A Different Perspective

An exploration of the 'Social DNA' of the ABG area and the added value of this social perspective for Water Board Brabantse Delta in a time of complex challenges

A case study of Alphen-Chaam, Baarle-Nassau and Gilze and Rijen, The Netherlands

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Acknowledgements

Luckily no blood, also no sweat, but to be honest quite some tears later, here lies my final work and the culmination of my time as a Master's student in Development and Rural Innovation at Wageningen University. I vividly remember entering my first period with great enthusiasm about two and a half years ago. A few weeks later, I found myself, 'somewhat emotional', in the Leeuwenborg building to meet Lieke de Kwant, my study advisor. The amount of new information during the first few weeks of the first period had overwhelmed me, and I doubted whether I was smart enough for what I was doing. Terms such as 'boundary objects' and 'ontologies' were completely new to me, and for a long time, I had the feeling that I had no idea what I was doing. In short, I doubted my choice. I even doubted whether I should even continue. Lieke asked me about my interests and the reasons why I ended up in this Master's program. Fortunately, I had an answer to that question. She assured me that my interests aligned well with this program and that I should realize it was also quite a switch; transitioning from a Bachelor's in Landscape Architecture and Spatial Planning to a social Master's program in Development and Rural Innovation. Nobody here expects you to flawlessly reproduce what a 'boundary object' or 'ontology' is after just a few lectures, she assured me. Additionally, I had to be careful with comparing myself to others; some of my classmates already had work experience in this field, had taken more social science courses, or simply made connections more quickly. That's okay, Lieke reassured me, focus on what you can learn from the others instead of what you do not know yet. Additionally, she asked me to at least finish the first period. She said I was not the only one feeling like this during the first weeks of the MDR program. However, she told me that most of those who visited her with similar feelings to mine, ended up really enjoying the program in the end. She asked me to at least finish the first period? Yes, I answered. This conversation stuck with me throughout my time as a Master's student. Sometimes just the thought of it helped when I was struggling, and sometimes I needed someone from my environment to remind me of it. Anyway, a few years have passed, and I am now typing the last few words of my final assignment for Wageningen University. I think we can all guess that I did not quit after that first period.

Following from this story, my first thank you goes out to Lieke. I want to thank you for our pleasant contact throughout my time as an MDR student, it was really nice to know that I could reach out any time and to know you were always willing to think along.

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Abstract

Research problem: With its current water management program, Water Board Brabantse Delta aims to realize a climate-proof and resilient water landscape. However, the challenges the Water Board faces in order to reach this goal are becoming increasingly complex. A mix of climatological changes, spatial challenges and societal changes call for the Water Board to change their 'status quo way of doing things' and look beyond their traditional blue/green Water Board glasses. This research is a first exploration into what a different, more social, perspective has to offer for Brabantse Delta as one of the Dutch regional water managers. It dives into the 'social DNA' of three municipalities (Alphen-Chaam, Baarle-Nassau and Gilze and Rijen) who work together in one single executive organization. It also dives into the networks that exist within the study area which offers the Water Board an overview of potentially non-traditional network partners that could be valuable to explore connections with in the (near) future. The latter is done by identifying certain themes (boundary objects) that many actors engage with already and by visualizing the networks surrounding these themes. Finally, it links all these findings to theories from the field of Disaster Studies to examine what elements of the ABG municipality's social DNA can be regarded as either valuable capacities or vulnerabilities to keep in mind as a regional water manager. An analysis of how these different elements relate to one another as well as some practical information on how this can be taken up by the Water Board in its Strategic Crisis Management model is also included in this report.

Methods: The research questions developed for this research project were primarily addressed by conducting semi-structured interviews. A general interview guid was developed to maintain consistency across all interviews that were conducted. Each respondent was asked to share their organization's view on the 'social DNA' of the ABG area. Before each interview, the general interview guide was supplemented with several probe questions specifically tailored to each specific organization. These probe questions were formulated based on desk research. The results were analysed using the software tool Atlas.ti by means of a coding three that was based on a combination of both inductive and deductive coding.

Main findings: The ABG area consists of three separate municipalities, which are also experienced as such by its residents, who work together on executive level. This political construct comes with several snags related to capacity problems. All villages, except for Rijen are small with old-school village characteristics where people know and look out for one another. It is an area that mainly consists of rural, agricultural land and is also rich in forests. These two directly translate to the main economic activities in the area which are agricultural production and recreation geared towards small-scale, peaceful types of tourism. The recreational value of the area is enriched by the unique enclave situation in Baarle-Nassau, which comes with international attention as well as with some political challenges from time to time. The social network analysis made for the ABG area illustrates the many networks that exist outside the current network partners of the Water Board. By means of identifying two topics that serve as boundary objects in the ABG area, spatial planning and recreation, and the existing networks around these topics valuable new network opportunities are presented to the Water Board. Finally, the analysis on vulnerabilities and capacities in the area shows that the 'social DNA' can definitely be of importance to take into account as a regional water manager.

List of abbreviations

ABG	Alphen-Chaam, Baarle-Nassau and Gilze and Rijen
CGA	Convention of Municipal Archaeologists
CBS	Central Bureau of Statistics
DRMC	Disaster Risk Management Cycle
GGD	Municipal Health Service
NLGR	Nature and Landscape organization Gilze and Rijen
PAR	Pressure and Release Model
RAV	Regional Paramedic Services
SCM	Strategic Crisis Management
VCA	Vulnerabilities and Capacities Assessment/Analysis
VRMWB	Safety Region Mid and West Brabant
ZLTO	Southern Agriculture and Horticulture Organization (of the Netherlands)

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1. Introduction

As the front page and title reveal, this MSc thesis revolves around Water Board Brabantse Delta and the way in which they are dealing with the dynamic environment in which they operate. This thesis assists Water Board (Dutch regional water authority) Brabantse Delta in reshaping the way they look *at*, work *with* and work *in* the constantly changing context of their service area.

This introductory Chapter starts with a general introduction on the research topic and the forthcoming research problem, followed by a reading guide for the remainder of this report. Next, the research questions that were formulated to tackle the research problem are introduced. Finally, this Chapter touches on the relevance of this research project.

1.1 Problem statement and research objectives

The current water management programme of the Water Board that commissioned this research, Water Board Brabantse Delta, states that their main objective is achieving a “climate proof and resilient water landscape for Mid- and West Babant” (Waterschap Brabantse Delta, 2021, p.4). However, this is not an easy task. A combination of climatic, spatial and societal changes (which are all explained in further detail in Chapter 4) makes the realisation of the Water Board’s desired climate proof and resilient water landscape part of a complex challenge that reaches beyond the Water Board’s ‘official’ tasks and responsibilities. Even though the Water Board itself does not go as far as to say that the challenge they face is a ‘wicked problem’, one could argue the goal they are trying to realize does fit some of the characteristics of a ‘wicked problem’. Churchman (1967, p. 141) explains that these are problems or challenges which are “ill formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing”. For their respective service area, Water Board Brabantse Delta faces the challenge of navigating this complexity and advocating for the interests of water and water management.

Regarding the climatic aspect, Water Boards have a lot of in-house knowledge. Their specialists are able to translate data and predictions on climate change and its effects on the water system to their respective service areas and propose and implement measures accordingly. However, due to climate change, the weather conditions have become increasingly unpredictable, meaning we sometimes experience weather events we never saw coming, like the extreme rainfall in the summer of 2021 in Limburg (Deltares, 2021). Water Board Brabantse Delta took this as a warning sign which led to the realisation that many of their daily practices were focused on preventing them from failing to realize one of their three main duties (water safety, water quality and water quantity, all further explained in Chapter 4). Preventing weather events like those in Limburg is simply not possible, so since 2022 they have slowly but surely started to broaden the range of measures they take so that if something like this does happen in their service area, they are (for example) able to minimize damage and recover quickly. They have taken on this challenge by adapting a framework that is widely known in the field of Disaster Studies as the Disaster Risk Management Cycle (DRMC). They have redesigned this model, taking into account several critiques on the original concept and adapting it to the specific context of the Dutch water management sector. A detailed description of this model can be found in Chapter 4.

Another challenge the Water Boards face is that they are not the only ones having an interest in their service area. There are many other actors who want to realize their own respective objectives just as badly as the Water Board itself, however the way other actors want to use the area is not always in line of what would be optimal from a water perspective. In other words, space is scarce nowadays, different interest are at play and Water Boards are faced with the challenge of negotiating this complex field to get the best possible outcome for our water systems.

Besides this, Van Buuren, Klijn & Edelenbos (2011) emphasize that in today’s society, it is not only important *what* you are trying to do as a government authority, but also *how* and *with whom*. Building on this, Dückers (Personal Communication, 10 January 2024) argues that as the challenges you face (as a Water Board) become increasingly intricate and extend beyond the conventional boundaries and responsibilities of your organization, it becomes more and more important to look beyond the borders of your own organization. He explains that there are essentially two layers when you look past the borders of your own organization; The first one being your ‘traditional’ network partners, these are the organizations you work with on a regular basis to realize your goals and the second layer consists of the society you serve. I would argue there is one additional layer, which consists of organizations that find themselves in between the category of 'network partners' and 'individual citizens'. This additional layer consists of organizations in society that are not (yet) network partners of the Water Board but are organized groups of society. Examples of this are sports associations, local history associations etc. Figure 1 illustrates this way of thinking.

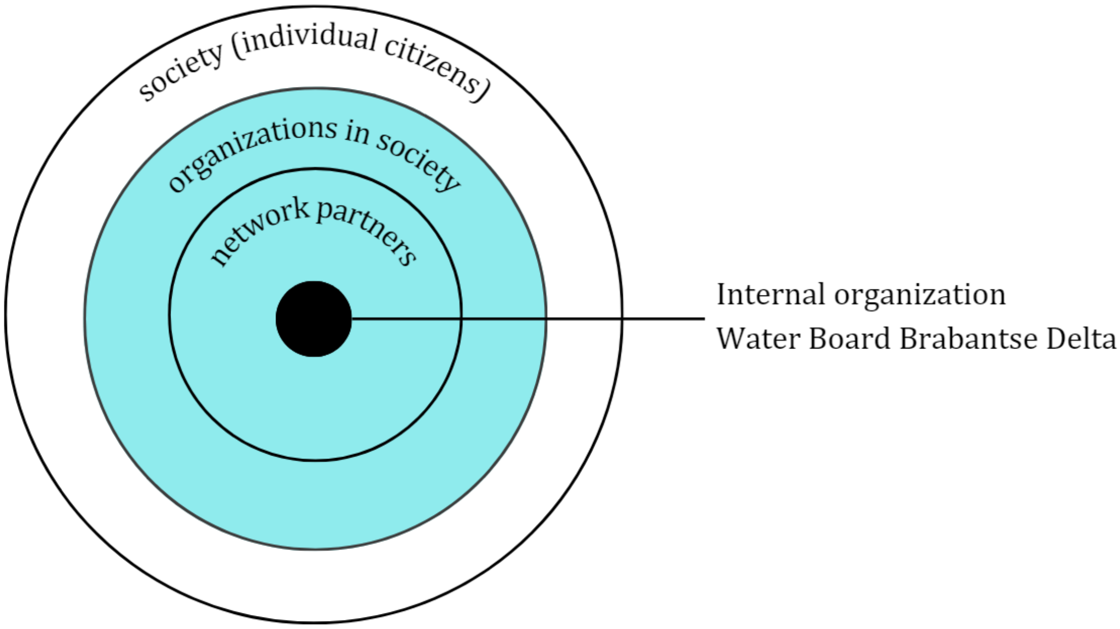

Figure 1: Visualization of the different layers in which the Water Board operates with the scope of this research project marked in light blue

Water Board Brabantse Delta has several 'traditional network partners', examples are municipalities that belong to their service area, the province of North-Brabant, Rijkswaterstaat, nature organizations etc. However, the challenges they are starting to face now, require them to broaden their view and look past this traditional set of network partners. However, looking past this requires a new way of thinking about, looking at and interacting with the actors in their service area. In other words, it requires the Water Board to take off their blue and technical Water Board glasses as, from an integral point of view, these traditional blue Water Board glasses only offer a limited view of their service area. These glasses do not allow them to take into account the 'social DNA' of the area they operate in. Water Board Brabantse Delta acknowledges that this social knowledge is indeed a blind spot. Broadening their view might help the Water Board better understand what is going on in their service area and can open their eyes to new 'non-traditional' network partners as well as developments that might become more important now that challenges the Water Board faces are becoming more and more complex. It can also help the Water Board in better understanding the needs of and different types of sentiment in their service area and allow them to cater to this information more.

Put shortly, due to the environment and the Water Board's challenges becoming more complex, Water Board Brabantse Delta argues that its current view on its service area might be too narrow. Broadening their view, looking beyond their traditional network partners and gaining a deeper and more complete understanding of the 'social DNA' of its service area, would benefit them in their role as water manager. As the Water Board currently lacks the knowledge required for mapping out the social side of their service area, they have turned to Wageningen University for assistance. This research project will assist Water Board Brabantse Delta bridging this knowledge gap. It will explore if an additional pair of social glasses is indeed valuable for the Water Board by providing an exploratory research into the 'social DNA' of a specific part of their service area. Furthermore, this research will offer insights into specific elements of this 'social DNA' that can be regarded as either vulnerabilities or capacities. The latter is linked to the Water Board's ambitions surrounding Strategic Crisis Management. This will be further elaborated on in Chapter 4, which also provides an explanation on what is meant by 'social DNA'. The final objective of this research is to provide a general method for mapping out the 'social DNA' which can be applied to any area in case this is indeed something the Water Board wants to implement at a larger level in the future. The chosen study area for this research project consists of three municipalities; Alphen-Chaam, Baarle-Nassau and Gilze and Rijen, also known as the ABG area in the political context. The study area will be introduced in more detail in Chapter 3.

Following from this, the main research question that was composed for this research is:

What does the 'social DNA' of the ABG area look like and what elements of this 'social DNA' can be regarded as vulnerabilities or capacities that should be taken into account when working on Strategic Crisis Management?

This research project is exploratory in nature as this is the first time Water Board Brabantse Delta explores the potential added value of such a social analysis for their role as a regional water manager. This, combined with the limited time available for this research, makes that the main goal of this research project is not to paint a complete picture of the 'social DNA' of the ABG area. Therefore, if something or someone is not mentioned in this report, this does not automatically mean it is not at play or this actor is not of importance.

As mentioned earlier, the remaining sections of this Chapter elaborate on the research questions and the relevance of this research. The remainder of this report is structured as follows:

Chapter 2: Conceptualisation and Theoretical Framework – This chapter provides an in-depth explanation on several concepts that are used in this research and introduces the theories that make up the theoretical foundation of this research.

Chapter 3: Methodology – This chapter briefly introduces the ABG area and explains what research methods were employed to answer the research questions. In addition it also touches on some ethical considerations that have been taken into account for this research.

Chapter 4: Context – This chapter provides some additional background information about (the tasks of) Water Boards and on the different challenges that Water Board Brabantse Delta is facing. If one is not familiar with either or both of these topics, it is advised to first read through this Chapter and then come back to Chapter 2.

Chapter 5: Results: the ABG area through the DESTEP lens – This chapter includes the first part of the results of this research. It elaborates on all information that was gathered on the 'social DNA' of the study area which aids in formulating an answer to the first sub-question.

Chapter 6: Results: Social Network Analysis of the ABG area – This chapter provides the second part of the results needed to answer the first sub-question that was formulated for this research and elaborates on the networks of all actors that took part in this research.

Chapter 7: Analysis: Boundary work – combines the information from the previous two chapters and the concepts that were taken from the field of Boundary Work (boundary objects and boundary spanning) and uses these concepts to analyse certain boundary objects (and the networks surrounding them) in the ABG area.

Chapter 8: Analysis: Applying VCA and PAR to the ABG area – This chapter combines the results as presented in chapter 5 and 6 and analyses what elements can be regarded as either vulnerabilities or capacities in the ABG area. Additionally, it provides an analysis on how these elements can be linked to the Water Board's Strategic Crisis Management model as well as a general analysis on how these different vulnerabilities and capacities relate to one another.

Chapter 9: Discussion – This chapter critically reflects on this research as a whole. It elaborates on the value of the chosen Theoretical Framework for the context of the work of Water Board Brabantse Delta and dives into some critical notes on the execution of this research project.

Chapter 10: Conclusion – This chapter summarizes the main findings of this research which, all together, formulate an answer to the main research question that was developed for this research project.

Chapter 11: Recommendations – This final chapter is mainly aimed at Water Board Brabantse Delta as it elaborates on several recommendations I suggest based on my findings and experiences whilst conducting this research. It also elaborates on a suggested method which the Water Board can use as a guideline for possible similar analysis in the future.

1.2 Research questions

As was introduced in the previous section, the main research question that was developed for this thesis is:

What does the 'social DNA' of the ABG area look like and what elements of this 'social DNA' can be regarded as vulnerabilities or capacities that should be taken into account when working on Strategic Crisis Management?

To help answer this main research question, three sub-questions were developed:

1. What does the 'social DNA' of the ABG area look like?
2. What does the network of actors look like in the 'social DNA' of the ABG area?
3. What elements in the 'social DNA' of the ABG area can be classified as vulnerabilities or capacities and how can these be taken up in Strategic Crisis Management?

The terms 'social DNA' and Strategic Crisis Management will be explained in further detail in Chapter 4. Vulnerabilities and capacities refer to vulnerabilities and capacities for the inhabitants of the ABG area. Their definitions are taken up in the Theoretical Framework, which is to be found in Chapter 2.

1.3 Relevance

1.3.1 Scientific Relevance

Mapping out the 'social DNA' of an area is not a new field in general. However, doing so from the perspective of a Water Board is quite new. Therefore, this research will contribute to existing literature on mapping the 'social DNA' of an area and, in particular, offer a new lens through which this context can be examined: the lens of the Water Board.

Furthermore, the research outcomes will be linked to Strategic Crisis Management (SCM). For instance, which stakeholders or networks can be crucial building blocks for recovery after a calamity. Since literature on this subject is still very limited in the Dutch context, this research will also make a contribution in this regard.

1.3.2 Societal relevance

This research is socially relevant because its findings will contribute to the practices and learning capacity of the Water Board as a governmental organization. The insights gained from this research will be directly applicable to the work of the Water Board in the municipalities included in the study area. Additionally, the research is expected to lead to general insights that could be important for the Water Board as a whole. Lastly, the methodology used to capture the 'social DNA' of the ABG area will also be applicable to the entire service area of the Water Board. As a whole, this social perspective can contribute to enhancing the effectiveness and resilience of the Water Board in a complex and rapidly changing context.

2. Conceptualisation and Theoretical Framework

2.1 Conceptualisation

This Chapter elaborates on several concepts used to guide this research. It starts out by elaborating on what exactly is meant when we refer to 'social DNA'. For this, the DESTEP model is used as a foundation for this so this model will be elaborated on as well. This is followed by a description on the method that is used to map out the different actors in the 'social DNA', the Social Network Analysis (SNA). Finally, the Chapter also explains in more detail what Strategic Crisis Management entails.

2.1.1 'Social DNA' and the DESTEP model

As explained in the introduction, Water Boards have a lot of in-house knowledge about the physical environment of their management. This, for example, includes geological, ecological and hydrological knowledge. This knowledge is needed in order to perform their day-to-day tasks. Besides, their employees have a lot of technical knowledge on how to optimally use technical solutions like dams and weirs to optimize water management. This thesis looks at how a completely different type of knowledge, knowledge about the 'social DNA' of an area (which is not yet explicitly taken up in the Water Board's way of working). It explores if this alternative type of knowledge can help them improve as an organization and cope with the dynamic set of challenges they face in trying to realize a climate-proof and resilient water landscape.

Essentially, what part of this research project does then is complete a so-called DESTEP analysis for the ABG area. The DESTEP (acronym for demographic, ecological, socio-cultural, technological, economic and political) analysis is a well-known extension of the PEST analysis. The PEST analysis was first introduced by Harvard University professor Francis J. Aguilar in 1967. Aguilar introduced the model as a "market analysis tool by which an organization [could examine] external uncontrollable factors of the market environment (political, economic, social, technical) in order to improve its competitive position in the market" (Danilova & Kuznetsova, 2020, p. 152). Since its introduction, many scholars have adapted and extended the PEST analysis. DESTEP is one of these extensions. Essentially, a DESTEP analysis serves the same goal as the original PEST analysis. However, it takes into account two additional factors on top of those that were already included in the PEST model. These additional factors are demographic and ecological factors (Vlieger, 2012). Even though this model is mainly used in business settings, to map out the context in which companies are operating and launch products, it can also be helpful to other types of organizations, for example Water Boards.

For the part of this research that explores the 'social DNA' of the ABG area, the DESTEP model serves as a guiding principle to structure the findings on this topic. For this research, the six themes included in the DESTEP model were adopted one by one. However, in consultation with the Water Board some of their definitions have been slightly adapted to fit this research's purpose. What is included in each respective theme is elaborated on below. Even though all themes are presented separately, it is important to note that in reality, they can overlap. This will become clear in the results section of this report.

Demography

The demographic aspect of the DESTEP analysis mostly revolves around qualitative information on the population of the study area. It includes information such as the current size and expected growth or decline of the population. Data on such topics is often published by the Central Bureau of Statistics (CBS) of the Netherlands. Their data is publicly available and is often already disaggregated into municipal level information which is useful when looking at a smaller study area as is the case for this research project. Other themes included in the demographic aspect are population density, income levels and population composition. Composition refers to topics such as age structure, educational background and ethnicity.

Economy

The economic aspect of the DESTEP analysis looks at the economic activities in the study area. It takes into consideration an area's main economic drivers and elaborates on how these have evolved over time and what developments are important to keep in mind when thinking about future economic activity in an area. Economic activity can often be linked to information on an area's environment, which is another aspect of the DESTEP analysis which will be explained in one of the following sections.

Socio-Cultural
The socio-cultural aspect of the DESTEP analysis partially translates the demographic information into how these facts are experienced by inhabitants of the study area. For example, small populations can result in tight-knit communities which can in turn explain why social cohesion is particularly high in a certain village. The socio-cultural aspect also takes into account information on the culture and social norms, values, and structures of a given area. Additionally, this part of the DESTEP analysis also takes into account how people are organized. This information can be valuable when, for instance, seeking to engage with a community more.

Technological
The technological aspect of the DESTEP analysis is not part of the scope of this research as it argued that this is the bread and butter of the Water Board. In this research project, the technological aspect can be understood as the measures the Water Board takes to manage the water systems in the study area. These include policy measures like water level ordinances and temporary sprinkling bans during the dry season, but also physical structures like dikes.

Environmental
In the original DESTEP model, the second 'E' stands for ecological. For this research, however, this category has been broadened to 'environmental'. Regarding this aspect, the same holds up as for the technological aspects as Water Boards also already have a lot of in-house knowledge on the physical environment of their service area. However, information on the environment can provide important context for findings regarding the other DESTEP aspects. Therefore, this report does include some information on the environmental characteristics of the study area. The environmental aspect encompasses information on soil types, for example, sandy soils are better suited for certain types of activity as compared to clay soils. In addition, the environmental aspect also takes into account land use, for example, how much urban area can be found in a study area or what proportion of the total area is used for agriculture.

Political
The sixth and final aspect of a DESTEP analysis focuses on political information. This aspect very much depends on the scale of your research. In a research project with a relatively small study area like this research area, it is most valuable to look at local level political structures; How are local politics organized and how do they influence, manage and interact with the environment they serve. This aspect also takes into account the stability/continuity of the political system in the study area.

Following from this, the Water Board already has a lot of in-house knowledge about the 'physical and technical DNA' of their service area, consisting of environmental and technical knowledge. This research explores the aspects of the DESTEP analysis which make up the 'social DNA' of a place, which is then a combination of knowledge on the demographic, economic, socio-cultural and political characteristics of an area. This definition overlaps with some more well-known concepts that touch on similar topics, like ''social DNA'' and 'soft infrastructure'. The former refers to the network of social relationships, cultural norms, values, and institutions within a society that contribute to its cohesion and functioning. It encompasses the social bonds that hold communities together. It has a lot to do with communities and social cohesion (Dückers, 2023). 'Soft infrastructure' as argued by Warner, De Jong, López-Gunn & Rica (2017, p. 66) "refer[s] to the networks and interactions among individuals, groups and institutions within and outside the community". In other words, the term 'social DNA' does overlap with the concepts of ''social DNA'' and 'soft infrastructure', yet is not confined to either or both of them. Besides, using the term DNA also refers to 'social DNA' not being something fixed. It can develop and change over time, just like human DNA.

2.1.2 Social Network Analysis (SNA)
The previous section highlighted the importance of networks in the 'social DNA' of an area. To help answer the second sub-question that was developed for this research project, which focuses on the networks within the ABG area, a tool known as the Social Network Analysis (SNA) will be applied. SNA is an analytical tool which allows researchers to, depending on the research objectives, study networks in various types of ways. It "takes as its starting point the premise that social life is created primarily and most importantly by relations and the patterns formed by these relations. Social networks are formally defined as a set of nodes (or network members) that are tied by one or more types of relations" (Marin & Wellman, 2014, p. 11). As Tremblay-Levasque, Warner, Gribanenkova & Robbins (2022, p. 26), SNA can assist researchers who are trying to gain insight in the (social) ties in a certain network to "grasp who the most influential players are, who performs 'bridge work', and how resources circulate. It can also help [them] assess why collaboration

exists between certain actors and what the barriers are for sparking collaboration between the others". SNA has been shown to be useful in many different types of networks. For example, it can assist researchers in gaining an in-depth understanding of how information flows, how diseases spread or how narratives are formed. Depending on the research objectives, the researcher can opt to study various parts of a network. For example, one can study the network as a whole, meaning its structure is the main point of study. Or, one can also focus on a smaller part of the network, this could mean one specifically looks at the ties between different nodes in the network (Marin & Wellman, 2014). Nodes or network members are usually people or the organizations these people work for. The Social Network Analysis that will be made for the ABG area, will use organizations as network members.

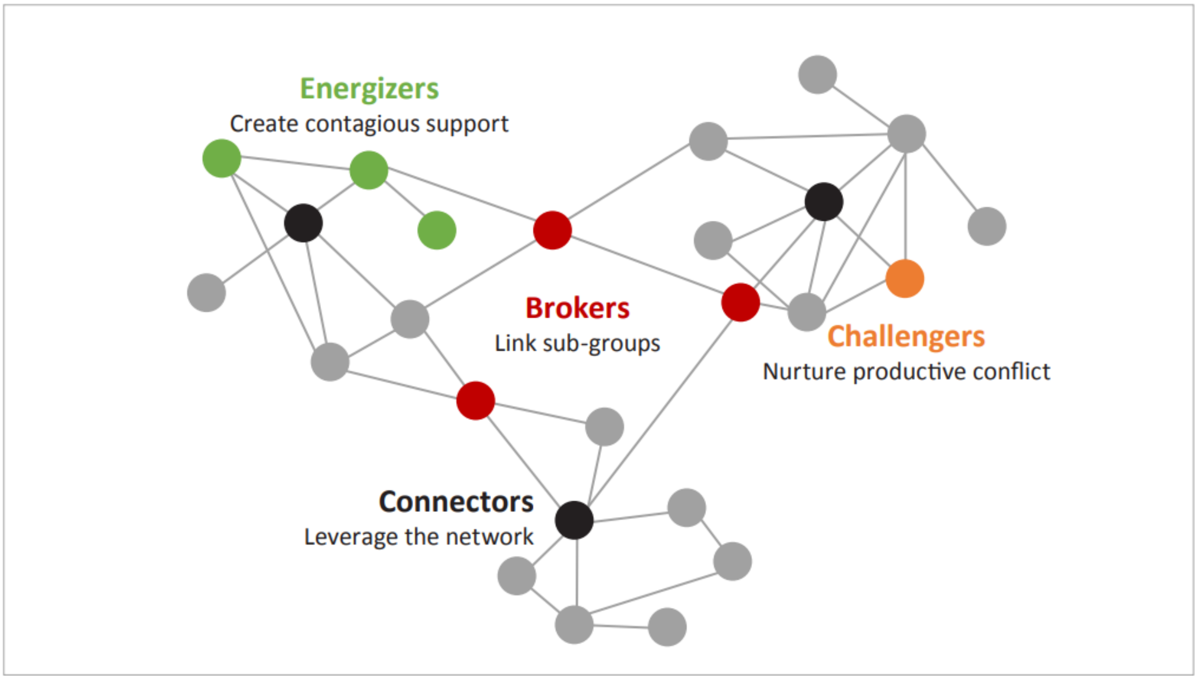

Figure 2: Visualization of a Social Network Analysis (Source: Cross, Gardner and Crocker, 2019)

The nodes identified in this research (the respondents and the partners they mention during the interviews) will be taken up in a similar network analysis as shown in Figure 2. One large network will be made which shows how respondents and the connections they will mention are related to each other. In addition, several smaller networks will be developed for the boundary objects that can be identified in the ABG area. For the networks surrounding these boundary object networks, actors taken up in these networks will be classified based on the function they fulfil within the network. These functions are based on the roles as introduced by Cross et al. (2019):

- **Energizers:** These individual nodes bring 'energy' and new ideas to the network. They assist in fostering a secure and cohesive environment conducive to the exchange of ideas and where team members feel free to engage in this exchange.
- **Connectors:** These are the nodes that leverage the network and foster collaboration between different individual nodes. Because of the way they are positioned in the network, connectors frequently serve as channels for information which other nodes reach out to for resolving problems.
- **Brokers:** These are the nodes that act as the bridge between different sub-networks.
- **Challengers:** These are the nodes that ask the critical questions and in doing so foster productive conflict.

These roles will not be assigned in the big network overview as functions of actors can differ per theme. For example, a local nature association can be a challenger when it comes to tree cutting policies, but can serve no particular function on another topic. Providing these functions for actors who engage with boundary objects can provide valuable information on what actors might be good entry points for the Water Board to get in touch with. For example, if the Water Board wants to start collaborating on a theme that is quite new to them, it might be better to connect with a connector than with an individual energizer.

As emphasized in Chapter 1, the aim of this research is not to provide a *complete* SNA for the study area, but rather to see if such an analysis would be helpful for the Water Board in their striving to broaden their view on the ABG area and potentially expand their network beyond their current traditional network partners.

2.1.3 Strategic Crisis Management (SCM)

As mentioned in Chapter 1, climate change is a pressing challenge for the Water Board (this is explained in further detail in Chapter 4). It has caused the predictability of weather conditions to decrease which, in turn, has caused the control Water Boards have over weather-related calamities to decrease as well. Various weather extremes in the Netherlands in recent years, particularly the water bomb in Limburg in 2021, have prompted Water Boards to think about how they can prepare for and deal with such events in the future (Schuwer & Vermeulen, 2022). Water Board Brabantse Delta concluded that since they cannot prevent such events from happening, they should broaden their view from putting almost all their attention, efforts and resources towards preventative measures to also looking at what else can be done to increase resilience. Essentially, Water Board Brabantse Delta is making a shift from what is known in the field of Disaster Studies as wanting to be 'fail-safe' (trying to achieve a system which does not fail at all) towards 'safe fails' (if something happens, the system can fail in a safe manner, i.e. economic loss and loss of human lives is limited) (Ahern, 2011). Water Board Brabantse Delta has taken up these ideas by implementing a model they refer to as Strategic Crisis Management (SCM), which is based on the well-known Disaster Risk Management Cycle (DRMC) as shown in Figure 3.

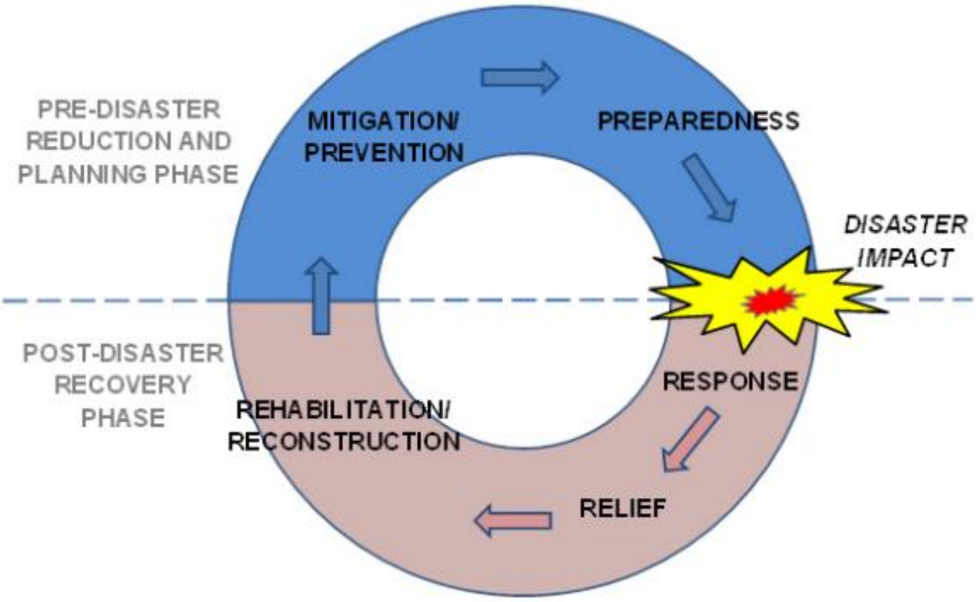

Figure 3: The Disaster (Risk) Management Cycle and the phases it is composed of (Bosher & Chmutina, 2017)

Since its first introduction, this cycle has been used by many scholars within the field of Disaster Studies. However, it has also been subject to quite some critique (Lee, Chmutina and Van Niekerk, 2021). When it was first introduced, disaster management mostly revolved around response and relief efforts after a disaster took place. In other words, a disaster was seen as the start of the cycle and risk reduction measures (which can be taken before a disaster takes place) were largely left out of the picture (Lewis et al., 1976). During the second half of the 20th century, the world experienced an increase in disasters with greater impact, both in terms of economic loss as well as human lives (Wisner et al., 2004). This led to an increased awareness of needing to move away from this overly reactive response to disaster risk, towards an approach that also focused on pre-disaster reduction efforts. These efforts largely revolved around what can be done to prevent hazards, which we largely cannot impact, from *becoming* disastrous (Bosher, 2008). This led to several alterations of the 'original' DRMC, which from then on mostly regarded the disaster itself as *part of* the cycle instead of the factor *initiating* the cycle and also put more emphasis on pre-disaster measures to minimize impact. Nevertheless, these alterations still implicated that disasters were cyclical in nature. In their article 'stop going around in circles: towards a reconceptualization of disaster risk management phases' Bosher, Chmutina and Van Niekerk (2021) argue that this cyclical approach is fundamentally incorrect. Instead, they propose a helix diagram as visualized in Figure 4. These scholars argue that based on the identified threats in an area (A), those in charge can take preventative and mitigative measures (indicated by the blue lines). Then, when a hazard comes along and meets vulnerabilities in a given area which results in a disaster (B), its impacts will have been reduced to these pre-disaster disaster risk reduction efforts. The disaster itself will be followed by post disaster response and recovery efforts (indicated by the red lines) which transition into new/additional preventative and mitigative measures (again, indicated by the blue lines). This process keeps repeating itself until "the impact of the next disaster 'event' is (ideally) significantly reduced (C) and possibly in some cases eliminated (D) [over time]. [Figure 4 also includes a 'resources/efforts' axis] to illustrate that, if Disaster Risk Management (DRM) is addressed in a sustainable manner, then less resources may be required in the future" (Bosher et al., 2021, p.7)

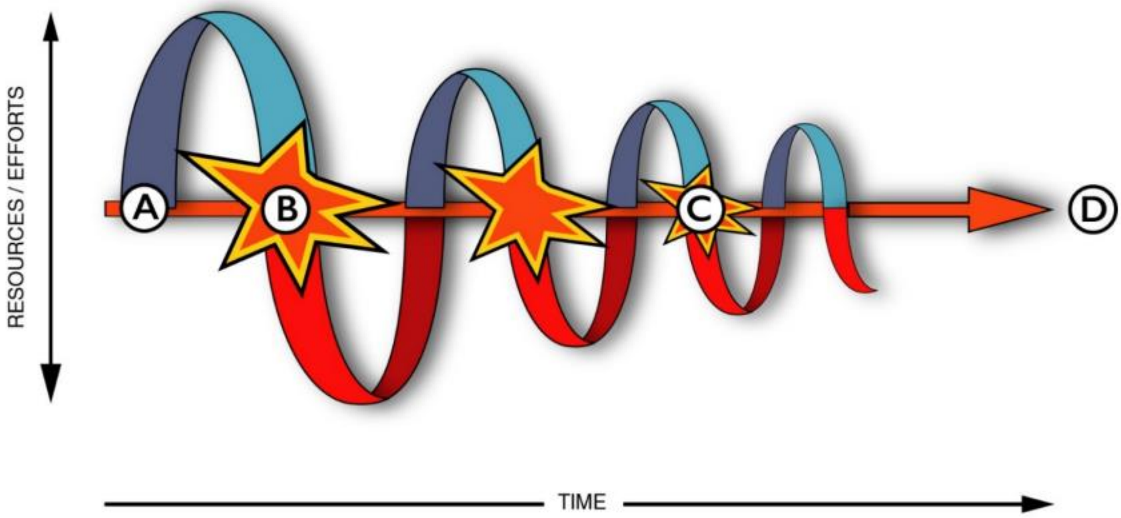

Figure 4: Helix diagram illustrating a reduction of risk over time (due to risk reduction interventions) (Bosher et al., 2021)

Even though I strongly agree with these scholars that the DRMC should be a non-cyclical model, I am critical about the seemingly linear diminishing of impact as well as preventative measures (as well as resources/efforts required) that have to be taken over time. Hazards are not something fixed, climate change is showing us over and over again that things are possible which we could have never imagined. Therefore, I agree over time impact might decrease due to preventative measures, however this is not a linear process and comes with ups and downs. In that sense, the helix as presented by Bosher et al. (2021) may also be too simplistic a way of looking at disasters.

Water Board Brabantse Delta has taken on these main points of critique, adapted the models as presented above to their respective duties as regional water authority and developed a model they now call Strategic Crisis Management (SCM). This model builds on the five distinct aspects as presented in the DRMC (prevention, mitigation, preparedness, response and recovery), however it distinguishes itself from the original model in two ways. First of all, it takes on the critique on the cyclical visualisation of the model by literally taking out the cyclical element and presenting the five aspects as pieces of a pie instead of phases that follow up on one another. Besides, the story that is told when using the SCM model is that all of these aspects should be considered *before* a disaster takes place. In other words, they have taken the moment of impact (the disaster) out of the model. Figure 5 shows two common visualizations of this model developed by Water Board Brabantse Delta. As is argued by this Water Board, all these elements should be considered in the regular activities of the Water Board with the idea in mind that if a hazard meets certain vulnerabilities in their water system, they are prepared to fail in a safe manner. The 'strategic' part of the title of the model refers to the need to strategically decide what set of measures suits which of the three core Water Board duties best. Besides this can also differ per area. For example, if preventing negative impacts in certain areas is near impossible or extremely expensive, it might be better to invest in mitigation and preparedness measures instead of spending lots of money on prevention measures (e.g. heightening of dikes). Because of this, SCM is also often presented as a pallet of measures (right picture in Figure 5) which can be mixed based on an area's needs, vulnerabilities and capacities.

