The impact of collaborative governance on the spatial quality of DFPP project areas

A mixed methods research

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Abstract

In 2017, the Dutch government revised the flood safety standards in The Netherlands, with the result that over 1500 kilometres of dikes need to be reinforced by 2050. To be able to complete this reinforcement, the Dutch Ministry of Infrastructure & Water Management started an alliance, called the Dutch Flood Protection Programme (DFPP). The most important task of the DFPP is to ensure flood safety all over the Netherlands by making the dikes comply with the new safety standards. Besides that, a side ambition of the DFPP is to integrate the reinforcements with other functionalities in their project areas, what should lead to improved spatial quality of these areas.

Based on previous water management projects, literature seems to agree that flood protection measures can be integrated with daily functionalities, ecological values and cultural aesthetics in the project area. However, little is known about how a collaborative governance process can contribute to the improvement of spatial quality. Therefore, this study aims to gain insight into the way that collaborative governance can have impact on spatial quality. To do so, both quantitative and qualitative methods are used in this research to gain multiple insights into the collaborative processes within the DFPP. To gain deeper insights into the topic, a case-study research on the DFPP project Grebbedijk was conducted.

The results of the research showed that certain collaborative conditions can affect the spatial quality of DFPP project areas. It can be concluded that to improve the spatial quality of DFPP project areas, it is necessary to have clear leadership in the collaborative process and sufficient resources to implement the process and plan. In addition, the improvement of spatial quality should be an explicit objective of the cooperation process from the outset.

Key words: collaborative governance; spatial quality; flood risk management; dike reinforcement; Dutch Flood Protection Program

Preface

I hereby present my Master Thesis "The Impact of Collaborative Governance on the Spatial Quality of DFPP project areas". With the writing of this Thesis, I complete my master programme Cities, Water & Climate Change at Radboud University. The research and writing of this thesis took place in the period between the beginning of February and the end of October 2023.

While searching for a possible research topic for my thesis, I noticed that I really wanted to do something with water protection. During my bachelor and the first months of my master, I found out that this topic really interested me. As a result, I found it really enjoyable and interesting to research the Dutch Flood Protection Programme. Writing this Master Thesis proved to be very instructive and also gave me a good insight into what I would like to do in my future career in the field of spatial planning. Of course, writing this thesis went with ups and downs but in the end I am very satisfied with the result.

I would like to express my gratitude to my supervisor, Dr. Emma Avoyan. She gave me fine guidance throughout the process and kept me on track with multiple meetings and clear feedback. In addition, her expertise on the DFPP and the Grebbedijk case proved to be very valuable for this Thesis. Lastly, I would also like to thank all the interviewees for their cooperation and valuable input.

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1. Introduction to the research

The function of this chapter is to introduce the research. First, the context and background of the research will be described. Then, the problem that this research concerns is stated. Third, the research aim and research questions are introduced. Last, there is a societal and scientific relevance part which describes how this research can be relevant for both society and science.

1.1 Background

The Netherlands is one of the most flood-prone countries in the world. According to Jorissen et al. (2016), 60% of the Dutch land, 70% of its inhabitants and 70% of its economy is flood-prone. The cause for this vulnerability is that the Netherlands is located on the delta of several rivers and big parts of the land area are located beneath sea level. Because this vulnerability to floodings has threatened the Netherlands for centuries, the Dutch have developed a long tradition of water management (Jorissen et al. 2016). This water management includes among others strict safety standards, dedicated forms of governance, regular safety assessments and sound engineering, which together protect the country from flooding.

However, according to Jorissen et al. (2016) the balance between flood protection and flood vulnerability is not stable. Factors as climate change, socio-economic developments and innovation require an evaluation of the safety standards. To deal with these influencing factors, the Dutch Delta Decision on flood risk management was made in September 2014. The core of this decision is that by 2050, the probability of dying due to floods for anyone living behind the dikes may not be bigger than 0,001%, which is called the basic safety level (Ministerie van Infrastructuur & Waterstaat, 2022). The safety level is set even higher in places where the consequences of floods are higher, for example places where many people live or places that have a high economic value (Ministerie van Infrastructuur & Waterstaat, 2022).

To reach the safety levels set in the Dutch Delta Decision on flood risk management, the Dutch Flood Protection Programme (DFPP) was started. The DFPP is an alliance between the regional water authorities and the ministry in which they work together on the dike reinforcement operation. The main goal of the DFPP is that by 2050, all primary flood defences in The Netherlands comply with the safety standards (Jorissen et al., 2016). To do so, the DFPP estimates that 1500 kilometres of dike and 500 civil engineering structures need to be reinforced (Rijkswaterstaat, 2022). This reinforcement is divided over nearly 300 projects spread over the country (Tromp et al., 2022).

Next to realizing flood protection projects, the DFPP has some other additional ambitions, which are:

- increasing the production rate (effectiveness) of flood protection projects
- improving efficiency of flood management by reducing the costs per kilometre
- enhancing the societal value of flood protection projects
- improving the cooperation between the authorities involved
- assuring the quality and control of both the programme and the projects

These ambitions show that the DFPP is more than just water protection. In the Dutch National Waterplan 2016-2021 (Ministerie van Infrastructuur & Milieu, 2015) it is stated that it is important to improve the connection between water and land. Therefore, water protection projects of the DFPP should align with other spatial challenges in the area. To get a complete picture of all spatial assessments in a project area, every dike reinforcement project of the DFPP starts with an exploratory phase (Ministerie van Infrastructuur & Milieu, 2015). In the exploratory phase, stakeholders outside the DFPP are getting involved, with the aim to explore all spatial opportunities that the dike reinforcement could cover.

1.2 Research problem statement

In the second half of the 20th century, spatial planning in The Netherlands was mainly focused on the separation of spatial functions (Hooimeijer et al., 2001). This means that in spatial development, there were for example separate areas located for housing, transport and nature. However, in the last decades, the idea of using space for multiple functions has risen in Dutch spatial planning policies. Here, spatial functions such as housing, recreation, nature are all integrated into one coherent area. For water management policies, for example the DFPP program, this means that the spatial planning of projects should aim for more than just protecting land from flooding.

In DFPP projects, the main goal is reinforcement of the water protection structures to reduce flood risk in The Netherlands. However, the DFPP has the side ambition to integrate dike reinforcement projects with other functions in the DFPP project areas. In the program plan of the DFPP (2019), it is described that the DFPP aims to improve the spatial quality in their project areas. However, it remains unclear what spatial quality means in the context of DFPP projects, and what their strategy is to improve the spatial quality. Spatial quality is a concept that is often interpreted differently by different actors, with the result that spatial quality as a proposed outcome of collaborative processes can create false expectations if there is not one common agreed definition of the concept between actors (Janssen-Jansen et al., 2009).

An improvement of spatial quality should come as an outcome of the collaboration process within the DFPP (DFPP, 2019). However, as the DFPP collaboration process includes many actors with different interests and perceptions of spatial quality, it is unclear if this collaboration process leads to better decisions on the improvement of spatial quality in the project areas.

So, the problem statement of this research is as follows: It remains unclear what spatial quality exactly means in the context of area development, and whether collaborative governance contributes to better decisions on the improvement of spatial quality in the project areas.

1.3 Research aim and research questions

The research aim of this Master Thesis research is to gain insight into the process of collaborative governance within the DFPP and the impact it has on the improvement of the spatial quality of their project areas. This research aim aligns with the following main research question:

Main Research Question:

How does collaborative governance in DFPP projects affect the likelihood of improving the spatial quality of the project area?

The main research question will be answered based on the answers to the sub questions, which are as follows:

Sub-Question 1:

How can the impact of collaborative governance on spatial quality be measured?

Sub-Question 2:

How does collaborative governance influence the improvement of the spatial quality of DFPP project areas?

Sub-Question 3:

How did collaborative governance influence the decisions on the spatial quality of the Grebbedijk project area?

1.4 Societal relevance

In case a flood event occurs in The Netherlands, the consequences will be catastrophic as almost 60% of the Dutch land is prone to flooding. The water is a threat to millions of households, companies and the whole Dutch economy (Jorissen et al., 2016). Recent events of very high-water and even some floods have shown that it is essential to reinforce water protection structures, to reduce the chance of these events happening. Ongoing trends like climate change will only increase the demand for reinforcement of for example dikes. Therefore, dike reinforcement projects of the DFPP are of vital importance for The Netherlands, as they tend to decrease the flood risk in a lot of places. However, in the Netherlands, dikes and their surrounding areas fill in more roles than just water protection. Dikes are eminently suitable for recreational and sport activities, and can also function as a place where nature can develop undisturbed. It is important that dike reinforcement projects take these other functions into account, as they contribute to the spatial quality of the area.

Also, the DFPP program is financed by both the national government (5/9 part) and the water authorities (4/9 part) (Rijkswaterstaat, 2020). Indirectly, this means that the DFPP projects are partly financed by the Dutch taxpayer, which increases the interest of the Dutch society in the DFPP. Therefore, people are benefited even more on a collaboration process that actually helps increasing the spatial quality, as they are paying for these processes themselves.

This research will contribute to the preservation and increase of spatial quality in DFPP projects, as it will give an insight in how the collaboration process can influence the improvement of the spatial quality as an outcome of these projects.

1.5 Scientific relevance

Spatial quality is a frequently used concept in Dutch spatial planning documents. However, in scientific literature and Dutch policy documents, the concept of spatial quality is rarely defined and concretised in explicit terms (Busscher et al., 2019). Because the concept lacks of a broadly embraced definition, the use of the term spatial quality can differ between regions, organisations and projects (Hooimeijer et al., 2001; Janssen-Jansen et al., 2009). In this research, the different views and usages of the concept spatial quality are reviewed, after which can be concluded what spatial quality means regarding spatial planning policies in the water management domain.

For previous Dutch water management projects, for example the Room for the River project, it is researched what instruments can be used to generate spatial quality as an outcome of water management processes (Busscher et al., 2017). However, in scientific literature, still little is written about how collaborative governance as a whole can influence decisions on the spatial quality of a project area. Therefore, this research will provide an innovative approach towards the relation between collaborative governance and spatial quality, by combining quantitative and qualitative research methods to gain a more complete insight in the link between the two concepts.

1.6 Structure of the research

This research will start with an introduction of the topic in chapter 1. Following this introductory chapter, chapter 2 will focus on the theoretical framework, in which relevant theories regarding collaborative governance and spatial planning are reviewed. The main focus here is on the integrative collaborative governance framework by Emerson et al. (2011), a framework that forms a foundation for this research.

Chapter 3 discusses the research methods used in this research. Here it is explained how data is collected and analysed, and the choices behind it. Chapter 4 is all about the quantitative research. This chapter consists of a statistical analysis on a previously conducted survey by Avoyan (2020).

After the quantitative part, the research continues with a qualitative study. This qualitative research is discussed in chapter 5 and consists of an in-depth case study on the DFPP project Grebbedijk. For this case study, a document analysis was conducted and several interviews were held, of which the results are presented in this chapter. Finally, the main results from chapters 4 and 5 were studied after which conclusions were drawn in chapter 6. Several recommendations are also given here.

2. Literature review and theoretical framework

This chapter contains a review of scientific literature that is relevant for this research. In the first part of the chapter, the concept of collaborative governance is defined. In the second part, some relevant theoretical frameworks regarding collaborative are named and critically reviewed. In the last part, the concept *spatial quality* is operationalised, after which the conceptual framework for this research is showed.

2.1 Defining collaborative governance

The use of the term collaborative governance in public administration literature has increased over the last years. However, according to Emerson et al. (2012), the term collaborative governance is defined 'amorphous' and used inconsistently. To find a suitable definition for collaborative governance for this thesis, multiple definitions will be reviewed based on relevance for this thesis.

Emerson et al. (2012) describe collaborative governance as "*the processes and structures of public policy decision making and management that engage people constructively across the boundaries of public agencies, levels of government, and/or the public, private and civic spheres in order to carry out a public purpose that could not otherwise be accomplished".* This definition is very process oriented, as it assesses collaborative governance as a cross-boundary process that should lead to some intended outcome.

The definition of Emerson et al. (2012) differs from the definition provided by Ansell & Gash (2008), who define collaborative governance as follows: "*A governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision-making process that is formal, consensus-oriented, and deliberative and that aims to make or implement public policy or manage public programs or assets".* This definition is a lot more oriented to the institutional side of collaborative governance, as it assesses collaborative governance on the base of which actors are involved and in what way they are involved in the collaborative governance. Important here is that Ansell & Gash also involve non-state stakeholders. For this research, the definition by Emerson et al. (2012) suits better because this research will mainly focus on collaborative governance as a process.

Another definition of the concept of collaborative governance is provided by Bryson et al. (2015). Here, it is defined as follows: *"The linking or sharing of information, resources, activities, and capabilities by organizations in two or more sectors to achieve jointly an outcome that could not be achieved by organizations in one sector separately".* Compared to the definition by Emerson et al. (2012), the definition of Bryson et al. (2015) is quite similar but differs in the fact that the definition Bryson et al. (2015) focuses mainly on different sectors collaborating instead where Emerson et al. (2012) focus on more than just different sectors collaborating. Therefore, the definition of Emerson et al. (2012) suits best for this research, because in this research the focus will be on more than just intersectoral collaboration processes.

2.2 Collaborative governance frameworks

In scientific literature, there is a multiplicity of theoretical frameworks explaining how collaborative governance could work. Amongst those frameworks, the majority seeks to list all relevant conditions under which collaborative governance performs best (Douglas, 2020).

Ansell & Gash (2008) provide a framework that highlights the conditions under which collaborative governance will be an effective approach to policy making and public management. The framework consists of four variables, which are starting conditions, institutional design, leadership, and collaborative process, of which the latter functions as the core of the model. The core part of this framework, in which the collaborative process is described, can be useful to this research as it names

all the relevant conditions under which collaborative governance processes can have effective outputs. However, the framework of Ansell & Gash (2008) is also built upon conditions from outside of the collaborative governance process that influence the process itself. This makes the framework less relevant for this study, as institutional settings and external factors will be excluded from research.

Another framework related to collaborative governance is provided in Bryson et al. (2006). This framework focuses mainly on the components in a collaboration process. Here, the assigning of different leadership roles and addressing power imbalances are important components of the collaboration. However, the framework by Bryson et al. (2006) lacks a focus on the outcomes of a collaboration process. Therefore, this framework is less relevant for this research as this research focuses on the relation between a collaboration process and spatial quality as an outcome.

The framework of Emerson et al. (2012) is an extended collaborative governance framework drawing upon other frameworks, research findings practise-based knowledge aimed at collaborative governance (e.g. Ansell & Gash, 2008; Bryson et al.,2006; Bentrup, 2001). The combination and extending of all this knowledge into one collaborative governance framework ensures that the framework is one of the most integrative collaborative governance frameworks applicable for research. Comparing this framework to the one of Ansell & Gash (2008), the framework of Emerson et al. (2012) is more oriented on collaborative governance as a dynamic process that eventually leads to an outcome, where Ansell & Gash (2008) put more emphasis on how the institutional settings influence the collaboration process. Therefore, the integrative framework by Emerson et al. (2012) is the most useful for this research because this research aims to study the collaborative process rather than the institutional settings around the process.

