwater. Thus, urban green space has an effect on temperature, air quality, noise, and flood risk. To maximize the mitigating effect of greenery, unconventional areas should be utilized as well for creating new green spaces (Tóth et al., 2015). It can be concluded that installation, modification, and improvement of the quality

of urban green spaces are effective tools to mitigate the negative effects of climate change in urban areas.

The availability and quality of green spaces have been linked to physical and mental human well-being. According to (Maas *et al.*, 2006), the percentage of green space in the living environments of inhabitants has a positive association with perceived general public health. Stress reduction and attention restoration are possible factors that come into play when explaining the positive effect of exposure to green spaces on human health (Hartig., 2003). Due to its positive association with health, urban green space should not be regarded as a luxury, but rather as a necessity. Therefore, the development of green spaces should claim a central role in spatial planning policy (Maas *et al.*, 2006).

According to (Wan *et al.*, 2021), green spaces contribute to social cohesion by encouraging people to go outdoors and undertake social activities. The quality of green space is a significant factor in encouraging social interactions. (Wan *et al.*, 2021). Furthermore, a condition for supporting social activities is that sufficient facilities are provided in public green areas. Such facilities could include benches, outdoor sports facilities, playgrounds, jogging tracks, and basketball courts (Anuar & Muhamadan, 2018). Effective types of green areas for bringing people together and supporting social cohesion are community gardens and allotment gardens. Such types of greenery bring people from diverse backgrounds together and create opportunities for socialization (Yotti Kinsley & Townsend, 2006). They could serve as inclusive spaces, which, according to (Peters *et al.* 2010), can be seen as favorable places to stimulate social cohesion.

The literature above suggests clear connections between perceived liveability and environmental conditions, social cohesion, and green areas. Understanding their relations contributes to studying how residents perceive the effect of these concepts and their interaction on their own perceived liveability.

2.1 Conceptual model

The conceptual model illustrated in *Figure 3* shows how the relationship between the concepts as discussed in the theoretical framework. The direction of influence is indicated with arrows. In order to contribute to the comprehensive field of urban planning and community development, these concepts need to be considered in a well-rounded approach. In this model, the concepts are depicted in a dynamic relationship with public green space as a central concept. Perceived liveability is influenced by social cohesion and environmental quality. Better

environmental conditions result in more attractive living conditions, hence better-perceived liveability. Poor environmental quality also means less attractive living conditions resulting in decreased perceived liveability. (van Dorst, 2011).

Moreover, strong social networks lead to better perceived liveability. The contrary holds true, weak social networks lead to lesser perceived liveability. (Cramm *et al.*, 2012). Furthermore, environmental quality influences social cohesion due to the fact that places with good environmental quality can potentially encourage people to participate in outside activities that improve social cohesion. Public green spaces influence environmental quality, due to the capacity of green spaces to impact levels of heat and air quality (Tóth *et al.*, 2015). Furthermore, public green spaces can promote social interaction and community engagement, therefore influencing social cohesion. (Wan *et al.*, 2021). Public green spaces influence perceived liveability due to positive effects on wellbeing and physical and mental health which can be determinants for perceived liveability. (Maas *et al.*, 2006).

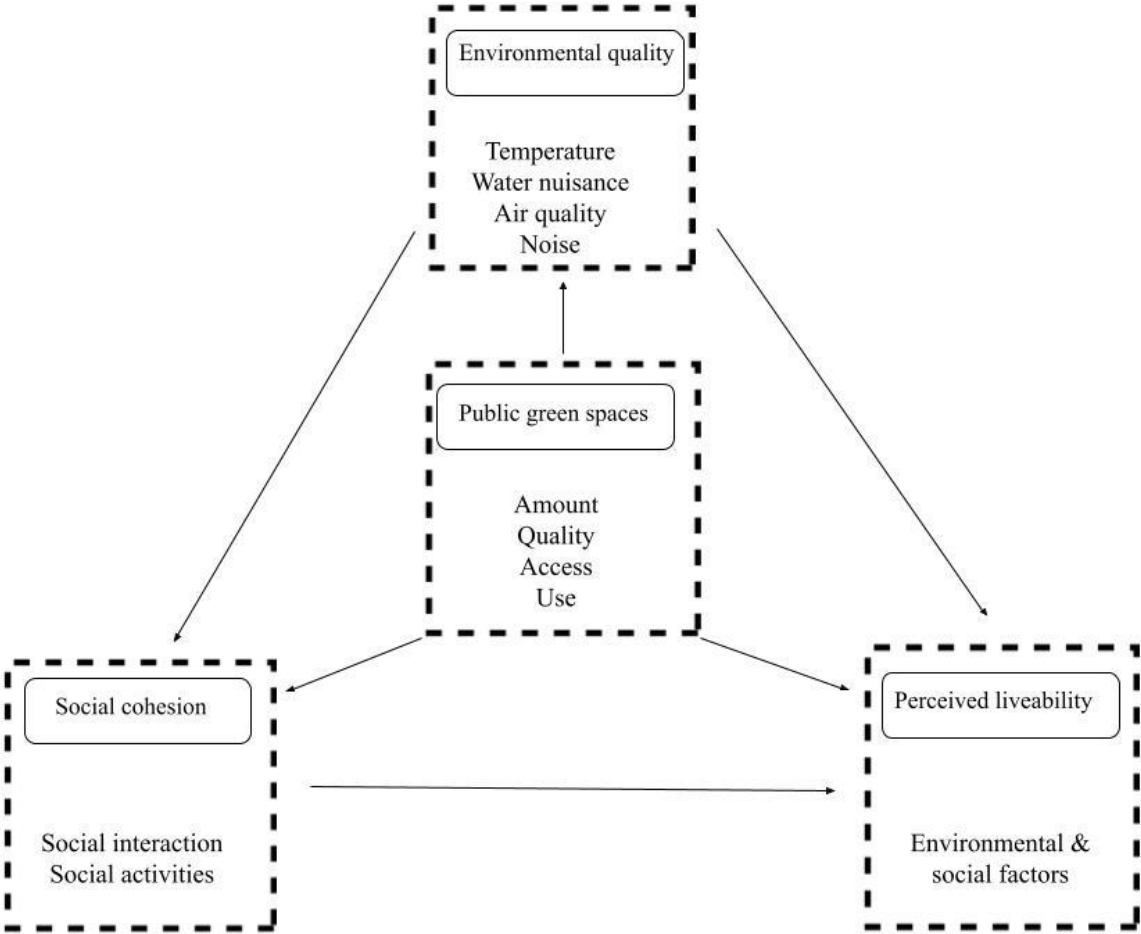


Figure 3: Conceptual model (Authors' own)

2.2 Hypothesis

From this study, it was expected that some respondents perceived to encounter problems relating to perceived liveability based on environmental quality and social cohesion. Furthermore, it was expected that respondents perceived problems relating to public green areas in terms of quality, use, and accessibility. Moreover, it was expected that the modification of public green areas, to impact environmental and social factors, would be perceived as enhancements of the perceived livability.

Chapter 3- Methodology

3.1 Surveys

To study the individual perceptions of residents, qualitative data measures were taken. Taking subjective measurements of liveability is of considerable practical and theoretical importance. Studying the perceptions of residents of their own neighborhood contributes to making realistic, substantial descriptions of their own living environment and the relationship with their individual perceived liveability (Namazi-Rad *et al.*, 2012). For environmental factors, temperature, flooding, air quality, and noise were considered due to the indications from relevant literature, described in Chapter 1, as well as the presence of the ring road to the north (*Figure 4*) and roads intersecting the neighborhood. For social factors, the focus was on social cohesion and well-being in relation to green space due to the indications found in reports and literature, described in Chapter 1.

