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Enriching urban river landscapes: increasing spatial quality in flood risk management practice
the case of Stadsdijken Zwolle

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Abstract

A shift in flood risk management is taking place from a traditional approach to an integrated approach, including spatial quality. This shift is also called the spatial turn. An integrated flood risk management approach is necessary to create cities that are able to withstand or adapt to flooding. The Dutch flood protection program Hoogwaterbeschermingsprogramma has the task of strengthening 1500 kilometers of dikes and 500 sluices and mills by 2030 which also has great impact on the living environment. The College of State Advisors advised in their report of 2020 to not focus solely on water safety but on spatial quality as well. The Hoogwaterbeschermingsprogramma is a window of opportunity to create added value for society. Therefore, this paper discusses the concept of spatial quality and instruments used to increase spatial quality in flood risk management practice. The focus is on Stadsdijken Zwolle, a project with the task of strengthening 7,5 kilometers of dike through the city of Zwolle. An in-depth case study is performed to gain knowledge on the meaning-making process of spatial quality and instruments contributing to increasing spatial quality. Thereby this study aims to reduce the knowledge gap by providing insight into the current status of spatial quality in planning practice. Based on the analysis, four recommendations are established. First, it is crucial to concretize spatial quality specifically for the project and project area. Second, the role of the Quality Team can be strengthened by equipping them with legal power. Third, a larger scope can increase spatial quality. Fourth, more steering from the program-level, for example by a dual objective on water safety and spatial quality, incentivizes and supports improving spatial quality.

Keywords: spatial quality, policy instruments, flood resilience, integrated flood risk management, Stadsdijken Zwolle, Hoogwaterbeschermingsprogramma

Inhoudsopgave

List of figures

List of tables

List of abbreviations, translations, and explanations

(English – *Dutch*)

CRa: "*College van Rijksadviseurs*" – College of State Advisors
DO: "*Definitief Ontwerp*" – Final Design
GWW: "*Grond-, Weg- & Waterbouw-sector"* - Soil, Infrastructure and Water Engineering sector
HWBP: "*Hoogwaterbeschermingsprogramma*" – Dutch National Flood Protection Program
MIRT: "*Meerjarenprogramma Infrastructuur, Ruimte en Transport*" – Multi-year program on Infrastructure, Space, and Transport
UO: "*Uitvoeringsontwerp*" – Execution Design

VO: "*Voorlopig Ontwerp*" – Preliminary Design
WDOD: "*Waterschap Drents Overijsselse Delta*" – Waterboard Drents Overijsselse Delta

Design leader: *ontwerpleider*
Environmental manager: *omgevingsmanager*
Executor: *uitvoerder*
Exploration phase: *verkenningsfase/initatiefase*
Synergies: *meekoppelkansen*
Memo on Basic Principles for the Spatial Design: *Uitgangspuntennotitie Ruimtelijk Ontwerp*
Note on integration: *integratienota*
Plan Elaboration phase: *planuitwerkingsfase*
Plan of Action: *Plan van Aanpak*
Project Plan for the Water Law: *Projectplan Waterwet*
Realisation phase: *realisatiefase*
Spatial integration plan: *ruimtelijk inpassingplan*
Steward: *beheerder*

Dijkzone Alliantie Zwolle = market combination, consisting of Dura Vermeer, Ploegam, Tauw, Fugro, H+N+S
Dijkteam Zwolle = market combination + waterboard WDOD

1. Introduction

1.1 A call for creating added value

Recent substantial rainfall in Germany, Belgium, Luxembourg, and the Netherlands led to floods with considerable damage and victims, emphasizing the importance of our water defense system. Extreme rainfall will only become more frequent in the future due to climate change (KNMI, 2021). Therefore, it is important to create a landscape that is prepared for the future. The Netherlands have been dealing for floods for a long time because of its location in a river-delta with more than 50% of its land beneath sea-level (van der Brugge et al., 2005). The flood in 1953 rose awareness of the importance of protection against high water resulting in higher safety norms for the primary flood defences (Rijkswaterstaat, n.d.). The tradition of fighting and controlling the water relates to a technocratic-scientific regime. As a result, the Netherlands have a sophisticated and extensive, but also a rather closed water defence system (van der Brugge et al., 2005). Two near dike-breaches of the river Meuse in 1993 and 1995 triggered rapid enforcement of the existing embankments but also the belief that the current flood control through dike building paradigm was no longer tenable (Busscher et al., 2019; Huitema et al., 2011; Klijn et al., 2013). A transition to integrated flood risk management with spatial planning is necessary (Verweij et al., 2021). When creating river landscapes that are resilient to flooding, responsibility should be taken to simultaneously enrich the environment.

This is in line with the report from 2020 written by the College of State Advisors (*College van Rijksadviseurs; CRa*) about the Dutch national flood protection program (*Hoogwaterbeschermingsprogramma; HWBP*). They advise to not solely focus on flood protection but also on spatial quality (College van Rijksadviseurs, 2020). They state that “the HWBP is a chance to create added value for the society” (College van Rijksadviseurs, 2020, p. 8). By adding to the quality of the area, besides water safety, maximum efficiency on the invested tax money will be achieved. Therefore, spatial planning of the Netherlands should be done by considering the following principles: 1) multifunctionality has priority over monofunctionality, 2) characteristics and identity of an area are leading, and 3) prevent transferring of problems or nuisance to other areas (College van Rijksadviseurs, 2020). This advice indicates an integrated approach to flood risk management with a key role for spatial quality.

In integrated flood risk management, traditional measures are combined with measures that accommodate the water, measures for other land use functions, and measures that increase spatial and local qualities (Verweij et al., 2021). An example of such an integrated approach is the “Room for the River” program, a Dutch flood protection program completed in 2017, with a dual objective of water safety and spatial quality (Rijkswaterstaat, n.d.). This dual objective has led to higher spatial quality in flood risk management projects. As a result, the assumption now is that spatial quality is a point of attention and it is integrated in practice, making a dual objective no longer necessary (Busscher et al., 2019). The question is whether spatial quality will indeed improve when it is no longer an objective of the program. A movement has been taking place for some time already in the HWBP aiming to ensure spatial quality in the process. Still, it does not structurally have a place in every planning process yet. It differs strongly per project if and to what extent spatial quality is ensured (HWBP, 2021).

A first attempt of monitoring by the HWBP showed that spatial quality is taken into account in the assessment framework for half of the projects (HWBP, 2021). Even less projects have taken spatial quality into account in the goals, application of tools, and its assurance in the organization (HWBP, 2021). In the academic debate, Busscher et al. (2019, p.1) have stated that "to date, research has largely ignored the question as to *how* spatial quality is to be achieved in planning practice". The article of Verweij et al. (2021) confirms this, adding that there has been very limited attention to the implementation phase and policy instruments for implementation.

To add knowledge to this debate, a case study will be carried out on the project Stadsdijken Zwolle. By means of this case study, attention is given to the meaning-making process of spatial quality as well as the instruments used to increase spatial quality in practice. The information obtained in this study can, subsequently, serve as lessons for the HWBP on how to increase spatial quality in practice. Accordingly, the HWBP can take the opportunity of creating added value for society.

1.2 Problem statement and research question

To achieve spatial quality, it is first necessary to understand the concept of spatial quality and find common ground. Meaning making of the concept is fundamental to improve spatial quality in practice. Currently, there has been limited research on how this meaning-making process in practice develops. Spatial quality is an often-used concept in spatial planning; however, it is rarely specifically defined (Moulaert et al., 2013). Moreover, spatial quality is in the eyes of the beholder and can mean something different to someone as opposed to someone else. As van den Brink et al. (2019, p. 15) describe: "the perceived landscape and its quality… is filtered through the preconceptions of the perceiver; there is, as it is called, a 'dependence without laws'. This dependence can possibly be unraveled through conversation with stakeholders in practice. Furthermore, the question of how spatial quality can be increased in practice needs attention. During the implementation phase, spatial quality is often left out because of pressure on time and budgets (Busscher et al., 2019). The advice written by the CRa (2020) to focus on spatial quality, next to flood protection, and thereby creating added value for society, expresses urgency. However, the question of how to successfully implement spatial quality in practice remains unanswered in research and therefore requires further research (Busscher et al., 2019).

The goal of this study is to improve spatial quality in planning practice to enrich urban river landscapes. Hence, the research question is:

"How is spatial quality negotiated in practice and how can policy instruments contribute to improving spatial quality in flood risk management projects?"

To answer the research question, the following sub-questions are discussed:

- How can spatial quality be conceptualized?
- What policy instruments contribute to spatial quality and how can they be classified?
- How is spatial quality negotiated in practice?
- What instruments have been used to increase spatial quality in Stadsdijken Zwolle and how are they experienced?

1.3 Theoretical approach

In order to understand why securing spatial quality in flood risk management projects is necessary, it is first important to explain how the transition towards integrated flood risk management developed. Therefore, chapter 2 starts with a description on the transition from a traditional engineering approach to flood resilience. The concept of resilience is elaborated in relation to flood risk management explaining that resilient cities can withstand or adapt to flooding without being harmed in their functionality and maintain their socioeconomic identity (Liao, 2012; Restemeyer et al., 2015). The transition started on the European level with the establishment of the European Floods Directive in 2007 which was a first step in the institutionalization of flood risk management. Accordingly, European member states have to prepare flood risk management plans for their river areas and develop several scenarios that can deal with different levels of flood risk (Klijn et al., 2015; van Ruiten & Hartmann, 2016). This asks for spatial solutions and, therefore, an integrated approach to flood risk management is desired where spatial planning and water management merge. This major governance challenge, called the spatial turn, also occurred in the Netherlands (van Ruiten & Hartmann, 2016). In this chapter it is explained what the spatial turn means for flood risk management in the Netherlands and is elaborated on the Room for the River program which is a leading example on spatial quality.

Consequently, the concept of spatial quality is analyzed as discussed in literature. Attention is given to the meaning-making process of this concept. In this study the Vitrivius triplet is used to define spatial quality. The triplet consists of the following elements: utilitas (functionality), firmitas (firmness/solidity), and venustas (beauty) (Klijn et al, 2013). The concept is made specific for flood risk management, referring to the translation of spatial quality by the Room for the River program. Lastly, barriers to increase spatial quality in flood risk management projects from literature are shortly discussed. The conceptualization of spatial quality forms a base for the negotiation of spatial quality in practice.

Chapter 2 ends with an analysis of policy instruments used to improve spatial quality. First, two different typologies of policy instruments are considered. This study elaborates on the NATO-typology by Hood (1986) which is in turn altered by Howlett & Raynor (2007). This typology orders instruments in the categories of government's resources that are nodality, authority, treasure, and organization. Second, the NATO-typology is operationalized specifically for flood risk management and examples of instruments are provided. Discussing which governmental resources are exploited and what is necessary to make them successful, provides insight in how policy instruments can contribute to increasing spatial quality in flood risk management projects.

1.4 Research strategy

The urgency to create cities that are able to withstand or adapt to flood risk, in combination with the advice of the CRa (2020) to focus on flood safety as well as spatial quality, creates the base for this research. This study focuses on the HWBP which has the large task of strengthening 1500 kilometers of dikes and 500 sluices and mills in 30 years (HWBP, n.d.). This national program on flood protection

has set itself the goal of structurally securing spatial quality in all of their projects by 2023 (HWBP, 2020).

A single-case study is performed to gain in-depth understanding of spatial quality in flood risk management projects. The strength of case study research is the opportunity to make use of different sources of evidence. This also increases the overall quality of the study compared to using one source of evidence (Yin, 2018). This research analyzes the case Stadsdijken Zwolle which is part of the HWBP. Stadsdijken Zwolle is a project that takes place in an urban, industrial, and nature area which adds to the complexity. Besides, the contract used in this project is a two-phase contract where the contractor is part of the project team from the plan elaboration phase onwards. It is interesting to analyze whether this type of contract has an influence on spatial quality. Lastly, Stadsdijken Zwolle is described as a case with much attention to spatial quality by professionals. This research strategy presents us with qualitative data and, thus, this study has a qualitative character.

First, a document analysis was executed. Documents central to this analysis are the Plan of Action (*Plan van Aanpak*), spatial integration plan (*ruimtelijk inpassingplan*), note on integration (*integratienota*), and the Project Plan for the Water Law (*Projectplan Waterwet*). Second, semi-structured interviews are conducted to gather information on spatial quality. The interviews provide information on how spatial quality is seen in practice, what policy instruments are used to increase spatial quality and how those are experienced by the people involved in the project. In total, 11 interviews were conducted with employees with different functions in the project. Third, knowledge on the case was acquired through participatory observation. This includes presence of the researcher in the project's office and participation in several meetings.