The integrative framework for collaborative governance is depicted in *figure 1*. The framework consists of three dimensions, which are the system context, the collaborative governance regime (CGR), and the collaboration dynamics and actions (Emerson et al., 2012).

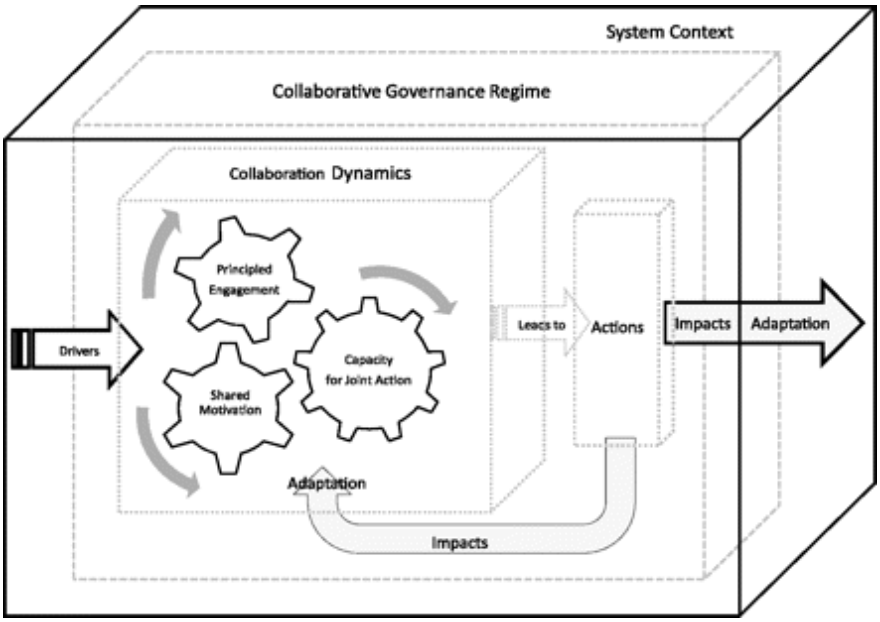

Figure 1: The Integrative Framework for Collaborative Governance

System Context

The first dimension out of the Integrative Framework for Collaborative Governance by Emerson et al. (2012) is the system context. The system context represents the external, multi-layered context in which collaborative governance is initiated. The system context contains political, legal, socioeconomic, environmental and other influences, that either create opportunities or constrain collaboration. The system context can influence and shape the CGR, however it can also work the other way around as the CGR can influence the system context with the impact of its actions. Emerson et al. (2012) distinguish several elements of the system context that can influence the CGR, including resource conditions, policy and legal frameworks, prior failures, political dynamics, degree of connectedness, historic levels of conflict and socioeconomic characteristics. Important to mention is that these elements are not just starting conditions, but can influence collaboration at any time during collaboration processes.

Drivers

Apart from the external elements of the system context that influence collaboration externally, Emerson et al. (2012) distinguish some essential drivers without which the impetus of collaboration would not be successful. These essential drivers are leadership, consequential incentives, interdependence and uncertainty. According to Emerson et al. (2012), at least one of these drivers should be present in order to begin a CGR. Furthermore, the more drivers are present, the higher the chance a CGR is started.

The first essential driver, leadership, refers to the presence of an identified leader that is in a position to initiate and help secure resources and support for a CGR. Important characteristics of a leader is that he or she should possess commitment to collaborative problem solving, have willingness not to advocate for a particular solution and exhibit impartiality with respect to the preferences of participants (Emerson et al., 2012).

The second essential driver is consequential incentives, which represents internal or external drivers for collaborative action. These incentives can exist in various forms, and are necessary to induce leaders and participants to work together (Emerson et al., 2012).

The third driver is interdependence. This driver occurs when individuals or organisations are unable to accomplish something on their own, and is therefore seen as a precondition for collaborative action (Emerson et al., 2012).

The last driver is uncertainty. This driver arises when uncertainty cannot be resolved internally which drives organisations to collaborate in order to diffuse, reduce and share risk (Emerson et al., 2012).

Collaborative Governance Regime

The second dimension of the integrative framework for collaborative governance by Emerson et al. (2012) is the collaborative governance regime (CGR) (*figure 1*). The dimension CGR represents the system in which cross-boundary collaboration is the predominate mode for conduct, decision making and activity. The CGR consists of two components: collaborative dynamics and collaborative actions. These two components influence both the development and effectiveness of the CGR.

Collaborative Dynamics

In collaborative dynamics, three interacting components can be distinguished: principled engagement, shared motivation, and capacity for joint action (Emerson et al., 2012).

Principled Engagement

The component of principled engagement refers to the quality of interactions between stakeholders in the CGR. Principled engagement takes place over time and can be organised in the form of face-to-

face or virtual formats and cross-organisational networks. Principled Engagement enables people with differing content, relational, and identity goals to work across boundaries in order to solve problems and create value. Principled Engagement consists of four basic process elements: Discovery, definition, deliberation, and determination (Emerson et al., 2012).

The element **discovery** represents the revealing of individual and shared interests, concerns, and values, as well as to the identification and analysis of relevant and significant information and its implications (Emerson et al., 2012).

Definition refers to the process in which participants try to build a shared purpose and objective of the collaboration. In the definition process participants clarify and adjust tasks and expectations of one another (Emerson et al., 2012).

The quality of **deliberation** is broadly seen as an essential element for successful engagement. High quality deliberation creates a safe space for hard conversations, constructive self-assertion, asking and answering challenging questions, and expressing honest disagreements (Emerson et al., 2012).

The last element, **determination**, entails both procedural decisions and substantive determinations. These elements concern jointly agreed procedural steps and actions needed to come towards the shared objective (Emerson et al., 2012).

Shared Motivation

Emerson et al. (2012) define the element of shared motivation as *"a self-reinforcing cycle consisting of four elements: mutual trust, understanding, internal legitimacy, and commitment."* Shared motivation highlights the relational elements of the collaborative dynamics. Shared motivation is partly initiated by principled engagement, however, once initiated, shared motivation accelerates the principled engagement processes.

The first element of shared motivation, **mutual trust**, develops over time as participants work together. To develop trust, it is important that participants show each other that they are reasonable, predictable, and dependable (Emerson et al., 2012).

Developing trust forms the basis of **mutual understanding**. Mutual understanding denotes the extent to which participants are able to understand and respect the interests of other participants, even if they do not agree (Emerson et al., 2012).

If mutual understanding is reached, it can generate validation and **internal legitimacy**. Internal legitimacy is the confirmation that participants are credible and trustworthy, which legitimizes and motivates collaboration (Emerson et al., 2012).

Legitimacy leads to **commitment**, the fourth element. Shared commitment enables participants to cross organisational and jurisdictional boundaries to commit to a shared objective (Emerson et al., 2012).

Capacity for Joint Action

The third and final collaborative dynamic distinguished in the framework by Emerson et al. (2012) is the capacity for joint action. Emerson et al. (2012) define the capacity for joint action as "a collection of cross-functional elements that come together to create the potential for taking effective action" and serve "as the link between strategy and performance". The dynamic capacity for joint action includes four different elements: procedural and institutional arrangements, leadership, knowledge, and resources (Emerson et al., 2012).

Procedural and institutional arrangements refer to process protocols and organisational structures that are needed to manage interactions within collaboration. It consists of both formal and informal forms and are necessary because large, long-lived collaborative networks require more explicit structures and protocols to make collaboration work. Procedural and institutional arrangement exist in both the intra-organisational level and the interorganisational level (Emerson et al., 2012).

It is widely confirmed that **leadership**, the second element, is essential in collaborative governance. In collaborative governance, leadership is an essential element in the different phases. Some leadership roles are important in the outset, others in moments of deliberation, and some are essential in the implementation phase (Emerson et al., 2012).

The third element, **knowledge**, can be seen as the currency of collaboration. In collaboration processes, knowledge is shared between the participants in order to generate knowledge that is needed by the participants (Emerson et al., 2012). According to Ansell & Gash (2008), knowledge is becoming increasingly specialized and distributed what together with the complex and interdependent institutional infrastructures causes an increasing demand for collaboration.

The fourth and last element of the capacity for joint action are **resources**. Collaboration processes can influence the availability of resources in multiple ways. In collaboration processes, participants get the opportunity to share and leverage scarce resources. Essential for collaboration processes are adequate budget support and other needed resources, such as time, funding and technical and logistical support. Resource imbalances between participants should be highlighted in order to prevent that resources form a barrier towards engagement (Emerson et al., 2012).

Collaborative Actions

The purpose of collaboration is that it results in certain collaborative actions, that should lead to accomplishing the desired outcome of the collaboration process. What these collaborative actions include depends on the context and charge of the CGR. Collaborative actions can be taken by all participants together, by individual partners who got these actions assigned as task during the CGR, or by external entities responding to the outcomes of the CGR. The likelihood that collaborative actions will be implemented depends on several factors, such as leadership, diverse representation, and power (Emerson et al., 2012).

Impact and Adaptation

Collaborative actions taken following up on the collaborative governance regime lead to certain impacts. Here, impacts refers to the intentional and unintentional changes of state within the system context. Impacts also includes added value that is generated by the collaborative actions (Emerson et al. 2012). In the context of this research, this means that impacts can refer to the added spatial quality as a result of the collaborative actions taken in the DFPP projects.

If collaborative action leads to certain impacts, this can eventually lead to a transformation of the context of a complex situation. This transformation of the context can be identified as adaptation. Adaptation occurs when, based on impacts, problems can be solved, new research confirm selected management, and different sets of challenges and opportunities arise.

2.3 Spatial Quality

Although the term spatial quality is not a very common concept in international scientific literature, it is often used in Dutch spatial planning documents (Janssen-Jansen et al., 2009). However, despite the frequent use of the concept in The Netherlands, spatial quality is rarely defined in explicit terms (Busscher et al., 2019). For example, the DFPP itself defines spatial quality as "*the extent to which the values of an area are met for different interest*". Although this definition roughly explains what is

meant with the term spatial quality, it remains unclear what the values of an area and different interest mean in the context of an DFPP project. Therefore, to be able to operationalise the concept of spatial quality, these values and interests should be concretised.

In this research, spatial quality is conceptualised and operationalised differently between the quantitative and the qualitative part. This is because the quantitative part only looks at the broad concept of spatial quality, and people's perceptions regarding the improvement of this spatial quality in DFPP project areas. Thus, the quantitative part does not look at different components of spatial quality. In the qualitative part, several components of spatial quality are researched separately. These spatial quality components are discussed in the remaining of this section.

Hooimeijer et al. (2001) tried to clarify the concept of spatial quality by dividing it into three different aspects: user value, experiential value and future value. The first aspect, user value, refers to the functional suitability, efficient use, efficient construction, efficient management, coherence, accessibility and interference of an area. The second aspect, experiential value, refers to identity, diversity, recognisability and meaningfulness of an area. The last aspect, future value, refers to guiding effect, efficiency in time, expandability and adaptability of an area. Although this division by Hooimeijer et al. (2001) already provides a more concrete description of the concept spatial quality, it is still insufficient for operationalisation.

Spatial quality has also been used in previous water management programs, such as the Room for the River program. In this program, the goal was to integrate water management projects along rivers with an improvement of the spatial quality of these areas. To achieve this goal, the Minister of Transport, Public Works and Water Management established a so-called Q-team. This Q-team had the task to produce independent recommendations on enhancing the spatial quality in the room for the river projects (Klijn et al., 2013).

To evaluate the spatial quality of the room for the river projects, the Q-team worked with an adapted version of the 'Vitruvian Triad' of Vitruvius, a former Roman architect who lived in the first century BC. Vitruvius stated that a good design should meet three criteria at the same time, which are functionality, firmness, and beauty. Although this indeed always applies to spatial projects, its practical use to a specific spatial project is difficult. Therefore, the Q-team decided to translate the Vitruvian Triad into more simple concepts, namely hydraulic effectiveness, ecological robustness and cultural meaning and aesthetics (Klijn et al., 2013).

Hydraulic effectiveness refers to the effectiveness of the measures taken to reduce the flood risk. Although hydraulic effectiveness is very important in water management projects, in this research, the hydraulic effectiveness of the projects will not be evaluated, because this concept is in direct sense not very relevant to the aim of the study. However, the relationship between the hydraulic effectiveness and all other functionalities, such as housing, recreation, traffic, nature, and agriculture is very relevant for this research as these are everyday functions. These everyday functions are the functions have to live with daily, whereas the flood protection functions are very occasional (Klijn et al. 2013). In this research, hydraulic effectiveness will be translated into *integration of hydraulic measures,* because this way it is more appropriate for the study.

The concept **ecological robustness** refers to the preservation of dynamic stability in the natural system in which the project and its measures are implemented. Because of human interferences, the natural system alongside rivers and dikes is slowly but steady evolving. Therefore, water management projects should last for many decades or even centuries, through being self-sustained by building on natural processes and thus requiring as little maintenance as possible (Klijn et al., 2013.

The last concept, **cultural meaning and aesthetics**, refers to the enhancing of the scenic beauty while taking the present quality and diversity of the location into account. Projects alongside rivers often take place on locations that have over a 1000 year history of flood control, which therefore calls for more than just planning on the basis of a cost-benefit analysis (Klijn et al., 2013).

According to Verweij et al. (2021), the goal of improving the spatial quality in the room for the river program has been achieved. This means that the evaluation method of the Q-team, which was used during the project, also has been successful. Therefore, it is logical to use the triad of the Q-team in this research as there is a lot of overlap between the room for the river program and the DFPP program regarding spatial quality. Also, the concepts used by the Q-team are a lot more concrete than the values named by Hooimeijer (2001) and the DFPP itself. So, for the qualitative part of this research, spatial quality will be divided into the following three indicators:

- **Integration of hydraulic measures**
- **Ecological robustness**
- **Cultural meaning and aesthetics**

2.4 Conceptual Framework

In this chapter, several frameworks were critically reviewed and discussed. From the theories discussed in this chapter, a conceptual framework was composed based on the most important findings from the reviewed literature. The basis of this conceptual framework is the framework by Emerson et al. (2012). In this research several parts of the conceptual framework by Emerson et al. (2012) are excluded. First, the drivers that Emerson et al. (2012) describe as essential for initiation of collaboration, are less relevant for this research as this research is dominantly aimed at the collaborative governance regime, in which the collaboration is already initiated and started. Second, the system context is left out in the conceptual framework as this research is aimed at the collaborative governance regime itself, and the institutional settings and other attributes of the system context are excluded because these are nearly the same in each of the DFPP projects.