The surveys consisted of 20 statements that addressed the central aspects of the research aim. The answer possibilities were based on a 6-point Likert scale, resulting in the following answers: 1. strongly disagree. 2. disagree. 3. neutral. 4. agree 5. strongly agree. 6. refuse to answer. This research method was chosen due to its qualitative nature and capability to define residents' subjective experiences. Respondents were recruited randomly, meaning people were addressed on the street, and around the community center and shopping mall.

Moreover, a door-to-door strategy was performed, including parts that were considered green and less green by the author. Respondents were selected on no other characteristic than being a resident of Selwerd. For this reason, personal information such as names and ages were

not required and therefore not included in the results. After voluntary consent was required, people were invited to participate by scanning a QR code or entering a link. In total, 28 respondents have participated in the surveys. According to Hill (1998), sample sizes of 10 to 30 are sufficient for exploratory research. Such a sample size is large enough to test the hypothesis.

3.2 In-depth interviews

The surveys provided the necessary initial data. In-depth interviews were performed in support of the survey results, to study how residents perceive the effects of the environmental and social concepts on their individual liveability. Thus, the in-depth interviews were performed when the surveys were completed. The in-depth interviews consisted of five open-ended questions that resulted in more comprehensive and specific answers.

This more extensive and detailed data was required to gain a deeper understanding of the perception of residents. The only characteristic on which participants were selected was being a resident of Selwerd. Furthermore, two out of the three participants were selected in a part of the neighborhood with a larger distance to Selwerd park, to account for the aspect of accessibility to the park influencing their perception of this public green space. (Figure 4).



Figure 4: Map indicating the distance between Selwerd park and interview participants 2 & 3. (Author's own)

The in-depth interviews required a smaller number of participants, due to the results of the interviews being in support of the results from the surveys. The perceptions of three individual participants were studied.

3.3 Data analysis

For the surveys, diagrams were made to visualize data and make statements about the distribution of the data results. ATLAS.ti was used to analyze the results of the in-depth interviews. This programme was used due to its usefulness and compatibility with qualitative data. During the interviews, notes were taken that were consequently transcribed and analyzed. The codes and code groups in ATLAS.ti contributed to making a systemic analysis per theme. For the coding process, the code tree in *Figure 6* was used. A total of 13 codes were created that were grouped into 4 code groups. The codes and code groups refer to the concepts discussed in the theoretical framework.

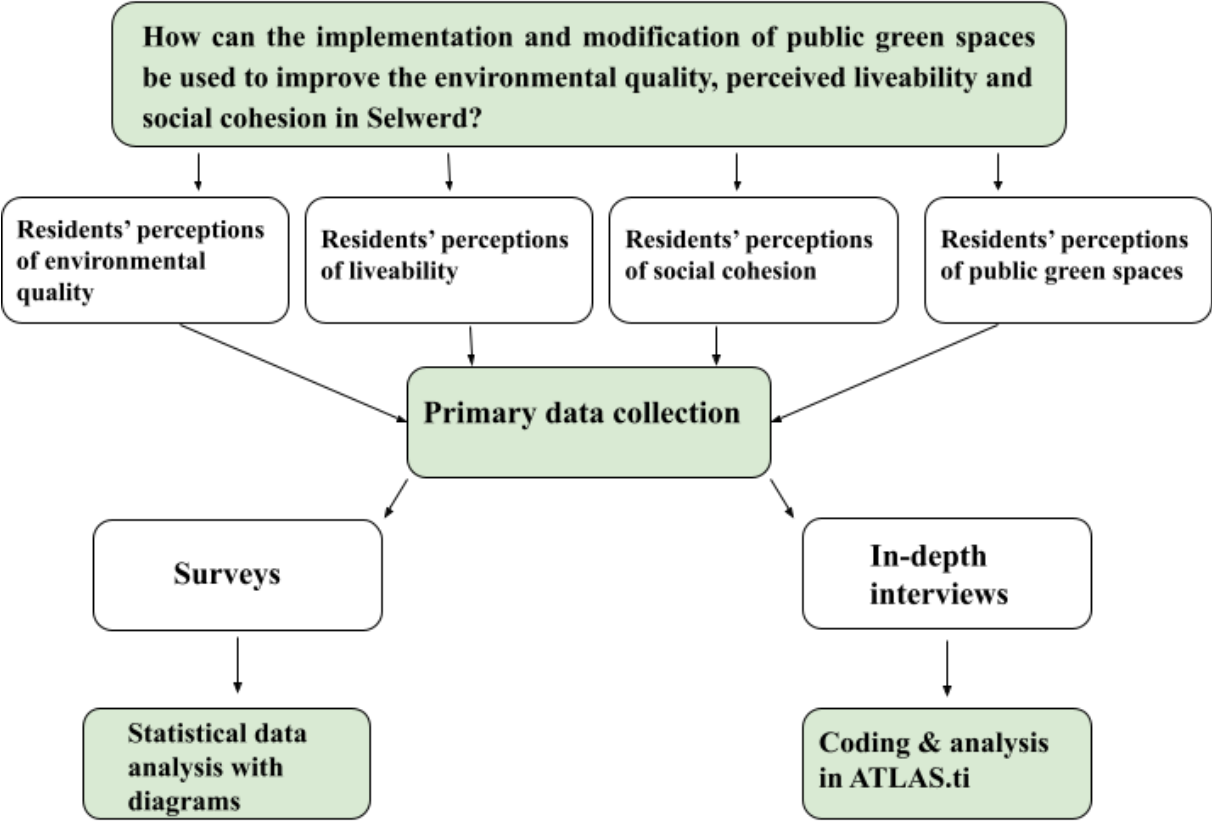
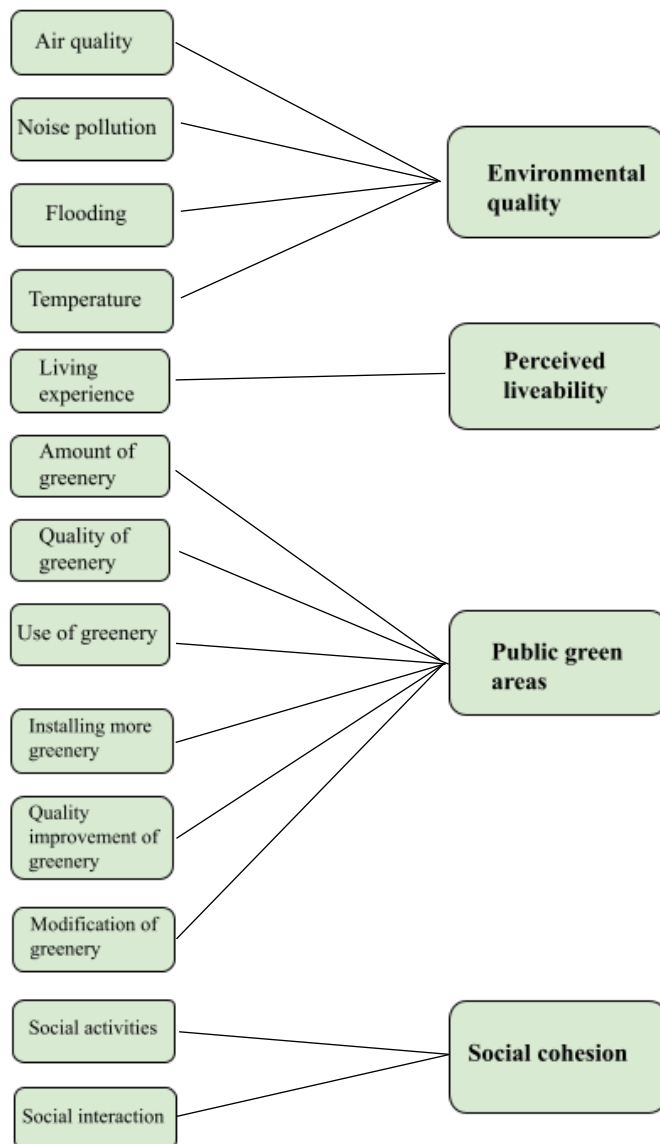