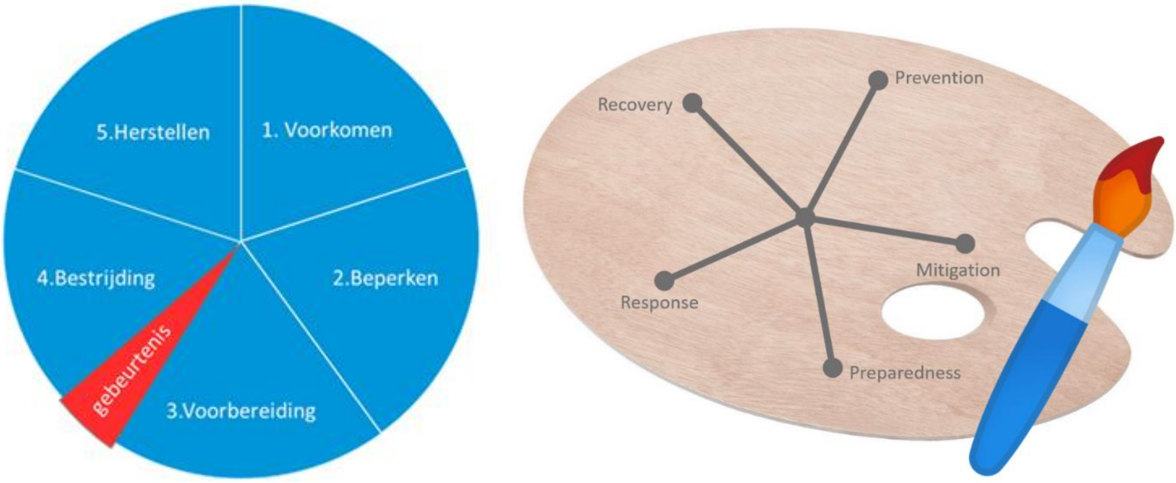

Figure 5: Two visualizations of Strategic Crisis Management as implemented by Water Board Brabantse Delta (Waterschap Brabantse Delta, n.d.)

The culmination of all this information resulted in the model as presented in Figure 5, consisting of five different elements. The five elements as presented and implemented by Water Board Brabantse Delta are (Deltares, 2023):

1. **Prevention**
   The realisation of a reliable and robust water system through regular maintenance, inspection and monitoring of assets and areas, efficiency/process optimization (improving, speeding up or changing maintenance. Legislation, handing out permits, and monitoring and enforcement also belong to this category.
2. **Mitigation**
   The realisation of measures that reduce the consequences of an event. These include spatial planning and adaptive building (in a changing environment with increased pressure on land).
3. **Preparedness**
   The realisation of an early warning system which results in early action due to increased awareness and self-efficacy of residents.
4. **Response**
   Making sure plans, capacity, equipment and materials are in place and are available and accessible 24/7. In addition this also includes agreements with partners about information sharing and manpower for crisis response.
5. **Recovery**
   Having a recovery plan in place for employees, assets and damage reports and making sure an evaluation strategy is present to address lessons learned.

2.2 Theoretical Framework

This research essentially consists of two main parts: (1) mapping out the 'social DNA' of the ABG area and (2) examining what elements of this 'social DNA' can be regarded as vulnerabilities and capacities and analysing how these can be taken up in Strategic Crisis Management. Therefore, to provide a solid theoretical framework for the set up and analysis of this research, this theoretical framework has drawn upon two domains. For the first part, there was drawn upon theories from the domain of Boundary Work. Two concepts from this field, boundary objects and boundary spanning/boundary spanning actors were used as the theoretical base for this research. These theories are used to formulate answers to the first two sub research questions. For the second part, this research has drawn upon work from the field of Disaster Studies, namely the Vulnerabilities and Capacities Assessment (VCA) and the Pressure and Release (PAR) model. A combination of these two frameworks has been used to formulate an answer to the third research questions.

The remainder of this Chapter elaborates on both theoretical domains explaining the concepts and frameworks that were used from each domain. Both descriptions are followed by a section on how each respective concept/framework, or a combination of the two, has been used for this specific research project..

2.2.1 Concepts taken from the field of boundary work

Boundary objects

When looking at the history of the study of social phenomena, many studies point to the importance of objects. Therefore, such objects have largely been used to study human action and interaction (Vakkayil, 2018). "Objects are treated as central, taken-for-granted entities within communities of practice, and achievement of membership in these communities involves developing capabilities to use them in certain ways" (Vakkayil, 2018, p.29). Many would at first glance associate the word object with some sort of physical artifact. However, over the years, several scholars in the social sciences have shown that an object can just as well be something intangible, it just depends on the definition one provides for such objects. Someone who dedicated a lot of her work to viewing objects as something more broad than just physical artifacts and also studied the implications of this way of thinking is Susan Leigh Star. In her work, Star (2010, p. 603) defined objects as "something people act toward and with. Its materiality derives from action, not from a sense of prefabricated stuff or 'thing'-ness. So, a theory may be a powerful object. Although it is embodied, voiced, printed, danced, and named, it is not exactly like a car that sits on four wheels". For the remainder of this report, this definition by Star will be used when using the word object. Using the term in this broader sense, allows us to study social interactions around all these 'additional' types of objects, like theories, ideas or concepts, too. An important characteristic of such objects is that they are not fixed, they actually travel across space and time. However, studies have shown that some objects retain their stability as they travel across different groups. Some famous work on this was done by Latour (1987) who referred to such objects as 'immutable mobiles'. The 'immutable' part refers to the stability these objects retain as they travel. The 'mobiles' part refers to their ability to travel across different social, cultural and institutional boundaries.

Following from these ideas of Latour, a similar view on objects evolved in the form of 'boundary objects'. This term was first coined by Star and Griesemer (1989) during their study of the establishment and development of Berkeley's Museum of Vertebrate Biology from 1907 to 1939. Their observation on objects, in their case the museum, came down to the idea that "some objects seem to be adaptable to different types of action and yet retain certain commonalities across communities that employ them" (Vakkayil, 2018, p. 30). Objects that possess this ability to maintain their core meaning across boundaries but yet are flexible enough to appeal to different communities are what they referred to as 'boundary objects'. In their own study, the museum functioned as such a boundary object, which was able to bring together various societal groups for their own respective purposes like universities, conservation activists etc.. In a later publication, Bowker and Star (1999, p. 297) elaborated on the characteristics of boundary objects as follows: "They are weakly structured in common use and become strongly structured in individual-site use, these objects may be abstract or concrete (…). Such objects have different meanings in different social worlds but their structure is common enough to more than one world to make them recognizable, a means of translation". A boundary object can thus serve as a common point of reference between different communities or groups with diverse perspectives, knowledge and goals (Bowker & Star, 1999). Boundary objects can also act as bridges between actors from different disciplines, fostering communication, collaboration and understanding across boundaries. These boundaries can be disciplinary, cultural, organizational, or even conceptual. Boundary objects possess the unique ability to bring together different interpretations and meanings for various groups while still maintaining coherence and consistency. They act as a shared language, enabling different actors to interact and work together that might otherwise not have collaborated (Star & Griesemer, 1989).

Boundary spanning and boundary spanning actors

A concept that closely relates to boundary objects is the practice of boundary spanning. It refers to the act of bringing things together across boundaries in order to be able to solve shared problems, to be able to innovate and/or to realize common dreams and hopes (Ernst & Chrobot-Mason, 2011). In other words, boundary spanning refers to the activities and interactions that occur at the interfaces, or boundaries, between different groups, departments or organizations. It involves individuals or entities that bridge these boundaries to facilitate communication, collaboration, and exchange of information, knowledge and resources. The goal of boundary spanning is to help overcome the challenges and barriers that often arise when groups with different backgrounds work together (Feldman & Khademian, 2007).

The people who perform the act of boundary spanning, can be referred to as boundary spanners or boundary spanning actors. As the concept of boundary spanning and boundary spanning actors has been used by many social scientists, many different definitions exist (e.g. Leifer & Delbeck, 1978 & Cross & Parker, 2004). For this research, a definition by Van Meerkerk & Edelenbos (2018) is used as a basis as it encompasses both the actors and the activities that belong to the concept of boundary spanning, and thus concretizes the function of a boundary spanner. Besides, it highlights that boundary spanning can occur *within* organizations as well as *between* organizations. Van Meerkerk & Edelenbos (2018, p. 2) argue that boundary spanners/boundary spanning actors are those who "who pro-actively scan the organizational environment, employ activities to collect information and to gain support across organizational or institutional boundaries, disseminate information and coordinate activities between their 'home' organization or organizational unit and its environment, and connect processes and actors across these boundaries".

Ernst and Chrobot-Mason (2011) explain that many people possess the ability to create bridges that cross boundaries, however they argue that spanning those boundaries is fundamentally different and is a skill not many people possess. Put simply: building a bridge to another city, does not automatically mean you have crossed this bridge yourself. The same holds up when creating bridges within and between groups and organizations; seeing or creating the opportunities for joint action does not automatically make it happen. Boundary spanners distinguish themselves by being the ones who actually cross these bridges. They are able to take what they know (in this case, knowledge or expertise), create and/or span a boundary within their own organization or between their own organization and one or more groups or organizations that lie outside of their own and foster collaboration. Schotter et al. (2017) argue that boundary spanning can either be formally appointed or it can happen informally. In other words, it can be part of a certain function but it can also be an intrinsic characteristic or way of working of people.

Boundary spanners can both use as well as create/unravel boundary objects. On one hand they can leverage these previously identified objects to foster cross-boundary communication and collaboration. However, boundary spanners can also be the ones 'creating' boundary objects. Creation here more-so refers to the unravelling of new boundary objects. Boundary spanners have the ability to understand different domains, which allows them to identify what objects serve as common ground and can serve as valuable boundary objects (Levina, & Vaast, 2005).

The concept of boundary spanning and boundary spanning actors has also already been shown to be useful in the context of water management in the Netherlands in a study by Warner, Lulofs and Bressers (2010). These scholars examined two cases regarding two Dutch secondary river flows called the Vecht and the Regge. Their study concluded that as space is such a scarce commodity in the Netherlands these days, decisions about the environment and the use of this environment are virtually impossible without at least some form of boundary spanning as one can easily step on another actor's toes. However, they argue that the level and timing of when to span boundaries can be of great importance. Regarding the time aspect they distinguish between proactive and reactive acts of boundary spanning. Proactive refers to boundary spanning early on in the project. Reactive on the other hand refers to boundary spanning in later stages of a project. Warner et al. (2010) explain that proactive boundary spanning comes with an important advantage as it comes with a lot of momentum, "as well as [a certain type of] freedom (…), so that one's hand is less easily forced by unexpected developments and constraints. It does not guarantee a successful outcome, but it certainly reduces the risk of project stagnation" (Warner et al., 2010, p. 147). Another important concept in their research was the act of counter spanning, which refers to acts of boundary spanning as a response to boundary spanning initiatives by a project initiator. This concept can add valuable additional insights about the interaction between different players in the network that will be mapped out to answer the second sub-question that was developed for this research.

Applying boundary objects and boundary spanning to this research

As was mentioned in Chapter 1 and will be explained in further detail in Chapter 4, the challenges Water Boards are facing are becoming increasingly complex. They are starting to transcend the boundaries of the traditional duties of a Water Board. In other words, these challenges can only be tackled by bringing together the expertise, experience and perspectives of multiple actors. And as their most pressing challenges span multiple types of boundaries (social, geographical, organizational), one could argue that so must the Water Board.

In order to foster connection and collaboration, this research links the practical findings on the 'social DNA' of the ABG area to theoretical work on boundary objects and boundary spanning. Identifying such objects for the ABG area can assist Water Board Brabantse Delta in gaining insight into what objects form common ground between actors in this part of their service area. On the one hand this can reveal new opportunities for collaboration, on the other hand it can also make existing collaborations visible of which the Water Board was not aware yet. In addition, identifying boundary spanners in the area, and possibly within the Water Board itself can shed light on important connectors in the area. Knowing who these individuals are, can offer valuable entry points for new and innovative ways of working together.

2.2.2 Concepts taken from the field of Disaster Studies

Vulnerabilities and Capacities assessment (VCA)
When assessing a community's or system's resilience to external threats (these threats can be natural hazards but also societal changes), a well-known approach is the vulnerabilities and capacities assessment/analysis, also known as VCA. VCA was first presented by Anderson and Woodrow (1989) with the aim of being used in development contexts. Nevertheless, its basic principles and methodologies can be used in non-development settings as well. The method involves identifying vulnerabilities and capacities regarding a given threat or multiple threats at once to which an area is exposed (McCall & Peters-Guari, 2012). In this approach, vulnerabilities are understood to be the weaknesses or susceptibilities that can lead to negative impacts and capacities, on the other hand, are seen as the strengths and resources that enable a group, community or organization to cope with and adapt to the challenges they face. This method is very specific and according to Davis et al. (2004) it works best when your research is confined to a smaller area. In the discussion (Chapter 9), the size of the study area will be reflected upon as well as the application of this method in a non-development context.

Since its introduction, VCA has widely been used in the field of Disaster Risk Reduction (DRR). It serves as an analytical tool to identify both vulnerabilities and capacities within a given area and its community as it aids in gaining an in-depth understanding of risk factors, their underlying causes as well as capacities that already exist and can be built upon when a disaster occurs. The UNDP (2017) distinguishes between three different categories of vulnerabilities and capacities:

Physical or material
This first category revolves around physical features which can both relate to the environment as well as the people living in this environment. Examples are "features of the climate, land, and environment where people live, or lived before the crisis; their health, skills, their work; their housing, technologies, water and food supply; their access to capital and other assets" (UNDP, 2017, p. 1). Even though significant physical and or material loss and damage is often involved in disasters, people always have some form of physical/material resources left. Examples are their personal skills and depending on the impact of the disaster also some goods. Besides, the presence of physical structures, like a road for example, can be a capacity in the sense that it can serve as an evacuation route. On the other hand, if a road is poorly maintained and can for example collide if an earthquake takes place it can be seen as a vulnerability .

Social or organizational
The second category encompasses the 'social DNA' of a community, it "includes the formal political structure and the informal systems through which people make decisions, establish leadership, or organize various social and economic activities. Social systems include family and community systems, and decision making patterns within the family and between families" (UNDP, 2017, p. 1). Social cohesion and participation are also important factors in this category.

Motivational and attitudinal
The final category focuses on motivational and attitudinal elements which "include cultural and psychological factors which may be based on religion, on the community's history of crisis, on their expectation of emergency relief. Crisis can be a catalyst for extraordinary efforts by communities, but when people feel victimized and dependent, they may also become fatalistic and passive, and suffer a decrease in their capacities to cope with and recover from the situation. Their vulnerabilities can be increased by inappropriate relief aid, which does not build on people's own abilities, develop their confidence, or offer then opportunities for change" (UNDP, 2017, p. 1).

As this research focuses on the 'social DNA' of the study area, it is expected that the category on social and organizational vulnerabilities and capacities will be most valuable for this research project. In reality however, the boundaries between these different categories are not as clear cut as presented here. Therefore, certain elements of the other two categories might also be referred to in the analysis of the research results.

Pressure and Release Model (PAR)

The second part of theory for the second part of the research is another well-known model from the field of Disaster Studies called the Pressure and Release model, also referred to as the PAR model. This model, shown in Figure 6, was introduced by Wisner et al. (2004) and argues that the risk people face is a where a hazard (which are believed to be beyond human control according to this model) meets the vulnerabilities in a certain system. A core principle of the model is that "vulnerability is rooted in social processes and underlying causes which may ultimately be quite remote from the disaster itself" (Wisner et al., p. 50).

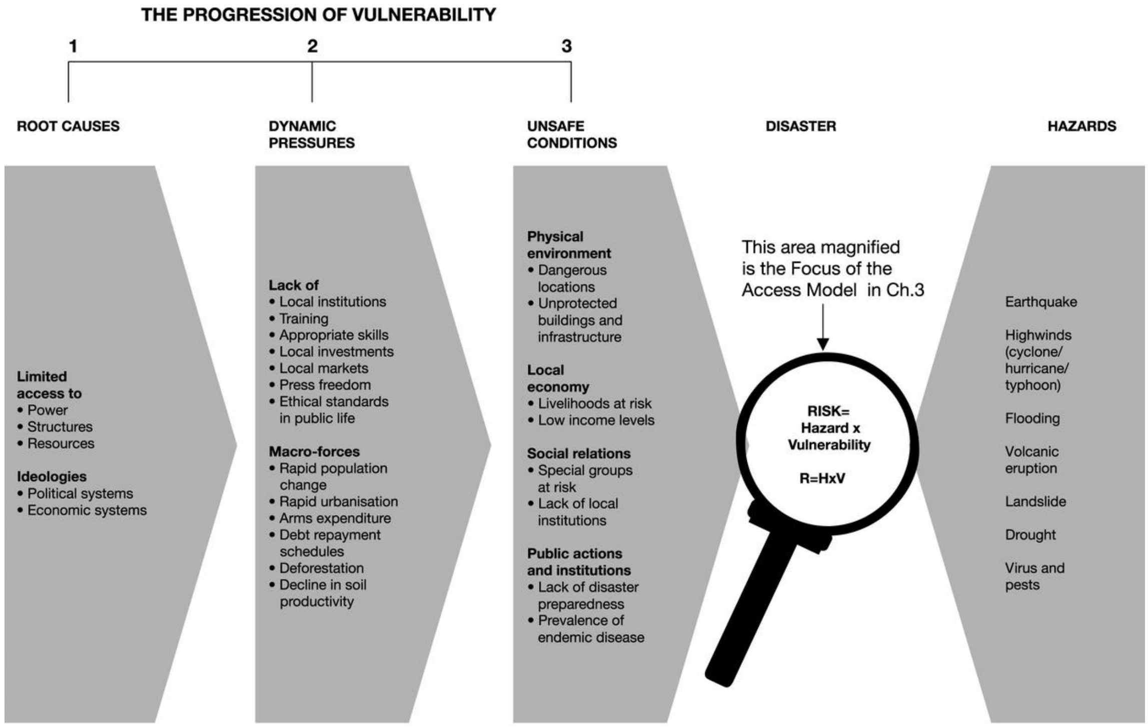

Figure 6: Pressure and Release (PAR) model – the progression of vulnerability (Wisner et al., 2004)

As Figure 6 shows, (social) vulnerability is understood in the PAR model as a concept with multiple layers. Wisner et al. (2004, p. 35) distinguish between three layers of vulnerability. They explain that "'underlying factors' and root causes embedded in everyday life give rise to 'dynamic pressures' affecting particular groups, leading to specifically 'unsafe conditions'". However, these are still very broad terms that require additional explaining, therefore each subsequent layer included in the PAR model is elaborated on below:

Root causes

Root causes are the first layer distinguished by the PAR model and essentially find themselves furthest away from a disaster, as they – as the concept suggests – lie at the very root of a vulnerability. These are things that relate to more general processes in a certain area, country or possibly even in the world. Wisner et al. (2004, p. 52) also refer to root causes being 'distant', for which they provide the following explanation "they are 'distant' in one, two or all of the following senses: spatially distant (arising in a distant centre of economic or political power), temporally distant (in past history), and finally, distant in the sense of being so profoundly bound up with cultural assumptions, ideology, beliefs and social relations in the actual lived existence of the people concerned that they are 'invisible' and 'taken for granted'". These scholars explain that root causes are usually economic, demographic and/or political processes that are embedded in the 'social DNA' of a certain area. They also profoundly reflect how power is distributed in a society. People who reside in environments that can be classified as marginal (e.g. isolated, flood-prone etc.) are often of little importance to those who possess economic and political power (Blaikie & Brookfield, 1987).

Dynamic Pressures

Dynamic pressures essentially form the bridge between the distant root causes and the very concrete unsafe conditions which will be explained in the following section. "These are more contemporary or immediate, conjunctural manifestations of general underlying economic, social and political patterns” (Wisner et al., 2004). Examples that are mentioned by these scholars include disease, rapid urbanization, wars etc.

Unsafe conditions

The final layer of vulnerability consists of what Wisner et al. (2004, p. 55) refer to as unsafe conditions. These are “the specific forms in which the vulnerability of a population is expressed in time and space in conjunction with a hazard”. Examples one can think of is people having to live in flood-prone areas. This is a factor directly intersects with a hazard when for example a flood occurs in a region where indeed people are living in flood-prone places. However, these people do not live here because they want to be exposed to these hazards. Actually, this unsafe condition can come from much more deeply rooted issues like an unequal economic system or discrimination of certain groups.

Combining all three levels creates what Wisner et al. (2004) refer to as a ‘progression of vulnerability’. However, vulnerabilities are not the only important factor that has to be taken into account according to the PAR model. Therefore, the model as presented in Figure 6 is accompanied by a similar model which focuses on the ‘release’ side which is shown in Figure 7. This part of the model touches on each three of the layers discussed above, but focuses on how addressing root causes can lead to a reduction of dynamic pressures and in turn eliminate unsafe conditions.

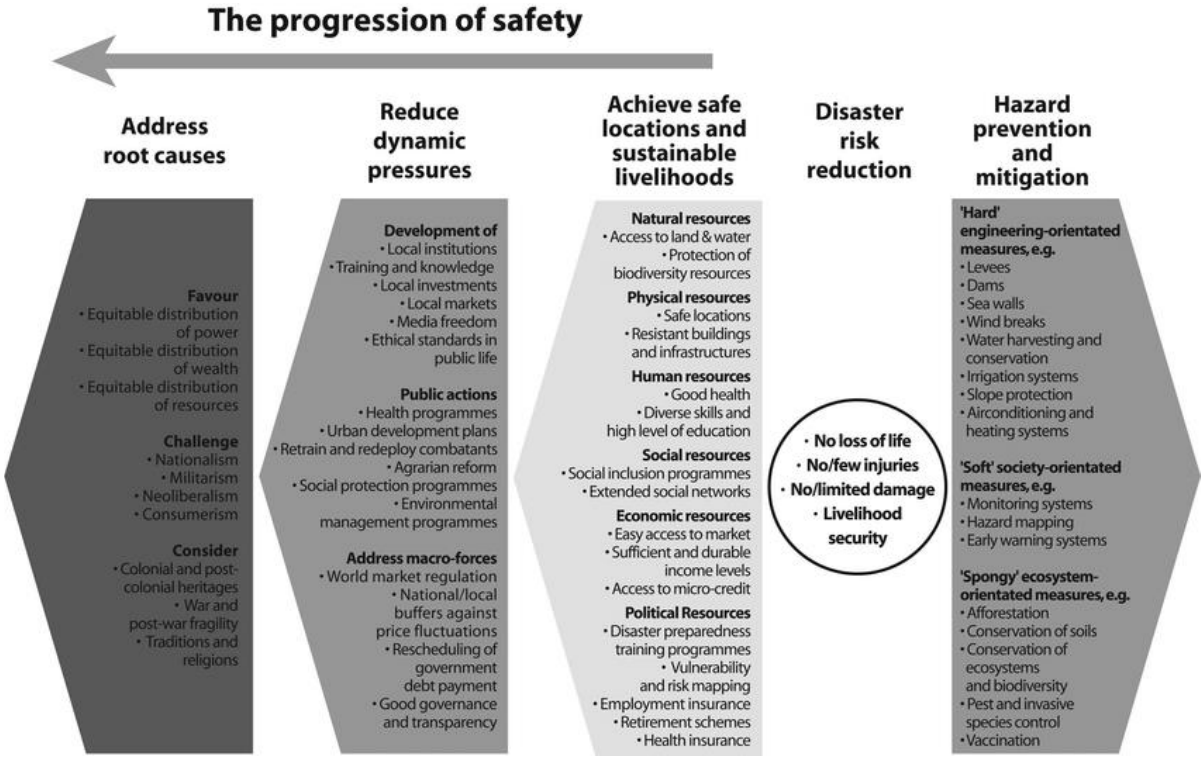

Figure 7: Pressure and Release (PAR) model – the progression of safety (Wisner, Gaillard & Kelman, 2012)

Applying VCA and the conceptual framework for disaster risk assessment to this research

Fully applying both of the frameworks that were introduced in the previous two sections would not be doable within the given timeframe for this research and would also not suit the research objectives that were set out in Chapter 1. Rather, a combination of the two models was used to create a model that does suit the objectives of this research project, in which both models provide one axis for the combined VCA/PAR model. The remainder of this section will elaborate on this combined model and both of these axes.

The horizontal axis is provided by the VCA as this theoretical approach can help identify certain vulnerabilities and capacities within the given study area ordered into three different categories (physical/material, social/organizational and motivational attitudinal). When talking about vulnerabilities and/or capacities, the definitions as presented by this model in §2.2.2.1 will be used. Following the definition of ‘social DNA’ as presented in §2.1.1, the analysis will mostly revolve around the social or organizational category of vulnerabilities and capacities. However, if deemed relevant or necessary to understand findings relating to social or organizational vulnerabilities and capacities, the other categories will also be incorporated in the analysis.

The vertical axis of the combined VCA/PAR model that was used for this study is provided by the PAR model. The three layers of vulnerability and safety which together make up the progression of vulnerability and the progression of safety, are plotted onto this axis. This allowed for the vulnerabilities and capacities that were identified within the 'social DNA' of the ABG area, based on the VCA model, to be subdivided into either of these three PAR categories. This axis provides a valuable insight in the scale of certain vulnerabilities and capacities. In other words, it illustrates if a certain capacity or vulnerability is something the Water Board (or another actor) can tackle themselves or if it is something that is rooted deeply into the system which would require multiple actors to take action or would require a more fundamental system change in order for these vulnerabilities to be eliminated. Figure 8 provides a visualisation of the combined VCA/PAR framework that was used for this study.

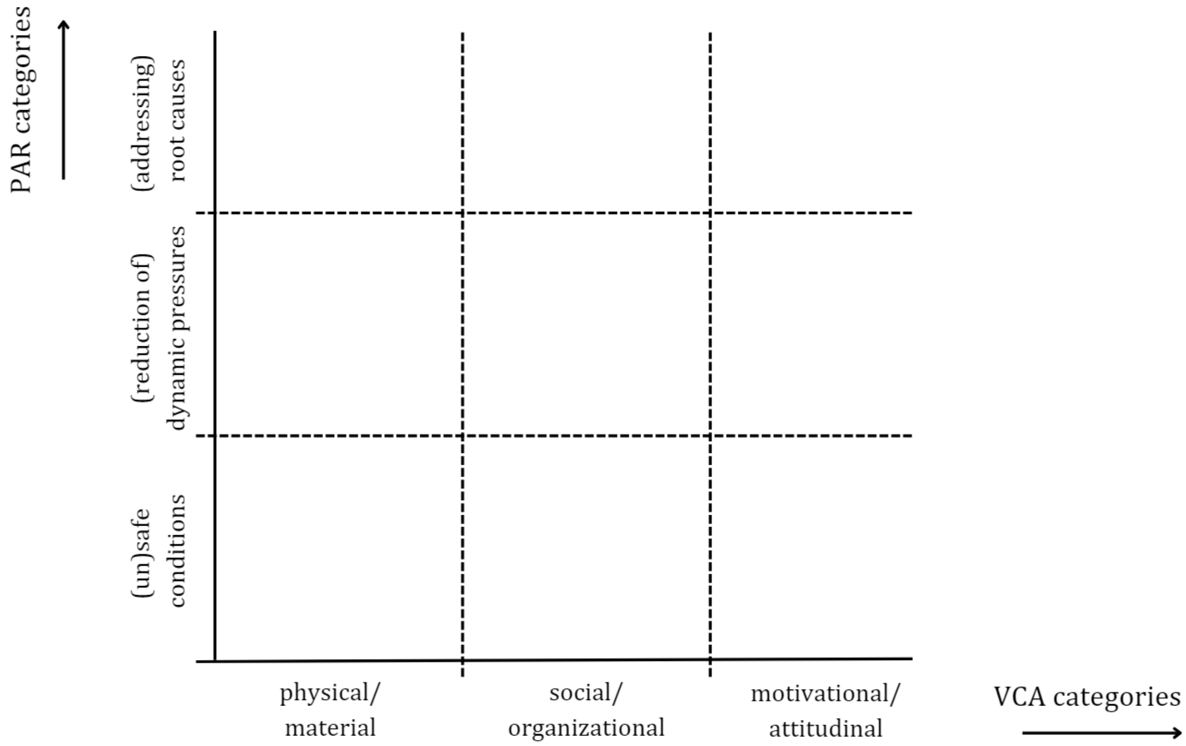

Figure 8: Combined VCA/PAR framework that was used for this research project

Finally, I want to re-emphasize that the aim of this research project is not to provide a complete VCA nor PAR analysis for the study area but rather to use these theories as guiding principles to structure the findings on the 'social DNA' of the ABG area in such a way that the findings of this research provide insight into what elements of the 'social DNA' that were discussed during the interviews can be regarded as vulnerabilities or capacities according to these theories. These findings, in turn can be linked to what Water Board Brabantse Delta is working on regarding Strategic Crisis Management as explained in §2.1.3. The discussion in Chapter 9 will reflect on the extent to which this modification proved to be helpful for this research project.

3. Methodology

This Chapter elaborates on the methodology of this research. First, the choice for an (exploratory) case study for this research is justified, followed by a description of the study area itself. Next, the chosen research methods (desk research and semi-structured interviews) are described and justified. Finally, this Chapter touches on some ethical considerations and discusses the positionality of the researcher.

3.1 (Exploratory) case studies

As was elaborated on in the introduction of this report, the social way of looking at their service area is new for Water Board Brabantse Delta. Therefore, rolling out a research project like this for the entire service area at once would not be suitable as they have yet to find out if this way of looking at their service area indeed offers (i) additional insights that (ii) are relevant to and can be implemented by the Water Board. In other words, the exploratory nature of this research combined with the limited time that was available for this research led to the choice of performing an exploratory case study.

Nowadays case studies are a well-known approach in the field of social sciences. Bromley (1986, p. ix) even went as far as to say that they are the "bedrock of scientific investigation". Despite this praise, case studies have also been subjected to quite some critique. They have been "dismissed as unscientific within the social sciences, with the exception of anthropology" (Edwards, p. 152) and were regarded by some as "hardly a methodology in its own right [that] is best seen as subordinate to investigations of larger samples" (Flyvbjerg, 2011, p. 301). One of the main points of critique substantiating this point of view was the idea that there was no way of verifying case descriptions and conclusions that were drawn from case studies, making them untrustworthy. Spence (1986, p. 211) explains that researchers "may succumb to 'narrative smoothing' and simplify and distort what really happened in a way that is misleading but makes a good story". Because of this, qualitative case studies were for some time regarded as non-scientific "as the knowledge they provided seemed incompatible with what [was] believed to be science" (Edwards, p. 153). Several scholars questioned how generalised, scientific conclusions could be formulated from looking at one specific case (Flyvbjerg, 2011). However, as Yin (2009) explains, case studies are indeed not generalisable like some other forms of research to populations or universes but rather to theoretical propositions. So certainly, for a researcher to form analytical rather than statistical generalisations, concise integration of theory into the study design is crucial (De Vaus, 2001). When working with a solid theoretical framework for the case study, researchers are able to generalise their findings theoretically instead of empirically (Bergen & While, 2000). When performed correctly, case studies can offer valuable insights in qualitative research. Besides, this method allows for triangulation, both through combining research methods (e.g. desk research and interviewing) as well as incorporating several objects (e.g. interviewees).

As looking at the Water Board's service area is new for Water Board Brabantse Delta, an exploratory case study was explicitly chosen for this research. The 'social DNA' of a place can be highly complex and also hard to quantify. Besides, exploratory case studies are suitable "to generate hypotheses for future testing with more rigorous research designs" (Vaus, 2001, p. 219), which suits the Water Board's aim of testing if this kind of research offers additional insights that are relevant to their duties. The case study that is presented in this research, the social DNA of the ABG area, offers the opportunity to test the Water Board's curiosity into this way of looking at their service area. This research, thus, aims to explore what the social DNA of the ABG area looks like and how Water Board Brabantse Delta can play into this in new ways by linking it to theoretical work from the domains of boundary work and disaster studies.

3.2 Study area

As this research was commissioned by Water Board Brabantse Delta, they delineated a study area they deemed suitable for this research. Waterboard Brabantse Delta suggested a study area encompassing three municipalities located in the south-west of their service area, adjacent to the Belgian region of Flanders. A visual representation of how these municipalities are positioned in the Netherlands as well as in the service area of Water Board Brabantse Delta more specifically can be found in Figure 9. No main rivers are located within the study area.

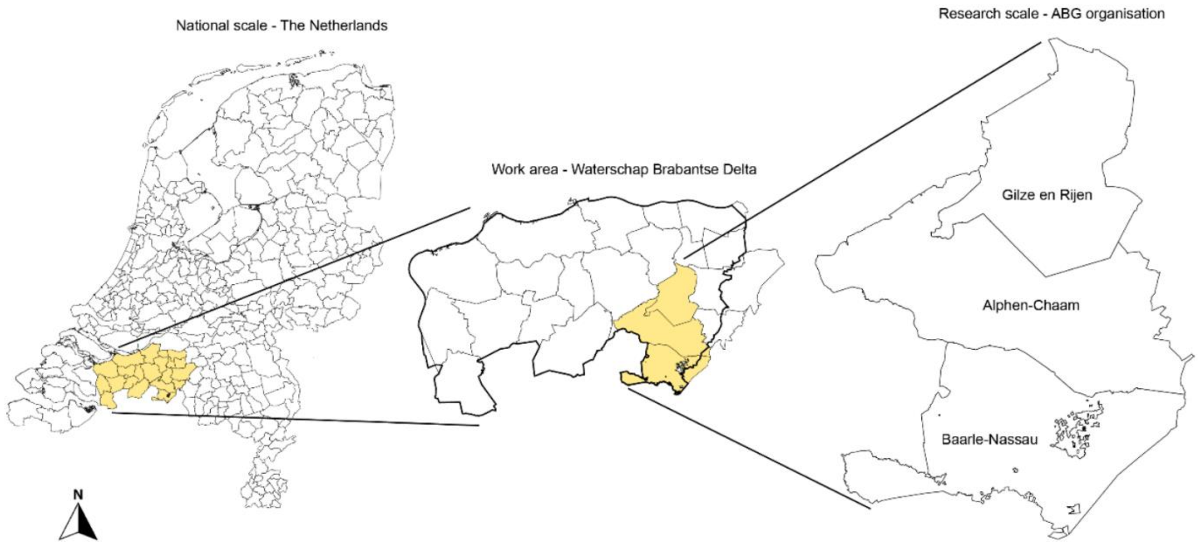

Figure 9: Location of the study area (Waterschap Brabantse Delta, 2023)

The municipalities are called Alphen-Chaam, Baarle-Nassau and Gilze and Rijen, in the political sphere these municipalities are also referred to as the 'ABG area' as they have been working together in one executive organization[1] called the ABG organization, after the initials of the constitutive municipalities, since January 1st, 2016. This means that the government officials working for Alphen-Chaam also work for Baarle-Nassau as well as for Gilze and Rijen and vice versa. Despite their collaboration on executive level, the municipalities are still administratively independent, meaning each municipality has its own mayor, councils and aldermen[2] (ABG Gemeenten, n.d.). Results Chapter 5 will provide a more in-depth description on how this organization functions.

All three municipalities are relatively small, both in terms of their total land area as well as population size. Gilze and Rijen consists of 66 km2 of land and has the largest population out of the three as it is home to almost 27,000 people. The vast majority of them, over 16.000, reside in Rijen. Alphen-Chaam is the largest of the three when it comes to acreage (over 93 km2), but is the second largest when it comes to population size. Close to 10,500 people live in Alphen-Chaam and they are almost equally spread out over the two largest villages, Alphen and Chaam. Baarle-Nassau is the second largest in terms of acreage (76 km2) and comes third when it comes to population size with 7,071 people residing in this municipality. The population density in all three municipalities lies below the national average of 529 people per square kilometre (VZ Info, 2023). All 'urban areas' in the ABG area can be characterized as small rural villages, except for Rijen which is the only bigger urban area in this region. The majority of the ABG area is made up of agricultural land, which results in agriculture being an important economic driver of the area. Besides, the area is also characterized by its nature. There are several forests and as a result the recreational sector also plays a significant role in the local economy. Another factor which on one side contributes to the recreational value but on the other hand also affects the political dynamic, are the enclaves in Baarle-Nassau. With 30 enclaves, this municipality is home to almost half of our world's enclaves (Janssen, 2016). As this research is an in-depth exploration of the 'social DNA' of the ABG area, many of the topics touched on in this paragraph, will be elaborated on in more detail in Chapter 5.

The main reasoning behind assigning this area as the case for this research is that the ABG area has been labelled a 'priority area' in the current Water Management Programme of Water Board Brabantse Delta.

[1] The ABG organization is a form of shared arrangements ('gemeenschappelijke regelingen', or GRs, in Dutch) in which municipalities, provinces and/or Water Boards collaborate to represent the interests of those involved in the collaboration (Rijksoverheid a, n.d.).

[2] Aldermen, together with the mayor of their municipality, make up the municipal government in the Netherlands. The amount of aldermen in a given municipality depends on the size of the population. Each alderman has its own themes for which he/she is responsible. Examples of such themes are spatial planning, education or economy.

This means it will receive additional attention (i.e. multiple projects and measures to meet WFD requirements as well as funding) in the upcoming years. Priority areas are areas where "developments in the environment and [the Water Board's] own challenges in the field of water safety, sufficient and healthy water" coincide. "In these areas, there are opportunities to make structural progress towards a climate-proof and resilient water landscape" (Waterschap Brabantse Delta, 2021, p. 78). For the ABG area specifically these developments and challenges mainly concern a significant Water Framework Directive (WFD) challenge and "several spatial challenges and developments directly related to opportunities or challenges the Water Board faces in the field of water and climate" (Waterschap Brabantse Delta, 2023, p. 4)[3]. The Water Framework Directive is a legislative act which requires EU member states "to achieve good status in all bodies of surface water and groundwater by 2027" (WISE Freshwater, n.d.). In the ABG area, there are two main catchment areas. On the western side, this is the catchment area of the Boven Mark and its several side streams and on the eastern side the Boven Donge and its side streams are located. In both water bodies, significant steps are needed to meet the requirements of the WFD by 2027. The spatial challenges and developments mainly refer to current housing challenge and increasing agricultural intensification in the area related to retiring farmers (Waterschap Brabantse Delta, 2023).