This study makes use of triangulation. This means the convergence of the different sources of evidence, in this case document analysis, semi-structured interviews, and participatory observation, is determined (Yin, 2018). The data has been analyzed using qualitative data analysis and research software ATLAS.ti.

1.5 Scientific and societal relevance

First of all, this study is scientifically relevant because it will provide insights into how a fuzzy concept like spatial quality is made sense of in practice, which policy instruments are used in this meaning-making process, and to which outcomes it leads. Spatial quality is a concept with links to spatial planning and landscape research. In the Stadsdijken Zwolle project, it is used in a world that has been dominated by engineering sciences for a long time. The meaning-making process of spatial quality in this case study will, therefore, be interesting for making interdisciplinary crossovers.

Second, the attention given to the implementation of spatial quality, contributes to the gap in literature on how spatial quality is achieved in practice. This study focuses on all phases of the project, aiming to draw a complete picture of the concept spatial quality in Stadsdijken Zwolle.

Third, much research has been done on the Room for the River program in relation to spatial quality and instruments to increase spatial quality. This study analyzes which instruments are used again in the HWBP, in which way, and how they are experienced.

Moreover, this study is societally relevant. There is a window of opportunity to create added value in flood protection projects of the HWBP in the coming years. Pressure on space in the Netherlands makes it even more important to combine functions in an integrated approach. In addition, an integrated approach "is now seen as an effective way of minimizing flood risk" (van Herk et al., 2015, p. 85). Thus, an integrated approach will create a safer living environment as well as added societal value which in turn establishes support for flood risk management projects.

1.6 Outline

In the next chapter, the theoretical framework is elaborated, focusing on the spatial turn, spatial quality, and instruments to increase spatial quality. In chapter 3, the methods used for research are discussed. Chapter 4 shows the outcomes of the case study on Stadsdijken Zwolle and an analysis of those results. In chapter 5, conclusions of this study are presented, a discussion is opened, and ideas for further research are given.

2. Integration of spatial quality in flood risk management practice

This chapter forms the theoretical basis for the empirical research on spatial quality in flood risk management projects. This basis is established by means of a literature review. Firstly, the transition in the water management sector from flood control to flood resilience is described, emphasizing the importance of an integrated approach to flood risk management. Second, the concept of spatial quality is defined. Third, an explanation on the meaning of policy instruments and two different typologies to arrange the policy instruments are explained.

2.1 The spatial turn

After years of trying fight the water and control extreme flood events, an increase in awareness taught us that solely traditional flood control measures are not able to deal with the growing flood risk (Busscher et al., 2019). Traditionally, flood risk management entailed the construction of dams and dikes regarding water management as civil engineering with the aim of controlling nature (van den Brink et al., 2019; Rijke et al, 2012; van Ruiten & Hartmann, 2016). This resulted in the gradual development of the washlands reducing room for the river to flow. Consequently, the need for heightened embankments increased (Rijke et al., 2012). The constant need for heightening of the embankments created a path-dependency in flood risk management which is called the “levee effect”. The feeling of safety as result of the heightened embankments stimulates further investment in inland development which in turn increases the need for dike reinforcements (Busscher et al., 2019; Vis et al., 2003; Wiering & Immink, 2006). This self-reinforcing process leads to institutional and physical lock-in situations. A transition from hard, technical solutions to a mixed integrated approach, combining structural and non-structural responses, is required (van Herk et al, 2015; Jha et al., 2012). An important aspect of this integrated approach is safeguarding spatial quality in flood risk management (Busscher et al., 2019). A shift from flood control to flood resilience seems promising, where cities can withstand or adapt to flooding without being harmed in their functionality and maintain their socioeconomic identity (Liao, 2012; Restemeyer et al., 2015). A resilient approach to flood hazard is necessary to deal with uncertainties and establish long-term flood safety (Liao, 2012).

A resilient approach applied to flooding “promises that a system like an urban region is prepared for both, the probability and the consequences of flooding, and is even capable to transform to a new, less flood prone state when necessary” (Restemeyer et al., 2015, in Restemeyer et al., 2017, p. 921). Resilience aims to minimise the consequences of flooding as well as reducing the probability of flooding (Restemeyer et al., 2015; Vis et al., 2003). Resilience consists of three key elements, namely, robustness, adaptability, and transformability. Robustness refers to the withstanding of floods and contains mostly technical measures such as the strengthening of dikes (Restemeyer et al., 2015). Brown et al. (2020) identify this characteristic as “persistence”, where the system keeps functioning in the same way in response to changing conditions and without changing its identity. The second element is adaptability, where the hinterland is prepared for flooding in order to prevent substantial damage (Restemeyer et al., 2015). Here, the integration of water management and spatial planning comes into place. Land-use planning, as a non-structural measure, is considered crucial in managing flood risk (van Herk et al., 2011). The third element is transformability which refers to the capacity of

a system to shift to a new state (Brown et al., 2020). In flood risk management, this indicates a shift from fighting the water to living with the water (Restemeyer et al., 2015). All three elements are necessary in establishing flood resilient cities.

In Europe, this transition was manifested with the implementation of the European Floods Directive in 2007. Since 2015, member states have to prepare flood risk management plans for their river areas and develop several scenarios that can deal with different levels of flood risk (Klijn et al., 2015; van Ruiten & Hartmann, 2016). The flood risk management plans are a step towards institutionalizing flood risk management with the objective of reducing "the adverse consequences for human health, the environment, cultural heritage and economic activity associate with the floods in the EU" (Hartmann & Spit, 2016, p.372). As a reaction on the major floods in the last decade of the 20th century, the Directive gradually establishes a paradigm shift. This shift asks for spatial solutions and, therefore, an integration of spatial planning and water management. Coordination on river basin level and a collaborative approach between the different stakeholders in spatial planning and water management is necessary to create successful plans (van Ruiten & Hartmann, 2016). Van Ruiten & Hartmann (2016) mention the 'spatial turn' and the scenario approach as the two major governance challenges of the institutionalization of flood risk management.

In the Netherlands, the spatial turn is also a major governance challenge in the paradigm shift towards flood risk management. Van Ruiten & Hartmann (2016, p. 697) explain that this spatial turn consists of three aspects: "space for the river, an integrated approach, and beyond structural measures". Land is needed for flood risk management; therefore, spatial planners and water managers have to cooperate (van Ruiten & Hartmann, 2016). Successful flood risk management depends on the integration of water management and spatial planning. Spatial flood risk management strategies, as a response to growing flood risks, do not only reduce the probability and consequences of floods but also aim to improve local and regional spatial qualities (Busscher et al., 2019). The paradigm shift thus has the goal of enriching its environment, next to improving water safety. A leading example in practice is the Room for the River program in het Netherlands which was initiated after the near river floods in 1993 and 1995. These events opened a window for policy change, namely a shift towards integrated water management where water management is combined with disciplines as spatial planning and ecology. The Room for the River program had a dual objective of flood protection and spatial quality (Rijke et al., 2012). From the beginning on, the spatial turn in the Netherlands has therefore been accompanied with calls for improving spatial quality.

An integrated approach to flooding, that includes spatial planning, minimizes flood risk. Still, van Herk et al. (2015, p. 85) add "that this has not always been recognized in practice and implementation is often still lacking". The Room for the River program taught us lessons about the integration of spatial planning and spatial quality into flood protection. Nevertheless, Rijke et al. (2012) conclude that there is a risk of losing those learnt lessons after completion of the Room for the River program. Through research on how spatial quality can be safeguarded in the process and be implemented in practice, this study aims to contribute to integrated flood risk management plans. Conceptualization of spatial quality is necessary to improve its structural place in the planning process. In section 2.2, spatial quality is further elaborated.

2.2 Spatial quality

2.2.1. Conceptualizing spatial quality

Spatial quality is difficult to define. Although the concept is often used and its importance is underpinned in literature, a definition of what makes a space 'qualitative' or not, is lacking. A common definition does not exist, it often comes down to the intention of doing something extra (Khan et al., 2014; Moulaert et al., 2013). However, in the context of spatial planning, adding different 'extra's' on top of each other does not necessarily result in the desired spatial quality (Khan et al., 2014). Besides, spatial quality is not quantifiable which makes it difficult to assess its effectivity and efficiency. Moreover, what spatial quality entails, depends on the views and mindsets of the involved actors (Klijn et al., 2013; Moulaert et al., 2013).

In trying to grasp the definition of spatial quality, it is essential to understand that landscape and its quality depend on personal biases. As van den Brink et al. (2019, p. 15) describe: "the perceived landscape and its quality is filtered through the preconceptions of the perceiver". The properties of the landscape and their effect on the perceiver are important to understand landscape quality (Daniel, 2001 in Oudes & Stremke, 2020). Elements that are associated with the experiential quality of space are, for example, human scale, comfort, meaningfulness, linkage and coherence, safety and security (Khan et al., 2013). Still, those elements cannot be seen independent of their context. They are the outcome of particular socio-economical, historical, environmental, and cultural contexts (Khan et al., 2013). Spatial quality is thus a negotiation between the involved actors and the multi-dimensional context. Hence, there is not one straightforward way to improve spatial quality which makes it difficult to operationalize. Still, in order to achieve spatial quality, it is important make the concept specific for its context (Busscher et al., 2019).

In literature, the reference to Roman architect Vitruvius' ideas often is made in conceptualizing spatial quality. The Vitruvius triplet states that good design comprises of three elements: utilitas (functionality), firmitas (firmness/solidity), and venustas (beauty) (Klijn et al, 2013). In this study, the Vitrivius triplet is used in order to analyze spatial quality in the Stadsdijken Zwolle project. The triplet has also been applied to the Room for the River program which is comparable to the HWBP. Moreover, in the Plan of Action (*Plan van Aanpak*) of Stadsdijken Zwolle, spatial quality is mentioned and described in relation to the Vitrivius triplet (Dijkzone Alliantie Zwolle, 2019).

In the Room for the River program, the Vitrivius triplet has been made specific for flood risk management. The three elements translate to user, experiental, and future values (Ruimte voor de Rivier, 2015). "User value refers to the usability, efficiency, and effectiveness of a physical structure and its surrounding space, experiental value refers to the perception and experience of it, and future value refers to the robustness and durability of the structures and the space" (Hooijmeijer et al., 2001, in Busscher et al., 2019). Aiming to increase those three values of an area (Ruimte voor de Rivier, 2015), the program translated the values into the following three criteria: hydraulic effectiveness, ecological robustness, and cultural meaning and aesthetics (Klijn et al., 2013). These criteria contribute to achieving the dual objective of the program that is accommodating higher flood levels while improving the spatial quality of riverine areas (Busscher et al., 2019).

2.2.2. Spatial quality in practice: barriers

Although spatial quality stood central in the Room for the River program, there are still barriers that prevent spatial quality from being implemented in practice. Four barriers from literature are discussed here.

First, research shows that often during implementation spatial quality is left out because of pressure on time and budget (Busscher et al., 2019). Balance between time, budget, and quality ought to be found in projects. However, in large flood risk management projects often there is no owner of (spatial) quality and it is not the primary steering principle. As a result, there is no party that benefits from this principle and, hence, finances it (AT Osborne, 2021). The implementation of resilient flood risk management plans requires large investments on the short-term while revenues will become clear in the long-term (Vis et al., 2003). In the HWBP, the waterboard responsible for the project contributes 10% to the projects' costs. The remaining 90% consists of 50% contribution by the HWBP and 40% by all the waterboards collectively. However, this 90% must explicitly be used to increase water safety (AT Osborne, 2021; College van Rijksadviseurs, 2020). Although, the costs of connecting spatial quality objectives to the flood protection project are often small in relation to the total project budget, it is difficult for the financing party to find sufficient budget. Opportunities to integrate spatial quality should be explored early in the process in order to arrange budget for this (Nationaal Deltaprogramma, 2021).