The conceptual framework (*figure 2*) represents the collaboration process of the DFPP project, with the three collaboration dynamics from the framework of Emerson et al. (2012) resulting in certain actions, such as the establishment of a preferred alternative in a DFPP project, which in their turn are supposed to impact the spatial quality of project areas. In this framework, the concept impact out of the framework by Emerson et al. (2012) is replaced by improved spatial quality and its indicators from Klijn et al. (2013), as this research aims to examine the relation between the collaborative governance process and the spatial quality of DFPP project areas.

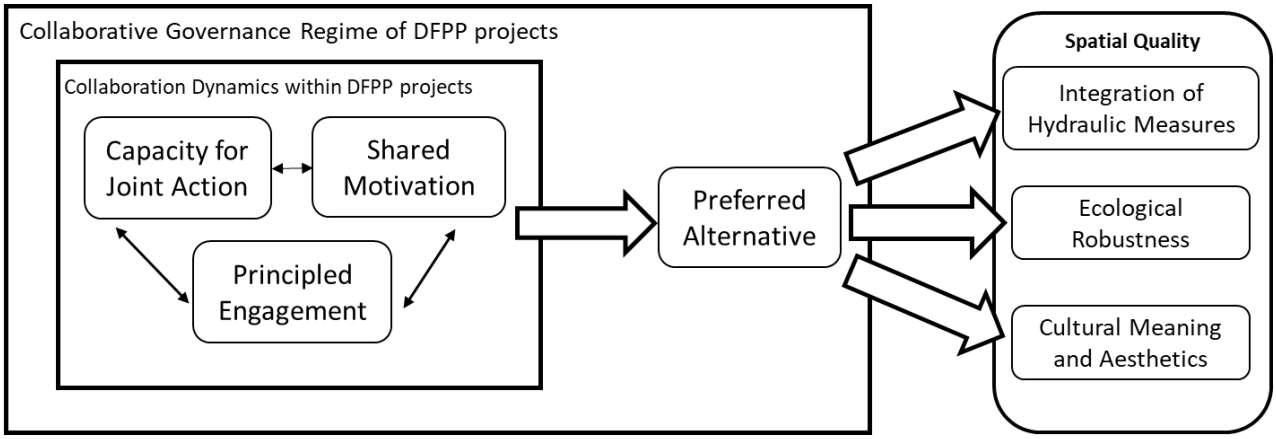

Figure 2: Conceptual Framework

2.5 Operationalisation

To assess whether the presence of collaboration dynamics in the collaboration process has had an impact on improving spatial quality in the project area, the different concepts from the conceptual framework (*figure 2*) need to be operationalised. This research contains both a quantitative and a qualitative part, and the relationship between collaboration dynamics and spatial quality will be operationalised differently between the two parts. For the quantitative part, the survey questions from Avoyan's survey (*table 1*) are leading. Each of these questions is linked to a particular collaboration condition. There is also a question specific to spatial quality. Based on these questions, the relationship between the collaborative conditions and spatial quality as a whole can be determined. The qualitative part of this research will explore this relationship in more detail. In this study, the three components of spatial quality will be examined separately. It will also examine in more detail what exactly the collaboration dynamics within a DFPP project entail and how this influences the spatial quality of DFPP project areas.

This operationalisation also functions as the answer to the first sub-question of this research: *How can the impact of collaborative governance on spatial quality be measured?*

Tabel 1: Survey questions per collaborative condition

Collaboration dynamic	Collaborative condition	Survey Question
Principled Engagement	Discovery	1. Participants have/had regular contact with each other 2. Participants have / had the opportunity to express their views, goals and concerns 3. Participants are / were aware of each other's ambitions with regard to the area and the VKA 4. The arguments of participants about their objectives with regard to the VKA were substantively understandable
	Definition	5. Participants can agree on what exactly is meant by concepts used (e.g., agreement on terms used, clarification of integration concepts, area ambitions, etc.) 6. Participants are / were able to identify shared goals and common needs and build a shared view of the VKA
	Deliberation	7. The chairman (s) of the meetings acted independently and neutrally 8. The chair (s) of the meetings provides deliberation mechanisms through which everyone can participate in discussions (e.g., Working groups, brainstorming etc.) 9. The collaborative process in your project offered/ offers many opportunities for debate and discussion
	Determination	10. Participants have reached agreement on a plan of action to draw up a VKA together 11. Participants were able to manage any conflicts during the meetings 12. Participants are/ were they provided with conflict resolution/ conflict management mechanisms 13. The decision-making process about your project is characterized by a high degree of transparency (insight into how concrete decisions are made)
Shared Motivation	Mutual Trust	14. Participants in your project usually honor agreements made

		15. Participants in your project trust each other
	Mutual Understanding	16. Participants appreciate and respect differences, such as the different area ambitions that are brought into the project 17. Participants in this project may assume that the intentions of the other participants are in principle good
	Internal Legitimacy	18. The VKA development organization meets your expectations 19. Participants within your project take into account the intentions of other participants
	Commitment	20. Participants in your project were generally committed to the process (uninterrupted participation, except exceptional circumstances such as elections)
Capacity for Joint Action	Procedural & Institutional Arrangements	21. To what extent does / has your project used the following procedural/organizational arrangements to support the collaboration A. Various types of meetings (workshops, information sessions, regular meetings, kitchen table discussions, etc.) B. Platform (s) for stakeholder participation C. Collaboration agreements, participation and communication plans to organize internal communication D. Basic rules and procedures specifically designed to produce an innovative and integral VKA
	Knowledge	22. To what extent does / has your project used scientific information, results of different studies to support the collaboration 23. Your project has / had attention for knowledge management
	Resources	24. To what extent does / has your project used resources (a. money; b. expertise/experience; c. other, please specify) by project participants/authorities to support the collaboration?

	Leadership	25. To what extent does / has your project used internally assigned (e.g., project manager, environment manager from water authorities) to support the collaboration 26. Internally assigned experts contributed to a transparent process of VKA development 27. Internally assigned experts have / had a substantial impact on the development of the VKA 28. The manager of your project aims to connect different spatial functions during the exploration of the project 29. To what extent does / has your project used recruited externally (e.g., external facilitators, hired experts such as landscape architects) to support the collaboration 30. Externally hired experts have contributed to a transparent process of VKA development 31. Externally hired experts have / had a substantial impact on the development of the VKA
Spatial Quality		32. Do you think the VKA contributes to improving the spatial quality of the area

3. Methodology

3.1 Research strategy

In this research, a mixed method research strategy is used, in which both quantitative and qualitative research is conducted. According to McKim (2017), using mixed methods in a research adds value when compared to conducting a purely qualitative or purely quantitative research. A mixed methods research combines the strengths and minimizes the weaknesses of both research types, with more breadth, depth and richness in the research as result (McKim, 2017). Therefore, it was logical to choose for a mixed methods research strategy in this research, as the aim of this research is to give a complete description of the relation between collaborative governance and spatial quality in DFPP projects. In this research, it was logical to choose for a mixed methods research strategy, because with the quantitative research, the relationship between collaborative governance and spatial quality first becomes broadly clear, after which this relationship can be explored in greater detail in the qualitative part.

The mixed methods study in this research started with a literature study. This literature study was necessary for the understanding and operationalisation of the many concepts of collaboration dynamics, conditions and spatial quality. With the literature study, the following sub-question could be answered:

How can the impact of collaborative governance on spatial quality be measured?

The completion of the literature study allowed the start of the second phase, the quantitative research. This quantitative research consists of a survey analysis on a survey conducted by Avoyan (2020). Here, the effect of all the collaboration dynamics and conditions on spatial quality of DFPP project areas was analysed, which resulted in the answer on the following research question:

How does collaborative governance influence the improvement of the spatial quality of DFPP project areas?

In the qualitative research, a case study on the DFPP project Grebbedijk was conducted. To do so, interviews were held with project actors and a document analysis was carried out. The focus here was on the collaboration conditions that were found to be most effective from the quantitative research. The qualitative research allowed the following sub-question to be answered:

How did collaborative governance influence the decisions on the spatial quality of the Grebbedijk project area?

Together, the research methods lead to an answer on the main research question. In the remaining of this chapter, all research methods will be explained separately and in detail.

3.2 Research methods, data collection and data analysis

3.2.1 Literature study

In this research, a literature study was conducted to create better understanding about the concepts of spatial quality and collaborative governance. To do so, multiple scientific articles, policy documents, and DFPP reports were critically reviewed. The literature review helped creating an overview of the characteristics of the concepts of spatial quality and collaborative governance, which enabled the operationalization of the concept spatial quality. The literature review provides an answer to the first research question:

How can the impact of collaborative governance on spatial quality be measured?

Data analysis

During the literature study, several theories and concepts that help understanding the concepts regarding the subject of this research were gathered. The found literature and theories were first described and critically reviewed, after which the relevant concepts were operationalised and constructed into an Conceptual Framework, that forms the base of this research.

3.2.2 Quantitative research

After the literature review was completed, the quantitative research phase could be started. In this phase, the data of a previously composed and conducted survey by Avoyan (2020) was analysed. As part of the All-Risk research programme, the aim of this survey was to improve the efficiency and effectiveness of collaboration between governments, society organisations, companies, and citizens that are involved in the DFPP dike reinforcement projects. Selected respondents were all involved in a specific DFPP project, for example in the role of project team member, consultant, authorities, stakeholders, and residents. In the survey, respondents were asked about project characteristics, behaviour of collaborating parties, the resources to support collaboration, perceived quality and characteristics of preferred alternatives and legal aspects of DFPP projects. The survey also contains some questions that are specifically aimed at the concept of spatial quality, which makes it very useful for this research. The survey also uses the framework of Emerson et al. (2012) to operationalize conditions of cross-sector collaboration, what makes it fit even better in this research (Avoyan, 2020).

From the survey by Avoyan (2020), several relevant questions that are relevant towards this research were picked. The data gathered from these questions was then analysed using multiple statistical tests in SPSS. This analysis helped answering sub question 2:

How does collaborative governance influence the improvement of spatial quality of DFPP project areas?

Data Analysis

From the survey by Avoyan (2020), relevant questions regarding the collaborative governance and spatial quality were selected and statistically analysed. This analysis was conducted in SPSS, where both descriptive statistics and regression analyses were used. With this analyses, the effect of the collaborative dynamics on the perception of the improvement of the spatial quality was examined.

The literature review elaborated on the collaborative governance framework by Emerson et al. (2011), in which there are many different collaboration dynamics and conditions that shape a collaborative process, and thereby influence the outcome of a collaborative process. In this study, these collaboration dynamics and conditions are the independent variables, influencing the improvement of spatial quality, the dependent variable.

In the survey conducted by Avoyan (2020), respondents were asked to rate each of the collaborative dynamics and conditions for the project they were involved in. Respondents could rate for each collaboration dynamic on a Likert scale of 1 to 5 how they felt the relevant collaboration dynamic was present in the project. To analyse how the collaboration process was rated per project, the average score from the survey was calculated for all projects. This means that the higher the score, the higher the particular collaboration dynamic or condition was rated by the respondents in their particular DFPP project.

In the survey conducted by Avoyan (2020), respondents were also asked to rate whether the project contributes to spatial quality in the area. Respondents could only answer this question with "Yes" or "No". To analyse how respondents rated improving spatial quality for each project, the percentage of

respondents who answered "Yes" was calculated. This means that the higher the percentage, the more respondents thought that the particular project would contribute to the spatial quality of the project area.

The scores for both the collaboration dynamics and conditions and spatial quality were noted and listed in a *table 3* that is shown in the quantitative results section. In this table, the scores were listed for all of the 36 DFPP projects. Doing this made it clear how the collaboration process was rated in each of the projects, which also helped the researcher when choosing a case-study. It should be noted that when collecting and analysing data from this database, cases that did not answer the particular questions regarding one of the conditions or spatial quality were left out in the calculation of the score. Also, respondents that were part of the general, national DFPP program were left out as these are not relevant for this research.

Once it has become clear how collaboration dynamics and spatial quality were assessed in the DFPP projects, it is important to examine the relation between these two variables. In this context, collaboration dynamics and conditions are the independent variables and spatial quality is the dependent variable. The effect of collaboration dynamics and spatial quality was examined using linear regression analysis. A linear regression analysis can be used to examine the relationship between two variables (van Heijst, 2023). Thus, by performing a linear regression analysis in this study, we examine the effect of the presence or absence of collaboration dynamics and conditions in DFPP projects on the improvement of spatial quality in the project areas.

The linear regression analyses were performed in the program SPSS. To do this, the entire database of Avoyan's (2020) survey was first put into SPSS. This database contains answers to questions for each collaboration dynamic and condition. These answers to the questions were used as the independent variables. The answers to the question on whether the project contributes to the spatial quality of the project area have been used as the dependent variable. When SPSS runs this, the programme gives many different values as the output of the regression analysis. Two of these values are the R and R^2 values, which are both between 0 and 1. The R value represents the correlation coefficient, which shows the extent to which the independent and dependent variables are related. Here, the higher the R-value, the higher the degree of correlation. The R^2 value represents the coefficient of determination, which indicates how much of the total variation in the dependent variable can be predicted from the independent variable. Next to the R and R^2 values, SPSS also provides a p-value. A p-value also ranges between 0 and 1 and indicates whether the other measured values are significant or not. In this study, a significance level (alpha level) of 0.01 was chosen. This means that if the regression analysis shows a p-value lower than alpha (0.01), it can be concluded that the measured R and R^2 values are significant.

All the R, R^2 and p-values were noted and listed in *table 4*, that shows these values per collaborative dynamic and condition. With this table it could be examined which of the dynamics and conditions have significant impact on spatial quality.

3.2.3 Qualitative research

In the qualitative part of this research, a case study on one of the ongoing DFPP projects was conducted. The chosen case for this research was the DFPP project Grebbedijk. The reasons for this choice will be explained further on in this chapter. An in-depth case study was used to outline the DFPP project collaboration process. This provided further insight into how a cooperation process is designed to improve the spatial quality of DFPP project areas. The case study consists of a document analysis and 5 interviews with people involved in the Grebbedijk project. In the document analysis, mainly policy documents related to the Grebbedijk project were studied, which already provided an

insight into the cooperation process and the design and goals of the project. The interviews were then used to explore this in more detail and also revealed the view of different parties towards the process.

The qualitative research will provide an answer to the following research question:

How did collaborative governance influence the decisions on the spatial quality of the Grebbedijk project area?

Case study selection

For the in-depth case study in this research, one of the 26 DFPP projects included in the survey is selected. As there are a lot of projects included in the survey, a selection process was necessary to come up with the best fitting case for this research. Eventually, the DFPP project *Grebbedijk* was chosen as the case study for this research for several reasons.

First, only cases with more than 10 respondents on the survey are eligible for this research, because for cases with a higher number of respondents, the regression analysis is more valid. This leaves only seven possible cases for the case study.