Figure 5: Data collection & analysis scheme. (Author's own)



List of codes

Code groups

Figure 6: Code tree. (Author's own)

3.4 Ethical considerations

Before performing the interviews, voluntary consent was asked from the respondents. Prior to participation, the aim and means of the research were explained to the respondents. Participation in the surveys and in-depth interviews was anonymous, therefore no personal information was required or presented in this thesis. The data obtained was used only for the purpose of this research. During the research, the data was kept confidential and by no means available for the use of third parties. The data was stored on an external drive during the research. After completion of the thesis, the data kept on the drive was destroyed.

Chapter 4 – Results & Discussion

4.1 Survey results

4.1.1 Environmental quality

In order to research the environmental quality in Selwerd, residents were asked for their individual perceptions of temperature, air quality, and flooding. Most respondents perceive that air quality is not an issue for them in Selwerd, with only 10.9% of the respondents agreeing with the statement that the neighborhood copes with bad air quality, whereas 35.6% disagreed and 10.9% strongly disagreed. For flooding, the results were 50% agreeing and 50% disagreeing with the statement that the neighborhood copes with excess water during heavy showers (*Figure 10*). This means that 14 out of the 28 respondents encounter problems with flooding. This might indicate a potential problem with surface water run-off due to problems with rainwater infrastructure. (Climate scan, 2021). This can be linked to the climate scan by the Hanze University which indicates problems with insufficient infiltration and surface water run-off, illustrated in *Figure 7*.



Figure 7: excess water resulting in flooded pavements. (FocusGroningen)

From the surveys, it was evident that high temperatures during warm periods were perceived as problematic by most respondents. A combined 65% agreed or strongly agreed with this statement, displayed in (*Figure 8*), whereas 21% disagreed and 14% remained neutral. The

author suggests that the fact that residents perceive excessive heat as problematic can be linked to the urban heat island effect. This effect describes the accumulation of heat in urban areas due to construction and human activities (Yang et al., 2016). Selwerd is an area where construction consists for a large part of stone and asphalt surfaces. The author suggests that this fact contributes to the heat island effect in Selwerd.

The perception of residents whether there is indeed a sufficient amount of greenery to temper the heat during warm periods for their personal needs was researched. The results were only 18% of the residents agreeing with this statement, whereas 36% disagreed and 46% remained neutral. (Figure 11). Thus, the results indicate that the respondents perceive that the greenery is unable to provide enough cooling for their personal needs during warm periods. According to the literature, additional green spaces could have a decreasing effect on the temperature, therefore increasing the resilience of residents against heat during warm periods. The author suggests that the installation of more public greenery could be a solution to the problem of excessive heat. This is based on the finding that urban greenery improves the outdoor thermal environment as well as human thermal comfort (Apostolopoulou & Tsoka., 2021). Green spaces heat less than paved surfaces, which are plentiful in Selwerd. Moreover, they can provide shade through trees and have an important impact on the reduction of air temperature. Green spaces can also create an opportunity to manage stormwater (Tóth et al., 2015).

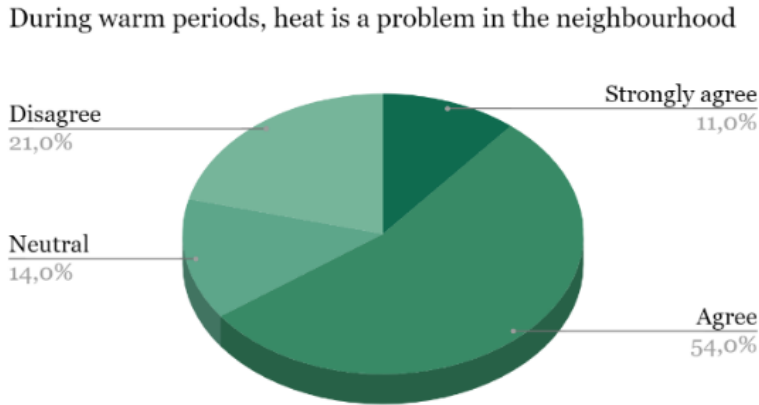


Figure 8: Respondents view on whether heat is a problem during warm periods in the neighborhood (Author's own)

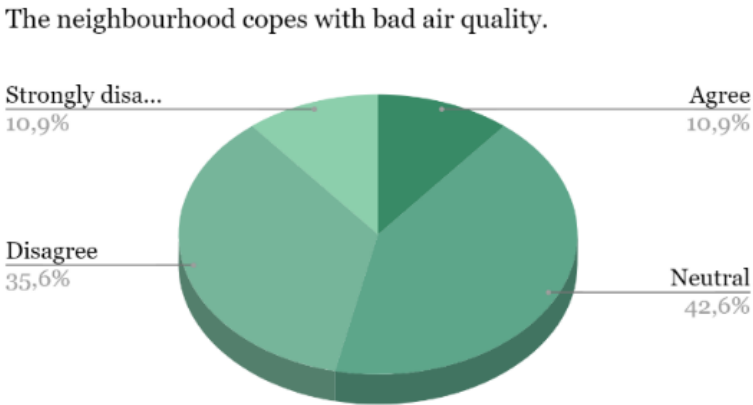


Figure 9: Respondents view on whether the neighborhood copes with bad air quality (Author's own)

The neighbourhood copes with excess water during heavy showers.

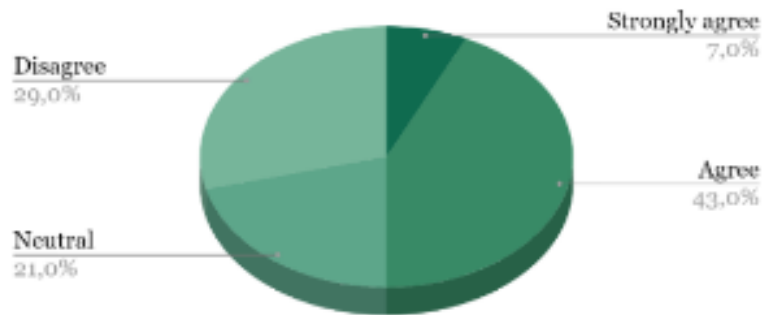


Figure 10: Respondents view on whether the neighborhood copes with excess water during heavy showers (Author's own)

The greenery in the neighbourhood provides enough cooling in warm periods.