Second, the fuzziness of the concept "spatial quality" can form a barrier. Wiering & Immink (2006) mention the importance of being aware of the different meanings and uses of policy concepts. "Living with the water", "space for the river", and "accommodating the water" are examples of concepts that are multi-interpretable. They can mean something different to a water manager compared to a spatial planner. It is necessary to reflect on these different meanings because cooperation between the fields of spatial planning and water management will affect ideas on flood risk management (Wiering & Immink, 2006). AT Osborne (2021) adds that there is a need to establish a framework per project or program that gives substance to the concept "spatial quality". This will provide guidance on how to stimulate spatial quality in relation to other tasks at hand.

Third, absence of an integral approach and regional collaboration in flood risk management projects hinders increasing spatial quality (AT Osborne, 2021). "The lack of an integral vision or perspective established from early on in the process results in missed opportunities on spatial quality", AT Osborne (2021, p. 53) states. Moreover, an integrated approach to flooding contributes to minimizing flood risk (van Herk et al., 2015). Nevertheless, establishing a collective integral vision on a region is not easy and asks for an extensive participation process (AT Osborne, 2021).

Fourth, whether the promised spatial quality of a design will actually end up in implementation remains unknown because often the implementation is the responsibility of builders, contractors, dredgers, etcetera (Klijn et al., 2013). It depends on the type of contract to what extent the actors responsible for realization are involved in the design phase of a project. When contractors are involved from early on in the process, they can possibly contribute to the level of spatial quality that will end up being realized.

The barriers identified in literature obstruct securing of spatial quality in the planning process. Instruments to safeguard spatial quality in the process are thus crucial. Below, policy instruments and typologies of policy instruments are discussed.

2.3 Policy instruments

2.3.1. The tools of government

Policy instruments "are the 'tools of government', the mechanisms and techniques used to implement or give effect to public policies" (Salomon, 2002 in Howlett & Rayner, 2007, p. 2). Instruments are the means to reach the governments' policy goals, in this study, improving spatial quality (Knill & Tosun, 2012 in Verweij et al., 2021). Mees et al. (2014) use the following definition in their study: "a deliberate structured effort by governors to solve a policy problem by modifying actions of the governed" (Brukas & Salläs 2012 in Mees et al., 2014). To accomplish policy goals, these instruments usually make use of state resources (Howlett & Rayner, 2007).

Often, a mix of instruments, also called New Governance Arrangements (NGAs), is used. Important aspects of policy mixes are "(1) that they usually involve both substantive and procedural elements and (2) that the exact pairing of instruments has an important historical dimension" (Howlett & Rayner, 2007, p.5). Choices made in the past, which resulted in institutionalization, have to be considered. Besides, it is crucial that the deployed policy instruments support each other. A coherent set of goals in combination with a consistent mix of instruments is necessary to achieve the best results. This is realized through integrated policy design and implementation (Howlett & Rayner, 2007).

2.3.2. Defining policy instruments

Policy instruments are defined in different ways. They can be instrument-based or governance-/resource-based. Which policy instrument and how many of each policy instrument is exploited, determines the governance approach.

First, Mees et al. (2014) discuss the instrument-based categorization of policy instruments. Initially, the type of governance arrangement is identified which are 1) hierarchical (public) governance, 2) interactive governance, and 3) market (private) governance. In the first category, the government is the main actor. In the second, it is an interplay between the government and the market. In the third, governance is in hands of the market or civil society (Mees et al., 2014). Next, instruments are arranged in the following categories: legal (or regulatory) instruments, communicative (or informational) instruments, and economic instruments. These categories relate to how actors are steered; legal instruments to restrict or allow behavior, economic instruments affect cost-to-benefit ratio of different options, communication instruments to inform about options (Mees et al., 2014).

A second way of defining policy instruments is discussed by Hood and adapted by Howlett & Rayner (Hood, 1986 in Howlett & Rayner, 2007). Hood groups the instruments according to the governance resource on which the policy instrument is dependent to be effective. These resources are nodality (or

information), authority, treasure or the organizational resources (Howlett & Rayner, 2007). Hood added the category of "organization" to the three beforementioned categories operationalized by Mees et al. (2014). This categorization of policy instruments is called the NATO-typology. Figure 1 shows possible instruments related to one of the four mentioned governance resources. There is a distinction made between substantive and procedural instruments. Substantive instruments aim to affect the production of goods and services and their delivery in society. Procedural instruments aim to change policy processes (Howlett & Rayner, 2007).

	Principal Governing Resource Used			
	Nodality	**Authority**	**Treasure**	**Organization**
Substantive **General Purpose of Instrument Use**	Advice Training Reporting Registration	Regulation Self-Regulation Licences Census-taking	Grants User Charges Loans Tax Credits Polling	Administration Public Enterprises Policing Consultants Record-Keeping
Procedural	Information provision/ withdrawal	Treaties Advisory committees/ commissions	Interest group funding/ creation	Conferences Commissions of Inquiry Government Re-organizations

Figure 1: Adapted from Christopher Hood, The Tools of Government (Chatham: Chatham House, 1986). 124-125 and Howlett, Michael. "Managing the "Hollow State": Procedural Policy Instruments and Modern Governance." Canadian Public Administration. 43, no. 4 (2000): 412-431, in Howlett & Raynor (2007).

The first category of resources is nodality which concerns the collection, use, and distribution of information, provided by the government as center of the information network. As a result of this position, the government can detect and build information or a certain image. Also, this means they can strategically distribute the information to influence the concerned private and public actors (Hood & Margetts, 2007; Verweij et al., 2021).

The second category is authority referring to the governments' legal or official powers conveying what is expected of other actors. Authority is used to gather information and change behavior. Because of authority, a government can command, prohibit, commend, and permit. This translates into prohibitions, bans, standards, and permits in order to regulate or sanction actors (Hood & Margetts, 2007; Verweij et al., 2021).

The third category is treasure which concerns financial instruments to direct actors. They are on a voluntary basis, aiming to incentivize to perform certain actions (Verweij et al., 2021). This can take shape in the form of rewards for supplying the government with specific information or transferring money in exchange for goods and services or to someone deserving of it. Treasure also refers to the use of contracts to direct actors to handle in a desired way (Hood & Margetts, 2007).

The fourth category is organization, referring to "agencies, services, amenities, facilities or infrastructure provided directly by the government" (Stead, 2021, p.298). Often a combination of the three resources authority, nodality, and/or treasure make organizational tools possible. Still, they are described as a separate category by Hood (1986, in Stead, 2021, p.298) as "stock of land, buildings and equipment and … individuals with whatever skills they may have in the government's direct possession". It covers the capacity and capability of the government or available to it (Hood & Margetts, 2007). Organization thus also includes human capital. Nonetheless, the possession of human capital by the government, in relation to spatial planning, has declined in the past years due to outsourcing, contractualization, and hollowing-out of the government (Stead, 2021). Still, the government can solve this by hiring external expertise.

In this study, the NATO-typology is further operationalized for spatial quality in flood risk management. The argument for this is twofold. Firstly, previous research on policy instruments in the Room for the River program has also used the NATO-typology to categorize their instruments to increase spatial quality as well. The HWBP and the Room for the River program are situated in the same context (environmental, legal, and social) and are both initiated by the Dutch government. Hence, the two programs are comparable and, therefore, the NATO-typology is operationalized to categorize policy instruments used in the HWBP. Secondly, the addition of the category 'organization' adds a category including human capital to the informational, legal, and economical categories. This category is rather important in the Stadsdijken Zwolle case because of its use of hired expertise on spatial quality.

2.3.3. Operationalization of the NATO-typology

In this paragraph, the NATO-typology is operationalized by discussing the four resources of government in relation to flood risk management. The operationalization in table 1 is substantiated with instruments from the Room for the River program because most research in literature has been executed on this program. This results in a framework that helps analyzing the instruments used in case study Stadsdijken Zwolle.

***Table 1**: elaboration of the NATO-typology in relation to spatial quality in flood risk management and examples of (policy) instruments*

Typology	**Nodality**	**Authority**	**Treasure**	**Organization**
	Obtain, use, distribute information	Official/legal powers	Financial instruments	Capability and capacity of or available to government
In relation to flood risk management	Collect information/perspectives on spatial quality through local participation, integral design teams/sessions or from advisory bodies.	Establishment of frameworks that outline the desired spatial quality in a project and that serve as a benchmark	The use of financial means to steer the process and outcome of projects, that is the desired level of spatial quality	Using (external) capacity to give substance to spatial quality in the project who have the capability to span boundaries between different expertise and

				between the project and the external world
Examples of instruments	Area scan (RWS-Ontwerpt, 2020)	Inclusion of spatial quality in Tender documents (Verweij et al., 2021)	Use of different type of contracts (Verweij et al., 2021)	Landscape architect (Busscher et al., 2019; van den Brink et al., 2019; Verweij et al., 2021)
	Advisory body: Q-team (Busscher et al., 2019; Klijn et al., 2013)	Spatial quality objective in Administrative Agreement between public partners (Busscher et al., 2019)	Subsidies from program level: HWBP (HWBP, n.d.)	
	Participation process (Rădulescu et al., 2020)	Spatial Quality (Assessment) Framework (Nilessen & Kok, 2015; Nilessen, 2018; Klijn et al., 2013)		
	Design ateliers (Busscher et al., 2019; Waggonner et al., 2014)			
	Spatial Quality Cluster: coordination of spatial quality objective (Busscher et al., 2019; Verweij et al., 2021)			

Nodality

The governmental resource category nodality refers to obtaining, using, and distributing information by the government as centre of the information network (Verweij et al., 2021). One way to obtain, use, and distribute information is to co-create. This can take different forms. Executing an area scan before the start of a project is a way to collect information on the area where the project is located, which tasks do and which do not belong to the flood risk management project at hand, and how the tasks in the area relate to each other. The result is an integral scope determination (RWS-Ontwerpt, 2020). Additionally, information can be acquired on preferences and wishes from residents and stakeholders through a participation process (Rădulescu et al., 2020). Moreover, projects can set up design sessions where different specialisms gather in order to design together resulting in a design with combined knowledge that can add value to an area (RWS-Ontwerpt, 2020; Waggonner et al., 2014). Furthermore, the government can provide information on or support, for example, spatial quality in projects. An example of this from the Room for the River program is the adoption of the Q-team which gives advice on spatial quality to the project team and reports to the minister on the achieved spatial quality (Klijn et al., 2013).

Co-creation can be understood as a "creative and interactive process which challenges the views of all parties involved and seeks to combine professional and local expertise in new ways (Cottam & Leadbeater 2004 in Rădulescu et al., 2020, p.2). Such a co-creation process can add knowledge, expertise, and resources from involved stakeholders supporting innovation, resilience, and

sustainability. A balance between environmental, financial, and social aspects can be a possible result (Rădulescu et al., 2020). Rădulescu et al. (2020) distinguish several conditions necessary to make co-creation successful. First, stakeholders must be triggered to co-create out of urgency to link opportunities. Second, overall diversity of stakeholders is necessary while groups of stakeholders internally may benefit from homogeneity. Third, the problem must be well-defined to create common ground for participants of the co-creation process. Fourth, communication must be transparent to establish mutual trust among stakeholders. Fifth, stakeholders must be aware of their role and position in the co-creation process as a basis for collaboration. Sixth, tying the local community to the infrastructure project through a local government level can useful.

Co-creation is also used to integrally determine the scope of a project. In the form of design ateliers, opportunities can be connected, resulting in synergies (RWS-Ontwerpt, 2020). Besides creating support for the project, these ateliers provide insight into the scope of the project and how different issues can be combined in one integral area vision. Moreover, they help determining the desired level of involvement from the environment (RWS-Ontwerpt, 2020). The integral determination of the scope should take place prior to the exploration phase of a HWBP-project. RWS-Ontwerpt (2020) describes several benefits of an early determination of the scope such as finding solutions that are a better fit or even an increase of value for society, but also, determining the desired level of integrality: is the ambition good integration of the dike, integration in combination with synergies (*meekoppelkansen*), or even area development?

Although, the scope determination can best take place at the start of a project, co-creation occurs throughout the project. Often, the Q-team, participation process, design ateliers, and the Spatial Quality Cluster are recurrent instruments during the project (Busscher et al., 2019). To make design ateliers successful, they should be well-timed and sufficiently organised throughout the project. They result in local commitment which in turn should be complemented by political commitment to result in improved spatial quality. In the Room for the River program, this political commitment was laid down in an Administrative Agreement between public partners (Busscher et al., 2019).