Water Board Brabantse Delta has indicated that performing this research in the ABG area can provide a valuable alternative point of view which could assist the Water Board to better address the challenges they face in this area.

3.3 Research methods

To formulate an answer to the research questions, semi-structured interviews were used as the main type of data collection. This was complemented by desk research. This section first describes the sampling strategy used to gather respondents, followed by a description of the data collection methods and the way they were applied in this research project.

3.3.1 Sampling strategy, contacting respondents and the stopping rule

In order to find respondents for the interviews, two sampling methods were used: purposive sampling and snowball sampling. Initially purposive sampling was used to acquire the first respondents. This sampling method lends itself well to research aimed at acquiring particular perspectives (Bernard, 2018). It allows the researcher to deliberately select respondents that are thought to hold information that can be relevant to the research. Purposive sampling is particularly useful when trying to gain in-depth understanding of something or target particular groups of respondents.

At the beginning of the research project, a list of potentially interesting respondents to interview was created. Employees of the Water Board looked through this list and suggested several additional potential respondents. As this research was commissioned by Water Board Brabantse Delta, their employees also provided contact information for several respondents. However, as the Water Board specifically wanted to look outside of their current network, most respondents were contacted on the researcher's own behalf.

The first round of sampling was initiated using just purposive sampling. After this first round, purposive sampling was used alongside snowball sampling. Snowball sampling refers to a type of sampling where the researcher locates several first respondents and whilst interviewing asks these people to list other respondents that might be worthwhile interviewing too. This way, "the sampling frame grows with each interview. Eventually, the sampling frame becomes saturated – i.e. no new names are offered" (Bernard, 2017, p. 150). Due to time limitations, I was not able to reach this point of saturation for this research project. Nevertheless, I contacted as many respondents as possible within the given time frame. Because of the time limit, I had to adhere to a fixed-time stopping rule regarding the field work phase, this came down to a period of two months to gather data in the field. Appendix I provides an overview of the interviews that were conducted.

[3] Source is an internal document of Water Board Brabantse Delta (not publicly available)

3.3.2 Desk research

The first research method that was employed for this research project was desk research. Desk research can take many different forms depending on its aim and the questions one aims to answer by conducting desk research. It is a highly agile form of research that can be tailored to specific research challenges at hand (Jaleel & Prasad, 2018). Put simply, desk research is a method by means of which a researcher can explore data from existing documents. Such documents can include books, journal articles (literature review), (online) newspaper articles, (online) reports and so on. For this specific research project specifically, desk research was employed throughout the research process. It served as a means to familiarize myself with contemporary topics in the domain in which the different respondents that were interviewed operated in. In other words, desk research itself was not employed to, in itself, answer any of the research questions that were presented in Chapter 1, but rather served as a means to provide input for the interviews that were conducted. It allowed me to complement the general interview guide, which will be explained in further detail in the subsequent section and can be found in Appendix II, with several probe questions and topics tailored to each specific respondent. The resources that were used for the desk research were websites of the organizations that took part in the interviews as well as publications on a regional news website called BN DeStem. This website and smartphone application allow you to customize your settings to certain municipalities on which you want to read articles. In addition, I also subscribed to the weekly newspaper of Gilze and Rijen, which was available for free. This 'preparatory desk study' before each interview allowed me to not start from zero and leave more time to dive deeper into certain matters during the interviews. It is important to re-emphasize that I kept on employing this research method parallel to conducting interviews. In other words, I did not do this for all respondents at the start of my field research as part of the respondents were recruited through snowball sampling, but rather called on this method a few days prior to each interview taking place throughout the entire fieldwork period.

3.3.3 Semi-structured interviews

The second, and also main, research method that was employed for this research project were semi-structured interviews. This type of interviews are a well-known and well-loved research method in the field of qualitative research. In fact, "the semi-structured interview format is the most frequently used interview technique in qualitative research" (Kallio, Pietilä, Johnson & Kangasniemi, 2016, p. 2955). The reasoning behind this method being so popular is because of their versatility combined with their flexibility. The former relates to this type of interview having been proven useful in a multitude of domains. Flexibility relates to the room they provide for both researcher as well as respondent. They leave room for researchers to come up with relevant follow up questions for certain themes based and the respondent's responses and also provide room for the participant to bring up topics they deem important. Galletta (2012) refers to this as the reciprocity these types of interviews enable between interviewer and respondent. Besides being a widely used research method, Wengraf (2001) also explains they are also perceived as an easy and accessible method.

The main reasoning behind conducting semi-structured interviews as my primary form of data collection is that this interview largely revolves around how organizations in the ABG area *experience* the 'social DNA' of the place they reside in. Experiences are hard to quantify which led to qualitative research methods being left out of the picture in the first place. The 'semi' part of semi-structured interviews lends itself well to this research as it was hard for me to determine beforehand what respondents would see as important aspects of the 'social DNA' of this area. Which would have made it very hard for me to come up with a rigid in-depth list of questions for a structured interview. The openness and flexibility that are key characteristics of semi-structured interviews matched the desired information to be obtained very well which led me to go for this research method. The interviews had a duration of somewhere between 60 and 90 minutes. 60 minutes was the aim but including personal introductions, which can really set the tone for the conversation that follows, most of these interviews took longer than this. All interviews were recorded from the point of where respondents provided their informed consent onwards. Since all respondents were Dutch, all interviews were conducted in Dutch. To protect each respondent's privacy, they remain anonymous and are all referred to as 'representative of'. The interview guide that was used for all interviews except for the first two can be found in Annex II and consisted of three main sections; (1) the 'social DNA' of the area from their point of view, (2) the respondents' network and (3) Strategic Crisis Management.

The first interview was an exception as this was an interview with two employees of the Water Board that are involved in the study area for their daily activities. This interview was meant for me to roughly get an idea of what was going on in this area and what and who were already on the radar of the Water Board. The second interview was an exception as this was the first interview with the first version of my interview guide. This guide was slightly adjusted after this interview and could, from then on, be used for all interviews that were still to follow.

Finally, personal statements from Dückers (Personal Communication, 10 January 2024) are taken up in this report. He has given permission to use this information for this report.

3.3.4 Data analysis
The data analysis was divided over three different steps. During each interview notes were made. Next, every interview was transcribed manually. Before starting the analysis process, a preliminary coding tree was set up based on key topics of the research that were taken up in the general interview guide, such as the four categories that make up the 'social DNA' of an area as presented in Chapter 2. This type of coding is also referred to as deductive coding which is when codes are determined prior to the analysis taking place (Azungah, 2018). During the transcription process, the coding tree was updated using inductive coding, meaning codes emerge from the data that is gathered. This resulted in a final coding tree which formed the basis of my analysis. The coding tree can be found in Appendix III. The coding process took place by using the ATLAS.ti software. This software allows you to filter out certain codes so that results regarding different topics can be analysed by comparing statements on the same topics from different interviews.

3.4 Research ethics

3.4.1 Informed consent and confidentiality
Confidentiality and informed consent are two very important components of research ethics. Therefore, in order to conduct an ethically sound research, researchers should elaborate on how they will guarantee both of these factors during their research. This section elaborates on how I made sure both of these topics were covered for this research.

Regarding the topic of informed consent, Hammersly & Atkinson (2007) explain that each respondent has to give explicit consent to be interviewed and should be free to withdraw from the research at any given point during the research. As this research mainly relied on interviews, informed consent was an integral part of this process. All respondents were contacted by me through email with the question if they wanted to participate in an interview with me regarding my thesis. These emails contained a short description of myself, my study, a description on what the research was about and what I would like to interview them about. By agreeing to the interview, all respondents provided their consent to be part of this research. Additionally, when the interviews took place, each respondent was explicitly asked if they were okay with me recording the conversation for subsequent processing and data analysis. After respondents gave their informed consent, which all of them did, the recording was started. In case the interview took place in person, I used my personal mobile phone to record the conversations. For interviews that took place via Microsoft teams, both the teams recording function as well as my personal mobile phone (as a back-up) were used. I have thought about requesting my respondents to fill out an informed consent sheet, however as the conversations were quite informal, I did not use sheets and asked respondents for informed consent after personal introductions took place.

At the beginning of each interview, after an (informal) moment of personal introductions, I provided each respondent with a more in-depth explanation of my research. I emphasized that my research was commissioned by Water Board Brabantse Delta but that in the end it would be a product for my MSc thesis which is written for Wageningen University. I clearly stated that, if needed, negative opinions about the Water Board can be expressed without any consequences to which several respondents reacted with a smile and a remark along the lines of 'I am not afraid of sharing my real opinions on matters anyways'. After this introduction on my research topic, I introduced the 'plan' I had for the interview and gave the respondent(s) the opportunity to ask questions if they had any. As explained in §3.4.4, the interviews consisted of three parts. Once the interviews reached part three, an explanation on the SCM model was provided using imagery from a presentation that is used by the employee of the Water Board working on SCM (the two pictures as shown in Figure 5, Chapter 2). After this explanation, I provided the respondents with the opportunity to ask questions about the model if they had any.

None of the interviewees indicated to have feelings of fear about being included in this research, however I did not ask each respondent explicitly if they were okay with me using their full name for my report. Therefore, I chose to not mention any of my respondents by name but rather refer to their organizations to protect their privacy.

Regarding the confidentiality of raw data that was collected for this research, all interview recordings were uploaded to my computer as soon as possible after conducting the interviews. They were put in a separate folder only accessible to me. As soon as the recordings were uploaded to this folder, they were removed from my phone to prevent privacy and safety issues. All notes were made in a separate notebook which I kept to myself.

3.4.2 Do no harm principle

Another fundamental guideline when it comes to research is the 'do no harm principle'. By many researchers, this principle is seen as the bedrock of ethical guidelines to consider when conducting research in a multitude of disciplines. This principle emphasizes the importance of ensuring that your research activities do not cause any negative impacts or harm to the local population and/or environment you are researching. In some cases this relates to both physical factors as well as to the ethical management of data.

Throughout the course of this research project, I have been sensitive to the local community's values, concerns, and well-being. This entails obtaining informed consent as explained in the previous section, protecting respondent's privacy, and maintaining high standards when it comes to integrity in data collection, analysis, and dissemination. By adhering to the 'do no harm' principle, I can contribute positively to the communities included in this research as well as to the (knowledge of) the Water Board and scientific community while sticking to ethical standards.

As agreed upon with Water Board Brabantse Delta, a summary of my main findings will be created and shared with the Water Board. This summary will also be shared with each of the respondents of this research by email. This way, I aim to extend the notion of 'do no harm' to 'doing good' as explained by Van den Berg, Hawkins & Stame (2022) in their book 'Ethics for Evaluation', by showing my respondents what I found and what they contributed to. In addition, they will also be invited to the final presentation that will be held at the office of the Water Board.

3.4.3 Positionality

The notion of positionality "emphasize[s] that the production and understanding of knowledge in research is shaped by and also shaping the way researchers see themselves and are seen by others, and the agentive role researchers play within varied social contexts and structures" (Lu & Hodge, 2019, p. 226). It refers to someone's "personal values, views, and location in time and space influenc[ing] how one understands the world" (Sánchez, 2010, p. 2258). This way of understanding the world, in turn, affects how one carries out his or her research. It influences which topics one finds relevant enough to conduct research on, the way in which (potential) respondents are approached, which questions are taken up in interview guides, what elements stand out when engaging in participant observation and ultimately, and arguably most importantly, also how data is analysed and interpreted (Jacobson & Mustafa, 2019).

Following from this, reflecting upon one's positionality before entering the field is an important part of a research project. A structured way of doing so is by filling out one's own 'social identity map' as developed by Jacobson and Mustafa (2019). This map can assist the researcher in identifying and comprehending the impact of one's identity on his or her research project and its outcomes. It can serve as an accessible tool to mitigate one's bias when conducting research. The model can be filled out by anyone to paint a concrete picture of their positionality in a given research setting. My personal social identity map for this research is visualized in Figure 10. The map consists of three layers; (1) the main elements making up my social identity (outlined in dark blue), (2) how these elements influence me as a person and finally (outlined in light blue) (3) how this might affect my interactions with respondents (non-outlined). This visualisation is mainly based on reflections I made on my positionality before entering the field, but was complemented with additional insights I gained during my fieldwork.

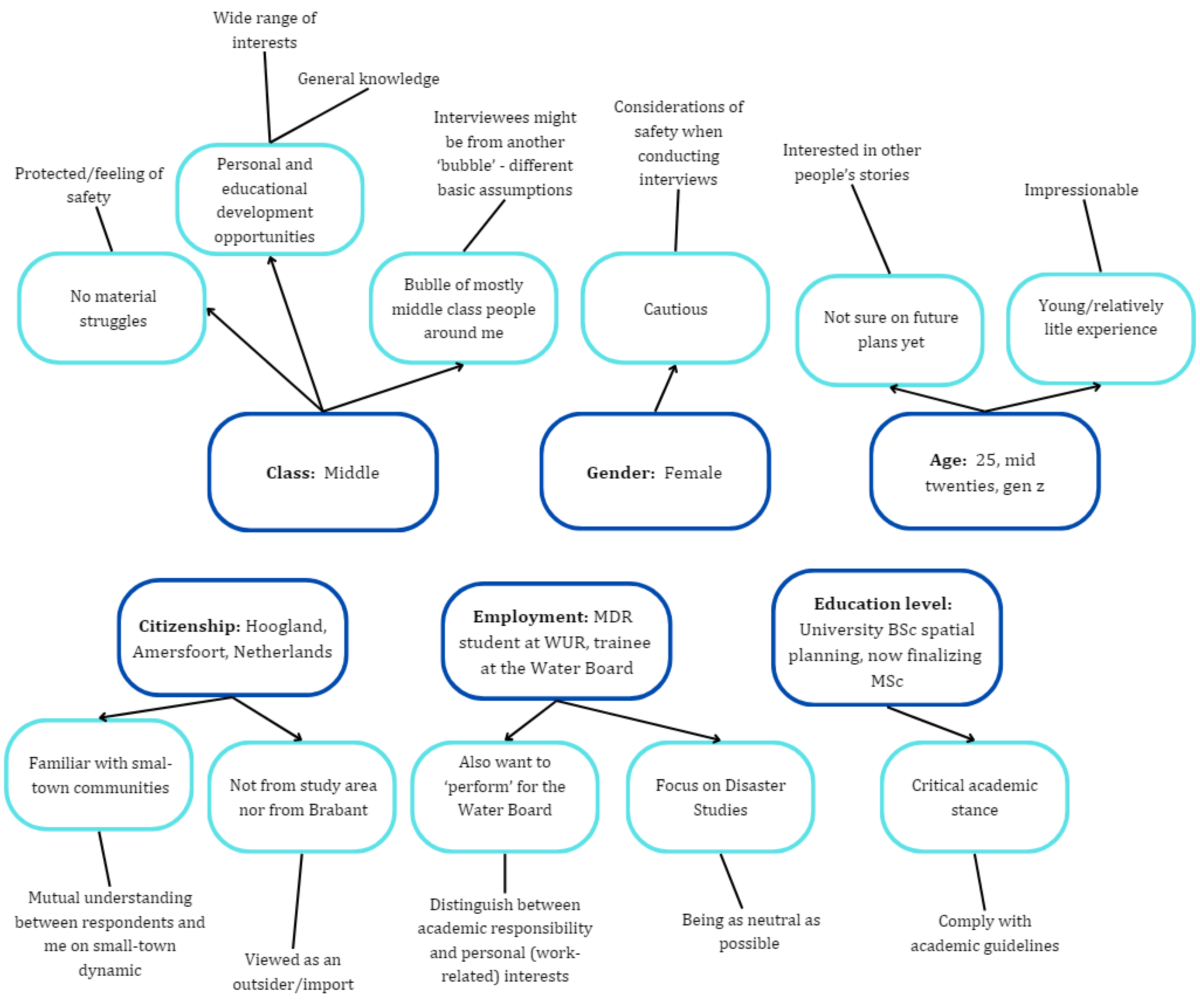

Figure 10: My personal social identity map relating to this specific research project

4. Context

4.1 Introducing the Water Board

In the Netherlands, regional water management is divided over 21 so-called Water Boards. These Water Boards (regional water authorities) are the oldest governing body in the country (Unie van Waterschappen, n.d.) and are responsible for various tasks of which the Dutch population benefits every day. The Water Boards' tasks can be summarized in three core duties: (1) water safety, which in the Dutch context is concerned with flood protection, (2) water quality, meaning clean and safe water for people and nature and (3) water quantity, making sure enough water is available (Unie van Waterschappen, n.d.).

This research was commissioned by one of the 21 Water Boards called Brabantse Delta. This Water Board is responsible for carrying out the core tasks in the western part of the province of Noord-Brabant (as visualized in Figure 9, Chapter 3). How Water Boards give substance to water management in their respective service area is specified in so-called water management programmes. The current water management programme of Water Board Brabantse Delta was drawn up for a period of six years. The main aim of Water Board Brabantse Delta's current water management programme, which runs from 2022 until 2017, is the realization of a "climate-proof and resilient water landscape for mid and west Brabant" (Waterschap Brabantse Delta - a, 2021, p.4).

4.2 Operating in a complex context

4.2.1 Climate Change

Water Boards operate outdoors, and the outdoors is subject to external influences, including climatological changes. A relatively stable climate means that Water Boards can anticipate on certain stable and predictable weather conditions and change their water management accordingly (Deltares, 2023). In case of more extreme conditions (also referred to as calamities), Water Boards have their crisis response organization to fall back on. However, due to climate change, the predictability Water Boards have somewhat gotten used to over time, seems to be diminishing. More frequently than before, the Netherlands experience extended periods of drought or prolonged periods of precipitation, which means such weather conditions – which are now regarded as 'extremes' – might become part of the 'new normal' in the future. In other words, Water Board Brabantse Delta argues that a 'new normal' is slowly emerging which fluctuates more than before. On top of this, extreme situations, such as the extreme rainfall in Limburg (also referred to as a 'waterbomb'), will occur (Deltares, 2023). This process is visualised in Figure 11. The blue line indicates what Water Board Brabantse Delta regarded as crisis situations before. The dotted green line indicates the even more extreme events (like the waterbomb in Limburg in 2021) they expect in the future and thus also want to prepare for.

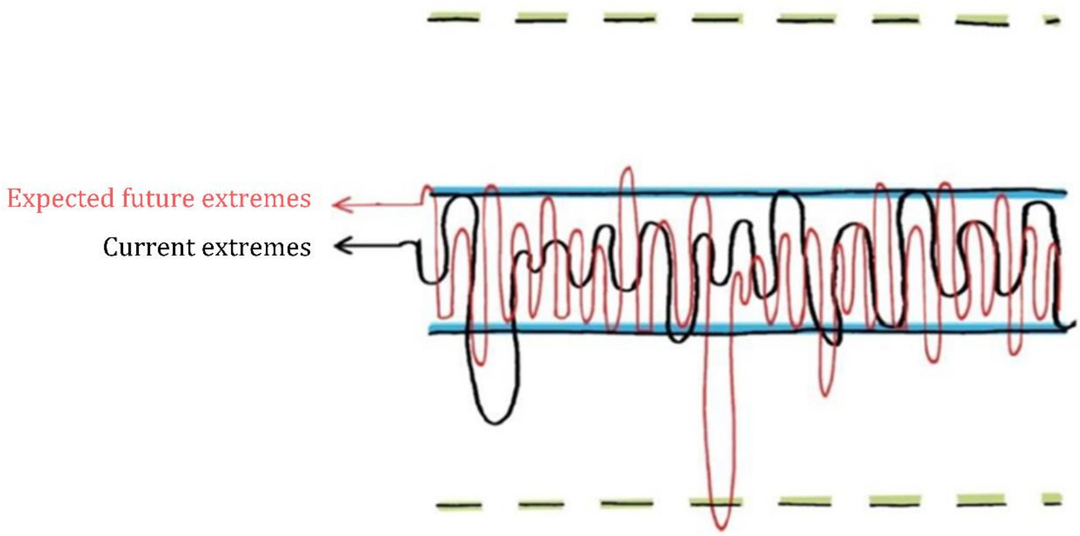

Figure 11: Current extremes can become the 'new normal' in the future (Adapted from Waterschap Rijn en IJssel, 2023)

The effects of climate change affect all three core duties of the Dutch Water Boards. First of all, it can affect the amount of water that is available for both people and nature. In addition, it can affect the quality of our water. If, for example, periods of drought will occur more frequently or last longer than we are used to, we will, have to deal with the implications of cyanobacteria or botulism more frequently (Waterschap Brabantse Delta, n.d.). Finally, it can also impact water safety. The decreased predictability of weather conditions touched on earlier also refer to more frequent occurrences of extreme weather events. Examples are longer periods of rainfall and more intense periods of rainfall. Water Boards' current strategies are very much focused on the prevention of the negative effects of such events. A textbook example of this are the many dikes in our country, which are heightened whenever needed to be able to protect against floods as a result of sea level rise. However, Water Board Brabantse Delta has started to question if keeping on heightening the dikes is sustainable with the expected levels of sea level rise due to climate change in the future. Besides, events like extreme rainfall cannot be prevented nor can we control where this rain will fall. This means that as the organization responsible for keeping people's feet dry, Water Boards have to shift their way of doing things to make sure we are prepared when such events take place (Deltares, 2023).

As explained in Chapter 2, Water Board Brabantse Delta has taken on this challenge by starting to shift their focus from wanting to be fail-safe (by mainly focusing on preventative measures) to being able to fail in a safe manner. Water Board Brabantse Delta has given substance to this by implementing Strategic Crisis Management (SCM). Besides preventative measures, this model also looks at measures that can be taken in four additional categories; mitigation, preparedness, response and recovery. Essentially this model focuses on creating a landscape and society that is resilient and can bounce back relatively quickly after an extreme weather event. Water Board Brabantse Delta argues that investments in all of these five components have to be made *before* an extreme weather event takes place in order to minimize impact and be able to respond quickly.

4.2.2 Spatial planning and land use transitions

The climatological changes elaborated on in the previous section are in themselves a complex challenge for Water Boards. However, this is not the only challenge they face. Water Boards are also affected by transitions surrounding spatial planning and land use. A first concern regarding this is that in order to realize their goals, Water Boards need space for their own projects. However, Water Boards are not the only ones needing space, they have to negotiate with many other actors who want to realize their own goals in that same space. As Warner, Lulofs & Bressers (2010, p. 147) argue "in today's policy arena, it would be hard to conceive of environmental decisions that do not involve some kind of boundary spanning. In the Netherlands, space is at a premium – virtually every square foot has been planned and allocated, which makes it very easy for a project initiator to step on other actors' toes".

In other words, space has become a scarce commodity these days, as is also re-emphasized in the new 'Nota Ruimte'[4] which states "the Netherlands face significant and urgent challenges in the living environment: regarding housing construction, agriculture and nature, water and soil, sustainable energy, the (circular) economy, and dealing with climate change. Space is scarce, the challenges are substantial, and the context is challenging. This calls for choices to be made" (Ministry of Infrastructure and Wager Management, n.d.). This illustrates that many different interests are at play, of which water is only one. Whereas for Water Boards, water (logically) is the most important one, other actors are in the game with a different set of priorities. An example are the challenges surrounding housing, which is a big theme in the Netherlands at the moment. Population growth combined with a set of other factors like aging, migration and elderly people living at home for a longer period of time causes a pressing housing shortage (Waterschap Brabantse Delta, 2021). Put shortly, more homes are needed and for those in charge of this challenge, water is only one of the interests that has to be taken into account which means that not all choices for new housing locations might be optimal from a water, and Water Board, perspective.

Another concern relating to spatial and land use transitions, which is also very relevant in the service area of Water Board Brabantse Delta are the transitions unfolding in the agricultural sector. Though the number of agricultural enterprises in the area is decreasing, the agricultural area is not decreasing in size. This can be explained by trends related to upscaling and intensification of the agricultural sector. Such developments are of great impact in a region that houses large amounts of agricultural land like the province of North-Brabant (Waterschap Brabantse Delta, 2021). The agricultural sector is mainly driven by economic interests, which creates a similar dynamic as was just explained for the housing shortage issue; besides the effects on water, many other interests are at play and taken into account when decisions are made regarding

[4] The 'Nota Ruimte' replaces the NOVI (Dutch National Spatial Strategy) of 2020, outlining integrated policy for the physical living environment. The 'Nota Ruimte' presents structuring choices for the short term and guidelines for the long term presented coherently for 2030, 2050 and 2100" (MER, 2023)

the type of agricultural land use in an area. Therefore, the interests of water and water managers might be overruled by other interests. This, in turn, can lead forms of agricultural land use that are suboptimal regarding water management in that area (interviewee 1).

A side note that has to be made though is that steps are being made to make choices surrounding spatial planning and land use more sustainable by taking water and soil as guiding principles. "Water and soil as guiding principles means that the soil and water systems play a decisive role in shaping the Netherlands. As a result, our country is better equipped to withstand climate change, and we prevent further pressure on biodiversity. The outcome: a healthy and resilient economy, society, and living environment" (De Rooij et al., 2023). This approach was adopted by the Dutch government at the end of 2022 by means of a letter to parliament[5] by the ministry of infrastructure and water management. 2023 was the first year of working with this approach and has shown that it is still a challenge to apply this principle to concrete situations. In other words, water and soil as guiding principles are an important step forward, however steps still have to be made to improve its usability (De Rooij et al., 2023).

4.2.3 Societal changes

To add a final layer of complexity, the challenges explained above all unfold in a society that is changing as well. Citizens are becoming more critical and sometimes even suspicious towards governmental organizations, including Water Boards (Voogd, De Vries & Beunen, 2021). Examples of incidents that have caused this suspicion to increase are the Dutch child-support affair and negative experiences of citizens with government authorities surrounding the handling of gas extraction in the province of Groningen as well as the handling of damage claims after the floods in Limburg in 2021. Citizens are becoming increasingly vocal and sometimes initiate legal proceedings against government authorities. On the other hand, research has shown that expectations of support and protection from governmental organizations are high whilst self-sufficiency of citizens is often overestimated (WRR, 2017).

The communication strategy of the Water Board, and with them also other authorities, was tailored to the idea that citizens did not have to worry about anything and that the government would take care of everything for a long time. However, due to increased suspicion as well as bigger challenges as elaborated on in previous sections, this narrative is no longer realistic. Dückers (Personal Communication, 10 January 2024) explains that because of this, governmental organizations essentially have to 'branch out' and fundamentally alter the way in which they engage with their environment. This refers to both their network partners as well as the citizens they serve. Dückers (Personal Communication, 10 January 2024) also emphasizes that if you (as an organisation) are able to build a good relationship with the citizens you serve, they can form an extremely valuable social early warning system. If you are able to listen to and read your society, in case of extreme events you can act in or on those places or topics where people unsettled. In addition, by having a good relationship you are also able to interact about what it is people need to feel more at ease. However, a lesson learned from the floods in Limburg in 2021, was that citizens do not want to be approached by many different government layers. Evaluations showed that citizens were also in need of one central point of contact. For them it is usually not clear which authority is in charge of what and especially in situations like the floods in Limburg or the other examples mentioned before, there is emotion involved and people do not want to be sent back and forth to finally end up at the 'right' organization after multiple calls or emails (Van der Heijden & Oostra, 2023). For citizens, authorities form one government and should therefore act as such too. It is therefore advised to join forces and foster a relationship with society with multiple government authorities (and possibly other organizations like the Safety Regions) at once instead of all reaching out one by one.

Operating in such a way, though, also requires a fundamental shift in the way many (governmental as well as non-governmental) organizations approach the tasks and challenges they face. Instead of looking at an area or situation and thinking 'what part of this is my responsibility', all should acknowledge that it is their joint responsibility. In other words, the task or challenge at hand should be put at the centre and each organization involved should think outside the lines of their own organization to tackle the task or challenge at hand.

[5] A letter to parliament is a written document that is exchanged by the Dutch government and the Dutch parliament.

5. Results: The ABG area through the DESTEP lens

As explained in Chapter 2, the 'social DNA' Water Board Brabantse Delta wanted to gain a deeper understanding of consists of both the context itself as well as the actors that are part of this context and the connections between these actors. This Chapter presents the data that has been gathered on the first point, relating to the first sub-question that was developed for this research project: *'What does the 'social DNA' of the ABG area look like?'*. The following Chapter will dive into the networks that are part of this context. As data has been gathered on multiple axes (thematic, time period and location), this paragraph will start by outlining how data on all these different axes is structured.

Since the DESTEP model was used as the conceptual foundation for this part of the research, this Chapter's main sub-headings are based on the different themes that make up the DESTEP model. As was explained in Chapter 2, the technological aspect lies outside of the scope of this research and will therefore not be touched upon in this Chapter. The Water Board is also already familiar with the environmental aspects of the area, however as some of the information that was gathered on the more social DESTEP categories can be better understood when one has a basic understanding of the environment, this Chapter does include a paragraph with some findings on the environment of the ABG area. However, this paragraph will only touch on findings that relate to and help understand findings in the social domains (demography, socio-cultural, political and economic) and therefore does not paint a complete picture of the environment.

The different categories are not presented in the 'original' DESTEP order. Rather, they are presented in such a way that the story of the ABG area is most logical and each new category builds on information that was provided in previous sections. Therefore, it was most logical to start this Chapter with data that can be presented for the ABG as a whole. These are results on the environmental and the political context of the study area. Next, results which also had to be differentiated between the different municipalities (and in some instances even between different villages) is presented. This entails results regarding the economy, demography and socio-cultural context of the study area. Clear in-text references will be made regarding the time specific results relate to.

5.1 Environmental

5.1.1 Geological information

The ABG area is almost fully made up of sandy soils. In the southern part of the study area, these sandy soils are around 30 meters + NAP, and they slowly slope downward in northern direction to about NAP where the sandy soils meet the loam/clay soils (Ball et al., 2016).

The sandy soils in the study area were "formed during previous ice ages and were largely 'finished' after the deposition of young cover sand and the river dunes along the Schelde valley and the Late Dryas. The stream valleys were also already present but still had a strong glacial character (…). [This part of] the landscape stabilized [at a later stage] and was influenced during the Holocene by the warming of the climate and the rapid sea level rise between the Preboreal and the Atlanticum " (Ball et al., 2016, p. 40). This dynamic in the Holocene affected climate, vegetation as well as hydrology.

Figure 13 shows that the ABG area falls into three geological zones that are found in this area. The majority of the area belongs to the 'Kempish Hoog' which are higher sandy soils in the area. Part of Alphen-Chaam and Gilze and Rijen is pictured as a separate geological zone called the 'Gordel van Sterksel'. This is because in this area, shallow fluvial deposits can be found here. Finally, a small part of Gilze and Rijen (the part east of the Gilze and Rijen fault, the leftmost black line in Figure 13) is considered to be part of the so-called Roer Valley Graben. This is the graben north-east of the Gilze and Rijen Fault. "The Roer Valley Graben has been a tectonic subsidence area for 30 million years, which has resulted in the deposit of thick sediment packages (mainly covering sand and loamy meltwater deposits) during ice ages" (Ball et al., 2016, p. 42).

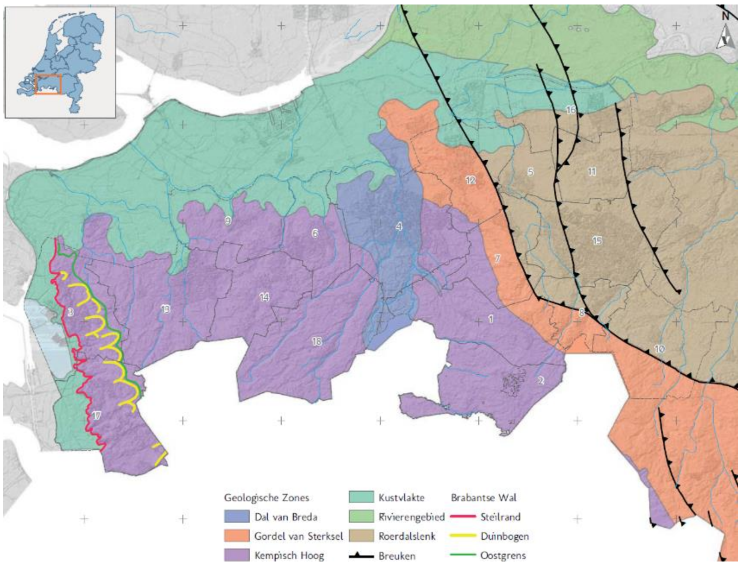

Figure 13: Geological zones in the Western part of North-Brabant (Ball et al., 2016)

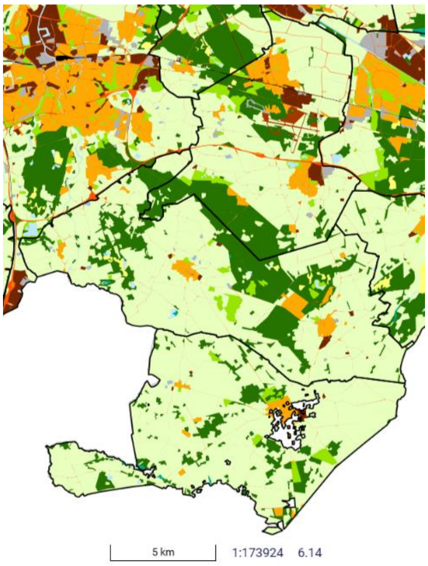

Figure 12: Land use map of the ABG area (CBS, 2010)

5.1.2 Land use

The combination of high and dry soils and the availability of water has historically been an attractive combination for people to settle. As the ABG area is home to some of the highest sandy soils in the province of North-Brabant, it ticks all of these boxes and thus was a logical place for people to settle and practice agriculture. Amongst archaeologists, Alphen is even referred to as the place where Dutch archaeology was born as the first famous farm layouts amongst archaeologists were found in this village (interviewee 8). Before around 1850 the parts of land in the ABG area that were not cultivated, consisted of mainly swampy areas, heathland and drift sand. From 1850 onwards, a period of heathland cultivations commenced, in which large parts of heathland were afforested and cultivated. These cultivations were closely related to the production of wood for mining activities (Arcadis, 2011) and to prevent drift sand from creating issues on the agricultural lands (interviewee 21).

Over the years, the need for wood for the mining industry diminished, but the forests remained largely intact. After the second World War, people's wealth and free time gradually increased which caused the recreational sector to grow. People who lived in the bigger cities like Rotterdam would use their free time to go outdoors and when you drive south from that direction, the forests around Breda are the first ones you encounter. This explains the emergence of many campsites in this area (interviewee 10), which is explained in further detail in §5.3.2.

Even though the type of agricultural cultivation and the function the forests serve have evolved over time, Figure 12 illustrates that both types of land use are still very characteristic for the area (light green indicates agricultural land and dark green indicates forests). The majority of the land in the study area is still used for agricultural purposes, which is still closely related to the geological characteristics of the soil in the area. The type of agricultural product has evolved over time though, following economic and political trends which are explained in further detail in §5.3.1.

An important note to make is that the (agricultural) landscape as it is now, has been largely influenced by two major land consolidations in the area. The first one is the land consolidation Alphen-Riel, which occurred right next to the current municipality of Alphen-Chaam, east of Alphen. The second one is land consolidation Baarle-Nassau. From around 1990 these land consolidations heavily influenced the landscape of the ABG area. Large parts of the characteristic small-scale landscape gave way to larger agricultural plots with canalized ditches (interviewee 11) in the eastern and southern part of the study area. While this was an improvement for the agricultural capacities of the area, it resulted in the disappearance of some valuable and characteristic cultural heritage (interviewee 19). These developments manifested themselves in larger plots of agricultural land and more intensive forms of agriculture in the eastern part of the study area with fewer small-scale landscape elements (e.g. hedgerows and pollard trees) and estates as compared to the western part of the study area where the small-scale character and estates are still more so integrated with the agricultural area (interviewee 2). Figure 14 shows the differences in agricultural plot size, with the left circle pointing to smaller agricultural plots in the western part of the area and the right circle pointing to larger agricultural plots in the eastern part of the area. Figure 15 shows some of the pictures I took whilst I was visiting the study area. The leftmost picture shows a smaller agricultural plot with multiple trees next to it, whilst the picture on the right shows a larger agricultural plot with no trees near the plot.

Figure 14: Bird's-eye view on the differences in plot size between the western and eastern part of the study area (Google Maps, 2024)

Figure 15: Visualization of the landscape in the western part of the study area (left) and the eastern part of the study area (right)

The forests touched on before are still present nowadays and mostly serve the recreational sector which also explains the amount of recreational land use as pictured in Figure 12 as the area remains popular amongst recreants to this day.

When it comes to built-up area in Alphen-Chaam and Baarle-Nassau, the land use map in Figure 12 shows that this is limited to the villages themselves. Gilze and Rijen is the municipality which currently has the most built-up area. Initially Gilze was the bigger village, however Rijen started to grow right before the second World War and developed itself into the largest 'urban area' within the ABG area.

When it comes to developments that might affect the environmental characteristics of the ABG area in the future, respondents mainly referred to changes in the type of agricultural use (which is explained in further detail in §5.3.1) and the decisions that will be made regarding building additional houses to counter the current housing shortage.

5.2 Political

5.2.1 The emergence of the ABG organisation

As was mentioned in the description of the study area, the municipalities making up the ABG area are officially independent but collaborate at executive level. They each have their own mayor, councils and aldermen but the government officials work for all three municipalities at the same time (ABG Gemeenten, n.d.). Such municipal collaborations are a form of shared arrangements ('gemeenschappelijke regelingen', or GRs, in Dutch) in which municipalities, provinces and/or Water Boards collaborate to represent the interests of those involved in the collaboration (Rijksoverheid a, n.d.). There are certain legal requirements that have to be met in order for such an arrangement to be legally accepted. These requirements are taken up in a specific law known as the law shared arrangements ('wet gemeenschappelijke regelingen', or WGR, in Dutch). Once these requirements are met, the collaboration is taken up in a register that holds all of these arrangements.

Such arrangements amongst smaller municipalities are not uncommon nowadays, however not too long ago they were. In a publication the CBS (2016) states that "in 2010, there was hardly any expenditure on such executive collaborations. By 2015, there were 18 executive collaborations involving 54 municipalities, amounting to 0.5 billion euros of expenditures". The ABG organization became official on January 1st 2016, so was not yet taken into account in these calculations of the CBS, however it was part of this seemingly 'sudden' increase in administrative collaborations. Even though the increase in such collaborations seemed sudden, a representative of Water Board Brabantse Delta explained that it was actually not an illogical development.