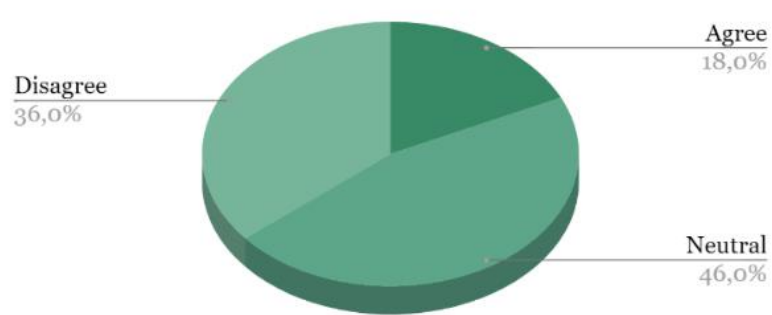


Figure 11: Respondents view on whether the greenery in the neighborhood provides enough cooling (Author's own)

4.1.2 Public green spaces and perceived liveability

When being asked if the respondents perceive that public green spaces are inviting to spend time in, only 15% agreed, whereas 63% disagreed and 7% strongly disagreed. (Figure 12). The author suggests that the reason for this could be a lack of quality due to insufficient facilities that draw residents. This is based on the finding that providing sufficient facilities that residents use for their leisure is essential to encourage people to spend time there. (Anuar & Muhamadan, 2018). An area intended for the recreation of residents is Selwerd Park, but the respondents perceive this area as insufficient in terms of quality and use.

Only 18% of the respondents agreed, and 7% strongly agreed with the statement that the greenery in the park is of sufficient quality, whereas 61% disagreed and 7% strongly disagreed. (Figure 13). For maintenance of the park, the results are 21% respondents agreeing and 7% strongly agreeing with the statement that the park is well-maintained, whereas 43% disagreed and 4% strongly disagreed. (Figure 14). Furthermore, the surveys indicated that most respondents often do not witness their fellow residents making use of public greenery. The result of this section of the survey shows that only 18% agreed with this statement, whereas 43% disagreed and 14% strongly disagreed. (Figure 15). Therefore, the author suggests that to increase use of green areas, maintenance and quality need to improve. To improve quality,

facilities could be added to invite more residents to spend time in Selwerd park. According to Anuar & Muhamadan (2018), it is essential to provide facilities to maximize the utilization of a public park. Thus, to stimulate the use of public green spaces, modifications could be made and facilities added that would adjust the public green spaces to the personal needs of residents. This would allow residents to spend more time in public green areas.

The greenery in the neighbourhood is inviting to spend time in.

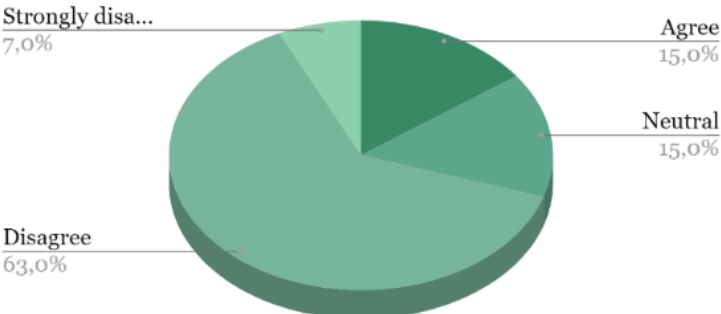


Figure 12: Respondents view on whether the greenery in the neighborhood is inviting to spend time in (Author's own)

The greenery in the park next to the neighbourhood is of sufficient quality.

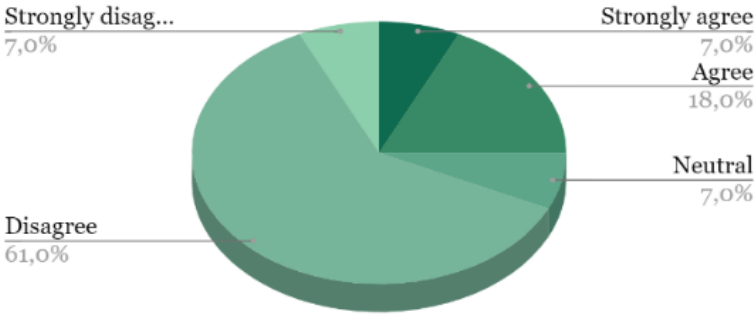


Figure 13: Respondents view on whether the greenery in the park next to the neighborhood is of sufficient quality (Author's own)

The existing park next to the neighbourhood is well-maintained.

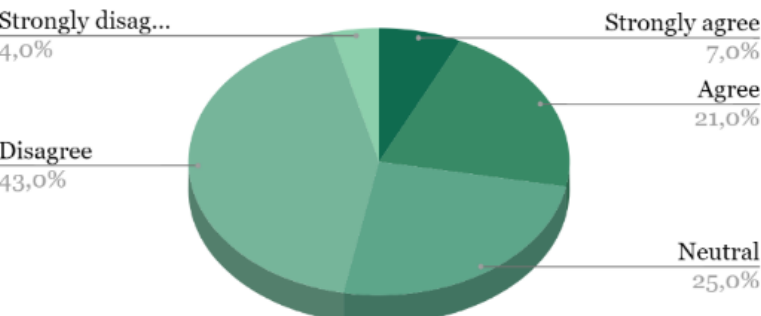


Figure 14: Respondents view on whether the park next to the neighborhood is well-maintained (Author's own)

I personally often see people recreate in the park or other forms of greenery in the neighborhood.

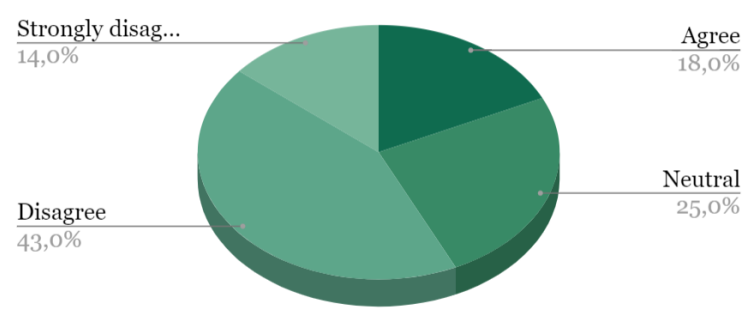


Figure 15: Respondents view on whether they see people recreating in the park or other forms of greenery in the neighborhood (Author's own)

4.1.3 Social cohesion

On the statement ‘strong social cohesion is existent in the neighborhood’ only 7% agreed. The majority of respondents disagreed with this statement, with 50% disagreeing and 7% strongly disagreeing. (Figure 16). On the statement whether the respondents perceive loneliness and social isolation to be problems among (some) residents of the neighborhood, 4.1% disagreed, whereas 36.7% agreed and 4.1% strongly agreed. A majority of 55.1%, remained neutral on this matter. (Figure 17). Based on these results it can be stated that the respondents perceive there are problems related to the social cohesion in their neighborhood.

A strong social cohesion is existent in the neighbourhood.

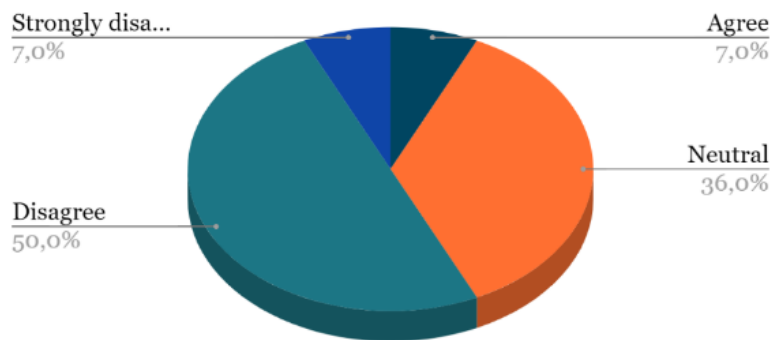


Figure 16: Respondents view on whether there is a strong social cohesion in the neighborhood (Author's own)

Loneliness and social isolation are problems among (some) residents of the neighbourhood.