As part of the Program Directorate of Room for the River, a Spatial Quality Cluster has been used to coordinate the spatial quality objective. The role of this instrument is as a facilitator of spatial quality in projects. The Cluster is responsible for “directing, facilitating, and monitoring the spatial quality objective of the program” (Busscher et al., 2019, p. 5). To illustrate, individual projects can ask the Cluster for support and assistance through a helpdesk or acquire formal assessments of their plan on spatial quality. The Cluster was supported by the Q-Team, an advisory body on spatial quality. Together, they visited and advised projects on spatial quality (Busscher et al., 2019). Three formal visits were arranged that were followed up by written recommendations to the project team (Klijn et al., 2013). To make the role of the Q-team successful, Klijn et al. (2013) concluded with two conditions. First, an explicit objective on spatial quality must be established. Second, the team should work independently with one clear task of securing spatial quality. The latter “requires that a formal role and competence must be attributed to the team, otherwise it is toothless” (Klijn et al., 2013, p.297). This does not mean that recommendations from the Quality Team should always be acted upon. However, it does mean their judgement should be trusted and backed by, in this case, the Room for the River program (Klijn et al., 2013).

The elaboration on examples of 'nodality' instruments above shows that in the past, they have been used in combination with each other. Design ateliers were part of the participation process but also of the area scan. The Q-Team and the Spatial Quality Cluster worked together on the program level. Accordingly, they were able to strengthen each other.

Authority

The resource category authority refers to legal powers of the government which they can use to steer actors' behaviour (Hood & Margetts, 2007; Verweij et al., 2021). In relation to flood risk management, and specifically spatial quality, authority can translate into to what extent frameworks are established to convey what is expected of actors.

A first example of an authority resource is the inclusion of spatial quality requirements in tender documents. To what extent spatial quality is defined in these documents, is important for the interpretation of the concept and, thereby, for the way it ends up in realization (Verweij et al., 2021). Room for the River gave extensive and ambitious substance to the definition of spatial quality on program-level. Besides, the program secured spatial quality, next to water safety, in their dual objective. Consequently, the Program Directorate experienced a collective responsibility to achieve these two objectives (Havinga & der Nederlanden, 2018).

A second example in the category authority is the administrative agreement. In an administrative agreement the spatial objective is defined between public partners, in the case of the Room for the River its Program Directorate and regional governments as waterboards and provinces (Busscher et al., 2019). At the start of the program, design alternatives were approached in a sectoral manner. After advice of the Q-team, an integral design approach was determined in the agreement to ensure all the established alternatives contained a basic level of spatial quality (Busscher et al., 2019; Havinga & der Nederlanden, 2018). Besides, agreements on task divisions and cooperation are included which ensure fast and effective implementation of measures (Van Stokkom, Smits & van Leuven 2005 in Busscher et al., 2019). Havinga & der Nederlanden (2018, p.187) conclude that "explicitly adopting an integral design approach as part of the project delivers a large range of qualitative solutions". Explicitly defining spatial quality as objective in the administrative agreement can contribute to higher spatial quality (Busscher et al., 2019).

A third example is the establishment of a spatial quality assessment framework. This instrument was included because spatial quality was a criterion in the evaluation of the Room for the River program (Nillesen & Kok, 2015). The evaluation was done by the Q-team that "evaluates flood risk interventions for their impact on spatial quality, using a predefined set of criteria" (Nillesen & Kok, 2015, p.5). The establishment of such a framework can help the project team in exploring the spatial setting of a project within a larger spatial context (Klijn et al., 2013). However, Nilessen (2018) notes that the framework established in the Room for the River context is applied at a regional scale, in a landscape setting. She proposed a revised framework for evaluating flood risk interventions and their impact on spatial quality at a local scale, in an urban delta setting. Moreover, this updated framework can be used to evaluate in an earlier stage of the development and does not require concrete design proposals (Nilessen, 2018). To make this instrument successful, a few requirements need to be met. First, sufficient data on expected changes in the water-level as a result of an area-specific flood risk

intervention are necessary. Second, this framework must be exploited by a team of experts that possesses knowledge on spatial quality as well as the local region. Also, the team must contain different expertise (Nilessen, 2018).

Treasure

Treasure indicates the financial instruments available to the government that allow them to steer actors. This can take shape as subsidies (Hood & Margetts, 2007). Projects of the HWBP are for 50% financed by the HWBP, 40% by all waterboards collectively, and 10% of the budget is the responsibility of the waterboard where the dike strengthening project is located (HWBP, n.d.). However, the budget share of 50% and 40% come from the "Delta Fund" (*Deltafonds*) which is only allowed to be invested in water safety (College van Rijksadviseurs, 2020).

Besides subsidies, treasure also includes the contracts used in projects. Different contracts are put in the market resulting in different outcomes. A contract as PD&C (Plan, Design & Construct) means the contractor is not solely responsible for the construction phase but also for the planning and design phase. This incentivizes, on a voluntary basis, the market to align those phases in order to work more efficient, faster and possibly deliver higher spatial quality (Verweij et al., 2021). Previous research on contract types by the Rijksuniversiteit Groningen shows that "the use of integral contract forms (Design & Construct, Planning Design & Construct, and Design Build Finance Maintain Operate) in the realization phase are promising but do not per se results in higher quality in projects" (Havinga & der Nederlanden, 2018, p.192). To make these types of contracts work successfully it is important to coordinate expectations on spatial quality between all involved parties to realize spatial quality (Havinga & der Nederlanden, 2018).

Organization

The last category of resources is organization which involves the capability and capacity of the government or available to it (Hood & Margetts, 2007). The employment of external expertise is an organizational resource. An example is the employment of a landscape architect. Landscape architects traditionally have the role of designing landscape interventions. Yet, they also have the role of process managers, where they participate in design workshops with decisionmakers and other stakeholders using design to bring different spatial functions together (van den Brink et al., 2019). In this role of the so-called boundary spanner, they "connect different actors and their interests, build trust between those actors, and help to improve coordination between decision-making and implementation" (van den Brink et al., 2019, p. 14). Havinga & der Nederlanden (2018) stated that spatial quality needs boundary spanners, especially in projects of high complexity. They connect organizations which may seem to disagree but actually have the same objectives. To make boundary spanners work successfully, their role has to be anchored inside as well as outside the program and project organization (Havinga & der Nederlanden, 2018).

2.4 Conclusion

Based on the literature review, several issues are identified. The concept of spatial quality is discussed in literature and is often narrowed down to the Vitrivius' triplet which is interpretated as user value, experiential value, and future value. Still, it remains a fuzzy concept because the meaning-making is subjective. That is, spatial quality is defined in the eyes of the beholder. This study analyses how spatial quality is discussed in practice and whether there is a difference with the conceptualization in literature or they correspond. Furthermore, literature provides us with knowledge on the instruments used to increase spatial quality in the Room for the River program. However, this program had a dual objective of water safety and spatial quality which is not the case for the HWBP. Therefore, this study aims to gain more knowledge on the instruments used to increase spatial quality in the HWPB and analyze whether this differs from the Room for the River program which had a dual objective. The NATO-typology offers the tools to analyze this process. This will provide insight into the current position of spatial quality in flood risk management practice and thereby diminish the knowledge gap on how to increase spatial quality in practice and how to safeguard spatial quality in the realization phase.

The case Stadsdijken Zwolle is analyzed to contribute to this debate. Therefore, first, the meaning-making process of spatial quality and, second, the instruments used to increase spatial quality in Stadsdijken Zwolle are studied. This will be done by following these research steps:

1) A closer look will be given to the context of Stadsdijken Zwolle by introducing the case. Also, the Room for the River program has taught us that the program-level has an influence on its projects. Therefore, as a first step, the role of the HWBP and the level of program steering in the Stadsdijken Zwolle project will be discussed.
2) The government can steer in different ways by using instruments of nodality, authority, treasure, and organization. Examples of these were found in the literature, however, knowledge on the operationalization of these instruments in the HWBP is still missing. This will be examined through a case study of Stadsdijken Zwolle. Literature has shown that certain mixes of policy instruments are successful, nonetheless, this does not offer tools for operationalization of the instruments in practice. This aspect is still underexposed which in turn this study aims to address. Therefore, factors of success are distinguished in order to provide tools for improving spatial quality in practice.
3) The meaning-making process of spatial quality will be elaborated. First, the initial ambition of the project will be discussed. Second, light will be shed on the meaning-making process of spatial quality. Third, an analysis of what level of spatial quality ended up in the realization phase of Stadsdijken Zwolle will be provided. This includes some visual references from the designs.
4) An overview will be given over the lessons learned in Stadsdijken Zwolle as suggested by the interviewees.

The next chapter discusses how this study is methodologically substantiated; what steps are taken to answer the research question.

3. Methodology

In this chapter, the methods used in this study to analyze spatial quality in water safety projects are substantiated. First, the use of a single-case study is elaborated. Second, the choice of the Stadsdijken Zwolle project as case study is justified and, consequently, the background of the project is sketched. Next, the three methods, desk research, semi-structured interviews, and participant observation are substantiated. Together they produce triangulation which is described at last.

3.1 Case study and case selection

A case study is a "detailed examination of a single example" (Abercrombie, Hill & Turner, 1984, in Flyvbjerg, 2006). Using this research method, a case is studied in depth within its real-world context which makes it a descriptive study (Flyvbjerg, 2006; Yin, 2018). Therefore, a case study is the preferred method of choice when the case under study cannot be seen separate from its context (Yin, 2012). Studying the conditions, the real-world context provides is necessary to understand the specific case (Yin, 2018). This research is based on a single-case study, thus focusing on one case only, which makes it possible to gain in-depth knowledge Stadsdijken Zwolle, specifically, about spatial quality. Consequently, as this project is part of the HWBP-program, conclusions can be drawn about the operationalization of spatial quality in this program. Because this research is focused on one case study only, no generalizations can be made between different projects. However, case studies are, like experiments, able to generalize from theoretical propositions. Therefore, the goal is to expand and generalize theoretical knowledge by doing analytic generalizations, in this case about spatial quality in water safety projects (Yin, 2018). This contrasts with statistical generalization where assumptions on a population are made based on empirical data collected from a sample of that population. A case study does not resemble a population. Hence, case study research is executed to shed empirical light on theoretical concepts (Yin, 2018). This study aims to gain knowledge from practice on the theoretical concept of spatial quality. Moreover, Stake (1995) adds that the goal of a case study is not to generalize but to particularize. A particular case is chosen to get to know it well and see what is does and not about seeing how it is different from others. Nonetheless, the lessons learned from this case study may apply to a variety of HWBP-cases, or even cases outside of this program or the Netherlands.

Stadsdijken Zwolle was chosen as the single-case study because it can be seen as a unique case. A first reason for this is the different types of environments the 7.5 kilometers long trajectory runs through. The project deals with protected nature area (Natura2000), the urban environment of the city of Zwolle, and an industrial area. This fact discards the possibility of one approach to spatial quality serving the whole trajectory. Besides, this project has been put into the market as a two-phases contract where the price is determined after the plan elaboration phase before going into the realization phase. This type of contract is increasingly used to maximize predictability and minimize risk. The contractor is involved in the plan elaboration phase and design process which support the realization of designs (Tauw, n.d.).

This study aims to demonstrate a complete picture of spatial quality specifically for Stadsdijken Zwolle. A sidenote should be made that the realization phase is not covered in this study because this phase

has not started yet. Nonetheless, it covers all phases until the realization phase, according to the MIRT(Multi-year Program for Infrastructure, Space, and Transport)-systematic. This process starts with, often after establishing an area scan or agenda, an exploration phase, followed up by the plan elaboration phase, ending with the realization phase (Ministerie van Infrastructuur & Milieu, 2016). By interviewing a variety of persons involved in the project, this study aims to provide a thorough description of the concept of spatial quality and its operationalization in practice.

First, desk research was done to gain insight into how spatial quality, its ambitions regarding this topic, and instruments used to achieve this, are described by the HWBP. Consequently, the same desk research was executed for the Stadsdijken Zwolle project. Second, this information was complemented with information acquired through semi-structured interviews. This data contributed to the meaning-making process of spatial quality in practice and deepened the knowledge about the instruments (substantive and procedural) employed to increase spatial quality in the project. Third, the researcher participated in several meetings (external and internal) to gain insight into how spatial quality is negotiated in practice.