From the seven cases that were left, the Grebbedijk project had some features which made it better fitting for an in-depth case study than the others. First, the quantitative research with the survey analysis showed that the collaboration process in the Grebbedijk project was rated relatively high by the respondents. The average score for all collaboration dynamics and conditions in the Grebbedijk project was 4.31 on a scale of 1 to 5, which is relatively high compared to other DFPP projects.

Not only the collaboration dynamics were rated well, 100% of the respondents of the survey of the Grebbedijk project also believed that spatial quality would be improved by the project. This unanimous agreement makes the Grebbedijk project a very suitable case study. It is interesting to explore what made the Grebbedijk project so successful, and whether the collaborative process here led to an improvement of spatial quality. The Grebbedijk project could serve as an example for other DFPP projects in terms of spatial quality, and by doing a case study on this, it becomes clear what the ideal collaborative conditions are for improving spatial quality in DFPP project areas.

Another advantage of the Grebbedijk project as a case study is that the process here is already somewhat more advanced. The project is currently in the plan development phase, which means that the exploration phase has been completed. With the completion of the exploration phase, a preferred alternative has been drawn up, which is a first rough sketch for the final outcome. By choosing the Grebbedijk as a case study, respondents can better reflect on the exploration phase, and the preferred alternative gives them something concrete on which they can express an opinion.

Interviews

To gain a more in-depth insight in the collaboration process of DFPP projects, a total of 6 interviews were conducted with people involved in the particular DFPP project. The interviews are semi-structured, which means that the researcher used an interview manual with several topics and questions the researcher desired to discuss with the respondent as a guideline through the interview (van Thiel, 2014) (*Appendix 1*). The reason for the use of semi-structured interviews in this research is that they allow flexibility for the researcher, while the data of multiple interviews is still comparable because all respondents are asked the same questions (McIntosh & Morse, 2015). The interviewees were first asked about spatial quality and how this was an objective in the Grebbedijk project. Then, the interviewees were asked to reflect upon the collaboration process, whereby all the collaboration dynamics were addressed.

In *table 2*, an overview of the interviewees can be found. The first interviewee came directly from the network of the researcher's supervisor. The second interviewee was allocated by the water authorities after the researcher contacted them. Then, the researches asked the first two interviewees to recommend other possible respondents, a method called snowball-sampling (Van Thiel, 2014). However, to prevent that all interviewees would provide information from the same perspective, the researcher also selected respondents based on function and organisation. Hereby, it should be noted that although interviewee 4 is formally employed by the province of Gelderland, in the Grebbedijk project he fills an independent role in the spatial quality committee and therefore does not represent the province of Gelderland within the project. Selecting interviewees with different functions in the project helped the researcher to get a broad insight into the organisation of the collaboration process. Also, by selecting respondents from different organisations, it became clear what the general perception of spatial quality in the Grebbedijk project was and what it meant for the different organisations involved.

Table 2: Overview of the interviews

Interview Number	Organisation	Date of interview
Interview 1	Water authorities	16-05-2023
Interview 2	Water authorities	25-05-2023
Interview 3	Province Gelderland	05-06-2023
Interview 4	Province Gelderland	12-06-2023
Interview 5	Dijkdenkers	12-07-2023

Next to the interviews, also relevant documents regarding the particular case will be analysed. The interviews together with the document analysis will help answering the following research question:

*How did collaborative governance influence the decisions on the spatial quality of the **selected case** project area?*

Data Analysis

To analyse the data gathered from the qualitative research, several steps have to be taken. First, all conducted interviews will be fully transcribed. Transcribing the interviews enables the next step of the analysis, coding. The coding of the interviews will be carried out in Atlas.ti. Gibbs (2018) distinguishes three different types of coding:

1. **Open coding**, where the text is read reflectively to identify relevant categories.

2. **Axial coding**, where categories are refined, developed and related or interconnected.

3. **Selective coding**, where the 'core category', or central category that ties all other categories in the theory together into a story, is identified and related to other categories.

In this research, all three types of coding will be used.

The aim of the qualitative study is to gain deeper insight into how the collaboration process is organised in the DFPP project Grebbedijk and in what way the collaboration dynamics are present in it. This also examined the extent to which improving spatial quality was a goal and on which these goals were or were not achieved. The qualitative study mainly tried to identify the relationship between these two concepts. In the interviews, respondents were asked about how the collaborative conditions were present in the DFPP project Grebbedijk. They were also asked about the different components of spatial quality in the project, and the relationship between the collaboration process

and the spatial quality. By analysing the data from these interviews through coding, the relationship between collaborative conditions and spatial quality emerges.

Since the integrative framework for collaborative governance by Emerson et al (2011) shows that the presence of collaboration dynamics leads to a certain output, this is an appropriate way to examine the relationship between collaboration dynamics and spatial quality in DFPP projects.

3.3 Validity and reliability of the research

In scientific research, it is essential that the research is conducted valid and reliable. Here, reliability refers to the accuracy and consistency with which the variables are being measured. Therefore, a reliable research means that outcome should be same if the research was executed multiple times. In research, validity can be split up into internal and external validity. Research can be named internal valid when the researcher has really measured what he intended to measure. To conduct internally valid research, it is important that theoretical concepts have been operationalised adequately, and that the relationship between the dependent and independent variable really exists. External validity refers to the extent to which the research results can be generalized (van Thiel, 2014).

In this research, a mixed-methods research strategy is used. Using both qualitative and quantitative methods creates triangulation. Triangulation enables the researcher to double-check the research findings, which enhances the reliability and validity of research (van Thiel, 2014). Therefore, by using mixed methods in this research, validity and reliability of the results is ensured.

4. Quantitative Results

The aim of the quantitative part of this research is to discover which collaborative dynamics and conditions influence improving the spatial quality of DFPP project areas. To do so, the survey data was analysed using the SPSS programme. This involved analysing per DFPP project how respondents experienced the collaboration dynamics and conditions in the particular project. We also looked at whether the respondents expected the spatial quality within their project area to improve. On the basis of this, links can ultimately be made between the various collaboration dynamics and spatial quality. This chapter will describe and display the results of these analyses. Based on this analysis, sub-question 2: *"How does collaborative governance influence decisions on the spatial quality of DFPP project areas?"* be answered.

4.1 Results of the survey

Table 3 shows per project how the respondents rated the collaborative dynamics within the DFPP project. The survey used a Likert scale from 1 to 5. 5.00 is therefore the highest possible score and 1.00 the lowest possible score. It also shows whether the respondents feel that spatial quality will be improved by the project. A 100 per cent score here means that all respondents feel that the spatial quality of the project area will be improved, which is the case in 25 of the 37 DFPP projects.

Table 3: Overview of the results of the survey per project

Project	Respondents	Principled Engagement	Shared Motivation	Capacity for Joint Action	Spatial Quality
Grebbedijk	12	4.26	4.18	4.49	100%
Sterke Lekdijk	12	4.01	4.21	4.01	85,7%
IJsselwerken Zwolle-Olst	12	4.06	4.30	4.02	62,5%
Tiel-Waardenburg	10	3.63	3.93	3.76	66,7%
Meanderende Maas / Ravenstein-Lith	11	4.63	4.57	4.57	88,9%
Markermeerdijken	10	4.15	4.17	4.13	100%
Stadsdijken Zwolle	6	3.82	4.31	3.93	66,7%
Veilige Vecht	3	3.72	3.81	4.08	
Noordelijke Randmeerdijk	7	4.04	4.05	3.63	100%
Dijkversterking Hansweert	4	3.87	3.82	3.25	66,7%
Krachtige IJsseldijken Krimpenerwaard	5	3.80	3.79	4.13	100%
Rijnkade Arnhem	5	4.31	4.00	4.13	100%
Houtribdijk	2	4.62	4.36	3.94	100%
Lauwersmeerdijk-Vierhuizergat	8	3.91	4.02	4.27	100%
IJsseldijk Apeldoorns Kanaal	3	4.08	3.62	4.02	66,7%
Arcen Well Nieuw Bergen	2	3.73	2.93	4.16	100%

Ringdijk Watergraafsmeer JLD Ankers	2	4.23	3.29	4.25	100%
Koehool Lauwersmeer	8	3.71	4.07	3.96	100%
Stenendijk Hasselt	1	5.00	5.00	4.63	100%
Havendijk Den Oever	3	4.08	4.14	4.34	100%
NRD versterking kunstwerken	2	3.77	4.14	3.91	100%
Lob van Gennep	2	4.31	4.00	4.22	100%
IJsselmeerdijk	3	3.92	5.00	4.67	100%
Gestuurde kustverdediging	2	2.35	2.50	2.44	0,0%
Gekanaliseerde Hollandsche IJssel Noord	1	2.70	3.00	5.00	100%
Wolferen-Sprok	6	3.63	3.57	3.96	100%
Vlieland	2	4.46	4.86	4.58	100%
IJsselkade RFR	1	3.77	4.86	3.81	100%
Spijk-Westervoort	2	3.69	4.00	3.69	
Ooijen-Wanssum	1	4.15	4.71	3.73	100%
Dubbele Dijkproject	1	3.69	4.29	4.44	100%
Willemstad Noordschans	1	1.38	1.14	4.54	100%
Durgerdam, Brede Groene Dijk	2	3.46	4.21	3.91	100%
Neder-Betuwe	5	3.67	3.86	3.81	50%
Vianen	3	4.00	4.00	3.63	100%
Gorinchem-Waardenburg	12	3.89	3.63	4.28	100%
Total	172	3.85	3.95	4.06	

4.2 Regression Analysis

To investigate which collaborative dynamics and conditions have significant impact on improving spatial quality, a regression analysis was carried out for each collaborative condition. These regression analyses were carried out using the survey data from all 36 DFPP projects combined.

In *table 4,* the R-value, R^2-value and significance are listed. The R-value represents the correlation coefficient, indicating how two variables influence each other. In this case, it indicates the extent to which the collaborative conditions affect improving spatial quality. The collaborative conditions with the highest R-value have the most influence. The R^2 value is the coefficient of determination, and indicates how much of the total variation in the dependent variable can be predicted from the independent variable. The significance indicates whether the effect of a collaborative condition on the improvement of spatial quality, is significant. In *table 4*, the significance is shown in the form of a p-value. A p-value lower than 0,01 means that the R and R^2 value are significant (Van Heijst, 2023). As *table 4* shows, there are eight collaborative conditions in which the correlation between the condition and spatial quality is significant.

Table 4: Survey results per collaborative condition

Collaborative Conditions	R	R^2	Significance
Principled Engagement	0,319	0,102	0,002
Discovery	0,251	0,063	0,016
Definition	0,225	0,051	0,031
Deliberation	0,168	0,028	0,110
Determination	**0,379**	**0,144**	**<0,001**
Shared Motivation	0,208	0,043	0,047
Trust	0,120	0,014	0,253
Mutual Understanding	0,201	0,041	0,054
Internal Legitimacy	0,253	0,064	0,015
Commitment	0,133	0,018	0,208
Capacity For Joint Action	**0,506**	**0,256**	**<0,001**
Procedural & Institutional Arrangements	**0,376**	**0,141**	**<0,001**
Internal Leadership	**0,395**	**0,156**	**<0,001**
External Leadership	0,286	0,082	0,007
Knowledge	0,333	0,111	0,001
Resources	**0,380**	**0,144**	**<0,001**

4.3 Evaluation

In this quantitative research, both the collaboration dynamics and the collaboration conditions, that are each part of one of the collaboration conditions, have been included in the analysis. For this research, both of these are relevant. The analysis of the overarching collaboration dynamics are important because this gives insight in which part of the collaboration process has in general the most impact on the spatial quality of HWBP project areas. Then, the analysis of each collaboration condition apart gives a more detailed insight into what aspects of the collaboration process specifically affect the spatial quality of HWBP project areas.

To answer sub-question 2, we analysed how all the different collaborative conditions have an effect on improving spatial quality. The regression analysis (*table 4*) showed that there are eight collaborative conditions in which the effect on improving spatial quality is significant. However, the researcher has decided that only conditions with an R-value higher than 0,350 are effective for the improvement of spatial quality. Now, only five collaborative conditions are left, which are *Determination, Capacity for Joint Action, Procedural and Institutional Arrangements, Internal leadership and Resources*. This means that although the collaborative conditions principled engagement, external leadership and knowledge have proven to have significant effect on the improvement of spatial quality, the R-value of these collaborative conditions is too low to be valuable indicators for this research.

After this evaluation, sub-question 2 "*How does collaborative governance influence the improvement of the spatial quality of DFPP project areas?*" can be answered. The regression analyses have shown that the collaborative dynamic capacity for joint action has the most effect on the improvement of spatial quality of DFPP project areas. As discussed, capacity for joint action consists of all the

necessary capacity to enable successful collaborative governance, such as resources. Looking at the collaborative conditions, four conditions that have the most effect on improving the spatial quality can be distinguished, which are determination, procedural and institutional arrangements, internal leadership and resources.

5. Qualitative Results

The qualitative part of this research consists of a case study on the Grebbedijk DFPP project. In this case study, a comprehensive document analysis was conducted to gain a deeper insight and understanding of the characteristics of the project. This document analysis was followed up by six interviews with people who were involved in the collaboration process of the Grebbedijk project. The knowledge and opinions of the respondents provided an even deeper and multilateral insight into the collaboration process. By combining the document analysis and the results of the interviews, more insights were given in how the collaboration process of the Grebbedijk project helped to improve the spatial quality of the project area.

5.1 Case context

The Grebbedijk project is part of the Dutch Flood Protection Program (DFPP), which contains almost 100 water protection projects all over the Netherlands. The Grebbedijk is a dike traject of 5,5 kilometres long, located next to the river Rhine between the cities Wageningen and Rhenen (*figure 4*). The main goal of the Grebbedijk project is to strengthen the water protection structures to ensure water protection for the Gelderse Vallei, a valley that stretches from the Rhine all the way to the Veluwemeer. The dike traject runs through both urban area in Wageningen as rural area towards the Grebbeberg. Adjacent to the dike is the Natura-2000 area Rijntakken located, which creates a high natural and ecological value of the project area.

Figure 3: The project area of the Grebbedijk DFPP project

In the past, the dike has been breached by the river water several times, with all its consequences. If the dike would breach again, this would affect 250.000 residents of the Gelderse Vallei with estimated damage costs of 27 billion euros (Waterschap Vallei en Veluwe, 2017). For this reason, the Grebbedijk project has high priority within the national DFPP.

Because the effects of a potential dike breach in the Grebbedijk would be disastrous, the flood probability standard was set to 1/100000 per year, with a maximum permissible probability of 1/30.000 per year. However, a safety assessment conducted by the water authority Vallei en Veluwe in 2017 showed that 4,5 km of the Grebbedijk did not meet the safety standard (Waterschap Vallei en Veluwe, 2017). Therefore, the water authorities placed the Grebbedijk in 'category D', which means that the flood probability is much higher than the signal value and the maximum permissible probability.