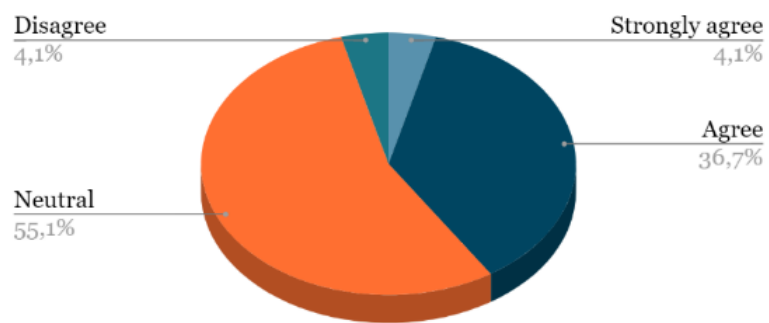


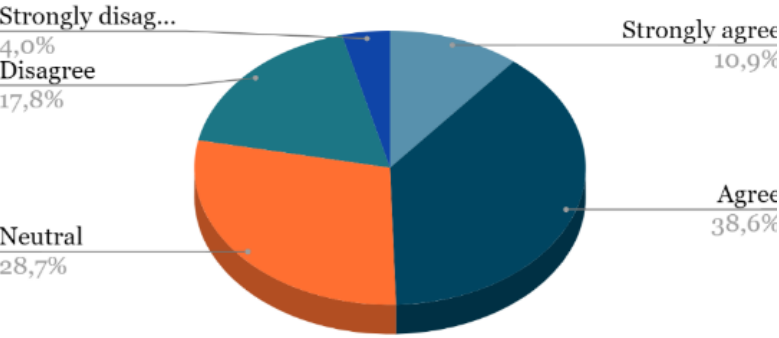
Figure 17: Respondents view on whether loneliness and social isolation are problems among (some) residents (Author's own)

4.1.4 Public green spaces and social cohesion

Respondents were asked how they perceived the effect of the implementation and modification of public green spaces on their individual social connections. When asked if the implementation of more green space in the neighborhood would increase the opportunity for the respondents to meet other residents, the majority agreed. The results being: 38.6% agreeing, 10.9% strongly agreeing, 17.8% disagreeing, and 4% strongly disagreeing. (Figure 18). Furthermore, when asked if the respondents perceived that the implementation of more green would overall lead to more social cohesion, 32.3% agreed and 14.1% strongly agreed, whereas 7.1% disagreed.

(Figure 19). Thus, these results suggest that the respondents perceive their individual social interactions would improve if they could make use of more public green spaces.

Adding more green to the neighbourhood would increase the opportunity for me to meet other residents.



Adding more green to the neighbourhood would increase the social cohesion.

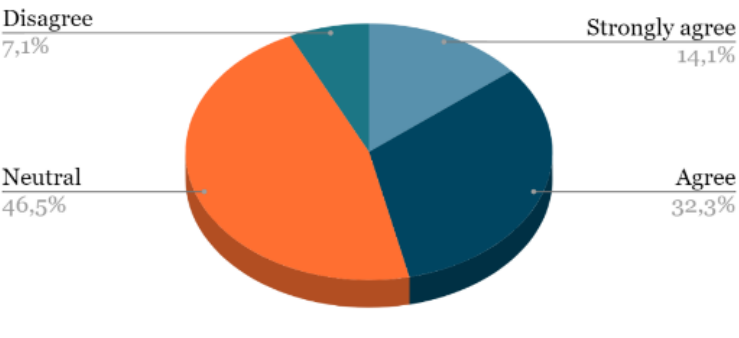


Figure 18: Respondents view on whether adding more green would increase the opportunity to meet other residents (Author’s own)

Figure 19: Respondents view on whether adding more green to the neighborhood would increase the social cohesion (Author’s own)

The modification of public green areas can be used as a tool to work towards more social cohesion. The data indicates such a solution has the support of the respondents. Previous sections have indicated the relationship between exposure to public green areas and human wellbeing, and the relationship between social cohesion and human wellbeing. These concepts inter-relate, meaning that the increased presence of residents in public green areas also have an effect on social cohesion (Oh et al., 2022). This increased presence could be realized in community gardens, places where urban residents are engaged in outdoor physical and social activities. (Egli et al., 2016).

Here residents can cultivate a piece of land collaboratively in their community, leading to more social connections and activities, hence improving social cohesion. The concepts of shared maintenance and community gardens were also tested in the surveys. For whether respondents perceive shared maintenance would strengthen their social bonds between residents, the results were as follows: 50% agreed with the statement, 32% strongly agreed and only 7% disagreed. (Figure 20). Thus, it can be concluded that the respondents perceive that that such projects would influence the social connections between residents positively. On

whether respondents perceive that the implementation of community gardens would strengthen the social bonds between residents, 54% agreed, 21% strongly agreed and only 4% disagreed. (Figure 21). The results thus indicate that the respondents perceive that such solutions would have a positive effect on the social cohesion between residents in Selwerd, which confirm the findings of Oh *et al.*, (2022).

Projects involving maintaining the greenery on streets and pavements would strengthen social bonds between residents...

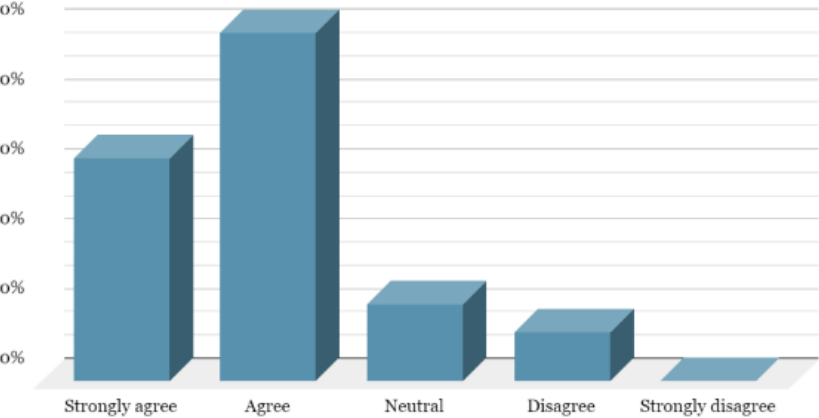


Figure 20: Respondents view on whether projects involving maintaining the greenery would strengthen social bonds between residents (Author’s own)

Implementation of community gardens would strengthen social bonds between residents of the neighbourhood.