3.2 Desk research

A first source of data are the literature and documents relevant to this case study. A distinction was made between scientific literature and grey literature. Scientific literature was studied to acquire knowledge on the concepts of, in example, spatial quality, policy instruments, (integrated) flood risk management. Grey literature mainly consists of archival data and key policy documents. First, (policy) documents of the HWBP were examined, predominantly on the role of spatial quality in the HWBP. This provided insight into how spatial quality is negotiated in the HWBP, the declared ambitions on and instruments that are introduced to improve spatial quality. Second, (policy) documents of the Stadsdijken Zwolle project were examined. The most important documents studied are the Plan of Action (*Plan van Aanpak*), Project Plan for the Water Law (*Projectplan Waterwet*), and the spatial integration plan (*ruimtelijk inpassingsplan*). A list of studied documents is shown in appendix 1.

Documentation can play a key role in data collection in case study research. Most important for case study research, documentation can confirm and enhance evidence from other sources, for example, interviews (Yin, 2018). Documents can provide specific details that add to the information of other sources. Possibly, information from documentation contradicts with data attained through interviewing which is a sign to dive deeper into the topic. Moreover, inferences can be made from document study which provokes further investigation. However, it is important to keep in mind that the documents are not written specifically for this case study but as a means of communication between other parties with another purpose than serving a case study. Hence, it is important to have a strong sense of the case study inquiry and keep focusing on the most relevant information (Yin, 2018). Accordingly, documents were studied solely with the topic of spatial quality in mind.

3.3 Semi-structured interviews

Interviews are one of the most important sources of information for case study research. They can provide us with the perspectives of interviewees on a specific topic. Interviews resemble a conversation rather than an inquiry where the line of questions is fluid instead of rigid (Yin, 2018). This study used semi-structured interviews hence questions are composed to structure the conversation. Besides, they help validating and elaborating on the information acquired from the desk research. The interviews were held in a timespan of two weeks in November 2021.

The interviews started with an introduction of the interviewer as well as the interviewee followed up by defining the concepts of spatial quality and instruments to create common ground. Next, the concept of spatial quality was discussed by asking questions on what spatial quality meant for the interviewee and how the interviewee would describe spatial quality in Stadsdijken Zwolle. Consequently, the interview dived into the subject of instruments, asking the interviewee about the instruments used to increase spatial quality in Stadsdijken Zwolle per phase in the project. Nonetheless, some instruments were not bounded to one specific phase but recurred throughout the project. Also, the interviewee's experience about an instrument was discussed, considering for factors of success and failure. Lastly, a reflection on the project in relation to spatial quality was debated, discussing milestones, lessons learned, and whether the ambition on spatial quality is fulfilled. For the complete interview guide, see appendix 2.

Table 2 provides an overview of the interviewees.

***Table 2**: interviewees in the case study*

Date	**Identifier**	**Function (**en**/***nl***)**	**Organization**
8-11-2021	R1	Executive board (*dagelijks bestuurder*)	WDOD
9-11-2021	R2	Environmental manager (*omgevingsmanager*)	Tauw
9-11-2021	R3	Design leader (*ontwerpleider*) (directs the design team)	Ploegam
10-11-2021	R4	Landscape architect *(landschapsarchitect)*	H+N+S Landschapsarchitecten
10-11-2021	R5	Permit manager (*vergunningenmanager*)	Tauw
15-11-2021	R6	Community worker Zwolle (*buurtwerker Zwolle*)	Travers Welzijn Zwolle
15-11-2021	R7	Project manager (*project manager*)	Dura Vermeer
16-11-2021	R8	Project manager Stadsdijken Zwolle (*project manager Stadsdijken Zwolle*)	WDOD
17-11-2021	R9	Executor (*uitvoerder*)	Self-employed
18-11-2021	R10	Advisor on heritage & spatial quality (*adviseur erfgoed & ruimtelijke kwaliteit*)	WDOD
18-11-2021	R11	Landscape architect (*landschapsarchitect*)	Municipality of Zwolle

The selection of interviewees was carried out based on their function in relation to the project. The goal was to interview a variety of persons involved in the project, from landscape architect to technical designer to contractor to advisor on spatial quality. Most interviewees were part of the "Dijkteam Zwolle", which is formed by the waterboard WDOD together with the market parties Ploegam, Dura Vermeer, Tauw, Fugro, and H+N+S landschapsarchiten. Some interviewees were closer to the project than others. For example, the executive board member and the neighbourhood worker from Travers Welzijn were less directly involved with spatial quality in the project than the design leader and the landscape and the environmental manager. With this selection of interviewees, a broad range of perspectives on (instruments for) spatial quality in general and specific for the project Stadsdijken Zwolle was gathered.

The interviews were recorded to enable transcribing afterwards. Recording, and transcribing, provides a more accurate construction of the interview opposed to taking notes (Yin, 2018). Taking privacy into account, each interviewee read and signed a form of consent. Transcription software was used to accelerate the transcription process. Afterwards, the transcripts were coded, according to the scheme as seen in table 3, and analyzed using qualitative data analysis and research software ATLAS.ti.

***Table 3**: codebook for the interviews*

Code group	**Code**	***Original Dutch Code***
Spatial quality in Stadsdijken Zwolle	Spatial quality	*Ruimtelijke kwaliteit*
	Milestone	*Mijlpaal*
	Synergies	*Meekoppelkansen*
Instruments	Quality Team	*Kwaliteitsteam*
	Twee fasen contract	*Two phases contract*
	Spatial Quality Framework	*Ruimtelijk kwaliteitskader*
	Note on Spatial Design	*Notitie Ruimtelijk Ontwerp*
	Landscape architect	*Landschapsarchitect*
	Design sessions	*Ontwerpsessies*
	Participation process	*Omgevingsmanagement*
	Plan of Action	*Plan van Aanpak*
	Spatial products	*Ruimtelijke producten*
	Dike Thinkers	*Dijkdenkers*
	Travers Welzijn Zwolle	*Travers Welzijn Zwolle*
	Financing	*Financiering*
Context	HWBP	*HWBP*
Reflection	Ambition	*Ambitie*
	Missed opportunities	*Gemiste kansen*
	Lessons learned	*Geleerde lessen*
	Successful	*Succesvol*
	Factors of success	*Succesfactoren*

3.4 Participant observation

The third and last source of data in this study is participant observation. As intern at Tauw, the researcher was able to work at the office of the project in Zwolle. Besides, the researcher was allowed to join several meetings. These were meetings such as a neighborhood evening to discuss the final design or the biweekly meeting on the design with all different people involved in the design. An overview of these attended meetings is found in appendix 3. In participant observation, the researcher is not solely a passive observer but also a participant, in this case, as part of an organizational setting (Yin, 2018). This provided significant opportunities in collecting information on the project for the case study. First, accessibility to groups or organizations is gained that normally are not accessible to study. Second, it opened a possibility to really study the case from within and acquire an insider perspective on the case. However, it should be noted that there is a higher chance of generating a personal bias when doing participant observation. Being part of an organization can make it difficult to retain an objective perspective on the case because the researcher becomes supportive of the organization, or it costs too much time to ask critical questions (Yin, 2018).

Besides, as a researcher, it is important to be aware of your positionality in the case study. As Skelton (2001 in Smith, 2016, p.98) states: “we are not neutral, scientific observers, untouched by the emotional and political contexts of places where we do our research”. The position of the researcher can influence the process of research. Besides, the researcher can be viewed as an outsider studying the case or as an insider in the studied context. This can affect the openness of the observed participants in sharing information. Therefore, as a researcher you should be aware of how your own identity is significant to or changes in different contexts (Smith, 2016).

Concludingly, participant observation can add to case study research but the researcher must be aware of its positionality in the studied context and the research must be exploited in a way that prevents a personal bias. This can be achieved by triangulation of data which is done in this study by accompanying participant observation as source of data by desk research and semi-structured interviews.

3.5 Triangulation

In his article, Yin (2018, p.46) explains that a case study “relies on multiple sources of evidence, with data needing to converge in a triangulating fashion”. Through triangulation of data is analyzed whether confidence can be taken in the interpretation of the gathered information about the observed phenomenon, in this case the project Stadsdijken Zwolle. This is called methodological triangulation (Stake, 1995). The use of three different methods, document analysis, semi-structured interviews, and participative research, constructs validity of the results from the case-study (Yin, 2018).

3.6 Ethics

In doing ethical research, it is of high importance to prevent biases. The researcher immerses himself in the theory and the chosen case beforehand. Based upon that information a hypothesis can be established. Nonetheless, it must be prevented that a case study is executed only to substantiate the preconceived propositions (Yin, 2018). Remaining subjective while holding interviews is crucial for the gathering of reliable data. To make sure this study does not sustain and elaborate preconceived perspectives on spatial quality in Stadsdijken Zwolle, the establishment of conclusions was postponed until all results had been assembled and written down.

Next to biases, ethical issues that were considered are confidentiality and anonymity. All the data collected was secured in a computer accessible by password only. Moreover, the information remained confidential. Interviewees remain anonymous and are described by their function in relation to the project. Lastly, participants were able to withdraw from the interviews when wanted (Longhurst, 2016). This information was all written down and send to the interviewee beforehand in a form of consent. These forms were signed by the interviewer as well as the interviewees.

4. Spatial quality in Stadsdijken Zwolle

4.1 Introduction to the case Stadsdijken Zwolle

In chapter 4.1, information on the project Stadsdijken Zwolle is given. Besides, insight into the process of a Dutch spatial planning project is provided where the systematic of typical project is explained. This systematic is then elaborated specifically for Stadsdijken Zwolle for the design process. Chapter 4.1 ends with a description of the program-project relation where the role of the HWBP in Stadsdijken Zwolle is discussed.

Stadsdijken Zwolle has been chosen as the unit of analysis in this study. As part of the HWBP, the urban dikes of the city of Zwolle will be strengthened in the upcoming years (WDODelta, n.d.). WDOD manages the dikes and is responsible for their functioning (Dijkteam Zwolle, 2021). The dikes, part of dike ring 53, protect the city of Zwolle and its hinterland. In 2015, it was detected that 7,5 kilometers of the trajectory of 8,7 kilometers of primary embankments did not meet the water safety requirements. In 2017, new water safety requirements (WBI2017), taking rising water levels because of climate change and more extreme weather into account, led to the conclusion that a trajectory of 7,641 has to be heightened and strengthened (Dijkteam Zwolle, 2021). The trajectory, shown in figure 2, runs from the Oostoever of the Zwolle-IJsselkanaal and het Zwarte Water, from the Spooldersluis to the estuary of the river Vecht. In total, the project consists of five sub-areas and nineteen sub-trajectories (Dijkteam Zwolle, 2021). In order to protect the city of Zwolle and its hinterland, the dikes have to be heightened and stabilized. Furthermore, the embankments have to be made resistant to piping, a phenomenon where seepage water streams underneath the dike (Dijkteam Zwolle, 2021). Currently, the final design is completed and a design for realization is established, following the MIRT-systematic.

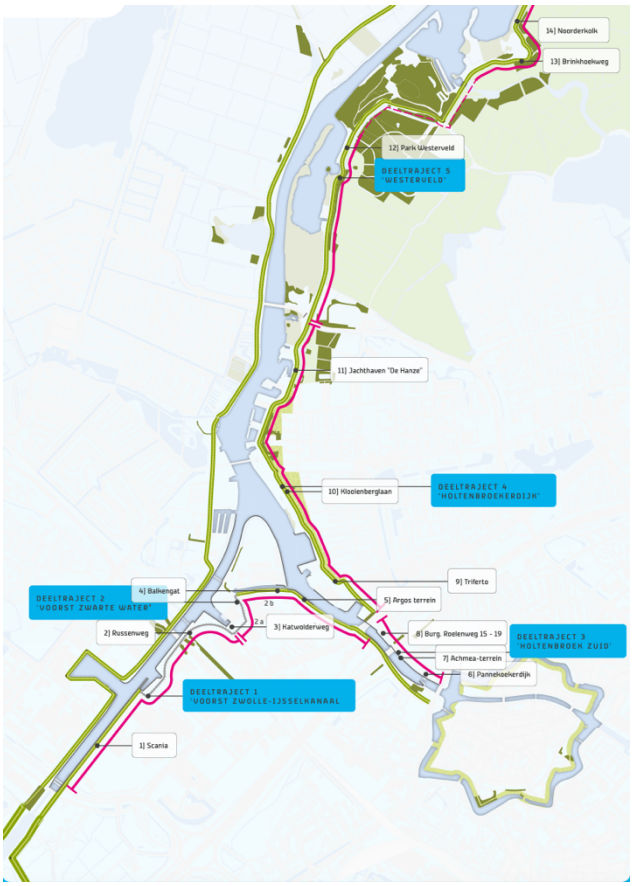

***Figure 2**: map of the trajectory of Stadsdijken Zwolle (WDODelta, n.d.a)*

MIRT, Multi-year Program on Infrastructure, Space and Transport (*Meerjarenprogramma Infrastructuur, Ruimte en Transport*) is a program where the State together with regions work on projects on the spatial planning of the Netherlands. Every project, as well as Stadsdijken Zwolle, is set up according to the MIRT-systematic as explained in figure 3 (Ministerie van Infrastructuur & Milieu, 2016).