The vulnerability of the Grebbedijk is caused by multiple failing mechanisms. The first failing mechanism is overflow (*figure 5*). Overflow occurs when high water levels and waves find a way over the dike, which can cause the dike to collapse. The second failing mechanism is Piping, which occurs when water comes from outside the dike through the sand layer under the dike towards the inside of the dike, where the water comes back to the surface. This stream of water under the dike can grow over time, which causes erosion that can destabilize the dike (*figure 7*) (Waterschap Vallei en Veluwe, 2017).

The third failing mechanism of the Grebbedijk is macro instability (*figure 6*). Macro instability of the dike occurs when the ground mass of the dike loses balance. When there is macro instability in a dike, the high pressure of high water levels can cause the dike to glide and eventually collapse (Waterschap Vallei en Veluwe, 2017).

The last failing mechanism of the Grebbedijk is erosion of the lining of the dike. When water levels are high or waves hit the dike, erosion can occur. This erosion can create holes in the lining of the dike which eventually can cause the dike to collapse (*figure 8*) (Waterschap Vallei en Veluwe, 2017).

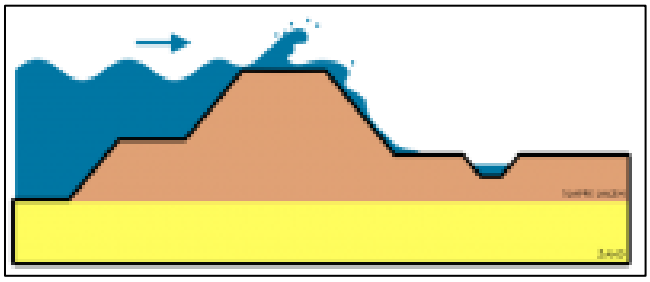

Figure 4: Overflow (Deltares, n.d.)

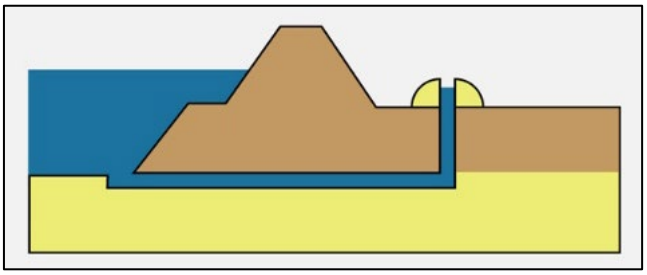

Figure 6: Piping (Deltares, n.d.)

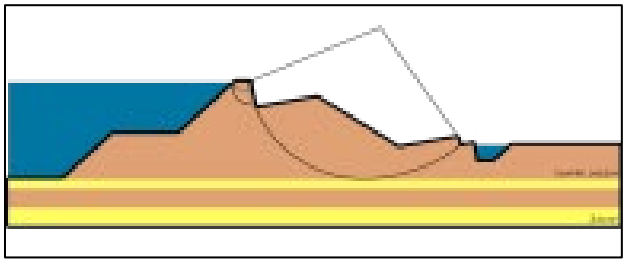

Figure 5: Macro-instability (Deltares, n.d.)

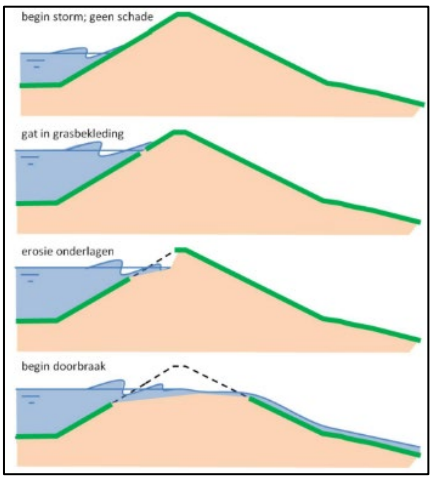

Figure 7: Erosion (Deltares, n.d.)

Waterschap Vallei en Veluwe, the responsible water authority for the Grebbedijk, conducted a safety assessment to explore on which dike sections the four failing mechanisms occurred. *Figure 9 and 10* show the results of this assessment, where *figure 9* shows which sections of the Grebbedijk are threatened by the one or more of the failing mechanisms and *figure 10* shows where the dike sections are located in the area. *Figures 9 and 10* show that only 900 meter of the Grebbedijk is strong enough, and all other parts need reinforcement to meet the new safety standards (Waterschap Vallei en Veluwe, 2017).

Dike section	Dike post	Overflow and Transhipment (1,0 m/s)	Bursting and Piping	Inward Macrostability	Outward Macrostability	Foreland stability	Microstability	Lining	Total
GR000-011	1 to 11	I	I	I	I	S	G	I	I
GR011-013	12 & 13	I	I	I	I	S	G	I	I
GR013-022	14 to 22	G	G	G	G	S	G	G	G
GR022-033	23 to 27	I	I	I	I	S	G	I	I
	28	G	I	I	I	S	G	I	I
	29 to 33	I	I	I	I	S	G	I	I
GR033-043	34 to 43	I	I	I	I	S	G	I	I
GR043-054	44 to 52	I	I	I	I	S	G	I	I
	53 to 54	I	G	G	G	S	G	I	I
Insufficient (meters)		4400	4300	4300	4300	0	0	4500	4500
Sufficient (meters)		0	0	0	0	5400	0	0	0
Good (meters)		1000	1100	1100	1100	0	5400	900	900

Figure 8: Water safety assessment Grebbedijk (Waterschap Vallei en Veluwe, 2017)

5.2 The Collaboration Process

5.2.1 Governance structure

Many parties and organisations are involved within the organisation of the Grebbedijk project. This chapter exposes the project's organisational structure and analyses the relationships within the project.

At the top of the Grebbedijk project is the principal, the DFPP. Despite the fact that the DFPP has the highest vote when it comes to setting preconditions, approving plans and making time and money available, they are still at a reasonable distance from the process (Interview 1). Only once a quarter, the DFPP programme directorate is informed through a progress report. Besides the DFPP as external principal, there is also an internal official principal. This internal official principal is responsible for contact and agreements with the water board. He also provides the IPM team with advice and directs the project manager (Waterschap Vallei en Veluwe, 2017).

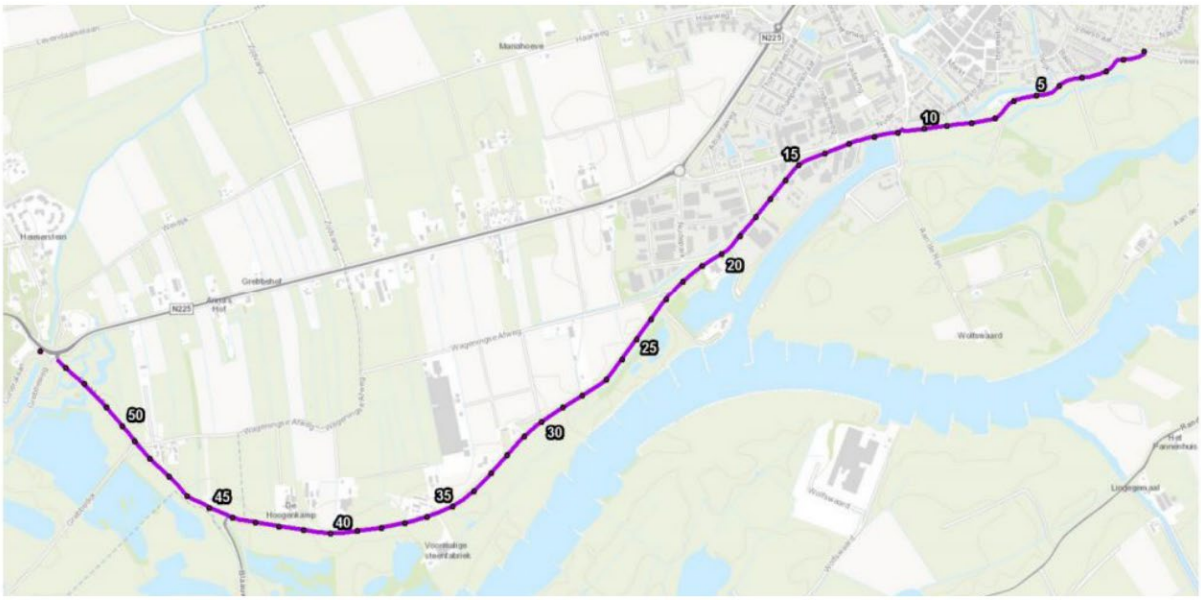

Figure 9: Dike trajects of the Grebbedijk (Waterschap Vallei en Veluwe, 2017)

In the start-up phase of the exploratory phase of the Grebbedijk project, it was decided to work with what is known as an Integrated Project Management Team, or IPM Team, which is responsible for the realisation of the project. Within this IPM Team, there is a certain division of roles. For instance, there is a project manager, environment manager, technical manager, project control manager and a contact manager (Waterschap Vallei en Veluwe, 2017). The Water Authority has chosen to fill these positions with people with experience and expertise in similar projects (Interview 1). Each of these role holders has a team including consultants under them that can be called in when needed. During the process, a number of other organisations also play a role towards the IPM team. For example, the Dijkdenkers are highly involved in different phases and parts of the project. The Dijkdenkers, consisting of people who live close to the project area or have an interest in the area development, have an advisory role towards the IPM team (Waterschap Vallei en Veluwe, 2017).

Besides the IPM team, there is also a process team, in which all partners are represented. Within this process team, the IPM team, and thus the water authority, has the driving role. Within the process team, progress, intermediate results and own input are discussed. The delegates of the parties in the process team feedback the project internally to their organisations, preparing the administrators for decision-making (Waterschap Vallei en Veluwe, 2017). An advisory team has also been set up within

the Grebbedijk project. This team provides advice at various points in the project, acting as a kind of sounding board for the process team (Waterschap Vallei en Veluwe, 2017).

Decision-making within the project is done during the many consultations that take place. Within decision-making, the relationships between all partners are equal, despite the Water Board's pulling role: *"We sit together as partners with all the partners' administrators and then decisions are made administratively. And it's not like the water authority then has a more powerful voice in that."* (Interview 2).

In *figure 11* a schematic organigram of the Grebbedijk project is shown. Important here is that the IPM-Team is at the core of the organisation, from where it links to almost all the other organisational structures.

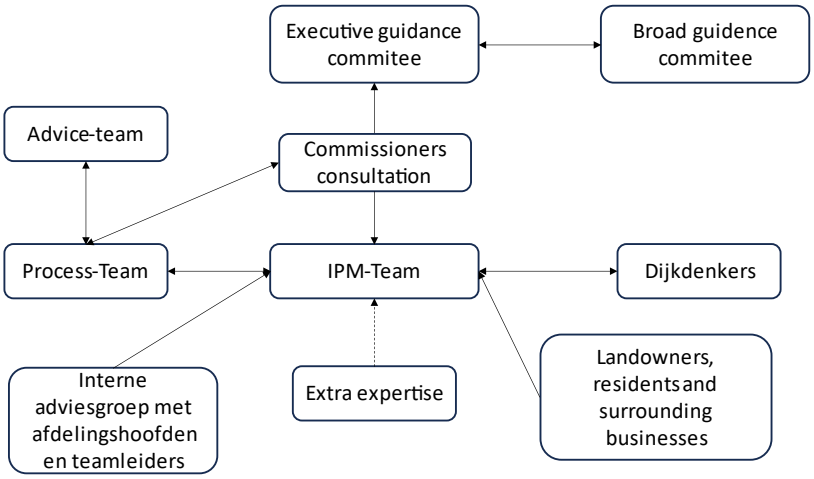

Figure 10: Organisational structure of the Grebbedijk project (Waterschap Vallei en Veluwe, 2017)

5.2.2 Dijkdenkers

As discussed before, one of the most important advisory organs in the organisational structure of the Grebbedijk project are the Dijkdenkers. These Dijkdenkers form an advisory group put together by the water authority at the beginning of the exploration phase. The Dijkdenkers consist of various interest groups that can give their advice on aspects of the project through this structure. The Dijkdenkers are chaired by an independent chairman appointed by the water authority (Interview 5).

Organising the Dijkdenkers ensures that interests that are not represented in the project through the eight partners are also represented. However, it is not only the interest groups that submit their ideas through the Dijkdenkers. The water authority itself also presents their dilemmas in the dike thinkers' meeting to create new ideas and insights into possible solutions. According to interview 5, this is quite unique: *"I think it is very special that the water authority also really gave space to share its own dilemmas with the interest groups at a very early stage as well, and to ask the interest groups to think along with the dilemmas they were also struggling with in the design team".*

While the Dijkdenkers' opinions were directly addressed to the IPM team, they are not binding. This means that despite interest groups being able to express their interests through the Dijkdenkers meetings, there was no obligation for the IPM team to represent all interests.

5.2.3 Exploration Phase

To reach the safety standards in the future, the Grebbedijk became part of the national DFPP. The DFPP project officially started when the 8 cooperation partners all signed a cooperation agreement. The 8 partners are as follows: Waterschap Vallei en Veluwe, Provincie Gelderland, Provincie Utrecht, Gemeente Wageningen, Gemeente Rhenen, Staatsbosbeheer, Utrechts Landschap and Rijkswaterstaat. With the signing of the cooperation agreement, the first phase of the project, the exploration phase, was started. In the exploration phase, the partners explored all the opportunities for area development in the project area. The exploration phase was divided into five different phases.

The first phase of the exploration phase was the starting phase. In the starting phase, the needed circumstances for a successful collaboration process were created. This involves the organisation of the IPM-team, specialists, consulting firms and internal and external consultation. Also, in this phase an action plan is established. This action plan describes the role distribution of the partners and also how to get from multiple possible solutions towards one particular preferred alternative (Waterschap Vallei en Veluwe, 2017).

The second phase of the exploration phase is the analysis phase. The essence of this phase is to get to some promising alternatives. To get to this point, some possible solution directions should be formulated from an area-based approach. Here, laws and regulations, client demands and possible co-opting opportunities are explored (Waterschap Vallei en Veluwe, 2017).

After the analysis phase the third phase, the assessment phase, is started. This phase is aimed at getting insight into the decisive criteria to get to an assessment. Here, partners can have different views on these criteria. In this phase this difference in views is made discussable to prevent problems. For the assessment, multiple aspects are assessed. The project needs to be financially, technically and legally feasible and practicable. Also, the sustainability and the degree in which the project contributes to the water safety awareness are assessed (Waterschap Vallei en Veluwe, 2017).

In the fourth phase of the exploration phase, the preferred alternative is chosen. The preferred alternative is established based on solution directions on multiple aspects. Also, the results from the assessment phase are taken into account by the choice for a preferred alternative. The costs of the particular alternative is also important in this phase (Waterschap Vallei en Veluwe, 2017).