> *"People often do not say this out loud, but during that time there were also municipal reorganizations taking place. If you [as three small municipalities] merge on an executive level, the necessity for the province to merge the three municipalities into one municipality with a meaningless name is also smaller. It was, thus, also a way to avoid municipal reorganizations."*
> *- Interviewee 1, representative of Water Board Brabantse Delta*

Municipal reorganizations are nothing new to the Netherlands. Around 1900, the country consisted of over 1100 different municipalities. By means of municipal reorganizations, this number has been brought down to 342 in 2023. The website of the Dutch government states that "the government's starting point is that municipal reorganizations preferably come about from the grassroots level. This means that ideally municipalities themselves decide on a reorganization. However, in some cases, the province takes the first step. For example, if this is necessary due to regional developments, or if the administrative capacity of a municipality is so weak that the municipality can no longer perform its tasks" (Rijksoverheid b, n.d.). Despite this 'starting point', talks about reorganizations can be perceived by smaller municipalities as a threat of being merged into bigger municipalities, which in turn could affect their autonomy. As explained by the representative of the Water Board, around the time of the emergence of the ABG organization, there were talks about such reorganizations too which led to conversations between what are now the ABG municipalities as well as two other bordering municipalities; Dongen and Goirle. The latter two backed out earlier on in the process. A full merge was discussed amongst the remaining three municipalities, however due to each of them wanting to maintain their own identity and character, a potential full merge was eliminated quickly. A collaboration at the executive level was left as the only option, which they agreed upon. The collaboration was made official on January 1st, 2016 (Eijkhout, 2023).

As the Water Board representative hinted at in the quote presented before, the story on municipal reorganizations was not the main narrative that was presented by the municipalities. Rather, their narrative focused much more on the increasing amount of responsibilities that were being transferred to regional and local government levels. This meant that some smaller municipalities could not bear the burden of properly executing these additional responsibilities. In other words, an executive collaboration between Alphen-Chaam, Baarle-Nassau and Gilze and Rijen would be better for both the government officials as well as for the people living in all three areas. The government officials were moved into one office building which would make it easier for them to communicate with each other. To ensure that residents would experience as little inconvenience as possible from this executive merge, there remained a local counter in each municipality for handling matters such as passports and driver's licenses (Eijkhout, 2023).

5.2.2 The current functioning of the ABG organisation

As it is currently 2024, the ABG organization has been in operation for eight years now. Over the past few years, there has been some commotion surrounding the housing of the government officials, all of whom were supposed to be accommodated in one office. Other than that, the ABG organization seems to have gotten very little negative media attention. A representative of the ABG organization, who used to work for the municipality of Alphen-Chaam before the ABG organization was created, agreed to what was explained in the previous paragraph about better possibilities for collaboration.

As the political situation was part of the 'social DNA' the Water Board wanted to gain a deeper understanding of, all respondents were asked about the political context of the area. However, the stories they told me were less optimistic than the news items that were found during the desk research as well as the remarks that were made by the representative of the ABG organization itself.

During an introductory interview with two representatives of the Water Board, one of whom being the account manager of the ABG area on behalf of Water Board Brabantse Delta who is in contact with the organization on a weekly basis, it was argued that for people or organizations working with the ABG organization it can be quite confusing and frustrating. The account manager explained that for him the situation is doable now because he has been working for this area for quite some time.

> *"In principle, I have my fixed contacts for the entire ABG area by now. The people who are there work for the entire ABG area, and that works quite well, but yes, many constantly have to look for the right contact person. Currently, in the cases where we, as a Water Board, are involved, I am the stable factor. I am sometimes brought in from the Water Board during meetings to explain how certain things have come about."*
> *- Interviewee 2, representative of Water Board Brabantse Delta*

The other employee from the Water Board that was part of the same interview, emphasizes that on one side, their account manager being a stable factor is a weakness. However, the fact that the Water Board's account manager is an important source of continuity and a linking factor in the local political sphere also offers valuable opportunities as it sometimes allows the Water Board to get things done more easily. This same employee agrees to the account manager's comment on constantly having to look for the right contact person and compares the ABG organization to a dovecote implicating that when a request is sent out to the ABG organization, it is never sure if and if so, which dove will stick out its head above the parapet (interviewee 1).

Several other interviewees expressed similar experiences with the ABG organization and confirmed the somewhat confusing and frustrating experiences the employees of the Water Board told me about. The lack of continuity and the difficulty of finding the right contact person for certain topics was confirmed by multiple interviewees. Adding to this, the organization has quite some open vacancies, which results in problems related to time and capacities to take on important matters. Interviewee 1, one of the representatives of the Water Board, explains that the ABG organization in itself might have some trouble filling vacancies as there are more exciting places to work as a government official. Adding to this, this same interviewee explains that such stories can spread quickly in small communities like these municipalities. In other words, negative publicity in informal settings does not help with regard to the existing problems surrounding filling vacancies. Moreover, if a position is occupied and that person drops out or goes on holiday, this can lead to additional problems and delays.

An additional challenge respondents mention when asked about the ABG organization is the lack of continuity as was also pointed out by the employees of the Water Board (interviewees 1 & 2). It seems hard to find permanent employees for certain spots which results in regular changes of contact persons for several respondents working with certain departments of the ABG organization. However, the respondents who do have a fixed contact person, on the other hand, generally speak positively about their collaboration with the ABG organization

An additional challenge that was brought up during the interviews, relates to what most respondents refer to as 'import'. This term refers to people from outside the ABG area coming to the ABG area, in this case to fill in vacancies at the ABG organization. On one hand, this helps in regards to the time and capacity challenges that were described before, however as these people are not from the ABG area themselves, this has its downsides too as they do not fully comprehend the dynamic of the three municipalities on their own as well as the differences that exist between the villages in the area. Besides, two respondents from the NLGR, the nature- and landscape association of the municipality of Gilze and Rijen indicated negative feelings regarding some instances where they felt the civil servants they were working with, hardly came outside of their offices which also resulted in feelings of frustration (interviewee 21 & 22).

> *I21: "But also some civil servants just don't come outside for years, you know, they just don't know what they are talking about"*
> *(…)*
> *I22: "And then there were people from the municipality, who came because they ordered something on their own behalf who said 'oh, how beautiful it is here, I have never been here before!'"*
> *I21: "It is really strange that, as a civil servant, you just do not really know the area"*
> *- Interviewee 21 & 22, representatives of the NLGR*

A final topic that came up in multiple interviews is the level of knowledge in local politics. As mentioned before, each municipality has its own local council. However, as all three municipalities have a relatively small population, the pool of people who qualify for such a position is also naturally smaller. Even though the number of people in a local council is based on a municipality's population size, this still sometimes results in people with less head for business end up in the local council. The following quote illustrates that this is mainly a problem in the municipality of Baarle-Nassau:

> *"It is in itself not easy to find people who are crazy enough to want to be part of a city council or who want to join a board [in the ABG area]. So, who ends up there? Well, it is the people crazy enough to do it like the owner of the local bike repair shop, the baker, the butcher and the biggest farmer in town. These people do not always have the right head for business. Besides, if an alderman has a big mouth, he or she usually gets his/her way because the council does not really know what it is about, so they are easily bluffed. I am especially talking about Baarle-Nassau, where this happens a lot. So it is really 'village politics'. They will discuss about a crooked sidewalk tile just as long as about any disaster plan.*
> *- Interviewee 11, representative of Verschel and Van Dun*

The respondent who works for the ABG organization confirms this view and indicates that the small-town character also means that local political discussions indeed often find themselves at 'sidewalk-tile level'. Councils often discuss topics that are really close to the municipality's residents which is not necessarily what they are meant for. They are meant for keeping an eye on the main points.

5.2.3 Baarle-Nassau and Baarle-Hertog

Another politically interesting point that is worthwhile mentioning regarding the political context of the ABG area are the enclaves in Baarle-Nassau and the level of bilateral political collaboration with Belgium that is needed because of this unique situation. "The challenges and opportunities presented by the enclave situation require much mutual understanding and consultation between Baarle-Nassau and Baarle-Hertog. It is and remains an administrative challenge to deal with the geographical interconnectedness of two countries on a daily basis. In the interest of the inhabitants, both municipalities provide good joint facilities and services. The municipalities themselves also call it 'little Europe': after all, cooperation on the scale of

Baarle is akin to a laboratory for international cooperation. The small scale of Baarle makes it possible to solve issues that at first glance seem impossible in a pragmatic way" (Visit Baarle a, n.d.)[6].

To make sure the administrative process runs as smoothly as possible, the joint authority Baarle (Gemeenschappelijk Orgaan Baarle, or GOB in Dutch) was set up in 1998, which morphed into the BeNeLux Grouping for Territorial Collaboration Baarle (BGTS). The BGTS is the legal entity of the Benelux treaty regarding cross-border collaboration. Essentially this means that both municipalities can transfer certain responsibilities to the BGTS. The BGTS in turn is able to make legal decisions for both municipalities.

The BGTS Baarle administratively takes shape the form of the so-called 'enclave council' (a joint meeting of both Baarle-Nassau's and Baarle-Hertog's municipal councils) and an 'enclave college' (a joint meeting of both municipality's colleges). The 'enclave council' is in charge of the joint legislation of the two municipalities and comes together three times each year. The 'enclave college' prepares the decisions that are taken by the 'enclave council', takes charge of the implementation of these decisions and additionally also has own competences relating to the executive management of the area. This component of the BGTS comes together every month (interviewee 7).

The representative of Visit Baarle, the local tourism office, indicates that in general, this collaboration has been working quite well. This respondent indicates she thinks this is because Baarle-Nassau and Baarle-Hertog have a joint interest in making things work. However, there are instances where the enclave situation has been a challenge as national legislation of Belgium and the Netherlands did not align. One example was the COVID pandemic, during which Belgian measures were stricter than Dutch ones. In an area where two neighbouring shops or restaurants are officially part of a different country, this led to interesting and challenging situations. On the other hand, this situation also came with a lot of positive publicity which boosted tourism post-pandemic, which is explained in more detail in §5.3.2. Another challenge this unique area deals with every year is discussions around fireworks. Just as with COVID, this comes down to a fundamental difference in legislation around the legality of fireworks. Certain fireworks are allowed in Belgium but not in the Netherlands. This results in large amounts of people from the Netherlands coming to Baarle to buy (illegal) fireworks. On one hand this is a safety issue, which is taken up by the police and the Safety Region, but also the large amounts of people visiting Baarle just to get these fireworks cause nuisance.

5.2.4 Legislative frameworks for farmers

An additional, more separate, political topic that came up in one of the interviews were the different legislative frameworks for farmers. In an area where land use is mostly agriculture-related, the farmers in the area are naturally a group of stakeholders you have to deal with.

As is widely known, the practices of agriculture and farming have been subject to quite some legal changes over the past years. Examples are discussions surrounding climate change and forthcoming discussions about the sustainability of livestock farming and the well-known nitrogen issues in the Netherlands. As a result, a multitude of legislative frameworks are being imposed on farmers. A former representative of the Southern Agriculture and Horticulture Organization of the Netherlands (ZLTO), which is the association for farmers and in the provinces of Zeeland, North-Brabant and South-Gelderland, argues that too often, farmers have to deal with a multitude of legislative frameworks which are sometimes contradictive. Part of the farmer's protests that took place over the past years in the Netherlands are related to frustration surrounding this topic.

Another respondent, a representative of Verschel and Van Dun[7], who is in regular contact with this group, explains that sometimes legislation does not match reality. This is not to say that the legislation does not make sense, however the measures taken sometimes just do not match the considerations farmers make within their operations. An example is the irrigation policy of the Water Board itself and the shift that has been taking place from a dominance in livestock farming and the production of corn and grass in towards forms of arable farming:

> *"Naturally, these [potatoes, beets, carrots etc.] are much more susceptible to measures taken by the Water Board, both in terms of drought and waterlogging. regulations regarding irrigation permits are becoming stricter, so if a farmer has 20 hectares of potatoes and is a few weeks late in irrigating*

[6] Source is a poster in the office of Visit Baarle. A picture of the poster is included in the folder of additional deliverables for this thesis or upon request.
[7] Verschel and Van Dun is a steward company which specializes in consultancy and management of real estates and spatial (re)developments.

them, they may dry out, costing him tons... (…). He can go bankrupt. So, when the Water Board calls for an irrigation permit, even if it's a misty Saturday morning, [a farmer will] still get out his hose and quickly irrigate because the €5000 fine does not outweigh the risk of bankruptcy or loss of income from his potatoes. Thus, you increasingly see that the regulatory pressure from the Water Board conflicts with the interests of the farmers"
- Interviewee 11, representative of Verschel and Van Dun

5.2.5 A joint desire to have a bigger say in spatial planning

An additional point that was brought up regarding the political context of the study area, but might play at the national level as well, is the current position and limited say of both Water Boards and Safety Regions in the spatial planning process. When it comes to spatial planning, several key players are involved throughout the entire design and decision-making process (e.g. municipalities, provinces etc.). For the Water Board itself, this is something they are struggling with as they currently only have an advisory role when it comes to spatial planning. Important steps have been taken over the past few years in the form of water and soil as guiding principles and also the implementation of the new Environment and Planning Act has further solidified the position of (amongst others) Water Boards in the spatial planning process. However, it is still very much a search for both Water Boards themselves as well as for other actors involved in this process to navigate through this new dynamic and give substance to their new role.

In the interview with two representatives of Safety Region Mid- and West Brabant, this was a particularly prominent topic of discussion. The area this safety region serves covers the entirety of the service area of Water Board Brabantse Delta plus an additional three municipalities North-East and two additional municipalities South-East of the service area of Water Board Brabantse Delta. The representatives of the safety region indicate that having a say in spatial planning is fairly new to their organization and that they are still unsure about their position in this process. However, there is a growing realization that they want to be involved early on in spatial plans. One of the representatives explains:

"From the point of view of the new Environmental and Planning Act, we really want to be involved early on in the [spatial planning] process. However, we are being pushed back by the municipality, which pushes us into the permit process by saying 'you can come back when we have to approve the permit or not'"
- Interviewee 4, representative of the Safety Region Mid- and West Brabant

Put simply, the safety region struggles with similar issues as the Water Board regarding their role in the spatial planning process. They see decisions being made that, from a safety perspective, should have been reconsidered. The respondents indicate the Safety Region would like to be involved early on, when vision documents are being created. On the other hand, it seems a little unclear who exactly should be in charge of this at the VRMWB. Whereas the Water Board has account managers who work closely with the municipalities they work in, the safety region does not have specific employees for this. In that sense, the Water Board is a step ahead of the safety region when it comes to this. The employee of the Water Board that was also present at this interview brought up that it might be worthwhile looking into account managers for the safety region or that it could also be an option to create a collaboration between those employees of the VRMWB who are partially involved in the spatial planning process and the Water Board's account managers. This way both organizations could represent both of each other's interests and form a stronger front. Both employees indicated that they definitely see this as an interesting way of thinking and working that is worthwhile exploring.

5.2.6 A potential changing role for archaeologists due to climate change

A final point regarding the political segment of the 'social DNA', relates to the political position of the Water Board themselves and has to do with the interests of archaeology and possibly closer collaboration between the two domains in the future.

Archaeological values might not be the first thing that comes to mind when talking about climate change, however during an interview with two archaeologists who (amongst others) work for the ABG area, it became clear that as the government layer in charge of water management, it might be worthwhile to look into this, especially as a Water Board that operates in an area as rich in archaeology as the high and dry province of North-Brabant. The respondents explained that there are two basic archaeological principles being put under pressure by climate change. The first one is the principle on conservation 'in situ' when it comes to archaeology in the Netherlands. This entails that, where possible, archaeological values are preserved in the ground because of the simple reason that this is the best way to preserve archaeological values (interviewee 9). This principle is under pressure as the preservation in situ principle only holds up in relatively wet soil conditions. However, due to climate change, we experience a general trend of our soils becoming drier. Therefore, the regional archaeologists argue that we have critically reflect on if this is still the best way to preserve archaeological values.

The second principle is 'the disruptor pays', which refers to the actor disturbing the soil (and therefore possibly archaeological values) has to pay for the archaeological investigation needed for his/her desired activities in a given area. However, if due to climate change our soils become drier and threaten the preservation of archeologically valuable objects, who pays for this to be investigated, removed and stored? A recent congress both regional archaeologist attended discussed the sustainability of both in relation to climate change. In addition, the archaeologists explain that changing ground water levels would also negatively affect the archaeological values (interviewee 8 & 9).

As Water Boards are the ones in charge of water management, these developments are something to take into account when thinking about water management of the future. If the Water Board takes the concerns these interviewees express seriously, it would be a possibility to collaborate more intensively with archaeologists. The Water Board could, for instance, involve archologists more in decisions that are taken by the Water Board. This could be based on projects, which happened in the municipality of Moerdijk before, but the Water Board can also think of more permanent forms of collaboration. For example by extending the advisory role of archaeologists in projects of the Water Board to broader decisions on water management or possible an archologist working full time for the Water Board in the future to make sure these interests are taken into account.

5.3 Economy

5.3.1 Agriculture

Wet to dry transitions in the landscape have traditionally been desirable places for people to settle, which made the ABG area (and especially Alphen) an attractive place to settle too (BRO, 2000). The geological characteristics of the area as presented in §5.1.1 revealed that the soil in the ABG area is particularly suited for agriculture. Therefore, ever since people started living here, agriculture has been an important economic activity. However, the agricultural sector has been subject to many changes over the years and thus so has the type of agriculture that was practiced in the ABG area.

It is expected that around 3000 B.C. the first people started to settle in this area in small agricultural settlements. These first farms were surrounded by Celtic fields, small agricultural plots on which people grew things like flax and grains and where domesticated livestock could graze. Due to agricultural innovations around 1000 AD, food production increased which resulted in an increased importance and professionalization of agricultural production. Besides, the urbanization process also started to accelerate in the entire province of North-Brabant during this time. During the 18th and 19th century, farmers on the sandy soils of North-Brabant started to have a tougher time as agricultural production intensified in a lot of areas but the soils in this area were not suitable for large scale crop production. Therefore, a lot of farmers in the area switched to livestock farming (Brabants Erfgoed, n.d.).

A mix of livestock farms and smaller scale agricultural production farms dominated the agricultural sector in the ABG area up until around the time of the land consolidations that were referred to in §5.1.2. These land consolidations mainly benefitted the agricultural sector as many different plots were merged into a smaller amount of bigger agricultural plots. This resulted in the disappearance of most of the characteristic small-scale landscapes in the area. As mentioned in §5.1.2 as well, this explains the differences between the landscape in the eastern and the western part of the study area (BRO, 2000).

Over the past few years, the agricultural sector has been subject to many changes as it has been put under pressure by (its effects on) climate change. The livestock sector is one of the sectors that was hit hard and since the study area housed many livestock farmers this has led and is still leading to a transition in the landscape. Due to increased legislative pressure as well as problems with aging of the population in the area and farmers not having anyone who wants to take over their business, large numbers of agricultural lands become available for repurposing. This development plays out in a number of ways. First of all, living in the rural areas becomes available to a wider public which means the rural areas become more and more of a residential area which comes with changing demands regarding water management as well. In addition, even though the farms themselves are still inhabited, some of the stalls on these plots are not being used anymore, these are also referred to as VABs (a Dutch abbreviation for 'vrijkomende agrarische bebouwing'). Some of these are repurposed but some are left vacant for prolonged periods of time. This can have implications in the sense that form attractive locations for criminal activities to take place. Another implication of these plots of land becoming available for repurposing has to do with agricultural activities right next to the study area. An intensive soft fruit and tree farming cluster is located in the municipality of Zundert, which is located south-west of the ABG area. The released agricultural plots are also wanted by people who focus on such more intensive agricultural products, which could result in such businesses expanding to the ABG area in the (near) future. However, these types of agricultural production do not align with the goals and ambitions of the Water Board in this area due to their water requirements.

5.3.2 Recreation

The rise and development of the recreational sector in the ABG area

Aside from agriculture, another important economic activity emerged in the ABG area during the second half of the 20th century, this happened due to a culmination of several different factors. First of all, after the Second World War, people's free time as well as the general wealth of the Dutch population increased. Adding to this, travelling became easier as a result of the construction of roads (Dierikx, 2020). The ABG area specifically benefitted most from people wanting to spend their free time in nature, away from the city. The wooded municipalities of the ABG area, especially Alphen-Chaam and Gilze and Rijen, were attractive places for people from the Randstad[8] to enjoy their time off in nature.

> *"In this region, there has traditionally been quite a high density of campsites, especially larger ones, which has a historical background. In the 1960s, when people in the Netherlands started to have a bit more disposable income and went on holiday, it was mainly people from the Randstad who went to the forests. They would travel from Rotterdam, heading south, and the first forests they would encounter are around Breda, you see. Because of this, quite a few of these large campsites emerged, and they are still here today."*
> *- Interviewee 10, representative of tourism organization De Baronie*

The same interviewee explains that over the past years, there has been a transition in the recreational sector. Whereas at first, the recreational sector in the area was mainly tailored to traditional types of camping like tents and caravans, now a lot of other types of recreational enterprises can be found in the area. Examples are smaller farm campsites, bed & breakfasts etc. The representative of tourism organization De Baronie also explains that there is a relation between the developments in the agricultural sector, as elaborated on in the previous section, with many farmers having to quit and switching to such smaller recreational enterprises on their farms. Nowadays, the amount of people present in this area triples in size during high season (interviewee 10).

The recreational product in Gilze and Rijen and especially Alphen-Chaam is very much built up around values like locality, small-scaledness etc. There are no big tourist attractions (like amusement parks) in each of these municipalities. Alphen-Chaam even carries the Cittaslow label. This is an international label for municipalities who belong to the best in the world in regards to the (living) environment, landscape, local produce, hospitality, ecology, infrastructure, cultural history and preservation of identity (Cittaslow, n.d.). Currently only 220 municipalities worldwide carry this label. The Cittaslow philosophy is an important branding strategy for the Municipality.

An exception to this small-scaledness is the annual cycling competition known as the '8 of Chaam'. This event takes place on the Wednesday after the ending of the Tour de France and often several well-known Dutch cyclists take part in this cycling event. For example, the latest edition was won by Mathieu van der Poel. Prior to the '8 van Chaam', the 'night of Chaam' takes place which is a festive night with all kinds of musical performances (8 van Chaam, n.d.). Despite the size of this event, none of the interviewees brought this up during the interviews, possibly because it is quite different from what most of the recreational sector in the area focuses on which is more centred around small-scale tourism.

Something that was touched upon in some of the interviews are potential developments in the Dutch recreational sector as a consequence of climate change. Two different points were made regarding this. On one hand climate change could lead to unpleasantly hot summers in current popular holiday destinations. This can potentially lead to an increase in popularity of other holiday destinations, possibly the Netherlands.

8 'Randstad' refers to an area in the Southern part of the Netherlands where some of its biggest cities (Amsterdam, Den Haag, Rotterdam and Utrecht) are located and where a lot of economic activity takes place.

In addition, people from the Netherlands might start to prefer to spend their summer breaks in their own country. On the other hand, if prices of plane tickets increase due to the negative impacts of airplanes on the climate, this could lead to less people wanting or being able to spend their holidays in other countries. Since the ABG area is already loved for its recreational value, such developments are good to keep in mind as they could lead to an increase of the economic importance of this sector in the study area. However, it has to be mentioned that these were just thoughts several respondents working in the recreational sector brought up, not yet supported by numbers.

Enclave tourism in Baarle-Nassau

Even though Baarle-Nassau also partially fits the tourism picture that was painted in the previous section, this municipality also has another recreational element that sets it apart, both from Gilze and Rijen and Alphen-Chaam as well as from any other place in the world. As mentioned before, Baarle-Nassau has a unique enclave situation with the Belgian municipality of Baarle-Hertog with almost half of the world's total enclaves in just one place. "The 22 Belgian enclaves of Baarle-Hertog are completely surrounded by the Dutch municipality of Baarle-Nassau. In the two largest Belgian enclaves, there are another seven Dutch enclaves. South of the Dutch national border, there is one more Dutch enclave, within Belgian territory" (Visit Baarle b, n.d.). A representative of the local tourism office called Visit Baarle indicated that this unique situation has been a tourist attraction for quite a while, but that it really took off during the COVID pandemic. As the legislation in Belgium and the Netherlands were different at that time, this resulted in Baarle-Nassau's Zeeman making world's news.

> *"On the one hand, we already got a lot of international attention, but due to the pandemic this increased massively! There was a shop which is half Dutch and half Belgian. Measures in Belgium were stricter at that time and had to close, and that shop thought to itself: 'well, I'm not going to do that, I'll just be half closed and half open'. That was the Zeeman here on the corner of the Stationsstraat; they put up a ribbon through the shop, red and white, and well, it made world press. The New York Times came, then CNN came, well, then they all came."*
> *- Interviewee 7, representative of tourism office Visit Baarle*

The same respondent also indicates that social media also plays a big role in the promotion of Baarle. Videos of people on TikTok easily get millions of views which makes for great publicity.

Figure 16: Illustration of how tourism is embedded in the street scene of Baarle

Figure 16 illustrates the way in which tourism is embedded in the street scene of Baarle-Nassau and Baarle-Hertog. The leftmost picture shows one of many flags that are distributed all over the village. On the bottom of each flag it says 'you are now in Baarle-Hertog' (indicating you are in Belgium) or 'you are now in Baarle-Nassau' (indicating you are standing on Dutch soil). The middle picture shows one of many signs that can be found in Baarle. These signs provide short descriptions of particular buildings or places around the village. The picture on the right shows specific tiles that are located in certain parts of Baarle to indicate where enclave borders are located. The table in the top left corner of the picture is a particularly famous table as the person on one side of the table finds itself in Belgium whilst the person on the other sides is officially in the Netherlands.

5.3.3 Industry

Even though nowadays the economy of the ABG area is very much dependent on its agriculture and the recreational sector, Gilze and Rijen also has an industrial history which is worthwhile mentioning too as several industries settled in this municipality over the years. This section elaborates on the different industries that were present in Gilze and Rijen over the years.

Leather tanning and shoe industry

Leather tanning initially started out as a secondary activity on farms. However, the industry grew quite quickly after the industrialisation. This led to leather tanning becoming a bigger, more specialized industry. Rijen was one of the places in which this industry took off because of its favourable location next to a train track which made sure all necessary raw materials needed for this industry could be delivered. In addition, the large scale application of machinery significantly simplified the process of leather tanning. Therefore, many leather factories emerged in the 20th century. These in turn formed the foundation for the shoe industry in Rijen (Heemkring Molenheide, n.d.). However, not too soon after the emergence of these factories, international competition in the industry increased, especially after the Second World War. Therefore, these factories slowly started to close down as production was relocated to other countries where production costs were lower.

Brickworks

Thanks to the geological formation of the soil (fine sand and thick layers of clay and loam near the surface which were therefore easily accessible) (Fabriekofiel, n.d.), Gilze and Rijen was also suited for the production of bricks as the raw materials from the soil could be used for brick production. The small municipality had a total of three different brick factories at one point. Around the same time as the emergence of the leather factories, these brickwork factories also started popping up. The most well-known one opened its doors in Rijen in 1871 and is now known as 'De Vijf Eiken'. The second one was located in Gilze and another one in Molenschot (a smaller village in the municipality of Gilze and Rijen). This industry disappeared from the municipality at the end of the 20th century (Fabriekofiel, n.d.).

Ericsson

When the leather industry started to shrink and relocate to other countries after the Second World war, other industries started to grow and settle in Gilze and Rijen. An example was the Swedish telephone company Ericsson which settled in Rijen back in 1920. Ericsson's growth accelerated after the Second World War which made it an important employer in the area. The company attracted many people from outside the municipality to come and work there. Many of these people settled in Rijen too, which will be further elaborated on in §5.5.2. This industry kept growing until around 1990, which is when phone sales started to decline. Mobile phones were invented and the import of cheaper phones produced elsewhere increased and slowly the Ericsson decreased in size and in level of economic importance for the area. Nowadays, only a small part of the industry still resides in Rijen, the remainder has all been relocated to other countries (interviewee 6).

5.3.4 Airport Gilze and Rijen and mock airport 'De Kiek'

Another notable economic activity in the municipality of Gilze and Rijen is the Airport located in between Gilze and Rijen. Besides, the story of Gilze and Rijen airport closely relates to a mock airport known as 'the Kiek' that was built South East of Gilze and Rijen, in Riel. Riel is located right next to Alphen and from 1810 until the land consolidation Alphen-Riel, these two villages formed one municipality. Because of this, the mock airport also had a significant impact on the development of the current municipality of Alphen-Chaam, which is why it is taken up in this section.

Airport Gilze and Rijen was built in 1910 the establishment of the first Dutch flying association. Several businessmen bought a piece of heathland between Gilze and Rijen and built the airport and a hangar. Many pilots achieved their flight certificate at the Airport of Gilze and Rijen and for quite a while pilots from the military base in Soesterberg, Amersfoort used this airport as an auxiliary airport. During the first World War, a small group of military personnel worked at Gilze and Rijen airport. At that time they were responsible for maintenance of several machines. In May 1940, right after the German invasion, the Germans seized Gilze and Rijen airport and started to upgrade and expand it to be fully operational during the Second World War (GRAS, n.d.). Gilze and Rijen airport became the biggest operational airport of Western-Europe during the Second World War (interviewee 6). Besides, to distract the allied forces from bombarding Gilze and Rijen, the Germans built a complete mock airport, now known as 'the Kiek', in Riel. Multiple fake airplane runways were constructed, along with a bunker, fake hangars and dummy airplanes

(DefensieFotografie, n.d.). Its location perfectly matched the characteristics of a real airport as it was located near a town, a road and a functioning train track. East of the mock airport, in the forest and heathland area, a large letter N (referring to the German word 'notabwurfplatz', meaning emergency dropping place) was created which served as a place where German bombers could drop bomb load that was not dropped on allied forces territory before returning to Gilze and Rijen (Carel de Roy, 2022).

After the ending of the Second World War, airport Gilze and Rijen stayed operational, serving a variety of functions and offering a place to work for both military personnel as well as for other people. This lasted until 1996 when the Dutch government cut back on defence (GRAS, n.d.). After this, Gilze and Rijen became a helicopter base. Due to a recent increase in threats, the ministry of defence has made new plans for the re-activation of several airports, amongst whom is Gilze and Rijen (Ministry of Defence, n.d.) . This could mean that airport Gilze and Rijen will regain some of its economic importance.

5.4 Demography

This section dives into these demographic numbers, which are split up into four main topics: population, ethnic composition, level of schooling and income.

5.4.1 Population

Population size

As mentioned in the introduction on the study area in Chapter 3, all three municipalities are relatively small, both in terms of their total land area as well as their population size. When it comes to population size, the municipality of Gilze and Rijen is the largest as it houses close to 27.000 people divided over roughly 11,300 households (AlleCijfers.nl, n.d.-a). Most of these people (over 16.000), as well as most of the households (over 7.300), are to be found in Rijen. With a total acreage of 1874 hectares, Rijen actually belongs to some of the largest neighbourhoods in the Netherlands regarding land area (KadastraleKaart.com, n.d.-a). Alphen-Chaam is the second-largest municipality when it comes to population size. Around 10,500 people reside in this municipality and they are spread over 4387 households. Residents are equally spread over the two largest neighbourhoods (Alphen and Chaam) (KadastraleKaart.com, n.d.-b). The municipality of Baarle-Nassau comes third in terms of population size, with 7,071 inhabitants spread over 3.140 households (KadastraleKaart.com, n.d.-c)

In all three municipalities, the average household size is higher than the Dutch National average of 2.1. In Baarle-Nassau the average household size is 2,2 (KadastraleKaart.com-c, n.d.), in Gilze and Rijen this number is 2,3 (KadastraleKaart.com - a, n.d.) and in Alphen-Chaam the average household size is the largest out of the three municipalities at 2,4 (Kadastralekaart.com, n.d.-b).

Gender distribution

When it comes to the gender distribution of the ABG area, some slight differences stand out when compared to the national averages. In the Netherlands, for each 100 women, there are 99 men. When it comes to the younger age groups, there are slightly more males compared to females. When it comes to the older age groups, females outnumber the males (CBS, 2022a).

In total, in Alphen-Chaam and Baarle-Nassau there are slightly more males than females. In Gilze and Rijen there is an equal amount of males compared to females. The (slight) dominance of males holds up for all age groups up until 30. For the age groups between 30-40, 40-50 and 50-60 this fluctuates a bit, however no shocking differences can be found. In the age group of 60-70, males dominate again in Alphen-Chaam and Baarle-Nassau, in Gilze and Rijen there is an equal amount of males and females in this age group. In the age group 70-80, Gilze and Rijen has slightly more females compared to males. In Alphen-Chaam this is the other way around, meaning slightly more males than females. In Baarle-Nassau the numbers are more or less equal for this age category. When looking at the 80+ age category, the numbers of the ABG area are in line with the National numbers, meaning there are significantly more females than males (CBS, 2022a).

Age distribution

Regarding the age distribution, the numbers of the ABG area are, again, compared to the national statistics of the Netherlands as visualized in Figure 17. A general trend in the Netherlands from around 1950 onwards is a decrease in the share of younger people (meaning people under the age of 20) and an increase in the share of elderly people. Especially people above the age of 65, but also the share of people aged between 40 and 65 has increased. The main explanation for this is the ageing of the so-called baby boom generation, a large group of people born between 1946 and 1970, the post-war period (CBS, 2022b).

The ABG area is no exception to this national trend of ageing. If anything, this effect is even more noticeable in these municipalities as can be seen in the graphs in Figure 17. Especially in Baarle-Nassau, the share of people above the age of 65+ stands out.

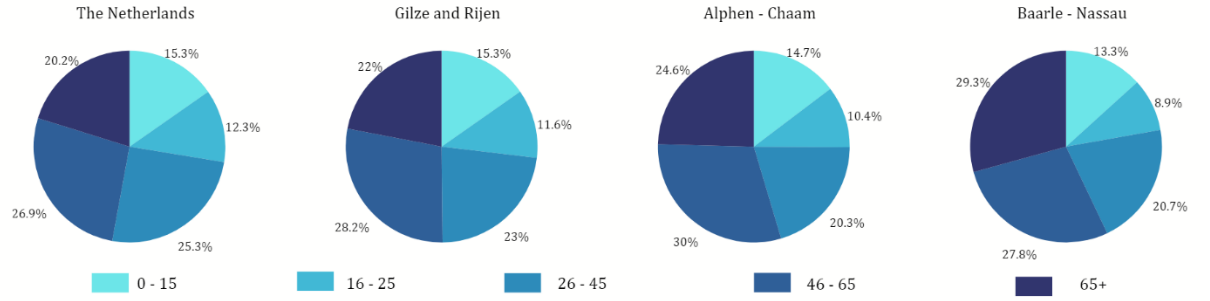

Figure 17: Age distribution of the ABG municipalities compared to the Dutch national average (AlleCijfers.nl, n.d.-a/b/c/d)

Population growth

The total Dutch population is expected to keep growing over the upcoming decades to an expected number of 20.7 million in 2070. The main drivers are an increased life expectancy and increased migration (CBS, n.d.-a). This growth is mainly expected in and around the bigger cities, the population of some outer regions of the country is expected to decline. However, forecasts surrounding this mostly point to the Northern provinces and places like the Achterhoek, Zeeland and the Southern part of the province of Limburg (VZ info, 2023). These developments are visualised in Figure 18 below, in which the ABG area is marked with a black circle. The forecasts for the ABG area are in line with these national developments.

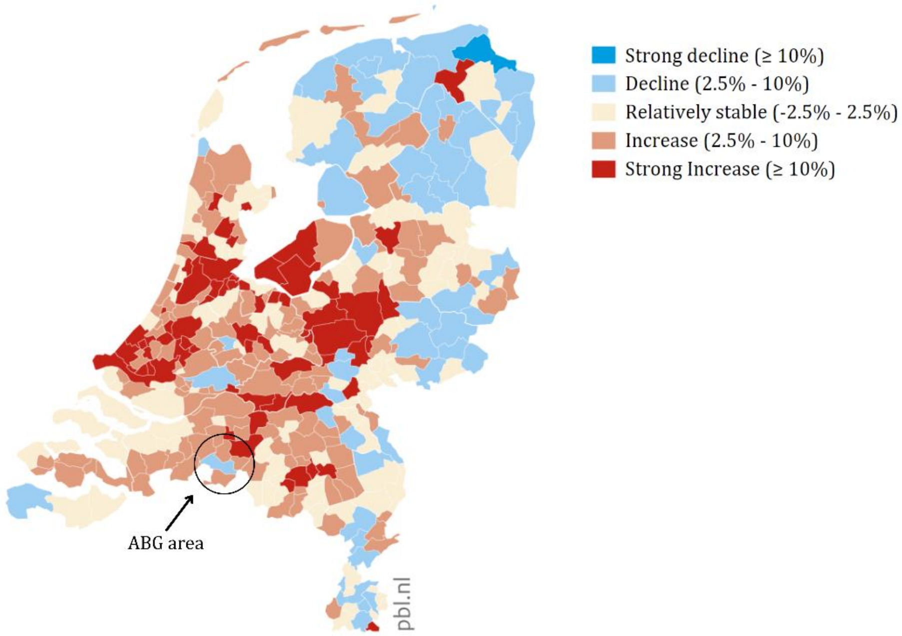

Figure 18: Expected population growth or decline per Dutch municipality, 2021 - 2035 (Adapted from PBL, 2022)

Population density

All three municipalities find themselves below the national average of 529 people per square kilometre (VZ Info, 2023) when it comes to population density. Gilze and Rijen comes closest to the national average with a population density of 410 inhabitants per km2. They are succeeded by Alphen-Chaam where the population density comes down to 113 inhabitants per km2. This means Baarle-Nassau has the lowest population density out of the three. The number for this municipality is 93 inhabitants per km2 (VZ Info, 2023).

5.4.2 *Ethnic composition*

Another important component of the demography of an area is the ethnic composition. Ethnic composition. Again, to put the numbers of the ABG area into perspective, they are compared to the national averages. The leftmost chart in Figure 19 shows the share of the total population of the Netherlands with a migration background. Migration background is split into people with a European and a non-European background. A little over one quarter (28%) of the Dutch population has a migration background. The majority of this share (18.1%) has a European background.