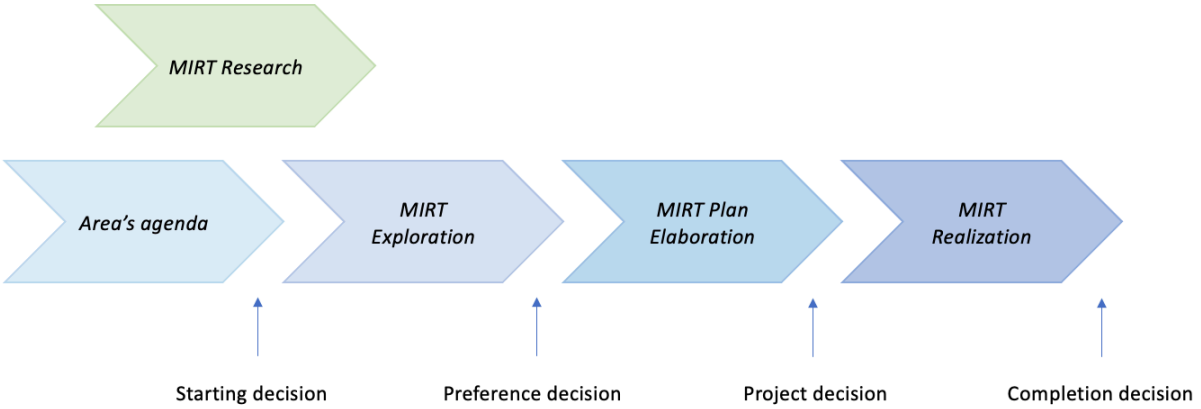

***Figure 3**: MIRT rules of the game, translated from Ministerie van Infrastructuur & Milieu (2016)*

In figure 4, the MIRT-systematic is explained specifically for the design process in Stadsdijken Zwolle. Because the project is now in the transition phase between plan elaboration phase and realization phase, there is no data gathered in this study on the realization phase. However, it is expected that no large adjustments are made to the design in that phase of the project. The plan elaboration phase consists of four design loops where in three of the loops (the arrow circles) the stakeholders are involved. The arrow circles consist of three phases which are 1) enriching: deciding on unambiguous design framework, 2) co-creation: generate and elaborate distinctive variants through participation, and 3) effectuation: objective specialists judge the variants (Dijkzone Alliantie Zwolle, 2019). In the first stage, the Dijkteam establishes a few alternatives which in the second stage are presented to the stakeholders. The second stage in the design loop refers to the co-creation as discussed in the literature review as part of the nodality instruments. Stakeholders are asked to provide input on the designed alternatives. In the third stage, the input from the participation process as well as the input from the Dijkteam is funneled into one alternative. Finally, the alternatives are judged on the assessment criteria.

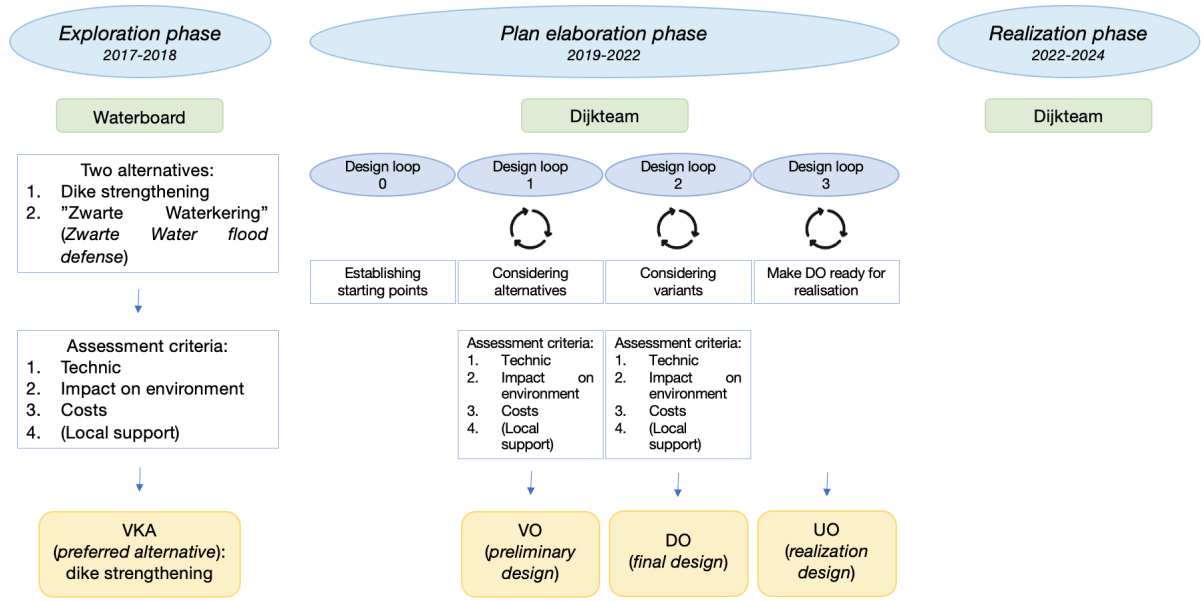

***Figure 4**: overview of the design process in Stadsdijken Zwolle (based on Dijkzone Alliantie Zwolle, 2019 and own research)*

The design is assessed on the following criteria: technic, impact on environment, costs, and local support. The last criterium is implicitly rather than explicitly assessed. It is not an official criterium, however, it is important for the project team to create a design that is supported by the stakeholders.

Besides these general assessment criteria for the design, specific criteria have been established on spatial quality. Figure 2 shows that the trajectory of Stadsdijken Zwolle consists of five sections which are in turn separated in smaller sections. Per section, an assessment of different variants has taken place with the desired spatial quality in mind. The following components have been taken into account in the choice for a variant (Dijkteam Zwolle, 2021):

1. Impact on current values/qualities
2. Good design and integration
3. Opportunity for future added value

Each consideration ends with advice on spatial quality per section of the trajectory, later mentioned as Advise on Spatial Quality (*Advies Ruimtelijke Kwaliteit*).

The project is not a technically complicated task. However, it is situated next to the city of Zwolle and, consequently, has to deal with the limited space available in the urban environment (Tauw, n.d.). Besides, the high dynamics of the city result in new spatial and social developments that move quickly (Dijkteam Zwolle, 2021). Moreover, the project has a lot of stakeholders among which are the waterboard Drents Overijsselse Delta, the municipality, businesses, and residents (Tauw, n.d.). Involving stakeholders to effectively take their demands and wishes into the project is high on the agenda of the project team (Dijkteam Zwolle, 2021). Stakeholders in this project are Travers Welzijn Zwolle, residents, landowners, tenants, local businesses, the Directorate-General for Public Works and Water Management (*Rijkswaterstaat*), province of Overijssel, municipality of Zwolle, and Natuur en Milieu Overijssel (WDODelta, n.d.). Lastly, the HWBP has program-project relation with Stadsdijken Zwolle which is discussed below.

Context: HWBP on program level

Stadsdijken Zwolle is part of the Dutch National Flood Protection Program (HWBP). This program aims to work smart and effectively with added value for the environment at acceptable costs and hindrance (Dijkteam Zwolle, 2021). On top of that, a goal of the HWBP is to secure sustainability and spatial quality in their projects by 2023. This is a result of the ambition of the waterboards and the State to establish a sustainable Soil, Infrastructure and Water Engineering sector (*Grond-, Weg- & Waterbouw-sector; GWW*) and the climate agreement which in turn led to the goal of dike strengthening projects being as climate neutral and circular as possible in 2030 (HWBP, 2020). In this study, the spatial quality in the Stadsdijken Zwolle project is examined.

Financing of the project is distributed as follows: 50% from the HWBP, 40% from all the waterboards together, and 10% for the waterboard executing the project. Thus, the HWBP subsidizes half of the costs. The slogan of the HWBP is “sober and effective” (*“sober en doelmatig”*). The project has to justify to the program that the design made is confirm this slogan which comes down to ‘not doing more than necessary’, according to project members. The spatial quality in Stadsdijken Zwolle is not allowed to

deteriorate but it does not necessarily have to improve, following the HWBP principles. Nevertheless, it is allowed to increase spatial quality of the area but this generally has to be financed by the waterboard. The program offers less possibilities to subsidize synergies. Those have to be paid for by the waterboard itself or involved stakeholders such as the municipality.

The HWBP acts primarily reactive in the project. The slogan "sober and effective" has not been concretized beforehand. As a result, the interpretation of that slogan is rather subjective, the boundaries between doing enough and doing too much are not that clear. After decisions on spatial quality have been made, the program level approves or disapproves. Hence, the HWBP does not necessarily steer on spatial quality, they react on concrete situations afterwards. Concludingly, the role of the HWBP has primarily been to create ambitions for all the HWBP projects beforehand and during the project to react on decisions made. Particularly, the end of the plan elaboration phase is an important milestone in the project. At this point, the HWBP determines whether the final design (*Definitief Ontwerp*) is approved and subsidy granted to the project.

In contrast to the Room for the River (*Ruimte voor de Rivier*) program, the HWBP does not have the dual objective of water safety and spatial quality. However, the HWBP has declared the goal of securing spatial quality in the processes and procedures of the HWBP by 2023 (HWPB, 2020). Also, securing spatial quality does not express the same ambition as the Room for the River program which aimed to improve spatial quality (Havinga & der Nederlanden, 2018). In Stadsdijken Zwolle, the goal of water safety appears to have higher priority than the goal of spatial quality. Members of the project team think that a dual objective, as applied in the Room for the River program, would contribute to higher spatial quality. The design leader of the project team (R3) confirms this, saying that *"it would have helped us if there would have been a goal in relation to spatial quality. Sober and effective stands at odds with one of our three demands 'good integration of the dike into its environment'. As a result, it is sometimes a bit of a search in establishing a qualitative design"*.

Nonetheless, the permit manager (R5) mentions that "*within the borders of 'sober and efficient' there are possibilities to increase spatial quality and this opportunity has to be seized*". The landscape architect of the municipality (R11) adds to this, stating that "*the HWBP pays serious attention to spatial quality and even reserves budget for this matter*". The executive board member (R1) agrees with this remark, declaring that "*the plans are of quality, however, the financial aspect cannot be lost out of sight*". The motto 'sober and efficient' does not conflict with increasing spatial quality, in his eyes, because requirements have been established which the plans have to fulfill (R1). He (R1) adds: *"sober and effective must be seen as a modern way of working with the environment, as the state of art. Otherwise, plans have to be changed multiple times and it will cost more than when you do it right the first time"*.

WDOD has set up a program team that focuses on developing a dual objective of water safety and spatial quality for upcoming HWBP projects. The aim is not to acquire more subsidy to increase spatial quality but to integrate spatial quality into the projects. Besides, the project manager (R8) says this has also to do with sustainability, stating that "s*omething of quality almost per definition is sustainable"*. He adds that a dual objective is a must when working on project with this large of an impact and it is troublesome that you will not, are not allowed to, or cannot put more energy into it. Moreover, a dual objective can work as an incentive to create more spatial quality. Nevertheless, the project manager

of (R8) notes that you have to beware the motto 'sober and effective' does not become an obstacle, saying that *"spatial quality can also be highly effective"*. The project manager (R7) substantiates this, noting that *"spatial opportunities have been missed that, in essence, did not have to cost more"*.

Concludingly, not everyone claims that the motto 'sober and effective' forms an obstacle for spatial quality, because spatial quality can also be effective, a dual objective will definitely support improving spatial quality.

Next, the (policy) instruments used in the Stadsdijken Zwolle project to increase spatial quality are elaborated, according to the NATO-typology. Figure 5 provides an overview of these instruments per phase of the project. Below, these instruments are further explained.