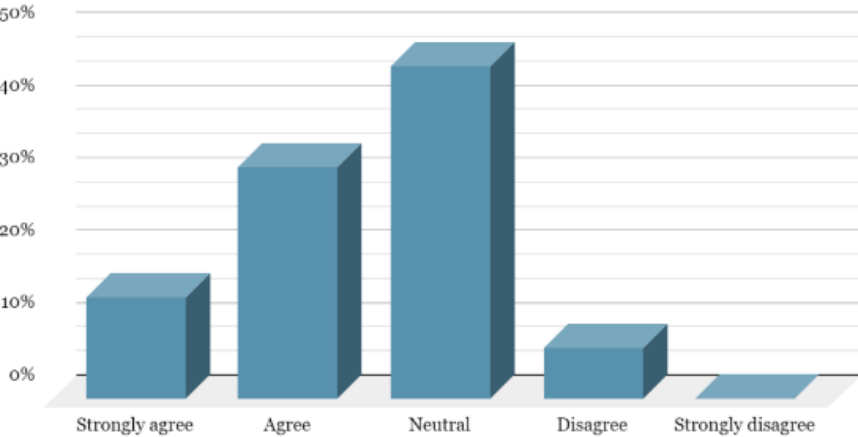


Figure 21: Respondents view on whether the implementation of community gardens would strengthen social bonds (Author’s own)

4.2 In-depth interview data

4.2.1 Environmental quality

The in-depth interviews have indicated that residents perceive environmental quality parameters such as poor air quality, noise pollution and flooding are no serious problems for them personally. However, the results indicated that respondents 2 and 3 regard heat to be a current problem for them in the neighborhood. Only respondent 1 did not regard heat to be a problem as of yet but is curious to see how this will develop in the future. Respondents 2 and 3 described that streets are not a pleasant environment to be when temperatures rise.

These respondents were worried about heat waves becoming more frequent and the effect this will have on their liveability in the neighborhood. Indeed, heatwaves are forecasted to become more intense, more frequent, and longer lasting as a result of climate change. (Meehl & Tebaldi, 2004). The implementation of more green spaces to cope with heat was proposed to the respondents, which they thought would improve their personal resilience to excessive heat. Respondent 3 expected that more green spaces would provide more shade for him during warm days. Furthermore, respondent 2 wished there was more accessible greenery surrounding her house which she perceived would make summers with excessive heat more comfortable for her.

4.2.2 Public green spaces & perceived liveability

In the interviews, respondents were asked to reflect on the quantity, quality, and use of public green areas in their neighborhood. All respondents stated that efforts have been made to create a green environment and would describe the neighborhood as 'green' to some extent, but all respondents have remarks on either the quality or use of public green spaces. Respondent 3 he wished for the municipality to do more against overgrowth and deterioration.

Furthermore, all respondents thought their perceived liveability would improve if more green spaces were to be implemented in the neighborhood. Furthermore, all respondents indicated that a modification of the current public green spaces would be necessary to improve their perceived liveability. The remarks vary from building more connections between the public green areas to implementation of different plantations such as flowers and trees, to reshaping public green areas for recreational purposes.

The results of the in-depth interviews clearly indicate that the respondents think their perceived liveability would improve if more public green space were to be implemented in Selwerd and adjustments were made to the existing greenery. Thus, it is important that the

public greenery throughout the neighborhood and in the park is of sufficient quality if the perceived liveability of residents is to be improved.

4.2.3 Social cohesion

During the interviews, respondents were asked to describe the social cohesion between residents in Selwerd. Respondents stated not experiencing much conflict between residents. However, the respondents indicated that a deeper social connection was lacking, and shared social activities are not common. Furthermore, the respondents indicated that they would be welcoming to new opportunities to meet their fellow residents and strengthen their social relations.

4.2.4 Public green spaces and social cohesion

The interviews indicated that the respondents agreed that if more public green was installed or the existing public green was redesigned for a different purpose, they would have more opportunities to undertake social activities. Respondent 1 indicated that more sitting spots, benches, and chess tables would improve his opportunities to meet other people. Such facilities could for instance be installed in the park, where such facilities are currently lacking. Respondent 3 thought newly created green areas could provide a place for people to meet each other and form social connections.

Furthermore, respondent 3 indicated that the neighborhood lacks inviting public meeting places close to their houses. This respondent stated that the park could fill in this role, but currently lacks the sufficient facilities. The respondents perceive that if more green recreational facilities were to be installed, residents could participate in social activities. Effective types of green areas for bringing people together and supporting social cohesion are community gardens and allotment gardens. Such types of greenery bring people from diverse backgrounds together and create opportunities for socialization (Yotti Kinsley & Townsend, 2006).

Respondent perceived that community gardens in Selwerd could be places where the opportunity would arise for people to meet each other and form social connections. This correlates with the findings of Jennings & Bamkole (2019), who state that urban green spaces can foster social interactions between people, cultivating social cohesion and enhancing human health and well-being. Appendix III includes a visual representation of a community garden inside an urban area (*Figure 24*), as well as a photograph of the current situation at Selwerd

Park (*Figure 22*), as well as a visual representation of a possible future situation based on the findings. (*Figure 23*).

Chapter 5 - Conclusion

This thesis was aimed at residents' perceptions of liveability in Selwerd, a neighborhood in the city of Groningen, based on environmental and social factors in relation to public green areas. Academic literature was used in search of definitions and relationships between concepts, whereas surveys, supported by in-depth interviews were used to study the perceptions of residents on these concepts in relation to their individual perceived liveability.

Relevant literature supports the notion that public green areas influence perceived liveability by means of environmental and social factors (Ruth & Franklin, 2014). Public green areas improve environmental conditions, including reduced heat and water nuisance. (Wolch *et al.*, 2014; Apostolopoulou & Tsoka, 2021). Moreover, public green areas improve social cohesion by providing opportunities for social interaction and activities, and improve perceived liveability by having a positive effect on physical and mental health and wellbeing. (Maas *et al.*, 2006; Wan *et al.*, 2021).

The results from 28 surveys indicate that for environmental factors, residents perceive excessive heat during warm periods and water nuisance after heavy rainfall as problematic in Selwerd. Moreover, these problems are perceived as having a negative impact on their perceived liveability. Moreover, the survey results indicate residents perceive social cohesion, determined by social interaction and activities, to be in a suboptimal state, which influences their perceived liveability negatively. These views are supported by findings obtained from the in-depth interviews. Furthermore, the survey results indicate that residents perceive public green areas in Selwerd are in need of improvement, based on lacking quality and underutilization. The survey results show that residents perceive modifications to public green areas, in relation to environmental and social factors, as effective measures to improve their individual perceived liveability. These findings are also supported by the in-depth interviews. Such modifications entail the addition of more facilities to Selwerd park to raise its quality and turn the area into a more inviting space to attract residents to spend time in as well as community gardens to provide opportunities for social interaction and activities to cultivate social cohesion. Based on the findings, it can be concluded that according to the perception of residents,

perceived liveability, in relation to environmental and social factors can be improved through the modification and implementation of accessible public green areas and sufficient facilities, to support quality and use.

Chapter 6 - Limitations & Future Research

This study focuses on the subjective experience of the residents. A limitation of a study is the sample size which potentially does not fully describe the range of perceptions among residents.

Furthermore, due to the qualitative nature of the study, the data is subject to the risk of response bias. In future research the sample size could be increased to allow for more accurate statistical analysis. Future research could also be aimed at making a comparison with the current and future spatial situation in Selwerd and the effect this has on environmental quality, perceived liveability, and social cohesion, if and when the suggested improvements to the neighborhood are realized.