The last phase of the exploration phase is the decision-making phase. The aim of this phase is to define the scope of the project. Here, the area developments are endorsed by the partners. In this phase, the water safety task is explicitly defined. For other area ambitions there is a possibility to deviate from the preferred alternative in a later stage of the process (Waterschap Vallei en Veluwe, 2017).

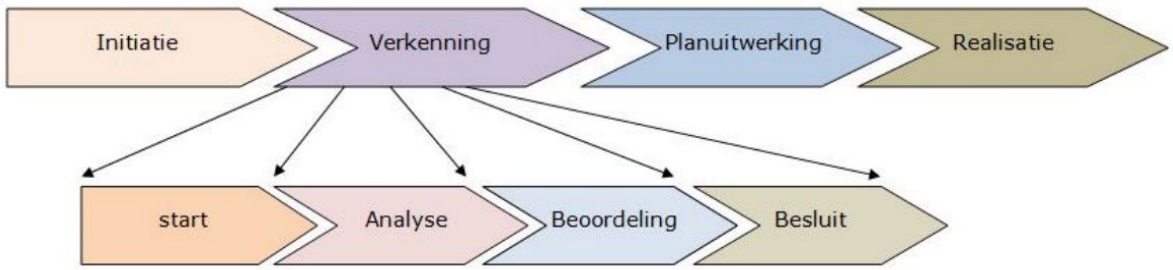

Figure 11: Process of the exploration phase of the Grebbedijk project (Waterschap Vallei en Veluwe, 2017)

The exploration phase eventually led towards the establishment of a preferred alternative. The preferred alternative consists of a total plan of measures in the area of the Grebbedijk. The preferred alternative not only includes water safety measures, but also measures regarding nature, infrastructure & economy, recreation & landscape and sustainability.

5.3 Spatial Quality

In the *Nota Voorkeursalternatief* (Waterschap Vallei en Veluwe, 2020), it is noted that giving the spatial quality of the Grebbedijk project area an impulse is the main ambition of the project. This means that initially, all partners had the ambition to improve the project area, but that it is not a main goal of the project. However, the interviews show that improving the spatial quality is a very important outcome, but always as a subobjective of the water safety assignment. Interviewee 2: *"Enhancing spatial quality is one of our goals that we have also formulated, alongside the water safety task, which is a very clear and a very hard and measurable one.* That improving spatial quality is taken seriously is reflected in the project with the setting up of the spatial quality committee. This committee consists of a number of people from different partners, who together form a team that takes an independent look at the process in the planning phase. Despite being formed by delegates from different partners, this team works independently of these partners and analyses the process purely based on their expertise. According to interviewee 4, this was a deliberate choice: "*You could also have chosen to really set up an independent quality team, so people who are not civil servants. People you hire from the market, which you see a lot in a spatial quality team. But here the choice was made to keep the connection with the partners, but on the other hand to ensure that you can say what you think, so they have arranged for independence in the assignment."*

To be able to improve spatial quality in the Grebbedijk project area, it is important that all parties share the same definition of the concept of spatial quality. In this research, spatial quality is defined by the simplified version of the Vitruvian triad by Klein et al. (2013). Here, spatial quality can be measured on the basis on three aspects: Integration of hydraulic measures, ecological robustness and cultural meaning and aesthetics. To improve spatial quality in the Grebbedijk project, at least one of these aspects has to be improved in the project area. The interviews have shown that in general, people involved in the project share the same definition of spatial quality. Almost all of the interviewees did, directly or indirectly, name the Vitruvian triad as the core of spatial quality when they were asked the meaning of the concept of spatial quality. Although the interviewees named the Vitruvian triad in their definition, they kept quite vague on what the different values and aspects of their definition meant in practice.

5.3.1 Integration of Hydraulic Measures

The integration of hydraulic measures entails the integration of the water safety objects, in this case the Grebbedijk, with the other everyday functions of the area (Klein et al. 2013). In this research, these everyday functions are housing, traffic and recreation.

In the Grebbedijk project, it is tried to integrate the Grebbedijk with housing by causing as little inconvenience as possible for local residents. This includes inconvenience during the reconstruction works, but more importantly also inconvenience because of a possible raising or widening of the Grebbedijk. In the city of Wageningen, houses and their gardens lay right against the dike which means that an adjustment to the dike could affect the living pleasure of these people. By applying customisation in all these places and involving residents in the process, it is tried to limit inconvenience and preserve or even improve the residential enjoyment (Interview 1 & 2).

The integration of the new Grebbedijk with traffic is an important aspect of the project. One of the main ambitions here is the separation of traffic flows. This means that on the Grebbedijk, on the part

next to Wageningen which is a car-free zone, cyclists and pedestrians would have separate roads they can use (Waterschap Vallei en Veluwe, 2020). This idea has been implemented in the preferred alternative, but it is questionable if it will be realised because of Natura 2000 legislation. Natura 2000 is European legislation to protect Nature areas all over Europe, and one of these areas is next to the Grebbedijk. Also, improving road safety on the other parts of the Grebbedijk is an important ambition of the project.

In the Grebbedijk project it is also tried to give recreation a place in the project area. In the preferred alternative, the partners agreed upon the realisation of a recreational lake in the floodplain area. However, although all partners agreed in the first place, later in the plan making phase, some partners started to hesitate. Some nature organisations felt that nature should be given priority in the area, and because it is natura 2000 area, they were proved right and the plan did not proceed. As this recreational lake was the main recreational aspect in the preferred alternative, a new plan will have to be put in place to also strengthen the recreational function of the project area (Interviews 1, 2 & 4).

Overall, the integration of hydraulic measures was well considered in the Grebbedijk DFPP project, but the ambitions did not always turn out to be achievable. This has resulted in that especially housing and traffic are well integrated with the dike reinforcement, but improving the recreational value of the area lags behind.

5.3.2 Ecological Robustness

The concept of ecological robustness refers to the preservation of dynamic stability in the natural system in which the project and its measures are implemented (Klein et al. 2013). To strengthen the ecological robustness of the Grebbedijk project, it is important to integrate the project into the natural values in the project area. This also includes taking the sustainability and maintenance of the project into account.

The Grebbedijk project comprises not only a water safety objective, but also a nature development objective. This has made the integration of the Grebbedijk with the natural environment of the project area a precondition in the project (Interview 1). The outer dike area of the project area is all Natura 2000 area, which means that the project has to deal with European legislation. It was planned to realise some aspects of the project in this Natura 2000 area, but to get a permit for this, an ADC test has to be done (Interview 2). This legislation ensures that the area's natural values are protected, forcing the project to integrate the Grebbedijk with nature. Also, a KRW channel will be created in the area. This is an initiative from Rijkswaterstaat to increase biodiversity in the area. This KRW channel will be a quietly flowing tributary of the Rhine in which fish and other animals can nest.

Sustainability is one of the spearheads of the Grebbedijk project. From the outset, ways to incorporate circularity and energy transition into the project were explored. First, wind turbines were considered, but this would not generate enough output. It was also examined whether soil excavated during the realisation of the KRW channel, for instance, could be used to reinforce the dike. By doing so, a circular project can be created.

How long the project will ultimately last is unclear. Interviews show that the dike reinforcement is expected to last 50 years, but that in practice, such projects often last shorter due to, for instance, climate change or technical developments. As a result, the dike might have to be reinforced again within those 50 years. The area development is expected to last a longer time (Interviews 1, 2 & 3).

Thus, ecological robustness is also generally well-integrated into the project. Nature retains an important place in the project area and is even enhanced where possible. Sustainability and

circularity of the area and the project have also been considered, adding to the ecological robustness.

5.3.3 Cultural Meaning and Aesthetics

The concept of cultural meaning and aesthetics entails the historical and cultural values of the Grebbedijk project area. Also, the cultural meaning and aesthetics can be strengthened by improving the physical characteristics of the project.

Within the Grebbedijk project, the historical and cultural values in the area are taken into account in various ways. The most important cultural heritage in the area is the Hoornwerk. The Hoornwerk is an 18th-century military defence work that used to be part of the Grebbelinie (van Unen, 2020). In the new plan, the Hoornwerk will have a new function as water protection. This restores cultural history and integrates it with water protection objectives in the new plan for the Grebbedijk (Interview 1 & 4). Another way in which cultural history returns to the Grebbedijk project is by allowing the dike to follow its original route. In some parts, the Grebbedijk has followed the same line since the Middle Ages. The new plan tries to deviate from the existing line as little as possible (Interview 4).

Interviews show that the external features of the project are also considered. A landscape architecture firm has been involved in the project from the beginning. These landscape architects can be seen as the guardian of the project's spatial quality, especially when it comes to external features (Interview 2). This is reflected in the design of the dike, which attempts to create a dike with relatively steep slopes, making you float above the landscape when standing on the dike. Important here is that what is beautiful is not always the safest, and that within the project a trade-off must often be made between those two aspects (Interview 4).

So, also the cultural meaning and aesthetics have been given a place in the project. Renovating the Hoornwerk and following the medieval dike route provides a connection to the history. However, the external features of the project area do have the least priority in the process, which sometimes does not benefit the cultural meaning and aesthetics.

5.4 Collaboration Dynamics

The interviews revealed how the various collaborate dynamics were present in the collaboration process of the Grebbedijk project. In this chapter, the links between the collaboration dynamics and improving spatial quality will be made. This chapter will look into the dynamics principled engagement, shared motivation and capacity for joint action. Finally, a more closer look at the five collaborative conditions that emerged from the quantitative research will be taken.

5.4.1 Principled Engagement

In a collaboration process, principled engagement will occur over time. If principled arrangement is present in the process, people with differing content, relational, and identity goals work across their respective institutional, sectoral, or jurisdictional boundaries to solve problems, resolve conflicts, or create values (Emerson et al. 2011). In the case of this research, principled engagement helps parties involved in the Grebbedijk project to create value in the form of improved spatial quality. To reach principled engagement in the Grebbedijk project, several steps had to be taken. First, all partners need to be made aware of each other's interests. The interviews show that even before the project started, the partners knew reasonably well what interest each had in the project because many of the partners already have a longer history with each other from other projects (Interview 1 & 2). After partners are aware of all the interests, it is important to formulate a common goal. In the Grebbedijk project, this was done in advance by drawing up a cooperation agreement. In this

cooperation agreement, ambitions and goals for the project were drawn up on the basis of all the partners' interests, and then was signed by the partners. Besides drawing up a common goal, it is also important for principled engagement that it is possible to have hard conversations within the project. In any project, disagreements will arise, and it is important that it is possible to discuss them and reach a constructive solution together. The interviews show that in the Grebbedijk process, disagreements are also frequent and discussed. Interviewee 1 indicated that certain partners often took a less constructive stance as difficult decisions had to be made. In these cases, the mutual gains approach was then applied to reconcile interests and reach decisions.

5.4.2 Determination

The last collaborative condition that is important for principled engagement is determination. The quantitative study showed that determination is one of the collaborative conditions that has the most impact on improving spatial quality in DFPP project areas, so therefore it will be discussed separately in this qualitative research. The condition determination includes procedural decisions and substantive determinations. The quality of determination in a collaboration project is defined by the presence of commonly agreed plan, conflict management and transparency (Emerson et al. 2011)

In the Grebbedijk project, the collaborative condition determination can be observed in several ways. At the beginning of the project, in the start-up phase of the exploration phase, a plan of action for the exploration phase was drawn up. This plan of action serves as a collaborative agreement between the partners. Ultimately, implementing the plan of action will have to lead to the preparation of a preferred alternative (Waterschap Vallei en Veluwe, 2017).

From the interviews, it appears that the drafting of this plan of action has meant that all partners know where they stand and can work towards a joint preferred alternative from there. Interviewee 1: "*The cooperation agreement containing the ambitions that were mentioned were a kind of starting point for me to move forward together from there, and to give a little to each other here and there. And that we say we want to make the area more beautiful, so one gives some and the other gets some extra".* In terms of conflict management, the plan of action also played an important role, as the plan of action could always be referred to at times when these conflicts occurred (Interview 3).

5.4.2 Shared Motivation

The collaboration dynamic of shared motivation highlights the interpersonal and relational elements between the collaborative partners. To create shared motivation in a collaboration process, it is important that the following four elements are present: mutual trust, mutual understanding, internal legitimacy and commitment.

The interviews show that in the Grebbedijk project there is a lot of trust, both between the partners and throughout the process. The cooperation agreement also played an important role in this (Interview 4). It has to be said, however, that this trust was not there from the start with some partners. According to interviewee 1, trust had to grow: *"Especially the nature organisations, and I don't mean the State Forestry Commission but the surrounding area, so to speak, they were very sceptical about what we were doing. And the residents in Wageningen too, but we managed to solve that. There was trust, I think, with reserve."*

Mutual trust between partners allows mutual understanding to develop. In the Grebbedijk project, this was present to varying degrees. The preferred alternative included a recreational lake, which the municipality of Wageningen was very keen to realise for its residents. Other partners, such as the province of Gelderland, did not necessarily want such a lake, but because they understood the importance of this for the municipality of Wageningen, they agreed anyway. However, there were also parties who opposed the plan for the lake even after the preferred alternative was adopted,

Interviewee 1 indicates: "*Especially when it came to nature, I found that those parties were really only looking after their own interests, and very little open to other social ambitions*." This shows that mutual understanding was very different for each party.

Mutual understanding can create internal legitimacy. If parties prove to be trustworthy despite different interests, this increases legitimacy and promotes cooperation. Here, there is again a difference between different parties. As discussed, the interviews show that certain parties fall back on their own interests when difficult decisions are made, which does not help internal legitimacy. To avoid hampering the project, decisions have to be made anyway, as in the case of the lake, for example: *"Based on content, you make choices and decisions, that has to be done. You can't do that because of opinions, but you substantiate that and that's the role we have as the initiator in this to know how to compare all pros and cons and that eventually a choice could be made based on content and motivation, and only then it will work. Then you can also say of that was decided in a businesslike way and even then it can be very unpleasant. And also you can be personally very sorry that it's dropped, but then that's why"* (Interview 2).

The last condition that is needed for shared motivation is commitment, which enables partners to cross boundaries between them and commit themselves towards a shared objective. The interviews show that commitment was also very different for each party when it came to improving spatial quality. For improving spatial quality, the Water authority was actually the leader, which according to Interviewee 1 was not obvious, as the water authority's main task is to ensure water safety. Other parties felt that improving spatial quality was less important. Interviewee 1 was not satisfied with how Province of Gelderland handled spatial quality: *"I found the province of Gelderland a bit ambivalent about this, to be honest. Gelderland is a very rich province, you could say that this is a very beautiful part of Gelderland that you could make even more beautiful, but I found them relatively reactive in that. Ultimately, we did have very good people there, but they really needed time and the right people to get going, to also become aware of what can we add to dike reinforcement, so I was a bit disappointed about that during the process."* (Interview 1). The commissioner, the DFPP, also felt that improving spatial quality was not the priority. According to interviews 1, 3 & 4, the DFPP thought it was fine if area development and improving spatial quality were done, but it should not be at the expense of the water safety task and hardly any extra money was made available for it.