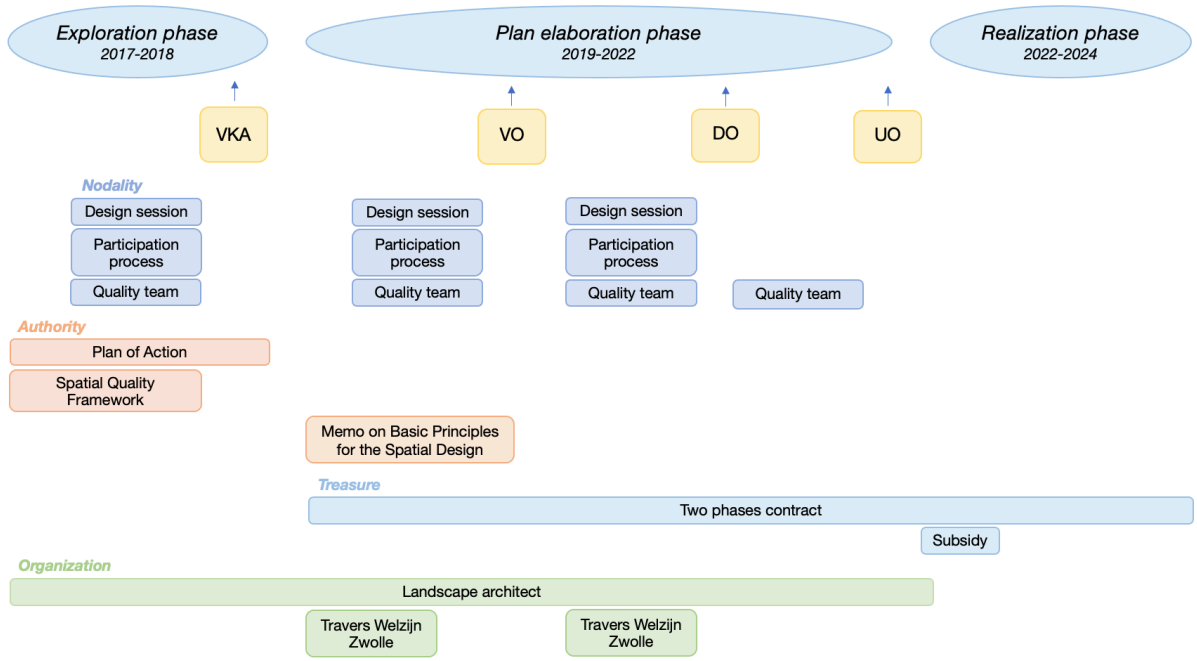

***Figure 5**: operationalization (policy) instruments according to NATO-typology for Stadsdijken Zwolle (based on Dijkteam Zwolle, 2021 and own research)*

4.2 Instruments: nodality

First, the category 'nodality' will be discussed. Nodality concerns the collection, use, and distribution of information provided by the government as center of the information network. Strategical distribution can influence the involved private and public stakeholders (Verweij et al., 2021). In the category nodality, Stadsdijken Zwolle made use of design sessions, the Quality Team, and put into place a participation process with the support of local community workers from Travers Welzijn Zwolle in the neighborhood Holtenbroek.

Design sessions (*ontwerpsessies)*

Design sessions have taken place from the start of the project. These sessions were of integral character, assembling different specialisms and perspectives on the meaning and operationalization of spatial quality. In the plan elaboration phase, these sessions were organized more frequently than in the exploration phase and also with a greater variety of disciplines at the table.

According to the design leader (R3), who introduced the design sessions, "*these sessions are the only way to get everyone on the same path*". Different disciplines have a different look on the design. By putting landscape architects and technical designers in the same room and work together on one drawing, it will become clear why something works and why not. The conversation between those different disciplines will lead to one result. Concludingly, the design leader (R3) declares he would make use of the design sessions in future projects.

"*At the start of the plan elaboration phase, before the establishment of the variants, integral design sessions with landscape architects, steward (beheerder), technical designers, water safety experts, executors (uitvoerders), and environmental managers*", the landscape architect (R4) explains. The project manager (R7) declares the integral design session as essential for the project's approach. "*In these sessions, the most fitting or appropriate solution has been chosen*" (R4). These early integral design sessions are valued highly by the landscape architect and the project manager (R4, R7) and contribute to spatial quality in their opinion. Later in the project, weekly or biweekly integral design meetings have been organized. In these meetings, the design is discussed from general to very detailed, technical issues. An important factor to make these design sessions successful is willingness of the participating people to listen to each other, be open to each other's story, and design in an investigating manner (R3, R8).

The role of the landscape architect in the design sessions is to combine the different objectives into one solution. According to the landscape architect, this is where the core of spatial quality lies. "*The challenge is to make the dikes safe again as well as creating the best possible design for everyone*. *The design sessions are an instrument to achieve that, although, the preparations between those sessions contribute to that as well*" (R4). Moreover, the landscape architect (R4) emphasizes the social role they have in the design sessions which in his/her opinion contributes to spatial quality. In literature, this role is described as boundary spanner (van den Brink et al., 2019).

Design sessions were also organized externally with stakeholders as part of the participation process.

Participation process

The participation process started in the exploration phase and was intensified, like the design sessions, in the plan elaboration phase. The participation process was set up by the stakeholder team. In every design loop, seen in figure 4, in the stage "co-creation", a participation process takes place. After organizing internal design sessions, external stakeholders were involved in the design process. The internally established design variants were then proposed to the external parties and feedback on these variants is collected. In the plan elaboration phase, ten participation moments were planned by the stakeholder team.

In the external design sessions local inhabitants, businesses, and interest groups participated. One group of participants in the participation process is called "Dike Thinkers" (*Dijkdenkers*). This group has been established by the waterboard and consists of inhabitants and people from interest groups that are intrinsically motivated to participate in the design process. "*Design sessions have also been carried out with the Dike Thinkers. Because of the large amount of people in this group, the design sessions generally discussed a larger part of the trajectory instead of zooming in on specific aspects of the design*", the environmental manager (R2) tells. The same design sessions were performed with businesses, although, these sessions were specifically focused on the location of the business instead of on a larger part of the trajectory (R2). A critical note is made by the landscape architect from the municipality (R11) that "*the municipality could have been involved from earlier on in the project to discuss the design*".

The participation process with inhabitants has been accompanied by the social workers from "Travers Welzijn Zwolle". A variety of meetings with the neighborhood have been arranged among which walk-in meetings and a design festival. "*At the design festival, people were brought together to discuss ideas and get information on the project and the design provided by the waterboard which gave the meeting an interactive character*", the community worker explains (R6).

An example where the participation process has led to a substantial adjustment of the design is at the harbor in the industrial area. The environmental manager (R2) explains that "*due to an idea of a stakeholder, and the fact that the project team was open to new ideas and again willing to explore those, tens of beautiful trees will stay, and two businesses will be located inlands. There are several examples of the participation process enhancing the design*". The landscape architect (R4) states that the voice of the neighborhood is important in achieving spatial quality. "*Their input is valuable to make good choices*" (R4).

The participation process is valued greatly. The landscape architect from the municipality (R11) states that "*the waterboard managed a successful participation process with the inhabitants which makes a difference for the spatial quality*". The board member of WDOD (R1) acknowledges this, commenting that "*the participation process is highly praised*".

Four factors contributed to making the external design sessions successful. First, the design leader (R3) explains that "*it is important to know what is going on in the area and have the right information available. This creates trust between the negotiating parties. Second, it is crucial to know the room of negotiation as this can prevent making promises to stakeholders that cannot be fulfilled*". Third, spatial products such as maps and images, created by the landscape architects, help in conveying the design and creating support from the stakeholders (R3, R4). Fourth, "*when involving the neighborhood in the participation process, join already existing groups and activities*", the community worker (R6) suggests. This lowers the threshold for inhabitants to participate in meetings. Moreover, the chance of reaching different communities increases.

Quality Team (*Kwaliteitsteam*)

The Quality Team for Dikes Overijssel (*Kwaliteitsteam Dijken Overijssel*) is an organization established by the province of Overijssel in 2017. "*Part of this team are the province, an ecologist, a landscape*

architect, the municipality, the waterboard, and "het Oversticht" which is a foundation advising on spatial quality and also the chair of the Quality team", the advisor of the waterboard (R10) says, who is also the secretary of the Quality Team Dikes.

The subject 'dikes' was underexposed in the Catalog Area Features, a steering instrument on spatial quality of the province of Overijssel. The province had a spatial perspective on dikes made by a landscape architect bureau which is a substantive instrument on province level for the HWBP projects. Furthermore, the Quality Team for Dikes Overijssel was organized. This local Quality Team watches and advises, solicited and unsolicited, on spatial quality in HWBP projects (R10). "*Before the end of each phase, the Dijkteam reports to the Quality Team with the purpose that adjustment can still be made*", the landscape architect (R4) mentions.

In comparison with the Quality Team of the Room for the River program, the Quality Team Dikes occupies a facilitating role instead of a judging role. The advisor of the waterboard (R10) notes that "*this instrument keeps the projects sharp on the subject of spatial quality. The organization of a feedback moment by the Quality Team Dikes makes the designer think about the spatial quality in Stadsdijken Zwolle and puts it high on their agenda. The meetings with the Quality Team put and keep the designers on the right path*".

The design leader (R3) adds that "*the Quality Team Dikes has a modest role in comparison to the Quality Team of the Room for the River program. The Dijkteam takes on the advice of the Quality Team Dikes which is generally to keep the dike a dike and not to put a lot of things on it. This is again in line with the motto 'sober and effective' of the HWBP*".

The landscape architect (R4) points out that "*the members of the Quality Team Dikes are not directly involved in the project Stadsdijken Zwolle and therefore have a greater distance to it. As a result, they are to a lesser extent able to steer specifically on certain aspects of the project. Their role is not per se to review but to guide, adjust, and give advice on how to approach certain matters*". The advisor of the waterboard (R10) agrees, pointing out the advising role of the Quality Team.

Lastly, the landscape architect (R4) mentions that "*the province is the authority to provide permits, the waterboard is the client, and the municipality is also an important stakeholder. Therefore, it is useful to take on the advice from the Quality Team Dikes and not to act against it*". Nonetheless, the landscape architect (R4) states that "*the Quality Team can also serve as backup to support the interest of spatial quality, considering the technical interest often outweighs the spatial interest. In Stadsdijken Zwolle the dynamic in the collaboration in the Dijkteam has been experienced as pleasant and, consequently, the backup for spatial quality was not that necessary*". However, the backup has at times been used to convince the municipality to invest in the spatial interest (R4, R8, R10).

The advisor on heritage and spatial quality from WDOD (R10) explains that to make the Quality Team work successfully: "*it is important to have a multidisciplinary team. They need to have a feeling of local developments, be competent and have experience with these kinds of projects. However, most importantly the team must consist of people from different disciplines as this will results in starting a discussion with each other on spatial quality which keeps everyone sharp*".

Looking forward, the project manager (R8) says that "*it would be better if the Quality Team is positioned closer to the project. The aim is to work towards a dual objective of water safety and spatial quality. On a social level, this is smarter and, eventually, also cheaper*".

4.3 Instruments: authority

Second, the category 'authority' as part of the NATO-typology will be discussed. Authority refers to the government's legal or official powers which convey what is expected of other actors (Verweij et al., 2021). In Stadsdijken Zwolle, a Plan of Action (*Plan van Aanpak*) was established by the market combination Dijkalliantie Zwolle. Besides, a spatial quality framework was created by H+N+S and WDOD which, consequently, was revised at the start of the plan elaboration phase as the Note on Spatial Design. What differs from the literature is the tender as instrument to increase spatial quality where in Stadsdijken Zwolle the tender did not play a large role. The tender focused on a successful process and not specifically on spatial quality. This is further explained in the paragraph on the Plan of Action.

Plan of Action (*Plan van Aanpak*)

The project is tendered on the criterium of best process with the main objectives of minimum (financial) risks and maximum predictability (Dijkzone Alliantie Zwolle, 2019). Spatial quality was not a criterium that had to be complied to in writing the Plan of Action. Predominantly, consideration is given to spatial quality through getting H+N+S landscape architects on board of the Dijkzone Alliantie Zwolle.