Appendices

Appendix I. List survey statements

1. During warm periods, heat is a problem in the neighbourhood.
2. The neighbourhood copes with excess water during heavy showers.
3. The neighbourhood copes with a bad air quality.
4. There is a sufficient amount of trees in the neighbourhood.
5. The greenery in the park next to the neighbourhood is of sufficient quality.
6. The existing park next to the neighbourhood is well-maintained.
7. The greenery in the neighbourhood provides enough cooling in warm periods.
8. The greenery in the neighbourhood is inviting to spend time in.
9. There is a sufficient amount of greenery for children to play in.
10. I personally often see people recreate in the park or other forms of greenery in the neighbourhood.
11. I personally use the greenery in the neighbourhood to meet fellow residents.
12. I personally use the greenery in the neighbourhood to practice physical activities (jogging, playing sports).
13. A strong social cohesion is existent in the neighbourhood.
14. Loneliness and social isolation are problems among (some) residents of the neighbourhood.
15. Adding more green to the streets and pavements in the neighbourhood would improve my living experience.
16. Adding more facilities such as benches, picnic tables or playground equipment in the park and other forms of greenery will increase the use of the greenery.
17. Adding more green to the neighbourhood would increase the opportunity for me to meet other residents.
18. Adding more green to the neighbourhood would increase the social cohesion.
19. Implementation of community gardens would strengthen social bonds between residents of the neighbourhood.
20. Projects involving maintaining the greenery on streets and pavements would strengthen social bonds between residents of the neighbourhood.

Appendix II. Summarized notes of the in-depth interviews

The interviews were taken in Dutch and later translated into English. Notes made during the interviews were transcribed and analyzed, resulting here in a summary of the answers given by the respondents to the research questions. The answers do not include quotes but are a direct interpretation by the author. The summaries of the interviews were analyzed in ATLAS.ti as explained in the results section.

Summary of notes interview 1

Thank you very much for agreeing to participate in this interview as part of my thesis. This interview will be completely anonymous. Only the notes taken during this interview will be used for this research. These notes will later be transcribed and analyzed. The results will be treated discreetly and will also be deleted after the completion of the research. Do you understand these conditions and do you agree to participate voluntarily?

Participant gave consent to be interviewed as part of the research.

First, the respondent was asked to provide his age and the duration of his or her residence in Selwerd.

The participant is 24 years old and has lived in Selwerd for 4 years.

Question 1, Would you please describe the environmental quality of the neighborhood? Think of factors such as temperature, flooding, air quality, and noise pollution.

Respondent indicated that he has not given this topic much thought before, which he thinks is a good thing, meaning he did not encounter large problems regarding environmental quality. The respondent says he thinks heat is less of a problem in this neighborhood compared to an earlier residence within the city of Groningen, since he thinks that the buildings were closer together there. The respondent indicated that waterlogging is no problem in that part of the neighborhood where he lives. The respondent says to be aware of heavy rain showers becoming more frequent in the future but is not worried this will problems to his own living comfort. Coming from a small village, the respondent says that noise levels there are always less. Although, noise levels have not been a problem to the respondent unless there is a noisy neighbor. The respondent indicates that he has always been able to breathe well, so is not

concerned about bad air quality. About temperature, the respondent indicates that he thinks it is getting warmer everywhere, so also in Selwerd. He is curious to see how this will develop in the future but does not regard heat to be a problem as of yet.

Question 2, Would you please describe the greenery in the neighborhood, and whether the amount, quality, and use of greenery is sufficient?

The respondent experiences the neighborhood as a green environment, with plentiful trees and gardens, and is content to live close to the Selwerd park. The respondent is aware of renewal plans for the neighborhood and sometimes sees construction work when cycling through the neighborhood, and is curious whether this will result in an even greener environment. The respondent says personally, the greener the better, which he thinks is due to the fact that he grew up in a small village where the environment was naturally more green. He does not use the public green for a specific purpose, other than an occasional walk in the park. For recreational purposes, the respondent moves to the Noorderplantsoen park, close to the inner city.

Question 3, Would you please describe the social cohesion between residents of the neighbourhood?

The respondent says that he thinks that the people in the neighborhood are friendly and polite and often greet each other. Growing up in a village it was usual that everyone knew each other, but this is not the case in his current place of residence. However, the respondent says not having strong social ties with his neighbors and goes to other parts of the city for social interaction. The respondent also predicts that there is not a strong social connection between other residents, but is aware to have not enough knowledge if this is true. The respondent states that he is open to forming stronger social connections with his fellow residents, but this is not a priority for him.

Question 4, Do you think that by adding more greenery the environmental quality and your perceived liveability would be improved?

What the respondent notices is that the greenery in the neighborhood feels quite 'divided' to him. He indicates that greenery and living areas feel separated. The respondent guesses that adding more green in the neighborhood will raise the environmental quality but is unsure how he will notice this improvement in the future. The respondent states that he thinks that the

neighborhood is already sufficiently green to him, but also states 'the greener the better' and thinks his liveability would be even more improved if other forms of greenery were implemented in the neighborhood. With other forms of greenery, the respondent means green areas designed for recreation, other than the current small public gardens spread throughout the neighborhood. The respondent thinks that by using such places, his experience of his own living environment would improve and he would not have to go to the Noorderplantsoen park that often anymore.

Question 5, Do you think that by adding more greenery or by making adjustments to the existing greenery, residents would be able to undertake more social activities?

Personally, the respondent thinks he would be able to participate in more social activities if the public greenery was designed for that purpose, but says he cannot speak for other residents. He thinks that if there were more green 'sitting spots' throughout the neighborhood we would naturally come in contact more with his fellow residents and form new social connections. The respondent states that he moves to the Noorderplantsoen park for the chess tables located there and that he comes in contact with strangers by making use of such tables. He suggests that such a facility would be an improvement to the park, combined with more sitting spots and benches. The respondent indicates that he is unsure if the overall social cohesion in the neighborhood would improve if adjustments are made to the existing greenery, but says this would certainly provide an opportunity for residents to meet each other and is curious to see what the effect would be.

Summary of notes interview 2

Thank you very much for agreeing to participate in this interview as part of my thesis. This interview will be completely anonymous. Only the notes taken during this interview will be used for this research. These notes will later be transcribed and analyzed. The results will be treated discreetly and will also be deleted after the completion of the research. Do you understand these conditions and do you agree to participate voluntarily?

Participant gave consent to be interviewed as part of the research.

First, the respondent was asked to provide his age and the duration of his or her residence in Selwerd.

The participant is 65 years old and has lived in Selwerd for 35 years.

Question 1, Would you please describe the environmental quality of the neighborhood? Think of factors such as temperature, flooding, air quality, and noise pollution.

The respondent indicated that she is quite satisfied with the environmental quality of her neighborhood. She thinks noise -and air pollution are no substantial problems, due to there being no heavy traffic in that part of the neighborhood where she lives. Although she sometimes experiences noise nuisance from young adults playing loud music on the streets. She determines the air she breathes in the neighborhood is clean and is very content with that. In terms of flooding, she experiences no problems. The respondent puts forward that as she has gotten older she has gotten less resilient against extreme heat during the summer. The fact that extreme heat and heatwaves are forecasted to occur more often in the future worries her. She indicated that during summer when the temperatures rise, heat can be a problem for her in the neighborhood. Although she has a garden that is quite green, she wishes she lived closer to a park or forest where she could enjoy some cooling around her apartment in the summer.

Question 2, Would you please describe the greenery in the neighborhood, and whether the amount, quality, and use of greenery is sufficient?

The respondent puts forward that she is aware the neighborhood was designed as an open and green environment. She agrees this has been achieved, however, she wished that the greenery would be 'more exciting' and better maintained. Around the apartment where she lives, there are some fields and trees but it is all quite boring, as she says. When bringing up the park in the conversation, she indicates that taking long walks there is problematic for her and wishes she had a similar environment closer to her house. She does not see people making use of the greenery around her house very often, other than people walking their dogs. She summarized that she is not dissatisfied with the amount of greenery in the neighborhood but would be open to suggestions on how to improve the existing green areas.