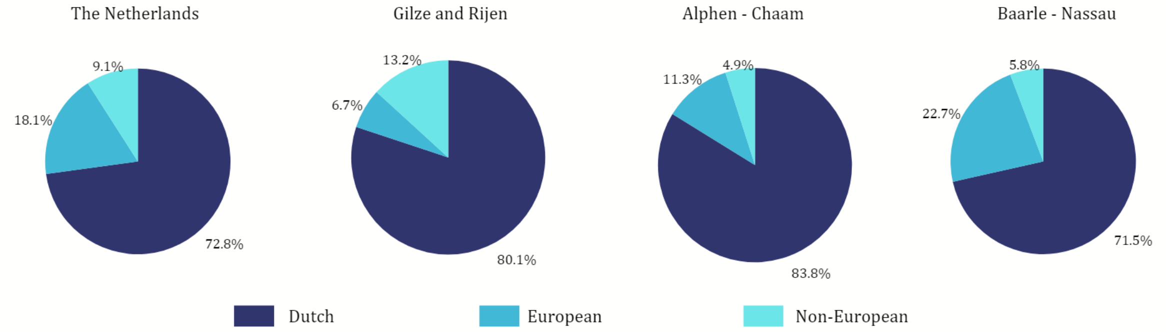

Figure 19: Ethnic composition of the ABG area compared to the Dutch national average (AlleCijfers.nl, n.d. - a/b/c/d)

In Figure 19, three things stand out when comparing the municipal charts to the national chart. Working from left to right, the chart of Gilze and Rijen shows a relatively large share of people with a migration background have a non-European background. The account manager of the Water Board explains that quite a big Turkish community resides in this municipality which explains this number. Moving on to Alphen-Chaam, the total share of people with a migration background is low compared to the national average, this can be clarified by it being a municipality consisting of small towns with mostly residents who have lived here their whole lives. Finally, what stands out in the chart of Baarle-Nassau is the large share (22.7%) of people with a European migration background (AlleCijfers.nl, n.d.-b). This can be explained by the Belgian enclaves in this area and Belgians residing on Dutch territory also belonging to the category of non-Western migrants.

5.4.3 *Level of schooling*

Level of schooling of the population is also a component often taken up in a demographic analysis of an area, therefor this thesis also looked into these numbers. Figure 20 displays these numbers at municipal level and, again, compares them to the national averages of the Netherlands, which are displayed in the leftmost chart.

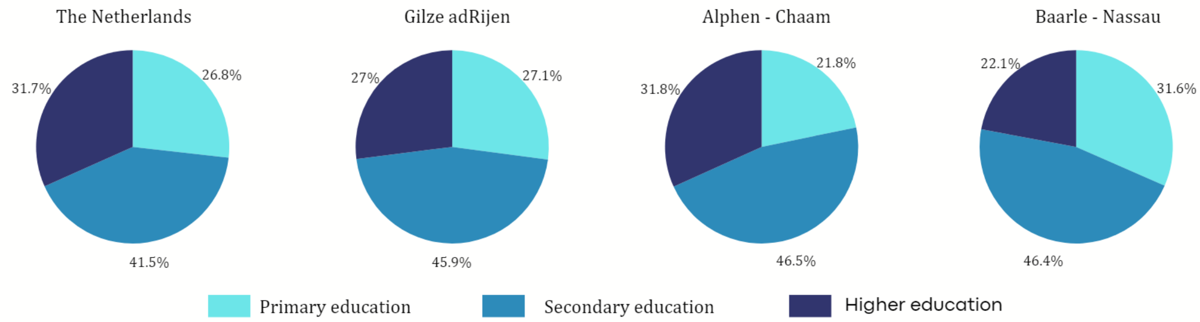

Figure 20: Level of schooling of the ABG area compared to the Dutch national average (AlleCijfers.nl, n.d. - a/b/c/d)

Figure 20 shows that the statistics for Gilze and Rijen largely resemble the national statistics, meaning the largest share of the population have a secondary level of schooling and there is not too much of a difference between the shares of higher and lower educated people. For Alphen-Chaam, the share of lower educated people is less than is the case for the national average and is compensated with a relatively larger share of people with secondary education. Baarle-Nassau is the only municipality out of the three where the share of lower educated people is higher than the national average. Here, compared to the national average, this is ‘compensated’ with a smaller share of higher educated people. The share of secondary educated people is more or less the same as the national average. This can be explained by a larger share of the population of Baarle-Nassau being older as was shown in §5.4.1 (Cubiss, 2019).

5.4.4 Socio-economic status
The final factor that was taken into consideration regarding the demography of the study area is socio-economic status. For this section, two factors were taken into account. The first one being gross annual income. The second one is the share of households in each municipality with a relatively low income. The most recent data available on this is from 2018.

Gross annual income

The average gross annual income numbers of all three municipalities in 2021 are compared to the average of the province of North-Brabant. For the entire province, this average is EUR 29,266 (AlleCijfers.nl, n.d.-c). Alphen-Chaam stands out with an average of EUR 30,700 (AlleCijfers.nl, n.d.-d). For both Gilze and Rijen and Baarle-Nassau the statistics are slightly lower than the regional as the average gross annual income in both is EUR 28,200 (Allecijfers.nl, n.d.-a/b)

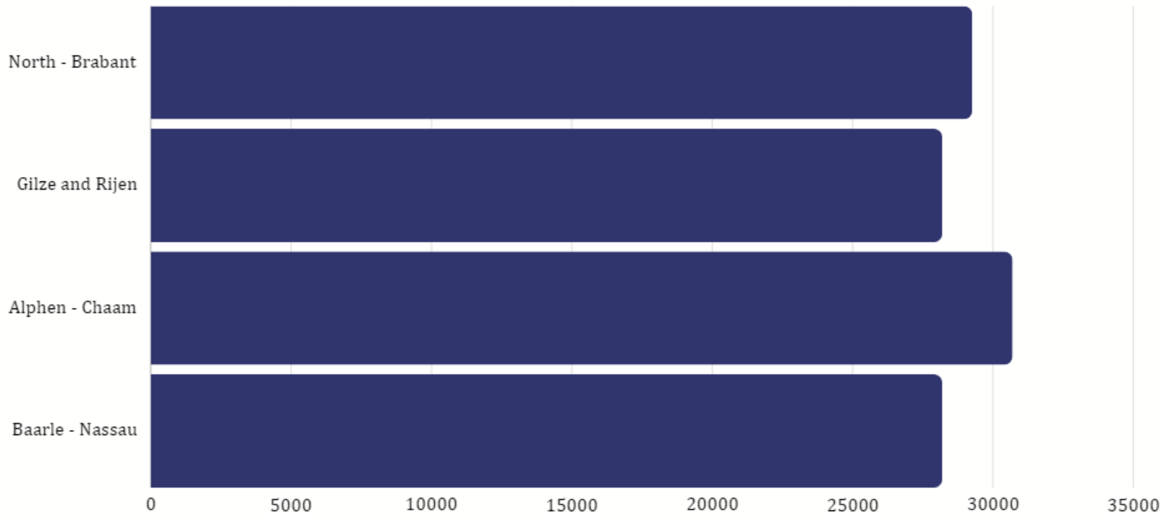

Figure 21: Gross annual income of the ABG area compared to the average of the province of North-Brabant (AlleCijfers.nl, n.d. - a/b/c)

Share of households with a low income

When it comes to the share of households who are considered to have a low income[9], there are large regional differences in the Netherlands. Especially in the larger cities and in the Northern part of the country these numbers are relatively high. Looking at the statistics at national level, 8% of Dutch households fall in this category. All three ABG municipalities have a lower share of their total amount of households which fall in this category than the national average. In Baarle-Nassau this number is highest at 6.4%, followed by Gilze and Rijen at 5,4% and finally Alphen-Chaam with 4,6% (VZ Info, 2023).

5.5 Socio-cultural

The final category from the DESTEP analysis taken up in this research is the socio-cultural aspect. As mentioned in Chapter 2, this aspect largely focuses on how people experience the area they live in.

5.5.1 Tight-knit small-town communities
The first socio-cultural topic that came back in some shape or form in all interviews that were conducted for this research are the tight communities in each of these municipalities. As all three municipalities are relatively small, the different villages within the municipalities house relatively small numbers of people. Most people go to the same grocery shop for their weekly groceries and the same goes for other day to day tasks. Everywhere they go, they meet the same people which results in people knowing one another well.

[9] "To determine whether a household has a low income, the disposable income of a household (excluding tied transfers such as rental subsidy or rental allowance) is converted into standardized income. Next, this standardized income (adjusted with the price index number for household consumptive) is converted back to the price level in 2000. The resulting standardized income and deflated income is considered low if it is below EUR 9,250" (CBS, n.d.-b)

Besides, many people have been living in these villages for several generations, this also strongly contributes to the notion of people knowing one another. People know one another and also look out for each other.

Even though the respondents of this research did not specifically mention these tight communities are even more present in one village than another, it might be good to mention that the municipality of Alphen-Chaam specifically scored really well in a national survey surrounding social cohesion. In the 2023 results of this annual survey on living pleasure conducted by Elsevier weekly, Alphen-Chaam ranks very high. The survey includes several different topics and regarding social connection ('gezelligheid' in Dutch), Alphen-Chaam even ranks second best. This research was called upon by several respondents taking part in this research. In an article on this research published by Omroep Brabant, a regional news website, an inhabitant of the municipality paints the same picture as the respondents from this research. He does add that this sense of community was even stronger in the past. The interesting thing about Alphen-Chaam is that it also ranks as a relatively rich municipality. A representative of the local history association of Alphen-Chaam explains this is a mix of people who are from the municipality itself, mostly farmers, and people from outside who buy a house in Alphen-Chaam due to the beautiful environment (interviewee 19). The citizen interviewed for the article in Omroep Brabant explains that most who are doing exceptionally well money-wise are also very much integrated in the community. He explains these are also mostly people from the area itself and visit the same pubs as the interviewee himself. In other words, there is no social gap despite these differences in wealth (Van der Plas, 2023).

The only exception to all that was explained above about tight knit communities, is Rijen. The reasoning behind this is elaborated on in the following section.

5.5.2 The influence of 'import'

Gilze and Rijen

As was elaborated on in §4.3.3, Gilze and Rijen is the only municipality in this study area with a notable economic background outside of agriculture and recreation with its industrial roots and its airport. Regarding the former, one of the respondents explains:

> *"Look, Rijen had its brick factory, had Ericsson, which required a lot of personnel. So people were brought in from everywhere, and they went looking for a house, so the demand for housing was high, and thus construction began. More and more people came from outside started to settle here"*
> *- Interviewee 6, representative of local history association Molenheide*

As these people came from all over the Netherlands, they did not have this intrinsic connection to Rijen and also had less of a connection with the other people who lived here. This automatically led to less social connection as compared to the other villages in the study area. As the municipality kept growing, this effect magnified which has led to a social structure that is referred to as 'loose sand' by some respondents.

This effect was amplified by another source of 'import' which consisted of military personnel who were brought to Rijen to crew the airport of Gilze and Rijen. The same respondent as quoted above, mentioned that in 1952, an entire military neighbourhood was built for military personnel who, just as was the case with the industries that settled here, were brought to the village from all over the country.

This looser social structure has persisted up until today and is even being enforced because of Rijen being located between the bigger cities of Breda and Tilburg. The trains that travel back and forth between these cities also pass through Rijen, which also makes Rijen an attractive place to live for people who work in Breda or Tilburg.

Alphen-Chaam

There is one other village which has been influenced by import as well, which is Alphen. As explained before, Alphen formed a municipality with the neighbouring village of Riel before Alphen and Chaam merged into one municipality. As mock airport De Kiek was located in Riel, this also left its marks on the composition of Alphen's population. De Kiek was being practiced by military personnel which also moved to Alphen from other places in the Netherlands. These people were predominantly protestant whereas in Alphen, most people were catholic at the time. Initially this caused some nuisance. One of the respondents mentioned that there were whispers of people arguing that if someone with a protestant background would make it to the board of their association, they would leave. However, this same respondent explains that this turned out to be mainly big talk as when it came down to it this was not the case at all. These differences that existed in the past, have largely faded with time and are near unnoticeable nowadays (interviewee 19).

5.5.3 The importance of associations

In the ABG area of the Netherlands, associations play a vital role in shaping social organization, according to several respondents. These associations encompass a wide range of activities and interests, including sports, social gatherings, and cultural celebrations such as carnival. Serving as hubs for social interaction, these associations serve as platforms where individuals come together, fostering a sense of community and belonging. Moreover, they serve as important channels for the dissemination of information and the exchange of opinions on various topics. Whether it's discussing local events, sharing knowledge about specific interests, or debating broader societal issues, these associations serve as catalysts for social cohesion and collective engagement within the ABG area. Some respondents mention that certain types might be declining in size, like religious associations or choirs, but other than that associations are very much alive in this study area. An association that was mentioned specifically multiple times is an association for elderly people, they have quite a large number of members and organize lots of activities. Something that also stood out in the interviews was the multitude of associations for businesses. Examples that were mentioned are associations for businesses working in the tourism sector and for businesses.

5.5.4 Ageing

Another theme that was touched on a lot in the interviews that were conducted for this research was the topic of ageing. Ageing is not something new and is definitely not unique to the ABG area. For years, the share of people aged above 65 has been increasing and estimates say this share will rise to over 24% in 2035 (PBL/CBS, 2022). The numbers shown in paragraph §5.4.1 are in line with statements that argue that the phenomenon of ageing will be most prominent outside of the bigger cities. Figure 17 showed that for all three municipalities in the study area, the share of people over the age of 65 is higher as compared to the national average. For Gilze and Rijen, the municipality with the largest population and located near two bigger cities this difference is smallest.

In the interviews, this phenomenon was linked to several other trends. Respondents from the Water Board explained that ageing affects agricultural businesses as many agricultural enterprises do not have anyone to take over when they retire which plays into the hands of the trends in the agricultural sector as explained in §5.3.1. In addition ageing combined with the increased pressure of the soft fruit industry and tree cultivation in the area can lead to increased dependence on seasonal or migrant workers. Combined with an existing housing problem, this could potentially lead to additional challenges when it comes to housing. Finally, several respondents also indicated that this ageing phenomenon could also affect the number of volunteers. On the shorter term, it could lead to an increase of people being able to do voluntary activities due to more free time.

5.5.5 Hands-on mentality

A final note on the socio-cultural aspect of the ABG area is that quite some farmers reside in this study area. These people do not mind getting their hands dirty or tackling challenges they face themselves. In other words, they possess a hands-on mentality which is characteristic for this group of people (interviewee 13).

> *"That's the thing, we can all call the government for every little thing, but eventually, they get so many calls that they don't know what to do anymore. If they get a report of a collision on the highway, they're all gone because that is seen as a priority, so people's self-reliance could be improved. They call for a cat stuck in a tree, well, that cat usually just comes down if you wait long enough, and yes, maybe the safety region will talk about it too, but if you want, you can handle it yourself. You grab a ladder, lean it against the tree, and get the cat yourself."*
> *- Interviewee 13, former representative of the ZLTO*

6. Results: Social Network Analysis ABG area

The previous Chapter dove into the *what* when it comes to the 'social DNA' of the ABG area. The next component that was looked at was the *who*. During all interviews, respondents were also asked about their networks and relations and also their (maybe not yet existing) relationship with the waterboard. This data was gathered to formulate an answer to the second sub-question that was developed for this research project: *' What does the network of actors look like in the 'social DNA' of the ABG area?'*. To answer this question, all organizations that participated in this research project were first structured based on the level on which they operate. This led to a distinction between three main layers; municipal level, ABG level and regional level. These layers, including the respondents operating on each level are visualized in Figure 22.

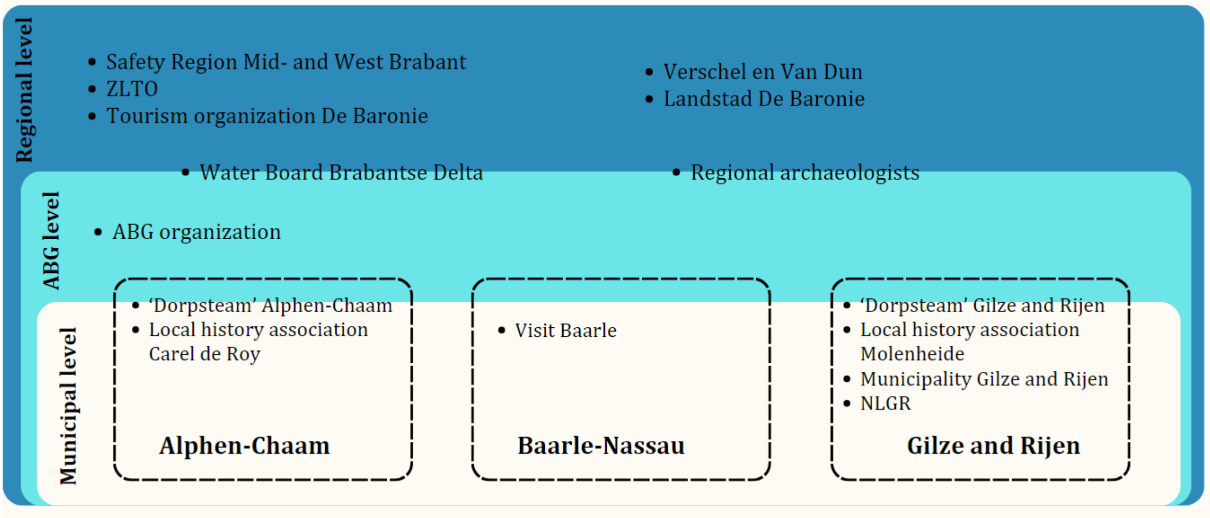

Figure 22: Division of participating organizations in this research project according to the level at which they operate.

The relationships between the actors that took part in this research and the connections they mentioned during the interviews have been visualized using a Social Network Analysis tool called Gephi. This resulted in the Social Network Analysis graph as presented in Figure 23 (a bigger version is included in Appendix IV). The green circles indicate actors/organizations that took part in this research project, the orange circles are actors/organizations the respondents for this research project mentioned as important network partners. The size of the circles has been adjusted to the amount of connections within this specific network. In other words, the bigger the circle, the more connections that specific actor has.

The remainder of this Chapter provides the textual explanation for both Figure 22 and 23. The Chapter is structured based on the levels as shown in Figure 22 (municipal, ABG, regional level). These textual explanations dives deeper into the connections between as visualized in Figure 23.

As explained in Chapter 2, the Social Network Analysis as presented in Figure 23 is solely based on inter-organizational connections. This means no connections with individual citizens have been taken up in this visualization. The textual explanation, however, does touch on these connections. Finally, I want to re-emphasize that this is not a complete overview of all actors involved in the ABG area but rather a structured representation of those who took part in this specific research project and the network partners they mentioned. This means that if a certain relationship is not taken up in Figure 23 and the textual explanation provided in this Chapter, this means that this relationship was not mentioned, not that it is non-existent.

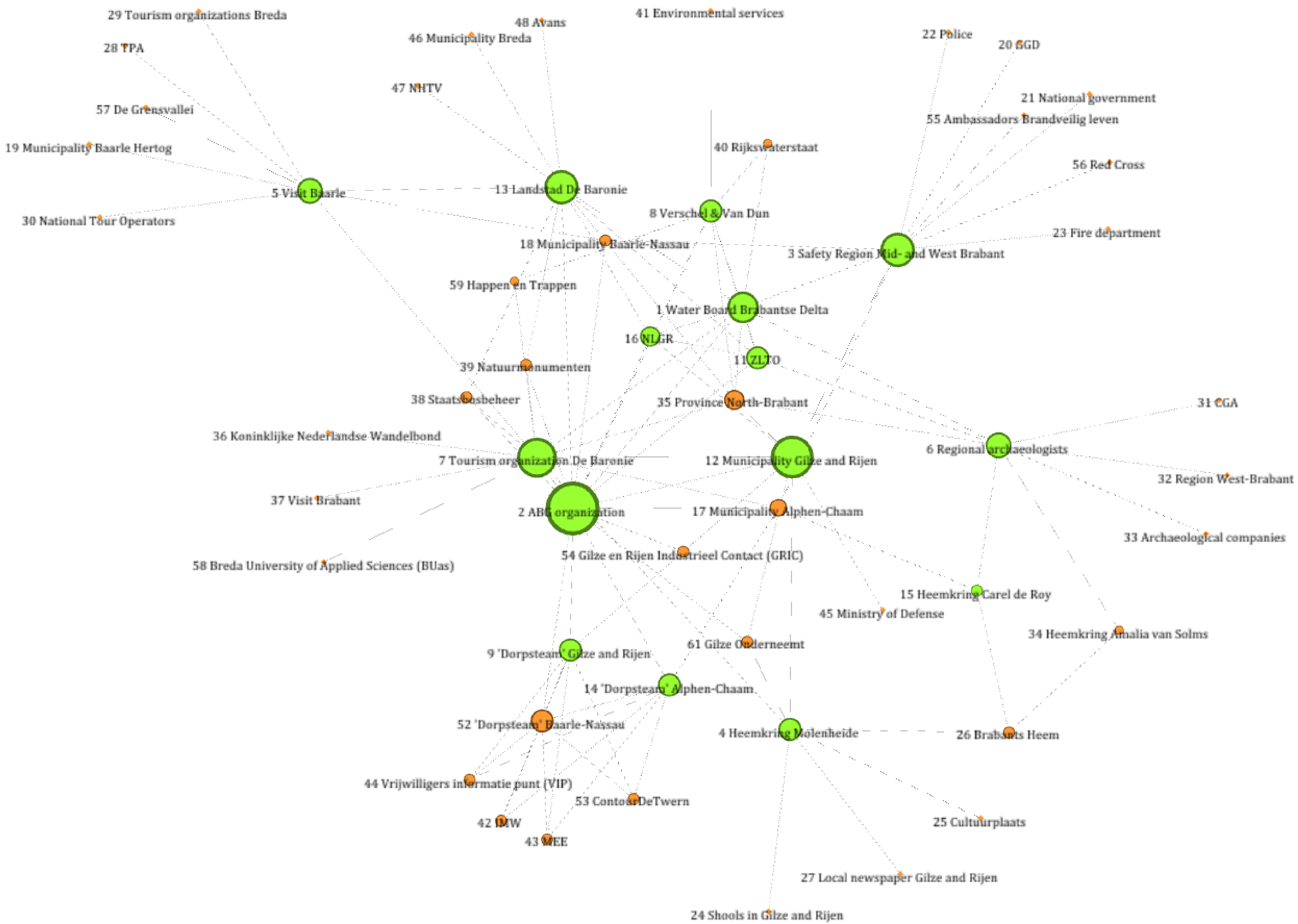

Figure 23: Social Network Analysis of the ABG area

6.1 Regional level networks

6.1.1 Water Board Brabantse Delta

The first actor taken up in Figure 22 which operates on the regional level is Water Board Brabantse Delta itself as their service area consists of a large share of the province of North-Brabant. They have been located on the transition from regional to ABG level though as they work with an account manager that specifically serves the ABG area. Since the Water Board already has a clear picture of who their current network partners are and the aim of this research was mainly to look beyond this, this analysis will not further dive into the network of the Water Board.

6.1.2 Safety Region Mid- and West Brabant

One of the organizations that I spoke to for this research, which operates at the regional level, is the Safety Region Mid- and West Brabant (VRMWB). Their service area largely overlaps with the service area of Water Board Brabantse Delta. Nevertheless, current collaboration between these two entities is limited and focuses primarily on emergency situations and crisis response exercises at the moment. Although there are several personal connections and occasional joint projects between these two organizations, the respondents from the Safety Region indicate that such a collaboration is not yet systematically integrated across the entire organization. However, the representatives of the Safety Region that took part in this research project recognize their own organization in the Water Board's struggle surrounding their challenges becoming increasingly complex. Besides, they indicate that they feel like the boundaries of their responsibilities are starting to blur because of this. They indicate they are definitely open to a closer collaboration with the Water Board (interviewee 4).

For their day to day activities, the Safety Region closely cooperates with emergency services (police, fire department and ambulances), because of their shared involvement in public safety response. This specific collaboration is predominantly operational in nature, pertaining to specific incidents that affect public safety. However, this set of actors also engages in collaboration on other fronts. To illustrate this, the respondents brought up their so-called 'integral safety monitor' as an example. The 'integral safety monitor' is a yearly report in which the VRMWB gathers data on 60 different indicators which are determined by the municipalities in their service area. These indicators are all in some way related to public safety. They are a combination of factors the municipalities they serve regard as important information to base their integral safety policy plans on. The Safety Region is in charge of collecting this data from various partners.

> "These are regular emergency response organizations such as the police, GGD (Public Health Service), and RAV (regional ambulance service). Well, figuratively speaking, a Water Board is just coincidentally not included here, but it could be, as well as a tax authority. However, there are also less traditional partners involved such as Veilig Thuis[10], the Red Cross, Meld Misdaad Anoniem[11], and various others. These different types of partners provide us with their data, which we collect and analyse to identify trends and developments. Through subsequent discussions, we can extract risks from this data."
>
> - Interviewee 4, *representative of the VRMWB*

The representatives of the Safety Region explain that these partners do not only provide the Safety Region with necessary data, but also engage in discussions regarding how data should be interpreted. Certain information might be easy to understand by, for example, a police officer but might mean nothing to someone from the Public Health Service (GGD). In other words, all partners are asked to engage in discussions to provide the necessary context that is needed to put their data into perspective.

The quote above indicates that the Water Board could be one of the partners in the 'integral safety monitor', however that it is not in the most recent version. This stood out to me as I would think water, or at least climate-related, indicators would be taken up in the list of indicators provided by the municipalities. To me, this appears to be a valuable and also important opportunity for the Water Board, which can be utilized in multiple ways. One way would be via the Water Board's account managers who can talk to their contacts at their respective municipalities about the importance of incorporating water/climate related indicators in

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[10] Veilig Thuis (Dutch for 'safe at home' is "the advice and reporting center for domestic violence and Child abuse [in the Netherlands]. These are regional organizations which offer victims, perpetrators, and bystanders expert help and advice. Veilig Thuis also provides support for professionals" (Ministry of Health, Welfare and Sport, n.d.).

[11] Meld Misdaad Anoniem (Dutch for 'report crime anonymously' is an "independent reporting center for anonymously reporting information about criminal activities" (Meld Misdaad Anoniem, n.d.)

their next request regarding their integral safety policy plans or new ways of collaboration could be created to guarantee this.
The relationship between the Safety Region and the municipalities they serve extends beyond their involvement in the 'integral safety monitor'. In case of emergencies, mayors play a crucial role: "Depending on the nature and scale of an incident, the administrative management of an incident is vested in the mayor of the affected municipality or in the chairperson of the safety region. In principle, the mayor leads the crisis response, unless multiple municipalities are (threatened to be) affected. If a crisis extends across multiple municipalities, the leadership shifts to the chairperson of the safety region" (NIPV, 2019). Another topic connecting the Safety Region and the municipalities is spatial planning. However, this role is still very limited as was explained in §5.2.5.

Furthermore, the Safety Region is connected to the National government, whose rules and frameworks they have to follow and implement. Besides, they also collaborate with other Safety Regions on a regular basis.

Additionally, the Safety Region also collaborates with various groups of volunteers for different purposes. Examples mentioned during the interview are their ambassadors 'brandveilig leven'[12], voluntary fire fighters and 'ready2helpers'[13]. Some of these networks might also be interesting for the Water Board to look into if they wish to extend their collaboration with the Safety Region. An option would be to extend the thematic focus of the ambassadors 'brandveilig leven' or to extend the xx of the 'ready to helpers' to also be able to jump in for water-related incidents.

Finally, the respondents from the Safety Region also indicate that they have started exploring ways to engage more with society. However, at the moment, this is more of a desire than a reality. This will be elaborated on in further detail in Chapter 7.

6.1.3 ZLTO

The ZLTO, the Southern Agriculture and Horticulture Organization of the Netherlands, was approached to take part in this interview, however they did not respond to this request. However, one of the respondents that took part in an interview as a member of tourism organization 'De Baronie' turned out to be a former representative of the ZLTO. This respondent shared some insights into the network of this association, which is how I was able to include this organization in this Social Network Analysis too.

As the ZLTO represents farmers and growers, individual agricultural entrepreneurs are an important part of their network. The ZLTO acts as an intermediary between its members and several governmental bodies like the national government, provinces, municipalities and also Water Boards. As explained in §5.2.4, all of these government bodies impose various rules and legislative frameworks onto farmers and their practices. To negotiate the interests of its members, the ZLTO engages in discussions with the authorities to lobby for mor favourable rules and regulations for its members.

The former representative of the ZLTO also specifically mentioned the pleasant collaboration with the account manager of the ABG area. The respondent explained that they always managed to link farmers to the account manager. This dynamic also worked the other way around, as the account manager also knew when and how to contact the ZLTO and understood their interests well and took them into account as best as he could.

A final point that was brought up by one of the Water Board representatives taking part in this research project is that the number of farmers and growers who are members of the ZLTO is decreasing. Some additional desk research indeed confirmed this trend as pointed to by the Water Board representative (Bron, 2014). However, this information reached me after the interview with the former representative of the ZLTO had taken place. Therefore, I have not specifically brought this up in the conversation, and neither did the respondent himself. Despite this, I have chosen to take this up in my results section as it is definitely a development to keep an eye on as a Water Board as the ZLTO is currently a common network partner of the Water Board. However, these developments might mean that they will have to invest in collaborations and relationships with farmers on a more individual level in the future.

[12] Ambassadors 'brandveilig leven' (Dutch for 'living fire-safe') assist the Safety Region in raising awareness on how people can make sure their environment (home and work) is protected against fire risks.
[13] Ready2help is an anitiative of the Red Cross and consists of a group of volunteers who can be called to action when help is needed. These are people who do not provide voluntary services based on a fixed schedule but rather provide their assistance when it is needed and when their schedule allows for it.

6.1.4 *Tourism organization 'De Baronie'*

A third organization that operates on the regional level is tourism organization 'De Baronie'. On one hand, this organization promotes recreational activities and on the other hand it also serves as the association for enterprises that earn their living in the recreational sector. Even though a large share of this organization's members resides in Gilze and Rijen and Alphen-Chaam, I have categorized this organization on the regional level as they do not serve the ABG area exclusively.

> *"[De Baronie] serves the area between Tilburg, Breda and the Belgian border. So, our members mainly come from Gilze and Rijen and Alphen-Chaam, but a quarter of our members come from Baarle-Nassau, Breda, Tilburg, Goirle, and the surrounding areas... You see, we approach it a bit from the perspective of tourists, who don't look at municipal borders but approach it as an area, and sometimes municipal borders cut right through that"*
> *- Interviewee 10, representative of tourism organization De Baronie*

Every member organization pays a contribution fee and De Baronie also receives some funding from the municipalities they work for. However, not all municipalities pay the same amount of money. This is due to differences in the total amount of money available per municipality as well as what choices are made within each respective municipality regarding the importance of an organization such as De Baronie. Besides the municipalities, De Baronie also has connections to the Province of North-Brabant and both Region Tilburg as well as Region Breda. Other regular collaborations consist of 'Staatsbosbeheer'[14], 'Natuurmonumenten'[15] and area managers.

To aid in developing and promoting the recreational value and product of the area, this organization collaborates with a variety of partners. Partners mentioned in the interview include Visit Brabant (a promotional organization for the province as a whole), Visit Baarle (the local tourism office of Baarle-Nassau) as well as national recreational organizations like the Royal Dutch Hiking association (Koninklijke Nederlandse Wandelbond in Dutch) and 'Happen and Trappen'[16]. The representative of tourism organization De Baronie explains that they are always looking for new ways to promote their area and all it has to offer.

The respondent explains that their collaboration with the Water Board is limited at the moment. Both this representative as well as two representatives of members of the organization refer to so-called 'climate safari's', which were organized for member organizations of De Baronie to bring people together and see what was already being done in the field of sustainability. At the time the Water Board, or more specifically the account manager of the ABG area, was also involved in this. Regarding possible collaboration opportunities with the Water Board in the future, the respondent indicated that he definitely sees possibilities. The respondent explains that it might be an opportunity for the Water Board to collaborate with De Baronie to be more involved in the recreational product of the area. For example, they could jointly develop a route for which the Water Board could provide the backstory. This way, De Baronie can benefit from the content of the Water Board, and vice versa, the Water Board can benefit from the reach of De Baronie. This approach not only taps into the experiential value of the area but also allows the Water Board to engage with non-traditional network partners and can also positively contribute to overall awareness on (the tasks) of the Water Board.

6.1.5 *Landstad de Baronie*

Another organization operating on the regional level is a regional network called 'Landstad De Baronie'. Even though the name might suggest that they are related to tourism organization De Baronie, which was discussed in the previous section, this organization does not focus on tourism specifically. Landstad De Baronie is a collaboration between several municipalities (Alphen-Chaam, Baarle-Nassau, Breda, Etten-Leur, Gilze en Rijen, Oosterhout, Rucphen en Zundert), Water Board Brabantse Delta, Staatsbosbeheer and Natuurmonumenten. This network initiates and encourages projects "that strengthen the living, social, and recreational climate [in their region]. Additionally, [they] organize a Networking Day twice a year for [their] network and facilitate new connections between parties" (Landstad De Baronie, n.d.). Besides, together with their partners, Landstad De Baronie also provides subsidies for small initiatives in the region.

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[14] Staatsbosbeheer is in charge of managing the green heritage of the Netherlands. In total they are in charge of the conservation of 270,000 ha of nature. Staatsbosbeheer is considered a semi-government authority, (Staatsbosbeheer, n.d.)
[15] Natuurmonumenten is Dutch association dedicated to the protection of "nature reserves, valuable landscapes and cultural heritage" (Natuurmonumenten, n.d.). As opposed to Staatsbosbeheer, it is a nongovernmental organization with members.
[16] Happen en Trappen is Dutch for 'eating and cycling' which is a Dutch initiative which provides combined cycling routes and food arrangements in the Netherlands and Belgium.

Initially, this regional network was funded by the province of North-Brabant, however five years ago the province stopped funding these networks. The municipalities involved in this network stepped forward as they appreciated the added value of this network. Together with Water Board Brabantse Delta they took over the funding task together with Water Board Brabantse Delta. However, this did cause a decrease in available budget. Each municipality provides a civil servant (for the ABG organization this is one civil servant for all three municipalities) and also representatives of the Water Board, Natuurmonumenten and Staatsbosbeheer join the meetings that take place every 6 to 8 weeks. Despite the fact that Natuurmonumenten and Staatsbosbeheer do not provide financial support, they are still regarded as full partners due to their contributions (nature areas) which contribute to the objectives of Landstad De Baronie. During the 6 to 8 weekly meetings, ongoing projects are evaluated and possible new collaborations and opportunities are explored. Even though funding from the Province of North-Brabant was discontinued, Landstad De Baronie is still in regular contact with the Province to coordinate certain matters

For each respective project, the appropriate collaboration partners are approached. This can vary widely, but there are some project partners who are often involved in projects of Landstad De Baronie. Examples of these mentioned during the interview are: schools (NHTV and Avans), ZLTO and agrarian nature associations.

6.1.6 Verschel and Van Dun

The second to last actor who operates on a regional level is a company which specializes in real estate and spatial (re)development called Verschel and Van Dun. This company plays an important mediating role between their clients and the involved 'opposing parties', which often are governments in the realm of landscape planning and land agent related tasks. The respondent mentioned Verschel and Van Dun is basically the real estate specialist in rural areas as there are no other companies in the area that take on such a wide range of tasks like Verschel and Van Dun does. Examples of tasks they assist their clients with are appraisals, lease agreements, expropriation by governments due to the construction of a dikes, cycling paths, residential area, etc. Their clients are mainly farmers and people living in the rural areas. They form the link between these people and the opposing company, government or organization. Principally, Verschel and Van Dun does not work for government bodies. However, sometimes the municipality approaches them to look at certain cases together as they both have an interest in making sure the right decisions are taken.

Because the scope of responsibilities of Verschel and Van Dun is so broad, they are in contact with, on one hand, their clients (residents of the area), and on the other hand, multiple different authorities. Examples mentioned by the respondent include municipalities, Water Boards, Rijkswaterstaat, provinces, and municipalities. In all these processes, Verschel and Van Dun act as a mediator. They speak the language of both their clients and that of the authorities and, in their own view, are an indispensable part of the network.

Besides their clients and several authorities, there is one other important group of actors involved in the network of Verschel and Van Dun. The representative of the company explains that cases sometimes run very smoothly and are resolved with relatively little trouble. However, if that's not the case, legal entities may need to be involved to settle matters which is why Figure 23 also shows a relation between this company and legal entities.

6.1.7 Regional archaeologists

The final respondents that were put in the regional layer of Figure X, are two archaeologists who work for the Region West-Brabant. As this region includes a number of smaller municipalities which lack the capacity to hire their own archaeologists, Region West-Brabant employs several archaeologists who serve multiple of these smaller municipalities. This is also the case for the ABG area. Because of this, these respondents have been placed on the boundary between regional and ABG level as their organization does operate regionally, however, they do serve the ABG organization, and other smaller municipalities, individually. Because of this, these respondents mention the CGA, which is short for Convent van Gemeentelijke Archologen (Dutch for Convention of Municipal Archaeologists. This convention represents the interest of and forms the consultative body for all municipal archaeologists in the Netherlands. The CGA is primarily concerned with local heritage (Gemeente Archeologen, n.d.).

"Since 2007, municipalities have been responsible for archaeological heritage [in the Netherlands]. Municipalities are required to identify where archaeological values are present and where they are expected. Rules regarding how the municipality manages its heritage must be included in their land use plan. It is the task of the municipal archaeologist to manage the existing values and traces as effectively as possible. This means that all infrastructure and construction projects must take into account the presence of archaeological sites. If it is not possible to protect a site, the municipal archaeologist will conduct an excavation, in close consultation with all parties involved" (Gemeentelijke Archeologen, n.d.). It is thus a legal obligation to involve an archaeologist in every spatial planning project that involves ground disturbance. This can include plans such as the construction of a new road or residential area, the basement of an existing farm but also projects from Water Boards can require archaeological advice. The archaeological research required for such spatial plans is conducted by archaeological research companies. The regional archaeologists base their advice on the findings of these research firms. Therefore, these research firms are also an important partner (interviewee 8 & 9).

Besides their connection to the CGA and their connections at municipal level, the network of these archaeologists consists of several other key connections. First of all, they are linked to the National and regional government (Province of North-Brabant). The National government makes the rules these archaeologists have to adhere to and the province is their point of contact when it comes to regional archaeology. The Province is considered as authority when it comes to excavations and once archaeological findings are excavated, they automatically become property of the province and are stored in a depot in Den Bosch.

Additionally, a quite unique collaboration was mentioned by the archaeologists when they were asked about their network. They explained that some years ago they had a lot of unintended contact with farmers around the introduction of the archaeological policy map

> *"Many farmers were afraid of those archaeological policy maps, thinking that they would then have to conduct research around their ploughing activities as well. So it really was a kind of mission to clarify that normal agricultural use is not subject to the obligation of investigation""*
> *- Interviewee 8, representative of the regional archaeologists of Region West-Brabant*

Officially, farmers were required to contact the municipality if they had questions or complaints about this policy. However, many of these farmers ended up reaching out to the archaeologist themselves. In turn, the archaeologists took it upon themselves to try and clarify any confusion around this topic. With a travelling exhibition called 'zonder boer geen voer' (Dutch for 'no farmer, no food'), they tried to connect the local history associations and the ZLTO. The aim of this exhibition was to raise awareness about local agricultural history as well as local archaeological and historical research whilst highlighting the interdependence between urban and rural areas. The respondents explain that this exhibition has contributed to mutual understanding amongst these different groups. Partially because of these efforts, lack of clarity surrounding archaeological research in the agricultural context is not really an issue anymore.