5.4.3 Capacity for Joint Action

As the purpose of collaboration is to generate a certain outcome that cannot be achieved separately, it is important that within a collaborative process new capacity for joint action is built. In a collaboration process, capacity for joint action can be seen as "a collection of cross-functional elements that come together to create the potential for taking effective action" (Emerson et al. 2011). Capacity for joint action consists of the combination of four essential elements: procedural & institutional arrangements, leadership, knowledge and resources. In the quantitative part of this research, it became clear that capacity for joint action and its elements have significant impact on improving spatial quality in DFPP projects. Therefore, each of these elements will be analysed separately.

5.4.4 Procedural & Institutional Arrangements

The collaborative condition of procedural & institutional arrangements encompass the range of process protocols and organisational structures necessary to manage repeated interactions over time. For long term collaboration processes such as the Grebbedijk project, this means that formal

institutional design factors such as charters, by-laws, rules and regulations need to be supplemented to support effective collaboration (Emerson et al. 2011).

In the Grebbedijk project, procedural & institutional arrangements were present from the start of the collaboration process. At the beginning it was decided to draw up a cooperation agreement, which was signed by each partner in the project (Interview 1). The signing of this plan of approach indicates that partners were pursuing a common goal from the beginning. In the end, this plan of approach helped to arrive at a preferred alternative that stakeholders were generally satisfied with (Interview 5).

In terms of decision-making, all partners were included in the process. When important decisions had to be taken, the IPM team ensured that consultations were held with all partners to reach decisions (Interview 2). Interview 2 shows that this was necessary once every 6 weeks. Partners were then briefed on the progress of the project, and could then give their views on this progress (Interview 2). In addition to these meetings, weekly meetings took place within the IPM team, once every fortnight between the IPM team and the hired engineering firm, and twice a year an administrative meeting (Interview 1).

The process also included a number of procedural & institutional arrangements from the DFPP. The DFPP had set a number of deadlines in advance within which a certain amount of progress had to be made in the project. According to interviewee 1, for certain matters, such as the exploration phase, too little time was booked in beforehand, but this was adjusted in time: "*That is sort of thought out in advance, two years this, two years that. And it is precisely such an exploration phase that you don't actually do it in two years because you want to set up the entire process with all those parties together, so we needed more time for that. The DFPP eventually went along with this, but they did say that every year of extra process time costs extra money that cannot be spent on dike reinforcement.*"

The interviews have shown that there were various forms of procedural & institutional arrangements present in the Grebbedijk project. All partners were involved in the decision-making processes, and every stakeholder was involved in one of the multiple meetings. The fact that the DFPP showed some flexibility in their predefined rules, helped progressing the Grebbedijk project.

5.4.5 Leadership

The importance of leadership in collaborative governance is widely confirmed. Leadership can be present in collaborative processes in different forms and roles. These leadership roles can be either essential at the outset of the project, in moments of deliberation of conflict, or in championing the collaborative determinations through to implementation (Emerson et al. 2011).

In the Grebbedijk project, different leadership roles could be distinguished. As discussed, the project worked with the so-called IPM structure. This resulted in the formation of an IPM team that was led by a project manager. The interviews showed that the project manager was the leader of the project. This project manager had final responsibility for the project results, and was also the one who reported the project's progress to the DFPP. Besides the project manager, the IPM team consisted of a number of other roles. There was an environmental manager, who was responsible for involving the environment in the project. This environment manager was also the point of contact for residents and businesses in the project area. Furthermore, the IPM team consisted of a contract manager, project control manager and a technical manager. In the Grebbedijk project, the technical manager had responsibility for spatial quality, which is a good choice according to interviewee 4: "I do think that is a very logical link. You see that projects deal with it differently. Here, they do it under technical management, but sometimes it's also under environmental management. I must say that I

prefer to put it under technical management. The technicians are going to design that dike, they are going to make it, so I think that is the logical link." This technical manager was also the point of contact for the aforementioned spatial quality committee.

When talking about leadership in the Grebbedijk project, it is important to mention that the Water Authority Vallei and Veluwe had the most important role in this. For instance, the IPM team was put together by people employed or hired by the Water Authority. The Water Authority also bears responsibility for meeting the water safety objectives and their quality in time. The fact that the Water Authority pursues other goals besides water safety is not self-evident as interview 2 shows: *"It is actually quite special that a water authority are the lead party in this. It's not the most logical thing for a water authority to take the lead role in a whole area development like this, actually taking ambitions from other parties as well."* There is also a leadership role for the DFPP itself, who are somewhat more indirectly involved in the project, but ultimately have the highest voice in the process.

The water authority's leadership was generally experienced positively by the partners, the interviews show. Here, the fact that the water authority takes on so many tasks and really wants to go for integrated area development is particularly appreciated. Taking all this in consideration, it thus appears that collaboration condition leadership was clearly present and in various forms in the Grebbedijk project.

5.4.6 Knowledge

In collaboration processes, knowledge can be seen as the currency of collaboration. In collaboration processes, knowledge is shared between parties and generated as an outcome of the collaboration. Therefore, sharing and generating knowledge within a collaboration project can help reaching the goals of the project (Emerson et al., 2011).

In the Grebbedijk project, sharing and generating knowledge was an important element of cooperation. From the beginning of the project, efforts were made to give as many people with expertise important positions within the project as possible. This included the IPM team, which was largely filled with experts from the water authority. People in important positions often already had a lot of experience with area development projects.

However, bringing in and sharing knowledge was not a matter of course for every party. Interview 1 shows that many smaller parties did want to contribute knowledge to the project, but that this was not always possible: *"I felt that smaller parties lacked the capacity. I thought they brought in quite good things in the project, but if it all rests with one or two people, it is very poor".* In contrast, a large party like the province of Gelderland did have enough capacity, but did not initially deputise the right people here, which also resulted in a lack of knowledge. Later in the process, the province of Gelderland did bring the right people into the project after some pushing (Interview 1).

Besides the knowledge of the partners themselves, there were also plenty of opportunities to bring in external knowledge. The water authority hired experienced people with expertise for a number of key positions in the project (Interview 1). In addition, according to interviewee 4, with a view to spatial quality, several companies were hired and committees set up to interact in a kind of triangle: "*They have the engineering firm, which makes the dike design from multiple disciplines. Then there is a landscape architectural firm, Fedes-Olthof, which they call the guardian of spatial quality, but they have been hired to think along with the engineering firm in the day-to-day work of the dike design. So there is a very direct link there. And the Spatial Quality Committee is a bit more at a distance, it has more of a helicopter view over it without having to deal with all the details, the daily work and all the*

daily discussions about engineering and management and qualities. So that should balance each other out a bit".

In summary, it could be said that there was a lot of knowledge available from the partners, but it was not distributed well initially. Later in the cooperation process, this improved. There was also the opportunity to bring in external knowledge, also with a view to improving spatial quality.

5.4.7 Resources

Sufficient resources are an essential ingredient for a successful collaborative process. These resources can include financial resources, time and knowledge. The advantage of collaborating is that these resources can be shared between parties, making more of it available. However, this requires parties to be willing to make this available (Emerson et al. 2011).

The interviews revealed that there was occasional disappointment with the financial resources within the project. Within an DFPP project, the vast majority of the dike reinforcement is financed by the DFPP itself. However, this money is only available for water protection purposes, under the motto of sober and efficient (Interview 1 and 4). As a result, the money for improving spatial quality had to come from the partners themselves. Here, there were some parties who were keen to contribute but did not have the resources for it, and other parties who did have the money, wanted to invest only little of it in spatial quality (Interview 1). According to interviewee 4, this meant a continuous trade-off had to be made between spatial quality and water safety, with water safety almost always being given priority. According to interviewee 4, the increased construction costs also played a role in this: *"You see that the overall DFPP is also affected by the increased construction costs, and that does lead to a reaction to sober down the project".* The interviews show that there was enough money to set up a good process and guarantee water protection, but that little was left for improving spatial quality, which also ultimately came at the expense of spatial quality (Interview 1,3 & 4).

Regarding the time available for the project, opinions differ. The DFPP has a clear dike reinforcement schedule with many deadlines attached. This creates pressure for the water authority and the project leaders to take steps as quickly as possible in the progress of the dike reinforcement. Any delays in the project costs the DFPP and the water authority money (Interview 1,2,3 &4). Because there was already a lot of pressure on the dike reinforcement task, little time was left for the other ambitions such as improving the spatial quality of the project area. Interviewee 1: *It was so incredibly busy. Of course, it also has to do with your own ambitions. If we had said we were going to reinforce the dike and nothing else, you would have had plenty of time. But I wanted to involve the environment, I wanted to give spatial quality a place, and that just requires a lot of effort.* This shows that if a little more time had been available for other ambitions in the project, this would also have benefited spatial quality in the project area.

5.5 Comparing the DFPP with the Room for the River program

In the interviews, the interviewees were also asked about other peculiarities in the cooperation process of the Grebbedijk project. What stood out was that the answers to this question several times made references to the Room for the River programme, which was completed in 2019. Like the DFPP, this programme was a national programme consisting of dozens of projects with the main objective of improving water safety along the major rivers in the Netherlands. However, the Room for the River project had an additional main objective besides creating water safety, namely improving spatial quality. This is in contrast to the DFPP, where improving spatial quality was often only an ambition within the projects themselves. The interviews show that this was a missed opportunity. According to interviewee 1, the scope of the DFPP was too narrow for sufficient improvement of spatial quality: "*I personally think that's a pity if you compare it to Room for the*

River where it was really a dual objective to pursue spatial quality. The programme was too limited in scope in that sense. What really bothered me was that everyone was very enthusiastic about Room for the River and the results achieved. I believe an integrated river management programme is also coming up and there, too, the objective is already broader than just water safety, and precisely in the intervening period between those two programmes, you had to keep that narrow scope and I really think that was a missed opportunity".

Interviewee 4 also mentions the dual objective of Room for the River as an example of how improving spatial quality should be implemented in this type of project. In fact, when improving spatial quality is not explicitly stated as an objective prior to a project, dependency arises: "*It is incredibly important to have that objective in there at the beginning of the project. That ensures that you are not dependent. Sometimes you don't need it at all, in that case you have a project with a project manager who understands that very well and wants that very much himself, but that is not in everyone's mind. But you can also have someone who is fairly sectorial and tight in it, but that should not depend on individuals. So if you get it right in your assignment, you always have a good basis for working on spatial quality"* (Interview 4).

The interviews show that spatial quality in the Grebbedijk project and the DFPP in general could have been improved much more if it had been explicitly mentioned as an objective at the beginning. The choice not to follow the example of the Room for the River programme meant that it was more difficult to achieve the ambitions in terms of spatial quality.

5.6 Evaluation

The case study showed that all three collaboration dynamics are present in different ways in the collaboration process of the Grebbedijk project. The presence of the different collaboration conditions in the process determines the quality of the collaboration (Avoyan 2021). In the remainder of this section, the extent to which each collaboration dynamic was present in the process is briefly summarised.

Several elements of the collaboration dynamic principled engagement could be observed in the Grebbedijk project. First of all, all partners were aware of each other's interests in the Grebbedijk project early in the process, which ensured that they knew what to expect from each other. In the project, there was room for hard consultation and there was the possibility to point it out if a particular partner disagreed with something. A common goal was also drawn up via a cooperation agreement that was worked towards during the exploration phase. Finally, the plan of action ensured that there were certain procedures in the process that worked as a guideline of the cooperation. It can thus be said that all four collaboration conditions that fall under the collaboration dynamic principled engagement were observed in the Grebbedijk project.

Several elements of shared motivation can also be observed in the cooperation process of the Grebbedijk project. The case study showed that although in general there was trust between the different partners, this did not always lead to mutual understanding. On certain issues, a number of partners lacked understanding about other partners' attitudes and interests. Nevertheless, there was a high degree of internal legitimacy, because each partner did see the importance of the cooperation and realised that cooperation was necessary to achieve their individual and joint goals. In terms of commitment to improving the spatial quality of the project area, there was a lot of difference between the partners. There were some partners who were very keen for the project to boost spatial quality, but also a few key partners who felt that improving water safety was enough. The lower degree of mutual understanding and commitment among certain partners means that the collaboration dynamic can only be assessed as sufficient.

The third and final collaboration dynamic is capacity for joint action. Several elements of this dynamic were also observed in the Grebbedijk project. Firstly, various procedural arrangements were drawn up that shape the collaboration process. These include the meetings that were organised on a regular basis. There was also a clear leader in the project, namely the water authority Vallei en Veluwe and the people they delegated to the project. This leadership was generally well perceived by the other partners. In the project, there was also a lot of knowledge present among the partners. However, this knowledge was not properly shared from the start, which did not help the cooperation. However, this was rectified as the process progressed, resulting in necessary knowledge being exchanged and new knowledge being generated. Looking at the project's resources, it was fairly tight when it came to spatial quality. The case study showed that for improving water safety, there was enough time, money and capacity available, but when it came to improving spatial quality, this was less often the case. The DFPP and certain partners were reluctant to provide the necessary resources for this, which did not help spatial quality. The scarcity of resources means that the collaboration dynamic capacity for joint action can be assessed as sufficient.

The quantitative part of the study showed that at the time of the survey, 100% of the respondents expected that implementing the preferred alternative would improve the spatial quality of the project area. However, the qualitative section shows that these expectations of spatial quality are nevertheless somewhat tempered on certain aspects. The best example is the recreational lake, which was one of the elements in the preferred alternative that would significantly improve the spatial quality. However, the realisation of this recreational lake proved unfeasible due to Natura 2000 legislation, among others. It also became clear from the study that there will be no alternative to this, which ensures that the spatial quality of the project area will not be improved as expected at the time of the survey.

6. Conclusion, Discussion & Recommendations

Improving the spatial quality has been an important ambition of the DFPP program. In many of the DFPP projects, the collaboration processes targeted to integrate the water safety assessment with the improvement of the spatial quality. However, little is known about how the collaborative governance and its dynamics and conditions can have impact on the spatial quality of DFPP project areas. This research has provided an insight in that knowledge gap by investigating the causal relationship between the collaborative conditions on the spatial quality of project areas. In this conclusion section, first all the three sub questions will be answered based on the mixed methods research that was conducted in this study. Then, based on these answers, the main research question, "*How does collaborative governance in DFPP projects affect the likelihood of improving the spatial quality of the project area?",* can be answered.

Next to the answers to the research questions, this section will also provide the discussion of the research. In this discussion, the researcher will reflect upon the conducted research. The discussion will provide some limitations of the research and also some recommendations on how to use this research in practice and for further research.