Question 3, Would you please describe the social cohesion between residents of the neighbourhood?

Regarding social cohesion, the respondent informs me that the people in the neighborhood used to be more in contact with each other in the past. This has changed over the years according to her, which she regrets. She says she used to know many of her neighbors and fellow residents but currently only knows those living in the apartments right next to her. Although she is not in contact with many of the other residents, she notes that the social connections in the neighborhood are not 'what they used to be'. She thinks trust and participation among the inhabitants have decreased over the years and is worried about loneliness among the elderly in the neighborhood. She indicates that she has family that would prevent her from becoming lonely, but fears that other elderly in the neighborhood might experience a different situation. According to her, this is an "overlooked problem" and should deserve "much more attention". The respondent notes that there is a community center that where elderly might turn to if they wished more social interaction.

Question 4, Do you think that by adding more greenery the environmental quality and your perceived liveability would be improved?

The respondent indicated that by adding more green spaces, her liveability and possibly that of fellow residents would be improved. She says that more flowers and plants would make the streets prettier and make people happier. She thinks that by installing more plants, trees, and green spaces the air quality and temperature would be improved, although she questions to what extent, given that the air quality and average temperature are not an issue to her. The respondent indicates she appreciates green environments such as parks and says that if the street she lives in would be turned greener with more flowers, plants, and trees she would regard this as a positive change. She also notes that she is aware of renewal plans for the neighborhood that should turn empty stone squares and streets into beautiful green areas. The respondent also regard this as a positive development.

Question 5, Do you think that by adding more greenery or by making adjustments to the existing greenery, residents would be able to undertake more social activities?

The respondent begins by indicating she is always in favor of initiatives where residents are given the opportunity to undertake social activities. The respondent indicated she has taken

notice of transformation plans for some parts of the neighborhoods where squares and streets should be transformed into inviting green areas. She thinks these newly created areas could provide a place for people to meet each other and form social connections. She thinks that if people are more in contact with one another the overall trust between residents would improve. If such a place were to be implemented close to her apartment so that she would not have to walk a large distance, she would certainly be interested in making use of it occasionally. She thinks that in such a place she could meet other residents and have a talk with them from time to time.

Summary of notes interview 3

Thank you very much for agreeing to participate in this interview as part of my thesis. This interview will be completely anonymous. Only the notes taken during this interview will be used for this research. These notes will later be transcribed and analyzed. The results will be treated discreetly and will also be deleted after the completion of the research. Do you understand these conditions and do you agree to participate voluntarily?

Participant gave consent to be interviewed as part of the research.

First, the respondent was asked to provide his age and the duration of his or her residence in Selwerd.

The participant is 47 years old and has lived in Selwerd for 19 years.

Question 1, Would you please describe the environmental quality of the neighborhood? Think of factors such as temperature, flooding, air quality, and noise pollution.

For a city, the air quality is quite good. Surrounding the neighborhood are some busy roads, but traffic within the neighborhood is quite calm. So air pollution is not really an issue according to the respondent. The traffic that is there does not produce much noise so according to those indicators the environmental quality is good. Floodings did happen in the past, but many streets were altered so water is now better transported. However when heavy rain occurs some streets still deal with too much excess water, but this is a local problem and not applicable to the entire neighborhood. In terms of temperature, the respondent indicates that he thinks that it has gotten warmer overall over the past years and that heatwaves and periods of extreme heat are more common. The respondent also indicates that when such high

temperatures occur the heat in the neighborhood is a problem. The respondent uses their backyard when temperatures rise, but indicates that outside, on street level, it is not pleasant to be. The respondent is somewhat worried about rising temperatures in the future and hopes that frequent heatwaves might still be bearable. So overall the environmental quality is quite good, except for high temperatures that might pose problems to residents.

Question 2, Would you please describe the greenery in the neighborhood, and whether the amount, quality, and use of greenery is sufficient?

The respondent indicated that he wishes the greenery in the neighborhood was more evenly spread, because some streets are much greener than others. He also indicated that the greenery in some parts of the neighborhood is much better maintained than in other parts and wished the municipality did more to go against overgrowth and deterioration of the neighborhood's green areas. For children, there is a sufficient amount of green playgrounds. However, the respondent indicates the wish for more green areas where adults can recreate and meet each other, other than making use of their own backyard. The respondent describes the current greenery mainly as strips of grass that are not entertaining or pleasant to look at. Some other places with plantations are overgrown. The respondent indicated that there is a park, but for the respondent, the walking distance is too far and in the park, there are no facilities that invite the respondent to spend time there. He occasionally takes a walk there but the park is not a place he spends much time in or meets fellow residents. The respondent indicates his wish for more green areas close to his home that is inviting to spend more time.

Question 3, Would you please describe the social cohesion between residents of the neighbourhood?

According to the respondent, the social cohesion is in a good state. There are no large conflicts between residents and people go along well. People greet each other on the streets but the respondent indicated that he does not know many of his fellow residents. Residents do not undertake organized activities with each other. The respondent says that people can participate in activities through the community center. Through his children playing with other children, the respondent knows some of his fellow residents, but there is no deeper connection that leads to joint activities. The respondent indicated that if there were opportunities to socialize more with other residents he would take this opportunity.

Question 4, Do you think that by adding more greenery the environmental quality and your perceived liveability would be improved?

The respondent indicates that if the neighborhood became greener and the quality of the existing greenery was improved (no deterioration, no overgrowth, more plantation, more flowers, etc.) his experience of his own living environment would certainly be improved. The respondent is not sure to what extent the environmental quality would be influenced but thinks more greenery could attract more animals and possibly provide shade during warm days. He also thinks more greenery would be positive for his children. The respondent indicated that he appreciates nature and goes walking in the forest occasionally and indicated that this always leaves him with a positive feeling. So in that respect, adding more green to his own living environment would possibly also create those positive feelings and thus improve his perceived liveability.

Question 5, Do you think that by adding more greenery or by making adjustments to the existing greenery, residents would be able to undertake more social activities?

The respondent is not sure in what way adding more greenery residents would be able to undertake more social activities. However, he thinks that if the current green spaces in the neighborhood were transformed into meeting places for residents, he would certainly be able to participate in such activities. The respondent indicates that he thinks that residents are willing to meet one another and form stronger social connections, however, most residents do not have an inviting public meeting place right at their doorstep. The park could serve this purpose, but currently, the respondent thinks that the park lacks sufficient facilities and infrastructure to make this possible.

I showed the respondent examples of community gardens and asked him to reflect on this concept.

The respondent thinks installing several of these gardens, where residents are responsible for the maintenance, would be a good idea. He thinks that community gardens could be places where residents meet each other and where children can be taught some things about nature: how to grow crops for instance. The respondent emphasizes he thinks that installing green meeting places would have a positive effect on his living experience, and possibly also on that of his neighbors and fellow residents.

Appendix III. Visual representations



Figure 22: Current situation at Selwerd Park, Rtvnoord.nl, 2024



Figure 23: Possible future situation in Selwerd park, [Businessnews.com.au](https://www.businessnews.com.au), 2024



Figure 24: Example of a community garden in a densely built-up area, [Urban harvest.org](https://www.urbanharvest.org), 2024

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