6.2 ABG level networks

6.2.1 The ABG organisation

The second layer included in this network analysis is the ABG level, referring to organizations that operate at the level of all three municipalities in the study area. Something that immediately stands out when looking at this layer is that only the ABG organization itself operates on this level. This in itself is an important finding. This means that the ABG organization fundamentally operates at a different level than all the actors they collaborate with. This will elaborated on in further detail in the analysis in Chapter 8.

Regarding the network of the ABG organization, the employee of the organization who was interviewed for this research, indicate that their network is very big and the actors they collaborate with can differ quite a bit depending on the project or topic. However, the respondent did mention several key traditional network partners, which were all taken up in the visualization in Figure 23.

First of all, the ABG organization works closely together with the mayors and aldermen of each respective municipality that is part of the ABG collaboration. Depending on the topic, project or task at hand, the municipalities that are affected or have an interest are involved. In addition, the Water Board is also a regular point of contact. This collaboration largely revolves around spatial planning. The Water Board has an advisory role in all spatial plans of the municipality. Besides the account manager of the ABG area works at the office of the ABG organization quite frequently to which works really well indicates the respondent from the ABG area.

As mentioned, specific projects call for specific collaborations. Examples of project-specific partners that were mentioned by the respondent of the ABG area are the ZLTO, local business associations, nature organizations and landowners. As tourism is important in this region too, tourism organizations are also frequently consulted. The same respondent also mentions that associations can also form valuable collaboration partners as these are an important form of organization for many people in this area as was explained in §5.5.3.

6.3 Municipal level networks

The third and final level taken up in this network analysis is the municipal level. As the study area consists of three different municipalities, this section touches on each of these municipalities separately. For each respective municipality, the networks of the respondents who participated in this study will be addressed.

6.3.1 Alphen-Chaam

Local history associations Carel de Roy

For the municipality of Alphen-Chaam, the first actor that was taken up in this network analysis is the local history association called Carel de Roy. In Dutch, these are called 'heemkundekringen', referring to the study of 'heem' which means local history. These associations are usually entirely run by volunteers. Which, in the case of Carel de Roy, are people from all over the municipality as well as people from Riel. As explained in §5.3.4, the villages Alphen and Riel formed a municipality before the Alphen-Riel land consolidation. Therefore, Carel de Roy also has numerous members who reside in Riel. Carel de Roy is a member of the overarching regional heritage organization called 'Brabants Heem' and is a very active association with approximately 700 individual members. Their members work on various matters such as family history research and exhibitions on local archaeological finds. Besides, they have developed an application with several hiking routes which pass by historically interesting points with information about each respective location. In addition, they also publish a magazine every three months. With all their projects, Carel de Roy actively seeks to establish connections with the community as well as the recreational sector. The association receives a small amount of subsidy from the municipality, but the majority of its income comes from membership fees (interviewee 19).

Two representatives of Carel de Roy explained that their collaboration partners depend on the topic they are working on, but they are always looking for new ways to get involved and hope that other actors working on anything local history related know how to find them. Sometimes this works well. For example, Carel de Roy came up with most of the street names in Alphen. As the respondents explain, a name that refers to local history is much more interesting than a generic name like "eikenlaan" (oak lane) or "lindenlaan" (linden lane) which can be found anywhere. Officially, this is a task of the municipality, however as some of the association's members are involved in local politics, such collaborations emerge quite naturally. However, there are also examples where these connections could have been made but were not. For instance, the local history association of Alphen-Chaam was not involved in naming the streets in the newest neighbourhood, and one of the respondents also mentions an example of information signs placed by the recreational sector. Sometimes, the information on those signs is incorrect, this respondent explains. That is a shame, the respondents say, as they could complement each other so well. Sometimes, they actively seek this collaboration with the recreational sector themselves. Examples are placing brochures about historical walks in the area at campsites or asking camping owners to actively promote the local museum instead of referring their guests to museums in the bigger cities in the area. Both respondents do acknowledge though that these connections are a two-way street; they can initiate contact as well. However, the respondents clearly express the desire to be more directly involved and for other actors to not assume the interests or contributions of the association will be represented by other actors.

A final connection that was mentioned by these respondents were schools. Schools are a group with whom they would really like to have a better connection, but which is a challenge. The respondents explain that in the past, most teachers had a stronger connection to the history of the municipality which made these connections a lot more natural as compared to nowadays. This combined with packed curriculums, makes creating a connection with the educational sector a challenge for Carel de Roy.

Regarding their interaction with the Water Board, the representatives of Carel the Roy say this is unchartered territory. However, they definitely see opportunities. Just as they would like to be around the table when it comes to spatial plans from the municipality, they would also like to be directly involved in projects of the Water Board. This could be to come up with names for engineering structures of the Water Board for example, like they sometimes do with street names for the municipality, but it could also be their direct involvement in projects that have to do with soils that are rich in archaeology, monuments, historical trees or farms etc. They do acknowledge they are fully run by volunteers, so if they get invited to think along, they cannot say for certain they have someone available. However, if the Water Board (and the municipality too) would actively seek this connection, this would certainly be appreciated.

'Dorpsteam' Alphen Chaam

The second municipal level actor that was interviewed for this research was the 'Dorpsteam' (Dutch for village team) of Alphen-Chaam. Each of the ABG municipalities has its own 'Dorpsteam', however there is some level of coordination between the three different teams, which is why they have been located on the border between municipal and ABG-level in Figure 22. They have a joint website, which provides information about each of the teams and the employees of the different teams talk to each other on a regular basis. Nevertheless, the employees work for one specific municipality. The respondent from this 'Dorpsteam' had limited time available for the interview, so I did not have the opportunity to discuss this 'Dorpsteam's' network specifically. However, prior to this interview, the interview with a representative of 'Dorpsteam' Gilze and Rijen had already taken place in which the 'Dorpsteam's' network was discussed extensively. Due to the collaboration of the three 'Dorpsteams', the partners that are important to Gilze and Rijen are also largely applicable to Alphen-Chaam (and Baarle-Nassau) as well. Additional information about these 'Dorpsteams' can be found in §6.3.3, where the network of the 'Dorpsteam' of Gilze and Rijen is explained in further detail.

6.3.2 Baarle-Nassau

Visit Baarle

For Baarle-Nassau, only one actor operating at municipal level took part in this research, which is the local tourism office called 'Visit Baarle'. Visit Baarle has two permanent employees and serves both Baarle-Nassau as well as Baarle-Hertog and therefore has to do with both municipalities and also receives subsidy from both. Visit Baarle has two permanent employees. Aside from the two permanent employees, Visit Baarle works with a group of voluntary guides who provide guided tours through Baarle.

Logically, Visit Baarle is primarily concerned with tourists. However, the representative indicates that they also make an effort to involve residents. Occasionally, residents come by with ideas, but overall, the respondent feels that these are two fairly separate groups. For the residents of the municipality, the situation is just so normal, she explains.

With regard to developing and promoting Baarle as a recreational product, Visit Baarle collaborates with many different organizations. For example, they regularly communicate with the local business association. Within this collaboration, they collectively think about goals for (tourism in) Baarle. Additionally, Visit Baarle actively approaches national tour operators. They try to add Baarle as a regular stop to bus tours through the Netherlands, which has been a success with some tour operators. Besides they collaborate with several regional recreational organizations like tourism organization De Baronie, which was elaborated on in §6.1.3. Other regional collaboration partners include Landstad De Baronie, tourism organizations in Breda and also Visit Brabant, which was also mentioned in the section on tourism organization De Baronie. Due to this municipality being located on the Belgian Border, Visit Baarle also collaborates with several recreational organizations from Belgium. These include 'Grens Vallei' which promotes the area between the 'Antwerpse Kempen'[17] and the Dutch border and Tourism Province of Antwerp (TPA).

When asked about their relationship with the Water Board, the respondent indicates they have never been in touch with them outside of having arranged a company outing for them not too long ago. The respondent indicates that she also does not really see any collaboration opportunities as the recreational product of Baarle is very much based on the enclave situation.

6.3.3 Gilze and Rijen

Local history association Molenheide

What Carel de Roy is to Alphen-Chaam, local history association Molenheide is to Gilze and Rijen. Just like Carel de Roy, Molenheide is an active association. Examples of what they are working on at the moment are genealogical research and an exhibition about the history of the leather industry in the municipality. Besides, they also have a monthly feature in the local weekly newspaper of Gilze and Rijen.

[17] The 'Antwerpse Kempen' refers to a big region rich in nature situated in the North-East of the province of Antwerp.

Like Carel de Roy, Molenheide is also a member of the overarching regional heritage organization 'Brabants Heem' and receives support from the municipality. They are located in a building provided by the municipality, receive support for housing costs, and receive some subsidy for their projects. Additionally, members pay dues, and the association also earns some money through the sale of self-written books.

When it comes to their relationship with the municipality, this does not solely come down to funding. The representative of the association explains that Molenheide collaborates with the municipality on a regular basis. The municipality contacts them on a regular basis to come up with street names when new residential areas are built, and they are currently jointly working on covering utility cabinets, which are often covered in graffiti, with historical images. The idea is to also include a short text with explanation and a QR code linking to the website of the association. The other way around, they also come up with ideas and approach the municipality themselves. Something that might assist the association in keeping close contact with the municipality is the fact that their current chairman is a former alderman. People in the local political environment are familiar with him as well as the other way around. This might make getting in touch easier.

The network of the chairman seems to come in handy when it comes to other connections too. As the respondent explains he is known in many different circles and has a relatively good overview of who is doing what. Examples of connections that were mentioned are the nature association, who contacted Molenheide to see if the hiking routes they were developing and the information they wanted to provide was historically correct and the business association.

A collaboration worthwhile mentioning is the one between Molenheide and the Jumbo supermarkets in Gilze and Rijen. The respondent proudly explains:

> *"The preparations took us more than a year. We created a photo album with 275 photos whit short textual explanations. We had several different themes, farms, street views, war and peace etc. The book also included a QR code which led people to our website. (…). All of Gilze and Rijen was collecting and trading the pictures. 30 of our volunteers sorted out the picture because people returned a lot of which they had duplicates. I am guessing we had between 25 and 30,000 pictures lying here, all to sort out, entire teams. We also organized a trading day (…) Well, it was such a success... unbelievable! We estimate that there were about 1100 people present. We filmed it, of course, all recorded. Photos and film. Even the police came to trade pictures."*
> *- Interviewee 6, representative of local history association Molenheide*

Two final points that were also made by Carel de Roy also hold up for Molenheide. The first one being that this association also actively seeks to connect with the community through their publications and exhibitions. Besides, they also mention that collaborations with schools are a challenge because of the full curriculums. The respondent does mention that they receive help in this regard from an organization called 'Cultuurplaats'. 'Cultuurplaats' is a municipal foundation that collaborates with cultural institutions, compiling their combined offerings into educational packages for schools.

'Dorpsteam' Gilze and Rijen

As explained in in §6.3.1, the 'Dorpsteams' of all three municipalities in the ABG area are closely related, yet officially operate separately. However, a large part of their networks overlaps regarding the bigger organizations they collaborate with. The team consists of employees from the IMW of both Breda and Tilburg, which is an institution focused on the social welfare of citizens. Additionally, employees from MEE West-Brabant are also involved. "MEE focuses on citizens with (temporary) limited control, limited social efficacy, and difficulties in independently participating in society" (MEE, n.d.). Finally, also employees from an organization called ContourdeTwern, which also works on various social issues and for people who are temporarily not keeping up. The respondent explains that they also collaborate with an organization called Vrijwilligers Informatie Punt (Dutch for volunteer information point), often abbreviated to VIP. They organize a large proportion of voluntary initiatives in the municipality.

The 'Dorpsteams' are fully dedicated to serving the community. The citizens of, in this case, Gilze and Rijen, can therefore be seen as the most important 'relationship' in the network of these teams. These can be individual citizens, but the 'Dorpsteams' also collaborate with associations a lot. Even though the 'Dorpsteams' are meant for all citizens, the representative of 'Dorpsteam' Gilze and Rijen indicates that they are mainly approach by elderly people, but they are increasingly trying to reach other groups as well. The respondent explains that the function of the 'Dorpsteams' is twofold:

"On one hand, it involves community building, being present in the neighbourhoods, getting to know people, and from there, assessing their needs, talents, and what initiatives we can create. On the other hand, the 'Dorpsteam' represents independent client support. So, that means providing practical assistance"
- Interviewee 12, representative 'Dorpsteam' Gilze and Rijen

The latter can be divided in two parts as well. On one hand the 'Dorpsteams' can serve as a bridge between citizens by referring them to the correct care provider. On the other hand, people are also sometimes referred to the 'Dorpsteam' itself by, for example, their general practitioner. Regarding some topics, citizens enter a trajectory *with* an employee of the 'Dorpsteam'.

The representative of 'Dorpsteam' Gilze and Rijen indicates that as far as he knows, he has not had people come to him with questions for which he had to refer them to the Water Board. However, the respondent does admit that there is not really expertise on this matter within the 'Dorpsteams' yes. Therefore, if the Water Board would want to collaborate with these 'Dorpsteams', it would mean they will first have to make sure these employees are told about the Water Board's duties and when they can refer citizens to the Water Board.

Municipality of Gilze and Rijen

For the municipality of Gilze and Rijen I was able to speak to two aldermen, one responsible for spatial planning, living environment and sport and the other for the social domain, which includes themes such as youth care, labour participation, income arrangements etc. Together with the municipality's mayor and one additional alderman, they make up the municipal executive ('College van Burgemeesters & Wethouders' in Dutch). This municipal executive is responsible for the implementation of decisions taken by the municipal council. The municipal council in turn consists of a number of representatives from various political parties. The municipal executive implements laws and regulations from the national government as well as the Province of North-Brabant (co-governance). On a more local level, the aldermen of Gilze and Rijen are also in close contact with the aldermen from the other two ABG municipalities as well as with the ABG organization itself. Following through with another governmental connection, Water Board Brabantse Delta is also a regular point of contact, especially for the alderman involved in spatial planning.

Just as was the case with many other respondents, the aldermen have quite a lot of project-specific collaborations. Examples that were mentioned by the aldermen of Gilze and Rijen are the local nature and landscape organization (NLGR), the local business association and the association for industrial businesses (GRIC). In addition, they always try to involve the citizens of Gilze and Rijen in every possible project.

A final connection of the aldermen of Gilze and Rijen specifically is the Ministry of Defence. Given that the municipality has an airport owned by the Ministry of Defence, this logically comes with an important additional dynamic and point of contact. In terms of spatial planning, this also means additional restrictions due to air traffic. The alderman responsible for spatial planning indicates that, overall, there is a well-functioning collaboration with mutual understanding.

NLGR

The final actor that was put into the municipal level network of Gilze and Rijen is the local nature- and landscape association (NLGR). The association was set up in 2006. The (now) founder frequently attended various municipality meetings related to nature and landscape matters. He noticed that the same individuals would be present at such meetings but that the municipality was not really listening to what all these individuals had to say. The (now) founder then published two articles in the local newspaper to reach out to these individuals and ask them if they were willing to join forces. A few months later, they sat together for the first time with 28 people. From this point onwards, those who were attending municipal meetings on nature- and landscape matters individually, now acted as one in the form of the NLGR. Because of this, they have been able to exert much more influence on spatial plans, including those of the municipality.

The NLGR works with many different volunteers organized into multiple working groups. One of their most active working groups is the 'Green Brigade'. This working group does not mind getting their hands dirty in nature. For example, they assist with tasks such as pollarding willows and cleaning up ponds every second Saturday of the month from September to April. Such larger tasks are always coordinated with the municipality, Staatsbosbeheer, or the Water Board. Throughout the remaining months, the 'Green Brigade' takes care of smaller tasks.

Besides the operational relationship between the NLGR and the municipality, the NLGR also receives funding from the municipality. The subsidy they receive covers some of their basic costs, but for specific projects they also receive additional funding. An example of such a project that was mentioned by the representatives of the NLGR are the so-called 'Ommetjes' they set out in the municipality. 'Ommetjes' are hiking routes of about 5 km that showcase the variety which Gilze and Rijen has to offer. Another notable collaboration between the municipality and the NLGR also involves the ZLTO. Together they formulated the new tree cutting policy for the area.

Even though the municipality is a regular point of contact for the NLGR and there are several success stories surrounding their collaboration, the representatives also indicate that this contact is not always easy. An example is that the NLGR would like to support the municipality in identifying monumental trees. The respondents indicate that the association reached out on multiple occasions to discuss what it is exactly that the municipality needs, but that this correspondence is quite difficult. Their struggles come back to what was explained in Chapter 5 regarding the functioning of the ABG organization. Another example mentioned during this interview involves the Water Board and concerned the evaluation of roadside management. The NLGR was supposed to be invited to this evaluation, but suddenly it turned out the evaluation had already taken place without them. Overall, their desire would be to be more directly involved in projects of such bigger players. They like to think along and also offer their assistance. This seems like a great opportunity for, among others, the municipality and the Water Board to create a stronger bond with the association and thus with (a part of) society. The respondents indicate that it would also be nice if larger organizations would also actively approach them.

Just like most of the other actors that were taken up in this Chapter, the NLGR also has project-specific collaborations. An example they mention is the local beekeepers' association. Finally, the NLGR also actively seeks to involve the citizens of Gilze and Rijen, for example with their 'plantgoedactie' where citizens can buy trees, plants or flower bulbs for their garden or balcony for a discounted price.

6.4 The role of the Water Board's account manager

When conducting the interviews, each respondent was asked about their connection to the Water Board. What stood out is that several respondents referred to the Water Board's current account manager of the ABG area specifically. This means they referred to the account manager personally instead of referring to the Water Board as a whole. This can be regarded as a personal compliment for the ABG account manager, as people indicated positive experiences with him. However, it also shows some of these connections heavily rely on this specific account manager. An important question to ask is who is able to take over when this specific account manager falls ill for a prolonged period of time or (temporarily) quits working for other reasons? A more elaborate reflection on this is taken up in Chapter 11.

7. Analysis: Boundary work

This chapter combines the results presented in the previous two Chapters and the concepts of boundary objects and boundary spanning as presented in Chapter 2. When analysing the data on the 'social DNA' of the ABG area, two topics were touched upon by many actors; spatial planning and recreation. Many different actors indicated to be working on either or both of these themes, however the ways in which different actors are engaging with these topics differ from one another. This led me to analyse these topics as potential boundary objects.

The remainder of this Chapter elaborates on how both of these topics can serve as boundary objects and also provides an in-depth description on each respondent that took part in this study that engages with that specific boundary object. These descriptions will also elaborate on if and how these actors engage in boundary spanning activities. In addition, a network analysis specific to these two boundary objects was drawn up. These networks show the relations between the actors that took part in this research and label each actor based on the function it serves within this the topic-specific network. These visualisations provide the Water Board with a valuable overview of smaller networks that exist around specific topics of interest within the ABG area. The labels provided for each actor within the network allow the Water Board to see what actors might be valuable and/or tactical new points of contact. All of this information is summarized in a table for each respective boundary object at the end of each section, including each actor's interest in that specific boundary object, the type of boundary spanning they engage in (none, proactive, reactive or counter), sum up what boundary spanning activities they perform and what function they fulfil within the network surrounding this topic.

Finally, this Chapter ends with a section on a topic that could possibly be turned into a boundary object by the Water Board (or other actors that are already working on it), namely 'connection with society'. This section dives into how different actors that took part in this research project are working on this topic and how it could possibly bring different actors together to foster collaboration.

7.1 Spatial planning

The first boundary object that was identified in the 'social DNA' and network of the ABG area by means of this research project is spatial planning. This topic came up in half of the interviews that were conducted. This might not come as a surprise as Chapter 2 already explained that spatial planning is of utmost importance in today's environment where space is a scarce good. Many different actors need space for realizing their own activities and/or projects and essentially, these actors are in constant negotiation with all other actors and their respective interests who also want to achieve something in that same space. This is especially a challenge when different interests and desired activities in an area do not align with one another. Even though many respondents mentioned spatial planning during the interviews, many of them provided different explanations as to why and how they are working on this theme. As explained in Chapter 2, this is a key characteristic of boundary objects as they are both flexible enough to appeal to different actors, but yet solid enough to maintain some kind of consistency across different groups that engage with these objects. The results of this research showed that spatial planning means something different to many different actors in the ABG area. Some see it as a means to a certain end, others view it as an end goal in itself. This section dives into how different actors are working on or with this topic in the context of the ABG area and connects their activities to acts of boundary spanning as explained in Chapter 2. Table 1, at the end of this section, provides an overview of how these actors engage with the topic and if (and if so, how) their activities can be linked to acts of boundary spanning. The remainder of this section provides the textual explanation for this table. In addition, Figure 24 at the end of this Chapter, visualizes the connections that are textually explained in the following Chapters. As mentioned, this network visualization also labels the different actors within the network according to the four different categories as presented in Chapter 2 (energizer, connector, broker and challenger).

7.1.1 Water Board Brabantse Delta

First of all, spatial planning is an important topic for the Water Board itself. As explained in Chapter 4, their interest in this field is twofold. First of all, the Water Board needs space for realizing their own projects. Examples of such projects include building or expanding flood defences, the (re)meandering of watercourses or activities such as the redevelopment of the Markdal and the Wouwervallei which are both aimed at creating more room for nature. Sometimes these projects can be realized in places that are owned/managed by the Water Board itself. However, this is not always the case, which means that in some instances, the Water Board has to enter the land market and essentially compete to get a hold of land area that is also wanted by other actors for other purposes.

The latter relates to the second interest of the Water Board in the spatial planning process, which relates to the activities of others in the realm of spatial planning. As regional water managers, Water Boards are responsible for water management in their respective service area. As explained in Chapter 4, this comes down to three core tasks (water safety, water quality and water quantity). If Water Boards were to be the one in charge of defining how land would be used, the Netherlands would probably look quite a bit different than it does now. And even though the interests of water (and soil) have become slightly more of a priority over the past year with water and soil as guiding principles, current land use in the Netherlands is primarily based on other, largely economic interests. In many cases, this means that current land use is far from optimal from a water (management) perspective. Examples are people living outside the dikes, agricultural practices in places that do not fit the local water system and our main economic area, the Randstad, being located on soils that would be swamps if soil and water would really be used as guiding principles. This all illustrates that in order to influence spatial planning in such a way that land use is as optimal as possible for a local or regional water system, the Water Board has to navigate its way through this complex field of actors as well as interests. Wherever they can, they have to advocate for the water (and soil) system to be used as a guiding principle for spatial (re)developments. However, since Water Boards formally still only have an advisory role, this is not an easy task.

The efforts of the Water Board in the realm of water and soil as guiding principles, can be regarded as an outreach by the Water Board to collaborate more with large spatial planning actors like municipalities and provinces. This outreach also fits the boundary work framework that was set out in Chapter 2 very well as the Water Board actively tries to change their role from an advisory one to a more collaboration-oriented one. These attempts can be regarded as attempts at boundary spanning and take place at different levels. First of all, Water Boards collectively lobby for increasing the influence of water and soil in spatial planning projects at a national level. However, this level was not touched on in the interviews that were conducted for this particular research. The second level is at regional level. One of the representatives of the Water Board that was interviewed for this research project, specifically dedicates a lot of his time to this. The final level on which the Water Board actively engages in boundary spanning is on the local level through its account managers. For this study area specifically, the Water Board's account manager of the ABG area, spans boundaries between the Water Board and the municipality. These efforts could be regarded as an invitation for the municipality to engage in acts of 'counter spanning', meaning they would respond to these efforts of the Water Board by reaching out to actors themselves to actively collaborate on the topic of spatial planning. However, these efforts were not identified in this research project. Nevertheless, the efforts of the Water Board itself can be labelled as proactive as they aim to collaborate in the early phases of a project when "little is fixed and time pressure is not felt" yet (Warner et al., 2010, p. 149). In addition, the fact that over the past few months the Water Board has hired additional account managers, resulting in smaller individual service areas per account manager, underpins the importance of representing their water (management) interests at the municipal level.

A side note that has to be made is that the dynamic and influence of water and soil might be positively impacted by the Dutch Environment and Planning Act which was implemented on January 1st, 2024. However, the interviews for this research project took place before the implementation of this act when the effects of this act on the spatial planning process were still largely unclear. Therefore, conclusions on this cannot be added to this analysis.

7.1.2 Municipalities and the ABG organization

Building on what was explained in the previous section, spatial planning is also a major topic of interest for municipalities. However, whereas the Water Board only has one theme to focus on (which is, logically, water), the municipalities have been given the task to navigate through *all* interests that are at play. They have to take into account the interests of the Water Boards, but also those of other public and private actors who make claims to public space. These other actors might, for example, be more concerned with building houses or creating space for new economic activities. This holds up for the regional and national government as well, however those were not interviewed for this research and will therefore not be included in this analysis. Whereas for the Water Board, spatial planning revolves around optimizing the water system, for the municipalities this is much more centred around balancing all the different interests that are at play. The results of this research did point to small efforts of counter spanning by the ABG organization. The representative of the ABG organization who was interviewed for this research project indicated that the regular presence of the Water Board's account manager at their municipal office is appreciated and decreases the threshold for discussing certain matters. During the interview, no other acts of boundary spanning by the ABG organization, nor the alderman working on spatial planning in Gilze and Rijen were brought up.

7.1.3 Safety Region Mid- and West Brabant

Another actor that engages with the topic of spatial planning is the Safety Region Mid- and West Brabant. As explained in Chapter 5, the Safety Region is currently involved in the spatial planning process, but at a relatively late stage. The representatives from the Safety Region interviewed for this research project indicate that only when permits have to be provided, they are called in by the municipality.

The efforts of the Safety Region at this moment in time seem very much reactive. In addition, the process they seem stuck in right now; handing out permits whenever they are asked for by the municipality does not really qualify as acts of boundary spanning. However, the respondents representing the Safety Region did indicate that their employees are starting to actively try and get involved earlier on in the process, which can be seen as small attempts at boundary spanning. The respondents indicate that they are looking for ways to have a say and represent the interests of safety earlier on in the spatial planning process and, thus, span boundaries between them and the municipalities they serve. However, it seems like the type of influence and boundary spanning the Safety Region is attempting to achieve, is still very much reactive.

As they were told about what the Water Board is trying to accomplish through the (boundary spanning) acts of their account managers, this seemed to spark some new ideas. An employee of the Water Board that was also present at this interview coined the idea of maybe hiring account managers at the Safety Region too. To this, the respondents cautiously nodded. The respondents themselves brought up the idea of possibly creating a closer collaboration between their advisors and the Water Board's account managers. The Water Board's account managers could then, for example, also represent the Safety Region's interests when they engage in spatial planning discussions with the municipality. In turn, when their own advisors talk to the municipality, they could also take into account the interests of the Water Board, they argue. This seems like an opportunity for boundary spanning in either direction (from the Water Board to the Safety Region as well as the other way around), however this opportunity has not been concretized yet.

Again, for the Safety Regions as well as for the Water Boards, their importance in the spatial planning process can possibly be enhanced by the implementation of the Environment and Planning act. However, at the time when the interviews for this research were conducted, a lot was still unclear about the changing roles of different parties in spatial planning by means of this act.

7.1.4 Verschel and Van Dun

Another actor engaging with spatial planning on a daily basis is the company Verschel and Van Dun which was introduced in Chapter 5. However, as Verschel and Van Dun are hired for certain jobs, their approach to spatial planning is fundamentally different than the actors elaborated on in previous sections. This company does not actively try to foster collaboration before someone comes to them with a certain job. However, when their clients approach them with a job that involves bringing certain actors together and in that sense bridging boundaries, they can play an important mediative role. In that sense, this company acts in a reactive manner. That being said, even though Verschel and Van Dun do operate on the boundaries between certain actors (their clients as well as opposing parties like Rijkswaterstaat or Water Boards), they mainly find themselves in this position because they function as mediators. They do not necessarily foster cross-boundary collaboration but are rather involved in these processes to reach agreements. In the end, they are a company that gets paid as soon as a deal is made. Because of this, I argue that they are not necessarily boundary spanners. Nevertheless, they possess the ability to make two opposing parties reach an agreement about certain spatial challenges and possess the crucial ability to both speak the language of their clients, which are largely farmers in the rural areas of North-Brabant as well as the governmental authorities. As the representative of this company that was interviewed for this research project explains himself, they are not seen by their clients as the "big bad government". Their clients trust their opinions and advice and they are able to explain why certain requests made by government authorities regarding their land might be good to comply with or not.

Even though the market position of Verschel and Van Dun might mean that they will never really be boundary spanners as in the end their aim is to make money and they do not have an intrinsic motivation to span boundaries and foster long term collaboration between actors, their intermediary competencies might come in handy when other actors try to engage in boundary spanning. What such a collaboration would look like is not part of the scope of this research, however their expertise might be good to keep in mind for other actors that do act from an intrinsic motivation of wanting to span boundaries.

7.1.5 Regional archaeologists
As became clear in the previous Chapter, the regional archaeologists that took part in this research are also heavily involved in spatial planning. Any time a spatial planning endeavor takes place in the ABG area, archaeological companies are called in to conduct archeological research on which regional archologists base their advisory documents. However, as became clear from my conversation with these respondents, their current role is very much reactive as they only bring in their expertise when asked for it. However, as Chapter 5 revealed, archeological values can suffer from climatological changes, which may force this group to engage in boundary spanning activities in the near future to try and preserve as much archeological values as possible.

7.1.6 Local history associations
Finally, this research also pointed to some actors engage with the topic of spatial planning on a smaller scale. The first example of this are the two local history associations, Local history association Molenheide and Carel de Roy. For these associations, spatial planning in itself is not something they try to influence. Rather, for them the realisation of spatial plans is regarded as an opportunity to draw attention to local history. Being involved in, for example, the process of coming up with names for streets and new neighbourhoods allows them to come up with names that relate to the history of the municipality and in that way hopefully generate more awareness amongst citizens about the history of the municipality they live in. Examples of this are street names that refer to the leather tanning history of the area.

As became clear in Chapter 6, both local history associations that took part in this research project, actively try to span boundaries and approach the municipal authorities to be involved in this process. In the case of the local history association of Gilze and Rijen, Local history association Molenheide, this collaboration seems quite solidified as the municipality also approaches the association to assist in this process. As mentioned before, this might be because the current chair of this association is a former alderman and still has good connections in the political environment. The respondents from Carel de Roy, indicated that they would appreciate it if municipalities would also approach them to engage in these kinds of processes more. In general, we can say though that these acts of boundary spanning by the local history associations are answered by the municipalities with acts of counter spanning.

7.1.7 NLGR
A final smaller actor engaging with the topic of spatial planning is the nature and landscape organization of Gilze and Rijen (NLGR). As their name suggests, they are always trying to find ways in which they can create more space for nature in the municipality of Gilze and Rijen. An example of this is verge management which they actively try to get involved in with the Water Board and the municipality. In addition, their active involvement in the tree cutting policy of Gilze and Rijen can also be regarded as an example of this. Even though these are spatial planning topics that play at a much smaller scale than some of the examples that were mentioned before, they clearly show the efforts the NLGR makes to be involved in the early stages of many nature-related projects. These efforts could be classified as proactive boundary spanning efforts. Counter spanning activities, however seem limited or were not touched upon in this interview.

Table 1: Overview and summary of activities surrounding spatial planning and boundary spanning activities surrounding spatial planning.

Organization	Interest in spatial planning	Type of boundary spanning activities	Spanning activities
Water Board Brabantse Delta	- Own projects - Water and soil as guiding principles	Proactive boundary spanning	- Lobby for water and soil as guiding principles at national level (in collaboration with other parties).

			- Lobby for the importance of water and soil as guiding principles in provincial and municipal spatial planning.
Municipalities	- Spatial planning as a main responsibility/task - Managing different interests	Small efforts of counter-spanning	N/A
Safety Region Mid- and West Brabant	- Spatial planning can affect their services - Desire to have a bigger say in spatial planning	- Reactive boundary spanning - attempts to engage in more proactive boundary spanning	N/A
Verschel and Van Dun	- Consulting clients when it comes to spatial (re)organization and mediation between clients and authorities	N/A	N/A
Regional archaeologists	- Opportunities for archaeological research	N/A	N/A
Local History associations	- Opportunities to put local history in the spotlight	Reactive boundary spanning	Coming up with street names
NLGR	- Opportunities to create more space for nature	Proactive boundary spanning	Approaching the municipality and Water Board to offer assistance

Figure 24 provides a visualization of all that was explained in previous sections on spatial planning as a boundary objects. This visualization only includes the actors that took part in this research project and the actors they mentioned as direct network partners for this specific topic. Only the interviewees have been labelled using the labels as presented in Chapter 2 as I was not able to dive deeper in the functions of those that were mentioned by my respondents with those actors myself. These actors have been left grey, just like several actors that did take part in the interviews for this research project but do not serve any of the functions as presented in Chapter 2.

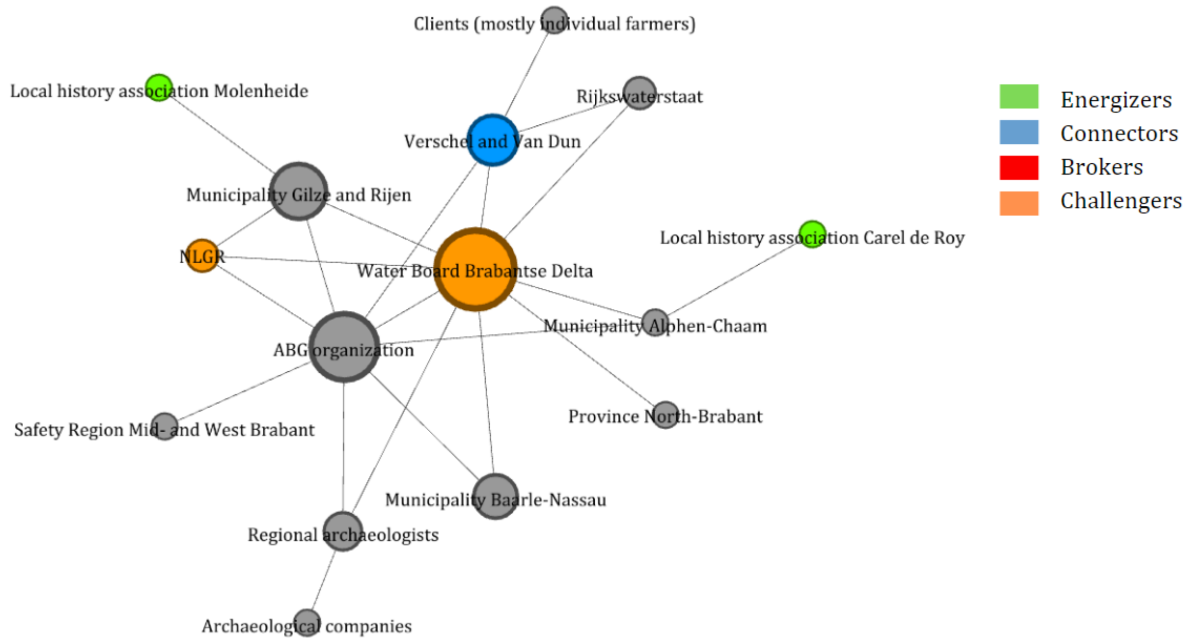

Figure 24: Network surrounding 'spatial planning' as a boundary object

Figure 24 illustrates that both local history associations were labelled as energizers as they come up with creative ways to use spatial projects as vehicles to promote local history. Besides, the NLGR was labelled as a challenger as they provide critical feedback on plans of the municipality (both by being present in municipal council meetings as well as through their contact person at the ABG organization), but they also initiate projects to provide more room for nature in the municipality of Gilze and Rijen, which is why they can also be regarded as energizers.

In addition, the Water Board itself has been labelled as a challenger too, but can (just as the NLGR) be seen as both an energizer and a challenger. This is due to the efforts of the water board surrounding water and soil as guiding principles which can be understood in two ways. First of all, water and soil as guiding principles is a way of challenging the current status quo regarding spatial planning. It is a call for a change in the way the Netherlands makes choices about land use. On the other hand, it is a guiding principle in their own projects which can be seen as an inspiring way to bring new ideas into the network surrounding spatial planning as a whole.

Finally, as explained in §7.1.4, Verschel and Van Dun acts as a mediator between their clients and the 'opposing parties' (e.g. municipalities or the Water Board), which is why they have been labelled as a 'connector' in Figure 24.

7.2 Recreation

The second boundary object is something completely different from the one that was elaborated on in the previous sections, however it was also very prominent in the interviews that were conducted, namely recreation or tourism. Chapter 5 explained that recreation is an important economic driver in the ABG area. During the interviews, it became clear that different actors I spoke to engage with this topic in different kinds of ways. This section elaborates on how these different respondents engage with this topic and where bridges are already being built and possibly also crossed by boundary spanners. At the end of this section, a table (Table 2) is provided again which gives an overview of how these actors engage with the topic and if (and if so, how) their activities can be linked to boundary spanning. In addition a network analysis (Figure 25), including the different functions all actors that are mentioned fulfil within this topic-specific network.

7.2.1 Tourism/recreational offices and associations

The first group of actors that engage with the topic of recreation are both tourism offices that took part in this research project, Visit Baarle and Tourism De Baronie. As explained in Chapter 6 Visit Baarle purely focuses on promotional activities whereas Tourism De Baronie also functions as an association for entrepreneurs that earn their living in the recreational sector. Both have an interest in keeping up and further developing the recreational value and product of the study area as this is where they gain their income from.

At mentioned, promotional activities are an important part of the daily activities of both of these actors. These include keeping their website and social media up to date, making and spreading brochures and being present at their respective offices to be able to answer questions when people come in. These activities cannot be seen as acts of boundary spanning, but largely take place within the organizations themselves. However, both actors indicated that they also actively reach out to other parties in order to promote their recreational product. A perfect example of this is Visit Baarle reaching out to national tour operators as explained in §6.3.2. By trying to include Baarle as a regular stop in such tours, they are proactively engaging with recreational enterprises who work on recreation on a national level. Toerisme De Baronie also engages in such national-level promotional collaborations, however it was not specified if they are approaching these larger actors themselves or if they are approached by these bigger players.