6.1 Literature study

The first part of the qualitative research of this study investigated how to measure the influence of collaborative governance on spatial quality. For this purpose, a literature review was conducted in which several scientific articles on collaborative governance and spatial quality were critically analysed. Based on this literature review, the following research question can be answered:

Sub-question 1: *How can the impact of collaborative governance on spatial quality be measured?*

In order to measure the impact of collaborative governance on spatial quality, it is important to first deconstruct the collaborative process an understand its separate elements in order to identify how they add or link up to spatial quality, which in its turn is measured separately as a sum of three elements. These three elements are *integration of hydraulic measures, ecological robustness and cultural meaning and aesthetics*. In the context of the DFPP, this means that at least one of these elements will have to be improved to enhance the spatial quality of a project area. The literature review also showed that collaborative governance influences the outputs of a collaborative process. This means that the dynamics and conditions of collaboration in an DFPP project influence the improvement of spatial quality. The collaborative conditions mentioned here are *principled engagement, shared motivation and capacity for joint action*.

Now that it is clear exactly what spatial quality and collaborative governance mean here, sub-question 1 can be answered. By examining how the various collaboration dynamics and conditions are present in an DFPP project and to what extent the elements of spatial quality have improved in the project area, it is possible to measure how much influence collaborative governance has on spatial quality.

6.2 Quantitative conclusion

In the quantitative part of this study, it was studied how collaborative governance can affect the spatial quality of DFPP project areas. For this quantitative research, a statistical analysis was conducted in SPSS on a previously conducted survey on collaborative governance in DFPP projects. This analysis allowed the following sub-question to be answered:

Sub-question 2: *How does collaborative governance influence the improvement of the spatial quality of DFPP project areas?*

To investigate how collaborative governance affects the improvement of spatial quality in DFPP project areas, each collaborative dynamic and condition was analysed separately. The results of this are analysis shown in *table 4*. The collaborative dynamics and conditions in which the R-value is the highest and whose result is significant have the most influence on the improvement of spatial quality in DFPP project areas. The quantitative results show that capacity for joint action is the collaborative dynamic that has the most influence on improving spatial quality. This means that when the elements of capacity for joint action, such as the procedural & institutional arrangements and resources are properly present in an DFPP project, it can have a positive effect on improving the spatial quality of the project. This means that within a DFPP project, there should be enough capacity in the form of financial resources, time, knowledge and organisational structures.

For improving spatial quality, capacity for joint action is therefore more important than the other two collaboration dynamics, principled engagement and shared motivation. This does not mean that these two collaboration dynamics have no influence at all on improving spatial quality in DFPP project areas, only that they have less influence than capacity for joint action. It is therefore important that in DFPP projects, principled engagement and shared motivation are also in order.

Besides the collaboration dynamics, the collaborative conditions were also analysed separately. This was done in exactly the same way as the analysis of the collaborative dynamics, so conclusions can be drawn from this in the same way. The results show that there are a number of conditions that significantly have the most influence on improving spatial quality in DFPP project areas. These are the conditions *determination, procedural & institutional arrangements, internal leadership and resources.* For the DFPP project, this means that elements of these conditions should be present in the collaborative process. For determination this means that within a DFPP project, it is important that a commonly agreed plan is set up in the first period of the collaboration. Elements of procedural & institutional arrangements that should be present in DFPP projects are formal institutional design factors such as charters, by-laws, rules and regulations. For the internal leadership it is important that within the collaboration process of a DFPP project, leader roles are well-defined at all times. Lastly, for the collaborative condition resources it is important that within a DFPP project, there is enough money, time and knowledge available between the partners of the project, so goals regarding spatial quality can be reached.

6.3 Qualitative conclusion

In the qualitative part of this research, a case study was conducted on the DFPP project Grebbedijk. For this case study, in-depth interviews were conducted with project stakeholders and key documents were analysed. Based on this case study, the following research question can be answered:

Sub-question 3: *How did collaborative governance influence the decisions on the spatial quality of the Grebbedijk project area?*

The quantitative study revealed that all stakeholders in the Grebbedijk project felt that the spatial quality of the project area would be improved. The case study showed that this improvement of spatial quality emerges in all three elements of spatial quality. The integration of hydraulic measures is particularly evident in the integration of the Grebbedijk with traffic and living around the dike. However, it should be stated here that the integration with recreation lags behind. In addition, the water reinforcement task in the area is well integrated with ecological robustness. The project takes much account of the area's natural values and sustainability. A KRW channel is also being realised and several plans have been stopped because they would potentially damage the Natura 2000 area. Finally, cultural meaning and aesthetics are also included in the area development of the Grebbedijk

project. Renovating the Hoornwerk and having it integrated into the water protection task is the main example of this. Efforts are also being made to make the area look as attractive as possible.

These improvements in spatial quality are a result of the collaborative governance in the project. The case study showed that the three collaboration dynamics were present in the collaborative process in different ways. Of the three dynamics, principled engagement was most present in the process. Shared motivation and capacity for joint action lacked some elements, but these were also sufficiently present in the project. The case study showed that the presence of the various collaboration dynamics had a positive effect on the spatial quality of the Grebbedijk project area, but that the absence of other elements also hindered this. What is striking here is that the collaboration conditions that emerged from the quantitative research as most influential on spatial quality were also often mentioned as important factors in the case study. For instance, the lack of resources such as time and money was seen as a strong limiting factor for the development of spatial quality. On the other hand, condition leadership was perceived to be very good, benefiting the spatial quality of the project area. From the quantitative research, conditions determination and procedural & institutional arrangements had also emerged as very influential, but in the case study, these conditions did not emerge as very influential elements in the collaboration process.

Thus, in response to sub-question 2, it can be concluded that the presence of principled engagement, shared motivation and capacity for joint action in the project contributed to improving the spatial quality of the project area. Here, certain elements of capacity for joint action, resources and leadership, emerged as the most influential in creating spatial quality.

6.4 Final conclusion

This research studied how collaborative governance in DFPP projects affects the spatial quality of the DFPP project areas. Both the quantitative and qualitative research carried out for this purpose has enabled the main research question to be answered:

How does collaborative governance in DFPP projects affect the likelihood of improving the spatial quality of the project area?

The answer to this question is that to improve the spatial quality of an DFPP project area, elements of all three collaboration dynamics must be present in the collaborative governance. The study showed that the dynamic capacity for joint action, and especially the collaborative conditions leadership and resources have the most influence on the improvement of spatial quality. It is important that there is clear leadership in an DFPP project regarding the improvement of spatial quality, because it is not a main objective of the DFPP itself. The leadership of an DFPP project must therefore take the initiative to improve spatial quality in combination with the flood protection task. If this initiative is not taken by the leadership within an DFPP project, spatial quality will not be able to be improved. It is also important that sufficient resources, in this case time and money, are available during the process for the implementation of an DFPP project and specifically improving spatial quality. As the DFPP only makes budget available for the flood protection task, budget must be arranged through the process to also improve spatial quality. If stakeholders in an DFPP project are not willing to make money available, spatial quality cannot be improved. Sufficient time must also be made available to improve spatial quality in addition to water safety. Since water safety is always the priority, a shortage of time can cause the improvement of spatial quality to be sacrificed.

Finally, it should be mentioned that the DFPP itself has significantly hampered the improvement of spatial quality in their project areas by not explicitly including it as a goal in the programme. This research shows that in previous large-scale water protection programmes where this actually was

the case, such as the Room for the River programme, it was much easier for the project management to be able to improve spatial quality.

6.5 Discussion

This discussion chapter will critically reflect on the study and the results obtained. This reflection will be described using theoretical methodological limitations.

6.5.1 Theoretical limitations

As mentioned earlier, the collaborative governance framework of Emerson et al. (2012) forms the foundation of this research. The conceptual model used in this research is entirely based on this collaborative governance framework. Nevertheless, some adjustments were made for this research so that the conceptual model would better fit the methods and goals of this research. For instance, the drivers and system context from the framework of Emerson et al. (2012) were not considered in this research, as they are not relevant to the influence of collaborative governance on improving spatial quality in DFPP projects. This adapted conceptual model proved to be very useful in both the quantitative and qualitative research.

However, the use of the framework of Emerson et al. (2012) has also brought some limitations. Despite the fact that Emerson et al. (2012) makes it clear that collaboration dynamics are parallel and mutually reinforcing, the collaborative governance framework has caused the collaboration process to be analysed and assessed very sectorally, per collaboration dynamic and condition. This does not quite correspond to what a collaboration process like an DFPP project actually looks like. In such a project, the collaboration dynamics and conditions are not organised separately, but as a whole.

6.5.2 Methodological limitations

The research methods used in this study contain a number of limitations. These limitations occur in both the quantitative and qualitative research and will be explained in detail in this chapter.

The quantitative part of this study used data from a previously conducted survey (Avoyan, 2020). This survey was conducted in 2020, while this research was conducted in 2023. This difference in time could have possibly affected the results of this survey. In 2020, many DFPP projects were in a different phase than at the time of this study. As a result, the opinions of those who completed the survey in 2020 may be very different in 2023. For example, the quantitative survey showed that 100% of the respondents felt that the spatial quality in the Grebbedijk project area would be improved. However, it subsequently emerged that a number of plans regarding spatial quality that were in the preferred alternative turned out not to be feasible for various reasons. As a result, if the same survey were to be conducted again now, the results might be slightly different.

The qualitative part of the study also has some limitations. First, only five interviews were conducted in this study, so not all partners were heard. However, it was attempted to interview the main stakeholders in terms of improving spatial quality. It could be interesting to also interview partners who have not contributed to spatial quality or have blocked plans for it, in order to find out their motives. It might also be interesting to interview the DFPP, and ask why spatial quality is not explicitly included as a goal in the program.

Also, using different operationalisations for the concept of spatial quality brings some limitations to the research. In the survey of Avoyan (2020), respondents were asked only about the broad concept of spatial quality, instead of the components that together form spatial quality. In the qualitative part of this research, spatial quality was divided into three components, namely *integration of hydraulic measures*, *ecological robustness* and *cultural meaning & aesthetics.* This means that the operationalisation of the concept spatial quality is different between the quantitative and qualitative

part. This is a methodological limitation of the research, which could have been improved by conducting a new survey in which respondents were asked about the three components of spatial quality separately.

Respondents in the interviews were also asked relatively sectorally about the various collaboration dynamics and conditions. This brings the danger with it of the researcher also analysing too sectorally and thus losing the big picture. An DFPP project is a large integral project in which all collaboration dynamics together become a whole. To properly analyse the collaboration process, this should always be kept in mind.

6.5.3 Recommendations

Here some recommendations will be given on how the results of this research can be used in practice.

Only one case study was done in this research. The case, the Grebbedijk project, was chosen partly because it was expected that spatial quality would be greatly improved here. Using the results of this case study, conclusions were then drawn for DFPP projects in general. However, a study of other cases, which score average or bad on improving quality, would be very interesting. This could generate new insights because in these cases it would become clear which elements of the cooperation hindered the improvement of spatial quality.

Further research could also be done on the individual role of partners in improving spatial quality. This research has mainly looked at collaborative governance as a whole, while each partner naturally influences the collaborative process individually. This could also include the role of public participation. Indeed, in this study public participation was only broadly included with the dike thinkers, while the voice of the public is very important in assessing the spatial quality of an area.

Finally, based on this research, project leaders of DFPP projects can be recommended to ensure that all three collaboration dynamics are present in the project. Here, it is especially important to ensure strong and clear leadership, as well as ensuring sufficient resources are present. In addition, it is very important to set improving spatial quality as a secondary goal at the beginning of a DFPP project. If this is the case, the water protection task can well go hand in hand with improving the spatial quality of the DFPP project areas.

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8. Appendix

8.1 Interview Manual

Topic	Questions
Introduction	1. Zou u zichzelf kort kunnen voorstellen? 2. Wat is uw relatie met het Grebbedijk HWBP project? - Hoe bent u hier terechtgekomen? 3. Vertegenwoordigt u iemand in het project? - Zo ja, wie dan?
Ruimtelijke kwaliteit	1. Wat houdt ruimtelijke kwaliteit volgens u in?
Ruimtelijke kwaliteit in het Grebbedijk project	1. In hoeverre was het verbeteren van de ruimtelijke kwaliteit van het projectgebied een doel gedurende het project? 2. Op welke manieren zijn deze doelen bereikt? 3. In hoeverre was het verbeteren van de ruimtelijke kwaliteit van het projectgebied belangrijker dan andere doelen? 4. Welke partijen speelden een belangrijke rol in het prioriteit stellen van de ruimtelijke kwaliteit? – Welke minder? - Hoe belangrijk vond u het verbeteren van de ruimtelijke kwaliteit zelf?
Integration of Hydraulic Measures	1. Vindt u dat de waterbeschermingsmaatregelen goed zijn geïntegreerd met andere functies in het projectgebied? - Recreatie - Wonen - Verkeer
Ecological Robustness	1. Op welke manier is er rekening gehouden met de duurzaamheid van het project? 2. Hoe lang denkt u dat het project mee zal gaan? 3. In hoeverre heeft het project onderhoud nodig 4. In hoeverre is er rekening gehouden met de integratie van het project met de natuurlijke omgeving van het projectgebied zoals de uiterwaarden en het natura 2000 gebied?

Cultural Meaning and Aesthetics	1. In hoeverre is er rekening gehouden met eventuele waardevolle historische aspecten van het projectgebied? 2. In hoeverre is er rekening gehouden met de uiterlijke kenmerken van het voorkeursalternatief?
Principled Engagement	1. In hoeverre was iedereen op de hoogte van elkaars belangen? 2. In hoeverre was er begrip voor elkaars belangen? 3. Hoe werd er omgegaan met tegengestelde belangen?
Shared Motivation	1. Wat waren de verhoudingen tussen de verschillende partijen? 2. Was er voldoende vertrouwen tussen de verschillende partijen gedurende het proces? - Waarom wel/niet
Capacity for Joint Action	1. Hoe vaak werden er vergaderingen georganiseerd gedurende het samenwerkingsproces? 2. Waren er voldoende middelen beschikbaar? - Geld - Tijd - Kennis 3. Was er sprake van een duidelijke leider gedurende het samenwerkingsproces? - Zo ja, hoe was uw ervaring met deze leider? - Zo nee, denkt u dat het ontbreken van een leider een gemis is geweest?
Collaboration	1. Waren er nog andere bijzonderheden gedurende de samenwerking die de uitkomst hebben beïnvloedt?
Choice for Alternative	1. Wat waren de voornaamste redenen om voor het gekozen voorkeursalternatief te kiezen? 2. Wat waren de redenen dat andere alternatieven afvielen?
Afsluiting	Tot zover het interview. Heeft u zelf nog vragen of aanvullingen voor mij? Bij eventuele latere vragen mag u me altijd mailen. Ontzettend bedankt voor uw deelname!