In addition, the associational function of Toerisme De Baronie, also makes them engage in acts of proactive boundary spanning in a different way. As an association, they try to bring different entrepreneurs together to foster collaboration with the end goal of improving the recreational product of the area. They do this by means of different working groups where members can join working groups that relate to themes they relate to. An example that was mentioned by one of the members of Toerisme De Baronie is a working group on sustainability which he himself is part of. This working group jointly works on sustainability within their recreational enterprises. They can visit and meanwhile learn from one another. This in turn provides opportunities for members to engage in counter spanning activities outside of this working group. However, this research did not dive into these connections and will therefore not elaborate on this. A specific example of boundary spanning by this working group to reach out to both members of the association Toerisme de Baronie as well as other actors with an interest in sustainability were so-called 'climate safari's'. These were specifically organized to see what they were doing regarding sustainability. This example fits the association's proactive boundary spanning activities.

7.2.2 Recreational entrepreneurs

The second main group that engages with recreation as a boundary object are entrepreneurs that earn (part of) their living by providing recreational services. Examples are campsite and B&B owners, hotels, people selling local produce or people providing 'boerengolf'[18] (Dutch for 'farmer's golf') on their territory. Generally, these are members of the tourism associations that were elaborated on in the previous section. Just like the recreational offices/associations, these actors have an interest in improving the recreational product of the area as this generates income.

As explained before, the efforts of the tourism offices and associations invite individual entrepreneurs to engage in acts of counter spanning. These individual entrepreneurs were not approached specifically, however two of the respondents turned out to be members of Toerisme de Baronie. They did mention the working groups initiated by the association, however the respondents did not specifically touch on individual acts of counter spanning. Therefore, conclusions on this cannot be drawn from the results of this research project.

7.2.3 Municipalities

The third and final bigger player that engages with recreation as a boundary object are the municipalities that are part of the study area. For these municipalities, the recreational product and value of the area is of importance to their economy. However, as was mentioned Chapter 6 the promotional activities surrounding this are largely outsourced to Visit Baarle and Toerisme De Baronie. Therefore, as far as can be concluded from the interviews that were conducted with the tourism/recreational associations, the municipalities themselves cannot be regarded as boundary spanners surrounding the boundary object of recreation. This does not make them a passive player whatsoever though. They fund the actors that do perform these activities so in that sense they are still an indispensable part of the network. They essentially enable boundary spanning by the associations elaborated on in §7.2.1.

7.2.4 Landstad De Baronie

Another actor that focuses part of their activities on recreation, is Landstad De Baronie. The respondent that took part in this research project explained that this regional network focusses on small-scale projects related to culture, nature and regional produce. Essentially, the entire set up of this organization is to foster collaboration between different actors. Their set-up, including several municipalities, Water Board Brabantse Delta, Natuurmonumenten and Staatsbosbeheer can be seen as an act of boundary spanning by this organization itself. Their 6/8 weekly meetings are meant to see what different actors are doing or what is going on in the area and how they can join forces. In turn the actors involved in this collaboration are invited to counter span when themes come up in which they think they can play a role. As this joining of forces sometimes revolves around developing the recreational product and value of the area, this organization is taken up as an actor that engages with recreation as a boundary object.

However, Landstad De Baronie also engages in acts of boundary spanning outside of the collaboration mentioned above. A perfect example which was mentioned by the representative of this organization himself is a map with regional products which was first introduced in the summer of 2021 has been renewed every year since then. They mapped out what regional products were being sold in the area and combined all of these into one map, divided into all sorts of categories like wine, meats, dairy etc. The map includes both names as well as all addresses of each of these spots where regional products are being sold. In addition, the map also provides two cycling routes for tourists as well as citizens.

> *"And the funny thing was that even local producers did not know about each other, so this map fostered a lot of partnerships, and now you see quite some 'shops in shops,' or however you want to call it. There are quite a few, yeah, in some stores, there are quite a lot of products from other local producers and vice versa"*
> *- Interviewee 17, representative of Landstad de Baronie*

The process described in the quote above might be a perfect example of a boundary spanning act by Landstad de Baronie which invited producers of regional products to engage in counter spanning activities

[18] Boerengolf is a Dutch recreational version of golf which takes place in meadows.

by spanning boundaries between themselves and other regional producers to sell each other's produce to jointly improve the awareness on local produce and improve the recreational product/value of the area as a whole. In addition, it shows how small initiatives can cascade into bigger things. In addition, people, organizations and associations can also approach Landstad De Baronie themselves with a request on assistance in a project related to one of the themes Landstad focuses on. This sometimes results in reactive acts of boundary spanning by Landstad De Baronie to foster partnerships to further develop this individual initiative.

7.2.5 Local history associations

Additionally, the two local history associations also engage with the boundary object of recreation. For them, recreation can serve as a vehicle to introduce people from outside the area to the local history of the region. They engage in acts of reactive boundary spanning in the sense that they contact recreational organizations, like campsites and ask them to put promotional flyers in their offices and ask camping owners to verbally promote their local history museums or exhibitions instead of only telling their visitors about nice big museums in the bigger cities in the region. In addition, they also engage in acts of reactive boundary spanning when other actors in the area come up with ideas which they think they can latch onto too.

7.2.6 NLGR

Finally, the representatives of the NLGR, the local nature and landscape organization of Gilze and Rijen also indicated to engage with recreation as a boundary object. This is mainly taken up by their working group that focuses on hikes. As introduced in Chapter 6, he NLGR creates so-called 'Ommetjes' in the municipality which show what Gilze and Rijen has to offer when it comes to nature. Right now, there are four different 'Ommetjes', which people can explore whenever they want. The representatives of the NLGR explain that they have reached out to the municipality to assist in the funding of these routes, which can be seen as an act of proactive boundary spanning by the association. The municipality, in turn, assists the NLGR by funding the needed equipment and informational signs along the routes. Once every so often, the NLGR arranges guided 'Ommetjes' in which a volunteer of the association guides participants through this hike and provides additional information about the surroundings. The respondents also mention that individual farmers are starting to build hiking trails which connect to existing routes and also to their 'Ommetjes'. This can be regarded as acts of counter spanning by these farmers in response to other recreational actors who already actively work on mapping out such routes. However, no individual farmers who are working on this were interviewed for this research which is why further analysis on this dynamic is left out in this paragraph as well as in Table 2.

7.2.7 Opportunities for the Water Board

Chapter 5 already illustrated that the ABG area has great recreational value. The previous sections on different actors that engage with recreation as a boundary object further confirm that this is a topic many actors in the area are working on in their own way. Water Board Brabantse Delta seems to be cautiously testing the waters when it comes to collaborations with recreational actors by means of their involvement in the Landstad De Baronie collaboration. As part of what Landstad De Baronie does revolves around recreation, the Water Board's will to get involved and take part in their meetings can be seen as a cautious act of reactive boundary spanning by the account manager of the ABG area. The representative of Landstad De Baronie does mention though that they are still figuring out how they can collaborate more with the Water Board.

Nevertheless, I argue there is much more potential for Water Board Brabantse Delta to engage more with the boundary object of recreation. In an area which has such great recreational value, this is something you can use to your advantage. Water is a theme that lends itself perfectly well to be experienced in multiple different ways. Recreational activities build on experiences too, so this seems like an valuable resource that could be benefitted from much more. Several respondents that took part in this research project indicated they are definitely open to exploring how they can collaborate and complement one another. One example that came up are hiking routes for which they can provide participants and Water Boards can provide content for guided tours or informational signs on these routes.

Table 2: Overview and summary of activities surrounding recreational and boundary spanning activities surrounding recreation.

Organization	Interest in recreation	Type of boundary spanning activities	Spanning activities
Tourism/recreational offices and associations	Earning a living	Proactive boundary spanning	- Bringing different recreational entrepreneurs together to develop the recreational product/value of the area. - Finding new ways to promote their recreational products
Recreational entrepreneurs	Earning a living	Counter spanning	Creating collaborations
Municipalities	Economic value/importance of the recreational sector	N/A	N/A
Landstad de Baronie	Supporting small-scale initiatives to develop the recreational product of the region	Proactive and reactive boundary spanning	Bringing different people/associations/organizations together to join forces on multiple topics
Local history associations	Vehicle for raising awareness on local history	Proactive and reactive boundary spanning	
NLGR	Opportunity to showcase what Gilze and Rijen has to offer when it comes to nature	Proactive boundary spanning	Reaching out to the municipality for funding
Water Board Brabantse Delta	Possible vehicle to raise more awareness on the work of the Water Boards	Cautious reactive boundary spanning	Involvement in collaboration with Landstad De Baronie

A similar network as was drawn up for spatial planning as a boundary object was created for recreation as a boundary object. This visualization is presented in Figure 25.

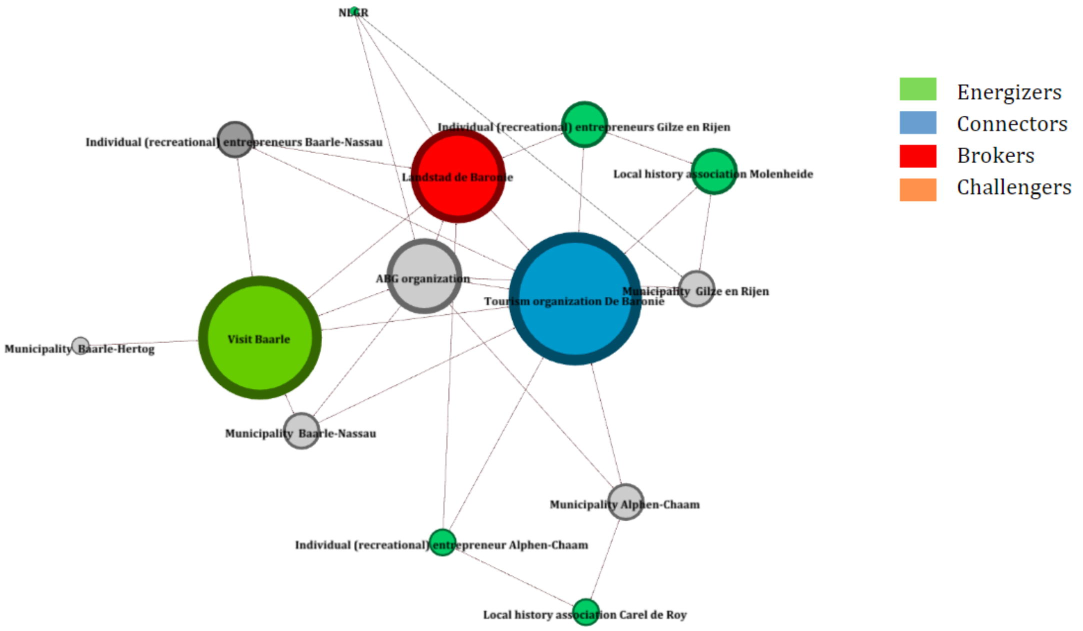

Figure 25: Network surrounding 'recreation' as a boundary object

Again, this network shows the actors that were interviewed for this research project and the network partners they indicated to collaborate with surrounding the topic of recreation. Again, the network partners that were not specifically interviewed for this research project were not labelled alongside the actors that did take part in this research project but do not fulfill any of the roles as presented by Cross et al. (2019) in Chapter 2.

What stands out when looking at Figure 25, is that there are quite some energizers in this network. This can be seen as a sign that there is a lot of creativity in the ABG area surrounding the topic of recreation. Both local history associations indicated to come up with creative ways to link local history to the recreational value of their respective municipalities. A similar point holds up for the NLGR, with their 'Ommetjes' as introduced in Chapter 6. Individual recreational entrepreneurs were also taken up in this network as energizers. I spoke to two people who had their own recreational enterprise in a joint interview. One of them from Alphen-Chaam and the other from Gilze and Rijen. They explained there are lots of smaller businesses who engage with the recreational sector. In turn, they are all connected by Tourism organization De Baronie who provides these individuals with opportunities to join forces and collaborate on developing the recreational product of the area as a whole. The tourism organization of Baarle-Nassau was taken up as an energizer. As explained before, this organization solely performs promotional activities for Baarle and is therefore fundamentally different from tourism organization De Baronie which also serves as an association for individual recreational entrepreneurs.

Finally, Landstad De Baronie was labelled as a broker in this network. Even though they also function as a connector between some individual actors in the ABG area (and beyond) they are also a unique collaboration between different networks (e.g. the networks of the municipalities that take part in this collaboration, the network of Water Board Brabantse Delta etc.), which makes them a valuable broker surrounding the topic of recreation.

7.3 Engaging with society

The final topic taken up in this part of the analysis is the topic of 'engaging with and reading the society you serve'. By analysing the interviews that were conducted, this topic came up as an important topic of conversation in multiple interviews. However, there is one fundamental difference between this topic and the topics presented in the previous two sections. This is that whereas the previous two are topics that already enable collaboration, this topic still seems to be worked on in isolation by different actors. Nevertheless, as creating/exploring a connection with society is a main focus point of this research, I think it is good to show that several actors are working on this. In other words, this topic can be seen as a potential boundary object. However, it is not yet considered to actually *be* one as it does not actually foster collaboration yet.

The remainder of this section elaborates on how four different respondents are already engaging with this topic by themselves. Table 3, again, provides an overview of this. However, this time the table does not include the boundary spanning activities as these are not (yet) taking place. Also, as the actors that are engaging with this topic still mostly do this in isolation, no network visualization is provided.

7.3.1 'Dorpsteams'

The first respondents who engage with this third topic are the 'Dorpsteams', which were introduced in Chapter 6. For them, engaging with society is an integral part of their jobs and thus something they work on on a daily basis. The 'Dorpsteams' both go out to connect with society themselves, but also serve as a place people can go to with different types of questions themselves. The former means being physically present in the different neighbourhoods, really getting to know people and listening to their needs, identifying their strengths and talents etc. Based on this, the 'Dorpsteams' are able to tailor their services and initiatives accordingly because they can build on what is already there and working on what may not be there yet but is wanted by the inhabitants. These 'Dorpsteams' thus already have quite a solid connection with society and have a good overview of who lives where. In other words, they have a good grip at how people *experience* the place they live in.

Even though they are partnered with the respective municipalities, this more so is about what services the 'Dorpsteams' can provide for the municipalities. I would not say they are really collaborating on this topic which is why their activities surrounding this topic have not been labelled as boundary spanning activities.

7.3.2 Municipalities

The second group that already engages with this topic are the municipalities. The previous section already pointed to the partnership between the 'Dorpsteams' and the respective municipalities. Through this partnership, municipalities also engage with society however on a more distant level than the 'Dorpsteams' themselves. The main point of contact within the municipalities are the aldermen within each respective municipality that has been assigned with the social domain. Regarding the remaining activities of this alderman, 'knowing the society' forms the basis for her work and the decisions she has to take. However, as the respondent was only able to join the interview about 15 minutes before it ended, I was not able to gather information on how she realizes this through other partnerships.

The other alderman, responsible for the spatial domain in Gilze and Rijen who also took part in this interview, did indicate another way in which the municipality tries to get a better insight into who their residents are and what their needs are. He explains that in Gilze and Rijen, for each project they do, they approach citizens to ask for their input. This can also be regarded as a way in which the municipality of Gilze and Rijen tries to include its residents in the decision making process, tries to listen to what they think and want and in that sense get to know them better.

7.3.3 Safety Region Mid- and West Brabant

A third actor that took part in this research project who is also cautiously starting to engage with this topic is the Safety Region. They have developed a tool with neighbourhood characteristics based on which they can define areas that are considered to be at increased risk regarding fire safety for example. Besides, this could also help them in tailoring their communication strategy to a specific community's needs. Even though this might sound like an amazing tool, the respondents from the safety region also explain that they are cautious when it comes to using this tool as you do not want to stereotype people solely based on the data in this tool. Regardless of this, it is valuable to mention that the Safety Region also acknowledges they also have this desire to have a closer connection to the people they serve to better adjust their services and communication to the needs of society. Besides, it can be helpful for the Water Board to know that this is something the Safety Region is working on as they could possibly collaborate on this as the respective areas they serve largely overlap.

7.3.4 Water Board Brabantse Delta

Finally, Water Board Brabantse Delta itself can be regarded as an actor that is, although cautiously, starting to test the waters more when it comes to this. This research can be regarded as a first attempt or exploration to see what this has to offer for them. At the moment, though, despite talking to organizations in their service area, they are not yet collaborating with other actors regarding this topic. However, as mentioned at the beginning of this section, this topic could become a valuable boundary object if actors would seek more collaboration when it comes to this.

For the Water Board specifically, it might be valuable to span this boundary between them and the Safety Region. It might be possible to further develop this tool together as the interests of both organizations overlap; they both have an interest in identifying which areas are prone to increased risks (may this be because of fire or water related risks) and could tailor their communication towards specific characteristics. However, I argue that a third crucial partner has to be taken up in this collaboration as well. As the representatives of the Safety Region explained, you have to be extremely careful when it comes to using these types of data. Therefore, I argue an actor that can provide the necessary context for interpreting this data is indispensable in working on this. For the ABG area specifically, the 'Dorpsteams' could form a valuable collaboration partner as they already possess quite some information on this and also have direct links to the citizens to supplement this information with whatever information is needed. This could mean the 'Dorpsteams' could gather *experiences* (information) *for* the Water Board and the Safety Region. However, ideally this could be organized in such a way that the Safety Region and Water Board are also present when these *experiences* are collected to create a relationship with the community they serve themselves too. Finally, it would be important to regularly organize such sessions to make sure information is up to date so that the Water Board and Safety Region can rely on this data to act on.

Table 3: Overview and summary of activities surrounding engaging with society.

Organization	**Interest in 'knowing the society'**
'Dorpsteams'	- Earning a living - Align services with needs
Municipalities	- Align policy and services with needs of society
Safety Region	Align services and communication strategy with characteristics, needs, capacities and vulnerabilities
Water Board Brabantse Delta	Align services and communication strategy with characteristics, needs, capacities and vulnerabilities

8. Analysis: Applying VCA and PAR to the ABG area

This Chapter focuses on the analysis of the second part of the research and formulates an answer to the third sub question that was developed for this research; *What elements in the 'social DNA' of the ABG area can be classified as vulnerabilities or capacities and how can these be taken up in Strategic Crisis Management?* In this Chapter, the results that were presented in Chapter 5 and 6, are analysed through the combined VCA/PAR model as presented in Chapter 2. As mentioned in Chapter 1, these are vulnerabilities and capacities for those who would find themselves (and/or their belongings) in the ABG area when an extreme weather event occurs. These can, thus, include inhabitants as well as tourists.

This Chapter is structured as follows: several topics that were introduced in the results section of this report which can be regarded as vulnerabilities or capacities based on their respective definition as introduced in Chapter 2 are presented in the VCA/PAR model context. For each topic, the x (VCA) axis will be explained first, which touches on why the topic can be regarded as either a capacity or a vulnerability and to which of three VCA categories (physical or material, social or organizational & motivational or attitudinal) each respective topic belongs. This will be followed by an analysis on how each topic is situated in relation to the y (PAR) axis ((addressing) root causes, (reduction of) dynamic pressures or (un)safe conditions). Finally, each topic will also mention in which element of Strategic Crisis Management each respective topic can be of importance. The topics are discussed in no particular order, except for the final topic 'recreational homes and campsites'. This final topic can be regarded as a regional capacity rather than an ABG level capacity, this topic will be touched on separately. Table 4, at the end of this Chapter, provides an overview of all the information that is presented in this Chapter. The Chapter closes with a general analysis on how the different elements presented in this Chapter relate to one another.

8.1 Environmental characteristics

Even though this first point relates to the environmental characteristics of the ABG area, it forms a fundamental piece of context for the remainder of the topics that are touched upon in this chapter. In addition, it helps put the following topics in a broader picture, which will be explained in more detail in the final paragraph of this Chapter (§8.10). As explained in Chapter 5, the ABG area consists of mainly high and dry sandy soils and in Chapter 3 it was mentioned that no main rivers run through this area which. This combination can be regarded as an important physical or material capacity when it comes to flood-related risks. A study conducted by Deltares (2021) examined which parts of the service area of Water Board Brabantse Delta were to be at risk if a similar event would take place as in Limburg in 2021. This study further solidified that flood related risks are minimal in this part of the service area of Water Board Brabantse Delta. On the other hand, it are exactly these same characteristics which make the area vulnerable to draught related issues. However, relating to the tasks of the Water Board these issues are less likely to result in 'disastrous situations' for large groups of inhabitants. However, the agricultural sector in the area could suffer from this, which was touched upon in Chapter 5 as well where it was explained that legislation from the Water Board to prevent water shortages can sometimes conflict with the needs of farmers in the area. As this topic does not align with one of the PAR categories, the y axis is left out for this theme.

8.2 Limited influence on spatial planning

The second topic taken up in this analysis is the limited influence of Water Boards on spatial planning, which might come as no surprise as this topic was discussed in many previous Chapters as well. Even though previous Chapters of this report have shown that steps in the right direction are being made in the form of water and soil as guiding principles, the current reality is still that the interests of the Water Board are not prioritized in spatial planning projects. As this is the consequence of a larger system which puts other interests above those of water safety, quality and quantity, I argue this can be regarded as a dynamic pressure. This goes for the study area of this research project as well as for the rest of the Netherlands. With the climatological changes and spatial challenges we are experiencing at the moment, this can be viewed as an important physical or material vulnerability which can result in specific unsafe conditions in particular places. However, building on what was explained in the previous section, this does not lead to unsafe conditions in the ABG area specifically due to some of its environmental characteristics.

By means of advocating for water and soil as guiding principles at different government levels, the Water Board is working hard on the mitigation aspect of the Strategic Crisis Management which revolves around creating a landscape in which the system could fail (i.e. an extreme weather could take place) in a safe way (i.e. human and economic loss is kept to a minimum). However, as it is regarded as a dynamic pressure, most likely more actors are going to have to be involved to really bring about change and reduce this dynamic pressure and prevent unsafe conditions from unfolding.

8.3 (Risk) communication and the recreational sector

The second topic revolves around one of the main economic drivers of the study area which is the recreational sector. As mentioned in Chapter 5 the amount of people that (temporarily) reside in this study area triples during high season. This means that during these months, a whole new target audience has to be taken into account. Currently, the Water Board's communication strategy does not differentiate between this group and other people they are trying to target. In addition, studies have shown that tourists in general are less informed about the risks that might be present in the places they visit. In addition, might employ different sources of information or might not know in what case they can contact the Water Board, let alone which Water Board is the responsible party in the area. This can be regarded as a motivational or attitudinal vulnerability for people visiting the ABG area. If, for example, the Water Board notices an extreme weather event coming up, their regular means and channels of communication might not suffice to reach this group. This could lead to unsafe conditions for this specific group who is not informed on (1) that this was seen as a risk in this area at all and (2) that they could actually face this risk during this visit.

Therefore, it is important to consider how to communicate with this group. If the Water Board would want to take this on, it would mean steps have to be made in both the preparedness aspect of SCM as well as making sure this group is included in scenarios for the so-called 'hot' phase of the disaster cycle ('warme fase' in Dutch), referring to the response aspect of the model. First steps in this regard could include a brainstorm with, for example, the communication department and the crisis management department of the Water Board to sit down and think about about how this vulnerability can be reduced through raising awareness on the risks people might face whilst being in the area. Regarding the response element of SCM, it would be good to realize that this information has to be taken into account when trying to gather all the facts during a calamity and also how to communicate with this group during a calamity.

8.4 Ageing of the population

Another, yet completely different, topic is ageing of the population in the study area. As mentioned in Chapter 5, this is a national phenomenon. However, this still means you have to think about its implications on the risks you face at local level. Research conducted by the Health Council (Gezondheidsraad[19] in Dutch) has shown that, in general, older people have a lower self-efficacy than younger generations. In several publications on different types of 'disasters', the Dutch Red Cross also refers to this group as being particularly vulnerable. Chapter 5 illustrated that the ABG area relatively houses a larger share of elderly people than the national average. In case of a calamity, a relatively large proportion of your population having a relatively low self-efficacy, can be a social or organizational vulnerability. An additional way in which the ageing of the population of the ABG area could be regarded as a vulnerability is that, as is the case for people visiting the area (i.e. tourists), the current communication strategy of the Water Board is not tailored towards people who (in general) draw less on modern communication methods like mobile phones and social media, like elderly people. An important consideration to make as a Water Board is how you want to reach this group, which makes up a large share of the total population of the ABG area. If you want to reach this group directly, modern communication strategies might not suffice which means the Water Board would have to employ different communication methods. However, an option could also be to try and reach this group indirectly, for example through informal caregivers (i.e. people who take care of, for example, their parents or grandparents), or through organizations that are in regular contact with this group (e.g. elderly associations like 'De Zonnebloem'[20] or possibly also the Dutch Red Cross.

Regarding the PAR categories, this phenomenon can be regarded as a dynamic pressure. As explained in Chapter 5, the ageing of the population now is caused by the ageing of the baby boom generation. This dynamic pressure in itself is not something the Water Board, or any other actor, can reduce. What they can do, though, is prevent this dynamic pressure from resulting in particular unsafe conditions. Investing time and effort into the suggestions relating to the preparedness element of SCM as mentioned above, can result in the achievement of safe(r) conditions.

[19] The Healt Council or 'Gezondheidsraad' is "an independent scientific advisory council with the legal task of advising the Dutch government and parliament on broad field of public health and healthcare" (Gezondheidsraad, n.d.)

[20] 'De Zonebloem' is an association which assists people with physical limitations to stay in touch with other people. A large share of their 'clients' are elderly people.

8.5 The importance of associations and high levels of social cohesion

The fifth topic has to do with the importance of associations as a form of social organization in the ABG area. The fact that many people in the study area are a member of at least some form of an association, can be a valuable social or organizational capacity. If a calamity were to occur in this area, it is likely that most people can count on help these social networks. For actors playing a role in the response aspect of these calamities (like the Water Board), these associations can serve as valuable points of entry to get in touch with the people in the affected area. Having fixed points of contact to contact during a calamity can aid organizations involved in the crisis response to quickly identify the needs of a certain group or area. The same goes for a potential recovery phase. In addition, these networks can also be used to spread information about the regular activities of the Water Board (general awareness) as well as on calamity-related topics which relate to the preparation element of SCM. Again, reasoning from the SCM perspective, it would be advised to invest in gathering this kind of knowledge and investing in relationships with these associations through fixed points of contacts *before* a calamity takes place as this can aid in the creation of safe(r) conditions when a crisis situation occurs.

In addition, it might be good to mention that, as stated in Chapter 5, the elderly association was mentioned quite often during interviews. A relatively large share of the elderly population of the study area is a member of the elderly association. Just as was argued for other groups in society, the elderly association can be a useful entry point to get in touch with this specific group and spread important information.

This goes hand in hand with the small-town character of all villages except for Rijen. As was elaborated on multiple times, this results in high levels of social cohesion; people know one another and look out for one another. This essentially comes down to the same point as the importance of associations as most people in the study area are part of a community that looks out for one another.

8.6 Limited capacity at the ABG organization

Next to this, the capacity challenges that are faced by the ABG organization, as elaborated on in Chapter 5, also have to be addressed in this analysis as this can be regarded as an important social or organizational vulnerability. This in itself can be regarded as a dynamic pressure which could result in problematic conditions. The latter categorization is not part of the PAR model. However, I deliberately made the choice to use a different term here as I do not necessarily think this dynamic pressure translates into conditions that are unsafe but rather hard to work with if the ABG area were to face a calamity. The main reasoning behind this is that since this organization already has limited time and capacity to take on important matters, a calamity occurring could worsen these existing problems. If a calamity were to occur, I am sure people would be made available to deal with these matters. However, this could mean that employees who normally work on other topics would have to switch positions and focus on handling this calamity instead of working on their 'normal' tasks. In a place where certain matters already take longer due to capacity problems as explained in Chapter 5, this could lead to delays in other tasks. As the municipality is an important partner of the Water Board, both during crisis situations as well as in their day-to-day activities, it would be advised to think about how a potential calamity would be handled and what role each of these actors would play in both the response as well as the recovery aspect of the SCM model. This way, the Water Board can manage expectations *before* a calamity takes place and can anticipate on the possible implications of the capacity problems at the ABG organization.

8.7 'Sense of place' of inhabitants

Another point relating to the political context of the study area is the inhabitants' 'sense of place'. This refers to the way people experience their citizenship in the respective municipality they live in. This research showed that even though the three municipalities making up the ABG area collaborate on executive level, residents of each municipality identify as a citizen of one of these specific municipalities. People's point of reference in the ABG area is mostly their direct environment, which means either of the three municipalities. I argue that this is not necessarily a vulnerability nor a capacity but rather something to keep in mind when trying to connect with the inhabitants of this area.

This piece of information can be useful in two elements of the SCM model. First of all, in the preparatory element it could help to link general concerns of the Water Board and translate these into what this will mean exactly for each respective municipality. This might require a bit of additional time and effort on the side of the Water Board as they logically operate on a larger scale, however it can aid in making the message you are trying to convey more personal which is appreciated by smaller communities like the ABG municipalities. In addition, keeping people's 'sense of place' in mind if a recovery phase were to be necessary in this area could make the efforts of the Water Board to better align with what is needed and wanted by the local communities. Again, people value local and personal communication. If, for example, recovery efforts or points of contact were to be located in Rijen, it is not unlikely for this to result in frustration amongst people in Alphen-Chaam and Baarle-Nassau as this would mean recovery efforts (by the Water Board for example) would be organized based on a frame of reference that differs from their own.

There is one additional note I want to make that builds on this which relates to needs of citizens that became clear after the floods in Limburg in 2021, which is that citizens do not want to be referred back and forth between different parties when trying to get help or deal with insurance claims . In other words, if you provide municipal level points of contact, make sure all parties that are involved are represented here. This does not mean having someone from every organization involved has to be physically present but making sure the people team that is present at these locations is able to assist people right then and there. Put shortly, act as one government instead of redirecting people to others.

8.8 Hands-on mentality of farmers

Another point that was brought up in Chapter 5 is the hands-on mentality of the farmers. I argue this can be both a motivational or attitudinal vulnerability as well as a capacity. As was briefly mentioned in Chapter 5, farmers have a certain mentality which makes them take on tasks they can themselves by themselves. This can be regarded as a capacity in the sense that they can assist in the response of calamities themselves. However, the other side of the same medal is that this can also be counterproductive as they might not contact the Water Board to make sure their actions align with what the Water Board would advise them to do. In other words, the fact that this group's initial response to a calamity is not to call the government authorities can also cause them to take action that is not necessarily in line with what would be best in a given situation, could lead to unsafe conditions.

However, the Water Board can also regard the farmers in the ABG area as an asset. By building a relationship and fine-tuning *before* a crisis situation occurs, the mentality as well as materials farmers have at their disposal, can be used as a resource in case of crisis situations.

8.9 Recreational homes and campsites

As mentioned, this final point relates to a capacity of the ABG area at a more regional level. When zooming out and examining the study area in its broader context, the recreational sector in the ABG area can be considered a valuable physical and material capacity. The high and dry campsites, holiday homes, b&b's etc. in the ABG area can function as refuge areas (if prepared to accommodate 'victims') when low-lying areas within the service area of the Water Board Brabantse Delta experience flooding and people have to be evacuated. If predictions show that these lower-lying areas will be affected in such a way that evacuation is regarded as the best possible measure, or if a calamity is already happening and seems to be worse than expected which also makes evacuation necessary, these recreational sites can be used as assets. This shows that campsites and other types of recreational residencies can serve as important assets regarding the response aspect of the SCM model. There are numerous advantages associated to this. For instance, most recreational sites are equipped with necessary facilities for occupation by (many) people, making them more suitable for prolonged stays compared to alternative evacuation locations such as gyms, which are not designed for residential purposes. In that sense, recreational homes offer a more sustainable option for evacuation.

In a similar manner, these recreational sites can also be seen as a capacity in the recovery aspect of the SCM model. After the floods in the summer of 2021 in Limburg, hundreds of people were not able to return home for months after the floods took place. People had to be evacuated for longer periods of time or had to live in container homes in their front yards until their homes were repaired. During the recovery phase the campsites could come in handy too. It could prevent people from having to be relocated to places further away to stay until they can re-enter their own homes again. Besides, it could save time as using existing facilities to evacuate people will most likely take less time than install temporary container homes, which means contractors are able to start recovery activities sooner. Besides, even though such an event is a significant disturbance in itself, it can help that people are accommodated in a place not too far away from where they live. Following the line of thought of the SCM model, it is important to think about such things before an actual calamity takes place and thus talk to and invest in a relationship with recreational entrepreneurs in the area *before* something takes place.

An important point raised by one of the Water Board's employees is that utilizing these recreational sites for evacuations would necessitate the upscaling of various other facilities, such as public transportation, in case of emergencies. While this falls outside the scope of this particular research, it is an important point to consider. Another side note that has to be made is that one cannot have blind faith in these places being available as evacuation options. In case of a calamity, there may be a gap between the amount of accommodations available to accommodate people from the affected areas as compared to the supply of these accommodations. Therefore, a back-up plan is still needed.

Table 4: Overview and summary of elements in the 'social DNA' of the ABG area that can be linked to the combined VCA/PAR model and the respective elements of SCM that are advised to take on these elements.

Thematic element	Vulnerability or capacity	VCA category	PAR category	Link to SCM
Environmental characteristics	Capacity/vulnerability	Physical or material	N/A	N/A
Limited influence in spatial planning	Vulnerability	Physical or material	Dynamic pressure	- Mitigation
Risk communication and the recreational sector	Vulnerability	Motivational or attitudinal	Unsafe condition	- Preparedness - Response
Ageing of the population	Vulnerability	Social or organizational	Dynamic pressure	- Preparedness - Response
Importance of associations and high levels of social cohesion	Capacity	Social or organizational	Safe conditions	- Response - Preparedness - Recovery
Limited capacity ABG organization	Vulnerability	Social or organizational	Dynamic pressure	- Response - Recovery
'Sense of place' of citizens	N/A	Social or organizational	N/A	- Preparedness - Recovery
Hands on mentality and contact with farmers	Vulnerability/Capacity	Motivational or attitudinal	Unsafe/safe conditions	Response
Recreational homes/campsites	Capacity	Physical or material	N/A	- Response - Recovery

8.10 Combining the vulnerabilities and capacities in the 'social DNA' of the ABG area

As described in Chapter 2, an important element of the VCA method is to analyze how different vulnerabilities and capacities in a given area relate to one another. The main reasoning behind this is that certain vulnerabilities might be compensated by capabilities and vice versa. Therefore, this final paragraph will elaborate on how the different vulnerabilities and capacities as presented in this Chapter relate to one another.

First of all, as explained in §8.1, the ABG area is located on the high and dry sandy soils of North-Brabant with no main rivers running through the area. Because of this combination, it is highly unlikely flood-related weather extremes (e.g. extreme rainfall) will result in disastrous calamities in the ABG area. Therefore, these environmental characteristics, automatically reduce the risks involved in many other vulnerabilities discussed in this Chapter as flood related hazards are unlikely to meet the vulnerabilities that resulted from the study on the 'social DNA' of the ABG area. For example, the fact that the Water Board has not yet thought about how to reach tourists if a calamity were to occur during the high season, is less of a vulnerability if it is unlikely that flood related calamities will occur. The same goes for the ageing of the population. This is also less of a problem if flood related risks are unlikely to occur in the ABG area.

Nevertheless, it are exactly these environmental circumstances, which cause the area to be at increased draught related risk. However, these risks are unlikely to cause large scale damage to human lives directly. It is mostly the agricultural sector who will suffer from this due to increased regulations surrounding water use. In addition, if you look at this risk outside of the responsibility of the Water Board, these draught related risks could mean the area is at increased risk regarding wildfires. Wildfires are officially not the responsibility of the Water Board, however in the beginning of this report it was argued that solely thinking from one's own responsibility is no longer a sustainable approach. Therefore, the Water Board might be able to connect with the Safety Region and discuss the vulnerabilities that were identified in the ABG municipalities with them as most of them hold up when it comes to wildfires. Especially the large share of elderly people in the area and the current lack of communication with tourists can lead to serious unsafe conditions in this area where many people live near or stay at campsites in forested areas.

The points that were made about the Water Board's limited say in spatial planning is a vulnerability which is not reduced by the fact that the area is unlikely to experience flood related calamities. As mentioned, the agricultural sector is prone to draught related risks. If the Water Board were to have a bigger say in spatial planning endeavors, they could, for example, make sure only draught resistant agricultural activities would take place in this area. In this sense, the limited say of the Water Board in spatial planning and land use, adds to the vulnerability of a certain group of farmers who are dependent on a consistent water for their production.

§8.5 touched upon the capacity that comes with the liveliness of associations of people in the ABG area. This could counterbalance the vulnerability of groups with a lower self-efficacy. A main group that fits this description and was touched upon in multiple interviews are the many elderly people that reside in the ABG area. It was mentioned multiple times that the elderly associations in the area have quite a large number of members and are also very active. This combined with the high levels of social cohesion as elaborated on in the same section further decreases the vulnerability of many elderly people with a decreased self-efficacy living in the study area.

The vulnerabilities relating to the capacity problems at the ABG organization might seem like less of a threat when it comes to flood related calamities as these are unlikely to occur in their municipalities. However, if wildfires are indeed a threat following from the area's proneness to draught, this vulnerability does hold up.

Finally, the hands-on mentality of farmers and the potential vulnerabilities or capacities that come with this can be regarded as something the Water Board can largely influence themselves. Investing in good connections with this group before a calamity takes place could create mutual understanding which can aid in making sure these farmers know what would be productive acts of service during a calamity. Again, as flood related risks are less of a threat in this area this would mainly come down to collaboration surrounding draught related issues. By investing in the relationship with farmers, listening to their needs and making sure they also understand those of the Water Board this might result in less conflict surrounding water use during prolonged periods of draught. In addition, the Water Board could pass on this knowledge to the Safety Region who can talk to these farmers about their possible involvement in wildfire response if needed.

In conclusion, many of the vulnerabilities that were identified within the 'social DNA' of the ABG area are decreased by the fact that this area is not particularly prone to flood related issues. Nevertheless, some vulnerabilities still hold up in relation to draught related threats and are, thus, important to take into consideration within the respective elements of Strategic Crisis Management that were assigned to each vulnerability as summarized in Table 4.

9. Discussion

Previous Chapters discussed the main findings of this research project substantiated with data that was gathered during the field work period and analysed by means of the theories and concepts as presented in Chapter 2. This Chapter provides some (critical) reflections on both these results as well as the theories that were used to theoretically guide this thesis. This discussion starts out by elaborating on the added value of using boundary objects and boundary spanners in the context of this research project. This is followed by some reflections on the combined VCA/PAR framework that was used to analyse the vulnerabilities and capacities that were identified within the 'social DNA' of the ABG area. The final section elaborates on several practical reflections relating to this research project.

9.1 Theoretical reflections

As explained in Chapter 2, the theoretical backbone of this research project consisted of two parts; Boundary Work in relation to the 'social DNA' of the ABG area and theories from the field of Disaster Studies to link these findings on the 'social DNA' of the study are to vulnerabilities and capacities. This section reflects on the extent to which the chosen concepts and frameworks served the purpose they were initially intended for.

9.1.1 Identifying boundary objects and boundary spanners

As mentioned, for the part of this research that focused on the 'social DNA' (including the networks) in the study area, two concepts from the field of Boundary Work were employed. The first concept was boundary objects which were defined as objects that are flexible enough to be able to appeal to a wide variety of actors whilst still being able to maintain some form of coherency across all these different actors that engage with this boundary object in their own way. These objects serve as a common point of reference between different groups with diverse knowledge, perspectives and goals (Bowker & Star, 1999). As these objects possess the unique ability to bring together a wide variety of actors, they are able to foster collaborations between actors that might otherwise not have come together. The concept of boundary spanning was brought in to complement the insights on boundary objects within the ABG area. Boundary spanning was defined as the activities and interactions that occur at the interfaces, or boundaries, between different groups, departments or organizations. It involves individuals or entities that bridge these boundaries to facilitate communication, collaboration, and exchange of information, knowledge and resources. Those who 'perform' the act of boundary spanning, were referred to as boundary spanners or boundary spanning actors.

Previous research has illustrated how both of these concepts can lead to valuable insights in a variety of contexts. For example, research by Bowker & Star (1999), who first coined the concept of boundary objects, illustrated that this concept helped to analyze and make sense of the variety of different actors that had some sort of connection to the museum they were studying. Another example of a context in which boundary objects have been proven to provide valuable insights is the field of technological innovations. Studies by Fox (2011) and Huvila et al. (2017) have shown how boundary objects can serve as vehicles for innovation in the technological field. Similarly, the concept of boundary spanning has been proven to serve as a valuable guiding piece of theory by a study conducted by Warner et al. (2010) which was discussed in Chapter 2.

Even though Chapter 2 illustrated how both concepts relate to one another, existing case studies of where this combination of concepts proved to be helpful seemed to have not been conducted yet. That being said, combining these concepts and using them as a theoretical guideline for this study was a bit of a gamble. However, having worked with both concepts before, I was convinced these concepts could be useful in the context of this particular research too. The combination of both terms was expected to provide a deeper understanding of the social dynamics and interactions within the ABG area surrounding certain objects. An analysis based on these two concepts was anticipated to shed light on key themes within the study area. This in turn was expected to be able to assist the Water Board in its desire to look at what other actors in the area, whom they might not yet collaborate with, are working on/find important and possibly find and create new partnerships. Analyzing current boundary spanning activities and visualizing these activities as connections, along with other non-boundary spanning activities, was expected to produce a clear visual representation of these findings.

Reflecting on the outcomes, the utilization of boundary objects and boundary spanning proved to indeed be a valuable theoretical framework for uncovering and analyzing the 'social DNA' of the ABG area. The coding process that was part of the analysis process allowed me to filter out themes that seemed of particular importance in the interviews that were conducted for this research. This resulted in the discovery of spatial planning and recreation in the context of the ABG area. By analyzing the connections surrounding these boundary objects, specifically focusing on boundary spanning efforts, I was able to present the Water Board with a clear description as well as a visual representation of the activities and connections which are present surrounding the topics of spatial planning and recreation. Overall, the integration of the two concepts from the field of Boundary Work enhanced the depth of the research findings, demonstrating their relevance and applicability in analyzing complex social phenomena. In addition, linking these findings to the four different network roles as introduced by Cross et al. (2019) in Chapter 2 provided me to translate the results relating to boundary objects and boundary spanning activities into an easy-to-understand network for the Water Board.

Furthermore, I have found that both theoretical concepts are relatively easy to work with and can be translated into practical or actionable tasks which is why I argue the Water Board can for sure benefit from using these concepts and the additional insights they provide in their organization. Even though the full theoretic background might be hard to follow for Water Board employees that are mainly technically schooled, the core of what both principles entail and how they can be of added value for an organization like the Water Board is easy to understand and work with. The final Chapter of this report, Chapter 11, includes a proposed method in which these elements are taken on board. However, I have chosen to work with the exact theoretical names as little as possible as I feel like they can be easily 'translated' into terms that are more meaningful to those who are not familiar yet with Boundary Work.

9.1.2 The combined VCA/PAR framework

The second part of the research utilized a combination of two prominent models from the field of Disaster Studies as a theoretical guidance; the Vulnerability and Capacity Assessment (VCA) provided the vertical axis of the combined model and the Pressure and Release (PAR) model provided the y axis. As presented in Chapter 2, the findings following from the analysis on the 'social DNA' of the ABG area would be 'plotted' onto this model. The combined VCA/PAR model was expected to provide three different insights on each of the elements that would be analyzed by means of this model; (1) if the element at hand could be regarded as either a vulnerability or a capacity, (2) which VCA category this vulnerability or capacity belonged to (physical/material, social/organizational or motivational/attitudinal) and finally (3) what PAR layer ((un)safe conditions, (reduction of) dynamic pressures or (addressing) root causes) that specific element could be assigned to. The latter was expected to provide insight into the extent to which the Water Board could take on certain vulnerabilities by themselves and which vulnerabilities were rooted deeper in the (political or economic) system and would most likely require other actors to take action as well.

As was noted in Chapter 2, both theories have primarily been applied in the context of developing countries. However, the basic principles of both could essentially be of use in any given context as they are categorizations that fit non-developing contexts as well. Even though the vulnerabilities of someone living in Alphen-Chaam might be fundamentally different than those of someone living in a slum in a developing country, they can still be disastrous in their own respective context. I therefore stuck with the original categories taken up in both theoretical approaches as I do not think the categories in themselves lend themselves better for any particular context.

Looking back on my decision to use a combination of these two famous frameworks from the field of Disaster Studies, I have mixed feelings. On one hand, I think the combined model did exactly what I 'designed' it to do which was to highlight different risk-related characteristics of the elements that were identified as potential vulnerabilities or capacities within the 'social DNA' of the study area. All categories were clear and the elements I identified were easy to link to both axes. However, regarding the PAR axis, it were really only the (labels of the) layers which indicate how deeply a given vulnerability or capacity is rooted in the system of that particular context that proved to be of added value for this research project. Therefore, I would recommend future researchers conducting a similar type of analysis to work with similar terms as indicated in the PAR model for the y axis of your theoretical approach, however I do not think it is necessary to include the full theoretical background that comes with the PAR analysis. Nevertheless, the combined framework effectively contextualized the research findings, enabling the linkage of these findings to elements of the Strategic Crisis Management model utilized by the Water Board. Therefore, in the end the combined VCA/PAR framework served its purpose in this research project by providing actionable insights for addressing complex challenges. Moving forward, simplifying the PAR model may make future projects less complicated without compromising the depth of analysis this axis provides.

9.2 Practical reflections

9.2.1 Time limitations

The first, and arguably one of the main limitations of this research project is the limited time that was available to conduct this research. This research project was carried out as part of a master's thesis for the study Development and Rural Innovation at Wageningen University. Within this study programme a set amount of ECTs is assigned upon completion of a thesis, which translates to a setting an amount of hours that have to be put into the research project. For me, this translated into having about 6.5 months to carry out this research project. This time was split up into three stages of approximately the same amount of time; two months to come up with a solid research proposal, two months to conduct my field research and two months to compile all findings into this final report.

Because of this time limit, I had to adhere to a fixed time stopping rule based on a certain date rather than being able to stop interviewing when my interviews did not harvest new information anymore and I had reached the point of information saturation. In other words, if more time would have been available, this would have enabled me to speak to more actors in the ABG area and therefore enable me to paint a more complete picture of the 'social DNA' of the ABG area. However, as explained in Chapter 1, one of the main objectives of this research was to develop a method or way of working and see if such a research project is useful for Water Boards at all. At the beginning of the research all parties were made aware that providing a complete picture of the 'social DNA' of the study area would not be the end goal.

Adding to this, I set out to do as much processing of my interviews as soon as possible after they took place to be able to fully comprehend what was said, take on this information and use it in interviews that were still to come. I was able to stay on top of this for about half of the interviews but lost track of this along the way due to time pressure and other tasks or interviews being scheduled shortly after one another. Nevertheless, you obviously do not solely store information by transcribing, but also by conducting the interview themselves. Had more time been available, I would have been able to (1) talk to more people and (2) leave more time in between interviews to be able to process information better and use it for interviews that were still to come more.

9.2.2 Recruitment and distribution of respondents

The second main limitation of this research project relates to the way respondents were recruited and also the distribution of type of actors as well as in which area they operate. Starting with the former, respondents were not selected through random sampling but rather through purposive and snowball sampling. Random sampling is essential if you want your sample be a good reflection of the population that is the subject of your study. However, this would have taken more time which would not have fitted the time that was available for this research. Additionally, I doubt if random sampling would have provided a representative sample of my study population as the 'social DNA' of a place consists of a multitude of different actors who all operate in different domains and on different levels. In that sense, drawing a random sample of respondents from the ABG area would most likely also not have resulted in a representative sample.

Looking at the second point that was brought up, relating to the distribution of respondents, an important limitation has to be taken up as part of this discussion too. I set out to, as best as I could, guard that the distribution of respondents would be as even as possible. Even both in the sense of their background (e.g. political actors, recreational actors, local history associations etc.) as well as regarding their work area. As the study area consisted of three municipalities, I wanted to make sure each municipality was represented well. Even though I was able to take these factors into account in approaching respondents, I had no control over who would respond and who would not. Besides, the restricted time available to conduct my field work also led me to focus on the opportunities I did get and put my attention towards the respondents that would respond quickly and enthusiastically to my request to take part in this research. In the end, this caused me to focus more on talking to as many actors as I could rather than focusing on an even distribution. In hindsight, this is something I might have done differently knowing what I know now.

9.2.3 Validity of the research generalizability of results

A third main limitation of this research relates to both limitations as explained in the previous two sections and revolves around the validity of the research. As I did not employ random sampling as a method, the validity of this research is already significantly compromised. Adding a fixed date rather than an information saturation stopping rule further negatively impacts the validity of this research. However, the objective of this research was to explore if such an analysis is useful to Water Board Brabantse Delta in general and develop a method for going about such a social analysis rather than creating a complete picture of the 'social DNA' of the given study area.

In addition, the findings of this research cannot be generalized to other areas as the 'social DNA' of places as it is something completely unique to a specific place. The fact that the two local history associations that took part in this research project are very active, both with their own volunteers as well as by means of looking to connect with society as a whole. Nevertheless, general lessons can be drawn from the results of this research that might be valuable for other places. Sticking to the example of local history associations, it could lead us to argue that it might be valuable to talk to local history associations when conducting a similar type of research in another area.

9.2.4 Study area

Another point I want to touch on in this discussion is the study area that was appointed for this research. Even though virtually any area within the service area of Water Board Brabantse Delta would have been suited to conduct an analysis of its 'social DNA' on, the second part of the analysis might have been more useful in an area that is more prone to flood related risks as compared to the ABG area.

As explained in Chapter 3, the ABG area was selected as the study area for this thesis by the Water Board because it has been labelled a priority area in their current water management programme. However, when it came to the analysis of vulnerabilities in this area related to extreme weather events, many vulnerabilities could be taken out of the equation as a study by Deltares (2021) concluded that this part of the Water Board's service area is highly unlikely to face disastrous flood-related events. While it is true that the study area is susceptible to drought, and yes for some particular farmers cultivating crops that are susceptible to draught related issues, this could result in disastrous events (i.e. no/less crops to harvest), these conditions will not result in ABG wide disasters. It is important to note that forest fires are excluded from this discussion as they are more so the responsibility of the Safety Region.

The point I want to make by saying this is that, reasoning from the Water Board's perspective, it would have been more beneficial to conduct this analysis in an area that, in its totality, is more prone to risks that are regarded as the responsibility of the Water Board.

9.2.5 Scope of the research question

A final, yet crucial, aspect to consider in this discussion relates to the scope of this research project. Since this research project was commissioned by Water Board Brabantse Delta, this organization logically had specific end goals in mind for this study. Primarily, the Water Board sought to assess the potential added value of incorporating the social knowledge that would arise from this study into their, predominantly technical, way of working. In order for me to provide them with recommendations regarding this 'question', I naturally had to conduct a case study on which I could in turn base my recommendations. This meant that my research project essentially turned out to consist of three elements (1) conducting a case study on the 'social DNA' of a given area (2) provide my thoughts on if this kind of knowledge is indeed of added value for the Water Board and why and (3) provide them with a suggested method to take on such an analysis in future endeavours. In addition, the topics on which the Water Board wanted to gain insight were also twofold; the 'social DNA' in itself as well as what elements of this 'social DNA' could be regarded as vulnerabilities and capacities and what does that mean for the Water Board

Even though this study resulted in several valuable insights regarding all points mentioned above, at times it felt like I was trying to focus on too many things at once resulting in several incomplete 'final products'. It was discussed at the start of this research project that the focus would mostly be to explore what works and what not, rather than to deliver a complete picture of the topics I would be looking into. However, this sometimes conflicted with my academic desire to provide an analysis that was as complete as possible. Looking back on this, I might have felt more at ease if I had taken on maybe one or two of the elements mentioned above and fully focussing on those than trying to do it all.

10. Conclusion

This thesis set out to assist Water Board Brabantse Delta in their desire to broaden their perspective when it comes to the way they look at their service area as well as the actors they partner with. This desire arose from the realization of the Water Board that the challenges they are facing as a regional water manager are becoming more and more complex and have started to increasingly interrelate with other domains. Water Board Brabantse Delta argues that solely thinking from one's own responsibility is no longer sustainable due to the many challenges they face, which increased their desire of looking beyond their current way of looking at their service area.

Water Boards typically have a very technical way of looking at their service area, this view was also referred to as the traditional blue/green Water Board glasses earlier on in this report. This research was set up to explore what putting on an alternative, more social, pair of glasses has to offer. This social information was referred to as the 'social DNA' in this research which consists of economic, political, demographic and socio-cultural factors. Three main research objectives were formulated; (1) to explore if such an alternative point of view is valuable for Water Boards in general, (2) what such an analysis would look like for the ABG area and (3) how they (and possibly other Water Boards as well) can go about exploring this alternative point of view in other parts of their service area in the future. The main research question that was developed for this thesis is:

What does the 'social DNA' of the ABG area look like and what elements of this 'social DNA' can be regarded as vulnerabilities or capacities that should be taken into account when working on Strategic Crisis Management?

As explained in the previous Chapter, the scope of this question is very broad. On one hand a wide scope aligns with the objective of exploring what more is out there for the Water Board to learn about their service area. On the other hand, the scope turned out to be so broad that it is hard to formulate one concise answer to the main research question. For this reason, this Chapter touches on the main findings on all three elements that make up the final answer to the main research question; (1) the main elements of the 'social DNA' of the ABG area, (2) the networks within this 'social DNA', specifically focussing on the networks surrounding the two boundary objects that were identified in the ABG area and finally (3) assess how elements from this 'social DNA' can be regarded as either vulnerabilities or capacities and can be addressed through Strategic Crisis Management. All together, these elements provide an answer to the main research question as presented above.

To find out more about the 'social DNA' of the ABG area, this research looked at the study area through the DESTEP lens as presented in Chapter 2. Regarding the environment, the area is made up of mainly high and dry sandy soils. The municipalities are located in a transition area of dry to wet meant the ABG area has been an attractive place for people to settle for a long time. The majority of the land area consists of rural agricultural land, but there are also various forests located in the ABG area. Politically speaking, the ABG municipalities are an interesting study area because of its political organization. Alphen-Chaam, Baarle-Nassau and Gilze and Rijen have their own mayor and aldermen, but work together at executive level. It was indicated by many respondents that this joint ABG organization is dealing with problems regarding its capacity, which leads to unpleasant experiences and frustration amongst partners who do not have a fixed point of contact for the ABG area. In addition, Baarle-Nassau specifically also has an important link to Belgium as it includes many Belgian enclaves, which requires regular political meetings with the local Belgian municipality of Baarle-Hertog. It was indicated though that, in general, this collaboration runs quite smoothly. Economically speaking, there are two main industries that currently form important economic carriers of this region which directly relate to the large share of agricultural land and the forests that are located in the area. Despite having been subject to quite some changes over time, agriculture is still a main economic activity in the area. Due to the increased pressure on the agricultural sector as well as a lot of livestock farmers not having anyone to take over their business, it is likely the type of agricultural production in this area will be subject to change in the (near) future. Besides, due to its nature, the area also lends itself perfectly well for the recreational sector, which is mainly geared towards the small scale character of the area. Out of the three municipalities, Gilze and Rijen also has an industrial history as it housed several leather tanneries, shoe factories and brick factories in the past. In addition it also housed a large phone company called Eriksson and has a military Airport. The latter two both once were important economic carriers, but are not anymore. However, both of these had their impact on the development of Gilze and especially Rijen as they caused Rijen to grow from a small village into a bigger town. Bigger is still relative though, as all of these municipalities are relatively small. Gilze and Rijen, logically, has the largest amount of inhabitants combined with the highest population density, followed by Alphen-Chaam and

Baarle-Nassau in third. Regarding the socio-cultural aspect the main characteristics of this area are that these collaborating municipalities are experienced as separate municipalities by their inhabitants. These are mostly small town villages where social cohesion is high, people know one another and look after one another. Rijen is the only exception to this at it is notably bigger than the other villages in the area. Finally, associations (in their broadest sense) serve as an important form of social organisation for people in the ABG area.

The networks within this 'social DNA' were mapped out using a social network analysis as shown in Figure 23. Several main findings resulted from this analysis. First of all, interviews were conducted with several actors that would qualify as non-traditional network partners for the Water Board. Nevertheless, several of these actors were able to come up with potential ways of collaborating with the Water Board which could benefit both parties, building on each other's strengths. Secondly, the network analysis concluded that the ABG organization is the only actor in this network that functions at the level of the ABG as a whole. This means its frame of reference is fundamentally different from both its inhabitants (who feel connected to the municipality or specific village they live in, not to the ABG as a whole) as well as their partners. Furthermore, this network analysis also elaborated on the importance of many actor's personal connection to the Water Board's account manager for the ABG area. This can be regarded as a personal compliment for this employee, however it can result in problems when this employee falls ill or is (temporarily) unavailable for other reasons. Finally, the network analysis as presented in Figure 23, provides the Water Board with an overview of connections that might be valuable to look into for possible collaborations.

To provide some guidance in regards to the latter point, the information on the 'social DNA' and the networks within this 'social DNA' was analysed by using two concepts from the field of Boundary Work, namely boundary objects and boundary spanners. This resulted in two boundary objects (spatial planning and recreation) for which a more in-depth network analysis as well as an analysis on how different actors engage with these topics within the ABG area was provided. Spatial planning is something in which the water board itself can be regarded as an important boundary spanning actor, trying to proactively collaborate with several parties when it comes to spatial planning. There are, however some collaborations that could be extended or newly initiated surrounding this topic. The second boundary object that was identified, recreation, seems an untapped resource for the Water Board itself. The ABG area has a high recreational value which creates a lot of creative partnerships in the area. However, the Water Board is not yet involved in this network. Nevertheless, many boundary spanning activities by other actors in the network that was drawn up for this boundary object are taking place. Because of this, recreation as a boundary object can be regarded as an untapped resource for Water Board Brabantse Delta. Some of these actors have also indicated their openness to exploring possible collaborations between them and the Water Board. A final topic was raised in this part of the analysis which is 'engagement with society'. This topic was not yet regarded as a boundary object in this study as it does not really foster collaboration between different groups yet. However, this research showed that several actors are working on this topic in isolation from one another. Now that these parties have been mapped out, the Water Board (or one of the other actors) can reach out to jointly think about how they can collaborate on this topic. A suggestion was made for the Water Board to join forces with the Safety Region who is experimenting with a tool regarding neighbourhood characteristics. However, a cautious note was added to this proposed collaboration as it largely rest on data. It was suggested to involve the 'Dorpsteams' who can assist the Water Board and Safety Region by providing necessary context for how the information they want to include in the tool can be interpreted.

The third part of this research focused on what elements that were identified in the 'social DNA' and the networks that are part of this 'DNA' can be regarded as vulnerabilities or capacities when it comes to extreme weather calamities. This part of the analysis revealed that many elements that are part of the 'social DNA' form valuable information for the Water Board to take on in one or more elements of its Strategic Crisis Management model. However, this analysis also showed that many vulnerabilities in this specific study area are compensated by the fact that large-scale flooding problems are highly unlikely to occur here.

Finally, some recommendations for upcoming research can be formulated. If a similar type of study were to be rolled out for another study area, it would be advised to work with one municipality. This would allow the researcher to dive deeper into one specific area as opposed to an area that functions as one on paper for the Water Board, but is *experienced* by its inhabitants as separate areas. This is further elaborated on in the recommendations Chapter. Another suggestion for further research would be to conduct such a study in an area that is more prone to flood related risks than the ABG area. As was elaborated in on Chapter 8, for the

ABG area draught is a much bigger risk than flood related calamities. Therefore, it is suggested to map out the ’social DNA’ in an area that is more prone to such risks to evaluate to what extent different elements identified as vulnerabilities and capacities of the ‘social DNA’ in such an area are able to cancel each other out. Finally, the importance of the account manager of the ABG area was pointed out in this research. Future research could elaborate on how this dynamic works in other parts of the service area of Water Board Brabantse Delta

11. Recommendations

This final Chapter is mainly aimed at the employees of Water Board Brabantse Delta. It provides a list of recommendations I formulated after having completed this research which could help the Water Board in further exploring the possibilities and implementing this alternative point of view in their day to day activities. Finally this Chapter ends with a summary of the method that was developed based on (my experiences during) this research project.

11.1 Making social knowledge explicit

The results from the DESTEP analysis were not ground-breaking in terms of discovering completely new things about the ABG area that were unknown to the account manager and the other Water Board employee involved in this research. However, before this research project took place, this was all latent knowledge. In other words, it had never been made explicit before by the Water Board which means it solely existed in the minds of those involved in the ABG area.

Therefore my first recommendation would be to make existing latent knowledge that exists within the Water Board explicit. There are several reasons as to why this is recommended. First of all, a lot of this knowledge currently resides within the mind of the ABG account manager. If he falls ill or becomes (temporarily) unavailable for other reasons, you are left with a problem regarding all this information on the social situation of the area that is mostly stored in his mind. His temporary replacement might have to figure a lot of this information out him/herself, which can take a lot of time which could easily be saved if this knowledge would have been stored somewhere.

A good first step might be for all account managers to write this information on the respective municipalities they serve down in a living document where others can easily access it. In addition, this provides a solid foundation for those who would be assigned to conduct a more in-depth analysis of a specific area. Besides, one simply cannot store all information he or she takes in solely by memorizing it. By making this knowledge explicit, just like the Water Board does with other types of information, you create an accessible form of compendium for both yourself to fall back on if needed as well as for colleagues. For the colleagues working on crisis management, having this type of information made explicit could be very valuable if a crisis situation were to occur in this place. On one hand it could save time because they would have information that might come in handy when trying to manage the situation at their disposal. Adding to that, if the specific account manager for the respective area is ill, on holiday, absent for whatever other reason when the crisis situation occurs, the Water Board still has this important information at its disposal.

Relating to this, I would mainly recommend conducting this kind of social analysis for areas that are at increased risk when it comes to possible extreme weather events and climatological changes that affect . As the Water Board already possesses the information which areas are at increased risk, potential new study areas can be identified based on this information. Complementing this existing 'blue/green' knowledge with information on the 'social DNA' of these places can assist the Water Board in making strategic choices about their crisis management. Chapter 8 provided several examples of this for the ABG area which could be taken on by means of SCM. The same method that was applied in this study can be applied to risk prone areas in the service area of Water Board Brabantse Delta.

11.2 Role of the account manager

Related to what was stated at the beginning of the previous section, this research has shown the importance of the current account manager of the ABG area. Chapter 6 explained that several respondents referred to him personally instead of talking about Water Board Brabantse Delta in general. Whilst this is a personal compliment for the account manager himself, it can also be seen as a vulnerability as was also pointed out by this employee himself during my interim presentation. The ABG account manager explained that he would rather have heard that network partners are happy with their collaboration with the Water Board as a whole instead of him personally. Again, if this specific employee falls ill or becomes (temporarily) unavailable for other reasons, there is no person that is able to seamlessly take over this role. The current account manager has built up a relationship with these network partners and has gathered a lot of knowledge on the DNA of the area over the years. Besides making his latent knowledge explicit, I would also recommend to (at least from time to time) also involve other employees of the Water Board in the activities of the current account manager. These could, for example, be account managers of other municipalities as they are already familiar with the types of activities and matters that are important to an account manager working for the Water Board However, I would also recommend the Water Board to invite other employees to think along whenever the possibility arises as this can, again, foster valuable partnerships too.

11.3 Including the 'social DNA' and society itself in crisis response exercises

A final recommendation based on this research would be to include information on the 'social DNA' in crisis response exercises. These exercises take place several times a year and serve as an important learning opportunity for those employees who are assigned to play a role during real calamities. For these exercises, a lot of time and effort is put into creating scenario's that mimic real calamities as good as possible. Incorporating information about the 'social DNA' of their service area can help create crisis response exercises that are even more realistic. If, for example, the information on the 'social DNA' of the area in question revealed that one village particularly houses a lot of elderly people, but that these people are well-organised by means of some form of neighbourhood association this can be included in the exercise scenario.

With that being said, these exercises also lend themselves perfectly well to ask for input from the people living in the area you plan on building your crisis response exercise around. The Water Board can ask people what their biggest concerns are regarding certain types of threats and from there create scenarios that resemble the real situation very well. This could be beneficial to both parties involved in multiple ways. First of all, the Water Board invests in a more personal relation with the people that live in their service area. Secondly, the Water Board gains valuable insights into how vulnerabilities and capacities are experienced by residents which they can use to act accordingly both during exercises as well as during real crisis situations. Finally, the Water Board is able to deliver learning opportunities for their employees that resemble real life situations as best as they can.

11.4 Suggested method for mapping out the 'social DNA' of an area

This section provides a short description of the method that was developed to map out the 'social DNA' of other areas within the service area of Water Board Brabantse Delta. This method is visualized in Figure 26.

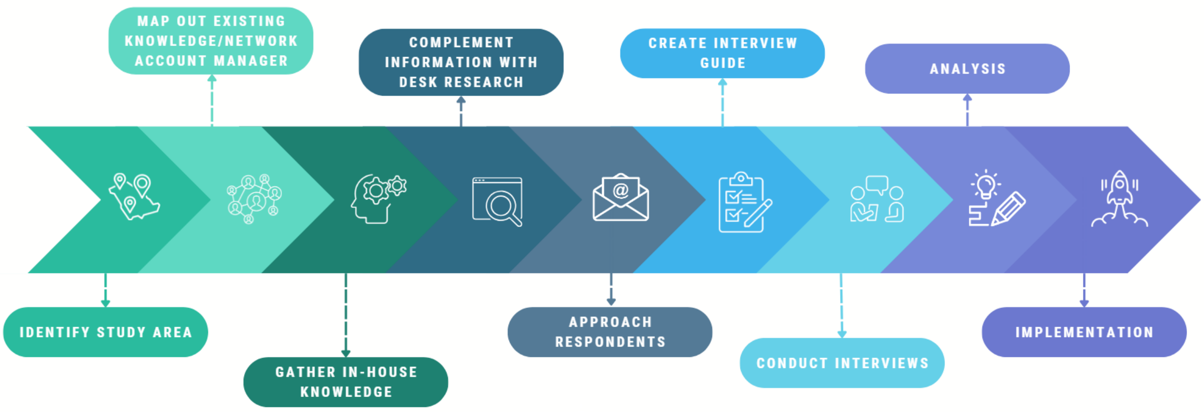

Figure 26: Visualization of the proposed method to map out the 'social DNA' of other areas

Step 1: Identify the area

The first step, might sound logical but is of crucial importance, is clearly defining your study area. As this research was exploratory and one of the main objectives was to create a methodology for Water Board Brabantse Delta to take on such a task in the future, this research project focused less on delivering a complete map of the 'social DNA' of the study area. However, I assume that if this method is applied to other parts of their service area, the aim will be to get a picture as complete as possible. Therefore, it would be advised to work on municipal level. For bigger municipalities, it might even be valuable to split up your analysis into different neighbourhoods and later examine how the dynamic between these neighbourhoods function. This allows you to make an in-depth analysis of a specific area rather than a more generic analysis which is less useful in the end.

Step 2: Map out the current knowledge on and network in the defined study area

The second step would involve sitting down with the account manager of the respective municipality and write out what is already known about this area. The DESTEP model can be used as a guide for this as it provides a general structure that touches on all elements that are important to take up in such an analysis. In addition, one can also map out the existing networks the Water Board is part of within this area; who are they collaborating with and why. This will form the basis for your network analysis in a later stage.

Step 3: Gather in-house knowledge on the study area
A step that was skipped in this research project as the goal was to broaden the view and specifically look beyond the boundaries of the Water Board's own organization, but is recommended for possible future studies is supplementing the information you gathered on the DESTEP topics with in-house knowledge. What I mean by this is talking to employees who live in the study area. They might experience their hometown differently than it is described by the account manager and offer valuable additional insights.

Step 4: Combine information with desk research
Next, the information gathered from the conversations that took place over previous steps can be combined into a list of organizations and/or people that might be valuable to talk to for your analysis. Besides this, I would advise to complement these conversations with a quick-scan desk research. This can be done by looking through policy documents of the respective municipality, keep an eye out for local newspapers etc. The combined results from this and previous steps will result in (1) a list of people you want to contact and (2) topics that might be worthwhile asking them about.

Step 5: Approach intended respondents
The next step would be to approach the respondents you identified in previous steps. This can be done by email, calling or by just passing by.

Step 6: Set up a general interview guide
Parallel to the previous step, one can start to create a general interview guide. I would advise to keep the DESTEP categories in mind when setting up this guide and coming up with specific probe questions or topic for each respective respondent. I would advise to stick to semi-structured interviews, which were also employed for this study as this method allows you to gather roughly the same types of information from each respondent whilst also leaving enough room for respondents to come up with topics you might have missed but they think are important.

Step 7: Conduct your interviews
Next would be to conduct the interviews and adjust the general interview guide after the first (few) interviews if needed.

Step 8: Analysis
The following step would be to analyse all interviews that were conducted. Coding with the help of the Atlas.Ti software worked really well for me and so I would also recommend this tool for future studies as well. Besides, the concepts that were used in this research (both from Boundary Work as well as from the field of Disaster Studies) proved to be helpful for this study. Therefore, I recommend using these in future studies too. Besides, the Gephi software tool used to map out the networks for the ABG area also worked well and could assist the Water Board in visualizing the networks in other places. However, besides creating a general network that visualizes all the connections that exist within your study area (as presented in Figure 23 Chapter 6), I would mainly encourage the Water Board to focus on the networks surrounding specific topics of interest (boundary objects) within the area. These topics can be derived directly form the information that is gathered through interviews. As Chapter 7 illustrated, combining the knowledge on boundary objects itself with an analysis on how different actors engage with these topics and what existing collaborations surrounding these topics look like allows you to see what roles different actors play in certain smaller networks and allows you to tactically choose which actors might be good (non-traditional) points of contact.

Step 9: Implementation
The final step would be store the knowledge that was gathered through this analysis in a living document and implementing these findings in both the daily tasks of the Water Board as well as the crisis response exercises.

There are two additional notes I want to make regarding this method. Firstly, it is important to be clear to your respondents about the follow-up of the interviews you conduct. You are not contacting them to then do nothing with the information you gathered. Make sure you manage their expectations: will you contact them again, will they receive a summary of your findings, will there be a presentation at which they can be present? Are you planning on collaborating more closely in the future?. The second point would be to keep the living document 'alive'. New employees bring in new knowledge and also, current employees can also discover new information. These both testify to what was stated in Chapter 2 about 'social DNA' not being something fixed just like real DNA. As it can evolve and change over time, it is important to make sure these documents are kept up to date.

I final note I want to make regarding this method is that it is a suggestion based on my personal experiences and the insights I gained from conducting this research into the 'social DNA' of the ABG area. I hope this can serve as a guideline for Water Board Brabantse Delta, and possibly other Water Boards as well, to learn more about their service area beyond their traditional 'blue and green' Water Board glasses.

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Appendix I: Overview of interviews

Interview no	Amount of interviewees present	Organization	Interviewee no	Date	Interview mode	Sampling method
1	2	Water Board Brabantse Delta	I1, I2	31 – 10 - 2023	Online with camera	Water Board employees
2	1	ABG organization	I3	16 – 11 - 2023	Online with camera	Through water board connections
3	2 (+ colleague)	Safety Region Mid- and West Brabant	I4,I5	20 – 11 - 2023	Physical	Through water board connections
4	1	Local history association 'Heemkring Molenheide'	I6	21 – 11 - 2023	Physical	Contacted myself
5	1	Visit Baarle	I7	21 – 11 - 2023	Physical	Contacted myself
6	2	Regional archaeologists	I8, I9	22 – 11 - 2023	Online with camera	Through water board employees/Contacted myself
7	1	Tourism De Baronie	I10	1 – 12 - 2023	Online with camera	Snowball sample
8	1	Verschel & Van Dun	I11	13 – 12 - 2023	Physical	Through water board connections
9	1	'Dorpsteam' Gilze and Rijen	I12	12 – 12 - 2023	Online with camera	Contacted myself
10	2	Former ZLTO representative & individual entrepreneur in the recreational sector	I13, I14	18 – 12 - 2023	Online with camera	Contacted myself/snowball sample
11**	2 (+ colleague)	Safety Region Mid- and West Brabant	I4, I5	18 – 12 - 2023	Online with camera	-
12	2	Aldermen representing the municipality of Gilze and Rijen	I15, I16	19 – 12 - 2023	Online with camera*	Through water board connections/contacted myself
13	1	Landstad De Baronie	I17	21 – 12 - 2023	Online with camera	Through water board connections

14	1	‘Dorpsteam’ Alphen-Chaam	I18	21 – 12 - 2023	Online with camera	Snowball sample
15	2	Local history association ‘Carel de Roy’	I19, I20	22 – 12 - 2023	Physical	Contacted myself
16	2	NLGR	I21, I21	22- 12 - 2023	Physical	Snowball sample

* Would have taken place physically but did not due to covid symptoms.
** Second interview with the Safety Region Mid- and West Brabant as we were not able to cover all the questions in the first interview.

Appendix II: Interview Guide

General introduction

- Thank you for your time.
- Ask for nformed consent

Start recording when informed consent is given

- Personal introduction & introduction study programme

Personal introduction

1. I am curious to hear more about who you are. Can you tell me a bit more about yourself, … you work for and your role within …?

Interview introduction

- Introduction of the research (context, objectives) and expectations/goal for this interview
- Check if interviewee has any questions.

'Social DNA'

2. Whilst keeping the categories that make up 'social DNA' in mind, can you tell me a bit more about the ABG area <u>at this moment?</u>
    - *Add probe question after desk research*
3. The way the area is now, is a result of developments and decisions that have taken place in the past. Again, whilst keeping the 'social DNA' categories in mind, can you tell me a bit more about historically important things that have taken place in the ABG area?
    - *Add probe question after desk research*
4. Again, keeping the 'social DNA' categories in mind, what developments do you see happening or do you expect to have an impact on this area in the future?
    - *Add probe question after desk research*

Networks

Within this 'social DNA' there are also lots of different actors. I am curious who you would identify as important actors in this area and how they relate to your organization.

5. Can you tell me a bit more about the role of your organization within the area/community?
    - *In which projects/themes do you see yourselves as important/influential actors?*
6. Who do you see as important actors in the area?
    - *You can think of organizations but also specific people.*
        - o *Whom do people listen to?*
7. Whom of these actors are network partners of your own organization? What do these connections look like?
8. Are you also in touch with the Water Board?
    - *What does this relationship look like?*
    - *What are your expectations of the water board?*
    - *Do you think there are more opportunities for collaboration than are currently being utilized? Would you like to be involved in more matters, and if so, how? Conversely, would you like the water board to be more involved in your plans?*
9. Are there any groups you have a hard time connecting with?
    - *Do you have any idea why it is hard to get in touch with this group/these groups?*

Strategic Crisis Management

Introduce SCM model

10. What would be the consequences of more frequent occurrences of extreme weather (heavy rainfall, prolonged periods of drought) on your work as…?
11. If the area is affected by such events, who would you turn to for information/assistance?
    - *Who would you see as responsible actors?*
    - *Besides formal organizations, do you know of any individuals that people might turn to in such situations?*
    - *What about the role of the Water Board, what do you expect from them?*
12. Do you think you can play a role in either of the five categories of Strategic Crisis Management?

13. Now that you have seen the SCM model, are there any things you are working on which the Water Board can join in on?

Closing

14. Are there any topics we did not touch upon during our conversation which you think are relevant for this research project?
15. Are there individuals/organizations you think might be valuable to speak with for this research?
16. What are your thoughts on the interview? Do you have any tips (content or style related) for the following interviews?
17. Would you like to receive the summary of the final report?
18. Would you like to be present at the presentation that will be held at the Water Board's office when the research project is done?

End by thanking the interviewee and asking him/her if you can reach out if anything comes to mind at a later date.

Appendix II: Coding tree

Socio-Cultural	**Ageing**	
	Religion	
	Assoctiations	
	Social cohesion	
	Volunteers	
	Opinion leaders	
Political	*'Ambtelijke fusie'*	
	'Bestuurlijke fusie'	
	Enclave	
Economic	Gilze and Rijen Airport	
	(level of) facilities	
	Agriculture	
Other thematic topics	Environment	
	Geological characteristics	
	Recreation	Cittaslow
		Campsites
	Spatial planning	'Omgevingswet'
		VAB
	Climate change	
	Role/position of the water board	
	Archaeology	
	Image of the area	
	sustainability	
	Participation	
Location	ABG area as a whole	
	Alphen-Chaam	
	Alphen	
	Chaam	
	Bavel AC	
	Ulvenhout AC	
	Baarle-Nassau	
	Baarle-Hertog	
	Gilze en Rijen	
	Gilze	
	Rijen	
	Hulten	
	Molenschot	
	Surroundings of the ABG area	Orientation Breda VS Tilburg
Networks/Partners/Relations	Relationship with the water board	
	Relationship with Tommy	
Time periods	Past	
	Present	
	Future (trends and developments)	
Strategic Crisis Management (SCM)	Risks	Criminal activities
		Fireworks
	Complexity of challenges	
	Risk perception	
	Risk communication	
	Prevention	
	Mitigation	
	Preparedness	
	Response	
	Recovery	
	Responsibility	
	Vulnerability	
	Capacity	