In the Plan of Action, an assessment framework on the design variants is included. One of the criteria, to achieve a compliant process, is spatial quality which is described as future value, user value, and experiential value. At the end of each design loop, with the preliminary and final design as result, the variants are assessed based on this framework (Dijkzone Alliantie Zwolle, 2019).

Besides, in the Plan of Action is described how synergies will be optimally integrated. As a result of insufficient financial means, synergies can be withdrawn from the project. Dijkzone Alliantie Zwolle aims to prevent this from happening and has established measures to enable the environment to suggest synergies without disrupting the design process. Specific moments to link synergies are set up, a design track is established parallel to the main design track until a final decision on the synergy is made, and when the administrative decision is made to incorporate the synergy, it will be integrated into the main design track (Dijkzone Alliantie Zwolle, 2019).

The Plan of Action is mainly focused on a successful process and, consequently, is not considered an instrument that greatly contributed to increasing spatial quality.

Spatial quality framework (*Ruimtelijk Kwaliteitskader*)

At the very start of the project, in the exploration phase, the landscape architect bureau H+N+S designed a spatial quality framework (*ruimtelijk kwaliteitskader*) in collaboration with the waterboard (H+N+S, n.d.). This framework is one of the first things established and is officially part of dike strengthening projects. The Spatial Quality Framework has been used to ensure spatial quality of the dikes and the environment in the process of funneling from all possible alternatives to the preferred alternative. The framework operates in a location specific manner, resulting in a design customized to the location, integrated into the landscape or urban environment, and creating added value (H+N+S, n.d.). It consists of a spatial analysis of the project area and the task at hand. In the spatial analysis, characteristics of the area regarding cultural history, water, recreation, and other important spatial aspects are elaborated. The landscape architect (R4) says that "*in the spatial quality framework, recommendations have been written down for spatial quality, for example, on viewing lines and the integration of the dike into its environment. It contains a detailed description and has created expectations for spatial quality in this project which have to be met ultimately. The ambitions of the waterboard are incorporated in the document but we have also explored additional opportunities and synergies*". An example is the investigation of opportunities for integrating the reconstruction of the floodplains with the dike strengthening project. Nevertheless, in this case other measures have been chosen to put through. Unique in this project is the fact that the landscape architect bureau who established the spatial quality framework is the same bureau that has been working with this framework during the rest of the project.

According to the design leader (R3), the spatial quality framework has added value to the project. Although, he (R3) mentions that "*the framework has become more dispersed instead of one final document in the final design (Definitief Ontwerp)*". Nevertheless, it still has the same goal and works the same way. The framework provides direction and starting points to begin with. Also, it provides tools for the technical employees to work with. Moreover, the advisor from the waterboard (R10) adds that "*an adequate spatial quality framework supports the environmental management in accommodating all the different interests. The framework provides a story along which environmental managers can balance ideas and preferences in the participation process*".

Two factors are identified that make the spatial quality framework a successful instrument in increasing spatial quality. First, it is important to describe in the framework where the spatial qualities precisely consist of. The concept of spatial quality has to be concretized. Do the qualities consist of the materialization, is it the quality of the solution, the quality of the integration, or is it a mix of those? (R7). He (R7) explains that "*you have to concretize that as early as possible, otherwise spatial quality will stay a floating concept*".

In Stadsdijken Zwolle, concretization of the concept spatial quality has been put into the hands of H+N+S, with great confidence. The collaboration between this landscape architect bureau and the other parties is based on trust and they are familiar with each other's way of working.

Second, "*it is essential to secure the role of the spatial quality framework throughout the different phases in the project*", the landscape architect from the municipality (R11) says. Especially when projects have a with a long duration, like water safety projects, this can become a challenge.

Besides the spatial quality framework made for Stadsdijken Zwolle, the province of Overijssel established such a framework on province-level. However, "*this framework remains rather general and does not propagate a vision on the complete area. This relates to the need for a vision on the whole project, instead of separated visions on the individual sub-areas, regarding spatial quality*", the project manager says (R8).

Memo on Basic Principles for the Spatial Design (*Uitgangspuntennotitie Ruimtelijk Ontwerp*)

The Memo on Basic Principles for the Spatial Design is an update of the spatial quality framework. The framework was made up to date to the task at hand by cutting out options that were not relevant anymore. Input from the participation process as well as from design sessions was processed in the note. At that time, there were no synergies, described by the landscape architect as connecting existing tasks. However, opportunities to do more have been detected and written down in this note. An example of such an opportunity is the rearrangement of the floodplains around the Klooijenberg, the neighborhood farm, to make it more attractive and increase its recreational value (R4).

These kinds of opportunities are identified in consultation with the concerned stakeholders, in this case the municipality, waterboard, and the Directorate-General for Public Works and Water Management (*Rijkswaterstaat*), local businesses, and local residents. Throughout the project, some opportunities will be left out, narrowed down, or news ones added.

In the Memo on Basic Principles for the Spatial Design, a distinction is made between on the one hand requirements specifically made by the HWBP and waterboard, derived from the spatial quality framework and further developed in the memo, and on the other hand ambitions to add spatial quality to the plan. Yet, spatial quality is only one of the considerations in choosing the right variant, next to costs and technique. When the future spatial quality did not weigh up to the financial and technical factors, sometimes variants were chosen that did not increase spatial quality and sometimes even deteriorated it in a specific area. In case of the latter, other solutions were found to make sure the spatial quality would not decrease.

The Memo on Basic Principles for the Spatial Design is seen as an important instrument according to the landscape architect (R4). In each phase of the project, requirements established in the memo needed to be verified. Substantiation was required if the requirements were not fulfilled.

4.4 Instruments: treasure

Third, the category 'treasure' of instruments concerns the financial instruments, aiming to incentivize actors to execute certain actions on a voluntary basis (Verweij et al., 2021). Stadsdijken Zwolle has been tendered with a two phases contract. Besides, the subsidizing on part of the HWBP has been important for spatial quality.

Two phases contract (*twee fasen contract*)

Stadsdijken Zwolle has been tendered in a two phases contract. In this project, this type of contract implies that the combination that wins the tender, will be involved in the plan elaboration phase as well as the realization phase. Furthermore, it has also been decided that the budget of the project will be determined by the market parties and waterboard together after the plan elaboration phase, when the final design (*Definitief Ontwerp*) is ready. In the final design plans are more precise and most risks have been identified. Besides, the contractor has already been involved in the planning phase, and this knowledge on the execution of the project makes a solid plan. Based on this solid plan a realistic budget for realization can be estimated.

A reason for choosing this type of contract is maximum predictability and minimalizing of risks which are also the main objectives of this project (R7, Dijkzone Alliantie Zwolle, 2019). Water safety projects, especially HWBP projects, are usually large projects with a large time span. This increases the possibility of overrunning time and budgets. All extra costs made, overrunning the budget, are responsibility of the waterboard. Stadsdijken is a rather complex project due to its surroundings, located partly in the city of Zwolle and partly in a protected nature area. The two phases contract provides more control by providing increased predictability and minimalization of risks.

This in an advantage of the two phases contract in contrast to contracts where the budget is often part of the Plan of Action of the tendering party. Spatial quality can be left out due to pressure of overrunning time and budgets where the former is considered as "luxury that costs extra money" (van Twist et al., 2011, p.15, in Busscher et al., 2019). Thus, tension between spatial quality and financial means exists. However, when the budget is set after the final design is created where spatial quality is incorporated and guarded, the chance of leaving spatial quality out possibly decreases.

The two phases contract is not an instrument that per definition increases spatial quality. This depends on the way substance is given to the contract. Nonetheless, the use of this type of contract offers possibilities to safeguard spatial quality into the realization phase. When different parties are responsible for the planning phase and the realization phase, spatial quality can be lost in the transition from the one to the other phase (R8). The project manager (R8) adds that "*when a contract is not tendered in two phases, the engineering party responsible for the plan elaboration phase hand the design over to the contractor in the realization phase and, consequently, loses ownership over the spatial quality in the design. Therefore, the importance of spatial quality can be lost when it is not secured in the project*".

This instrument has been positively experienced by project members. The design leader (R3) says that "*this contract creates a bridge between the drawing board and the outside world. Through involvement of the contractor in the plan elaboration phase, drawings will be correct and the right inspections will be executed which will save time in the end. Having the knowledge on realization available in the plan elaboration phase, most risk will be identified and tackled before realization starts. The remaining risks are calculated. This also prevents discussions on the contract later on in the project*". The executive board member (R1) agrees, saying "*this type of contract can improve control in the realization phase*". Nevertheless, he mentions the use of this contract is still rather new and, therefore, still has to prove

itself. Lastly, the two phases contract helps in securing information from the start, through the different phases, to the realization.

"*In order to make the two phases contract work successfully, thought needs to be given to other securing principles, to make sure the project does not overrun in budget*", the project manager (R7) mentions. In Stadsdijken Zwolle, pricing of the realization therefore takes place through checks and balances. Through value engineering, in which functions are added, prestation enhanced or costs decreased, costs of the project are optimized (WDOD, 2017). In this way, analysis is executed to guarantee the waterboard will not pay too much for the realization and the price is market conform. Moreover, a "cost table" ("*kostentafel"*) is organized under the direction of experts on budgeting investigate whether the collaboration between market parties and the government works as it was conceived at the start (WDOD, 2017). This team also advises the board of the waterboard on the developments. The project manager (R7) adds that "*it takes administrative courage (bestuurlijk lef) to work with this type of contract because the waterboard has to trust on their collaboration with the market parties*".

In projects with a lower degree of complexity and a clearly framed task, the use of a traditional contract is more appropriate because that attracts a free play of market forces. Complex in this case, is not technical complexity, but rather juridically complex (R8).

Subsidizing by HWBP

The project's costs are for 90% covered by the program level, the HWBP. Of this percentage, 50% is paid for by the State and 40% by all the waterboards together. That leaves 10% for the waterboard itself (HWBP, n.d.). "*The subsidy is only granted to the project when it is conforming the program's motto: "sober and effective""*", the design leader (R3) states. Accordingly, it is up to the project to justify their design is sober and effective. The design leader (R3) declares that "*the program's motto conflicts with one of the three main objectives of the project: good spatial integration*". The subsidy scheme of the HWBP thus complicates increasing spatial quality. It is not made impossible; spatial quality can be achieved within the established scheme, the permit manager (R5) and design leader (R3) mention. Still, subsidy scheme of the HWBP is overall negatively valued in increasing spatial quality.

4.5 Instruments: organization

Fourth, the category 'organization' as part of the NATO-typology will be discussed. Organization refers to the provision of staff, building, and technology as government's resources (Verweij et al., 2021). In this category, Stadsdijken Zwolle made use of a landscape architect to improve spatial quality in the project. Furthermore, community work organization "Travers Welzijn Zwolle" was deployed as an intermediary, supporting the local inhabitants in the participation process.

Landscape architect

The landscape architect is a crucial instrument in increasing and safeguarding spatial quality in the Stadsdijken Zwolle project. In this project, H+N+S landscape architects has been involved from the beginning of the project until realization. They assisted in writing the Plan of Action (*Plan van Aanpak*) in the tender phase in which the market parties, under the name "Dijkzone Alliantie Zwolle", wrote their approach to the project. In the assignment from WDOD, no specific criteria on spatial quality were formulated. In the Plan of Action, an assessment framework for the different designed variants has been established. One of the criteria in this framework is spatial quality which they describe as future value, user value, and experiental value (Dijkzone Alliantie Zwolle, 2019). Nonetheless, considering spatial quality is not a criterion for the Plan of Action, the responsibility for spatial quality is predominantly handed to the landscape architects in "Dijkteam Zwolle", the project team combining the market parties and the waterboard.

In the initiation phase, H+N+S established a spatial quality framework in collaboration with the waterboard. Exceptional about the participation of H+N+S in the project is their contribution to the spatial quality framework, before the market parties were involved, and their presence in the contractor combination Dijkzone Alliantie Zwolle from the exploration phase onwards. As H+N+S has been involved from the very start until the realization phase, continuity of their role in the project team has been guaranteed. This has been greatly valued by the members in the project team. It means the point of contact for the spatial design has been constant throughout the project. Moreover, the landscape architects have been able to design spatial quality but also safeguard their designs, and thereby the ambition on spatial quality, throughout the different phases and decisions made at the end of each phase.

The landscape architect in the Stadsdijken Zwolle has taken up two different roles.

Firstly, they have the traditional role of designing spatial quality by creating spatial products such as drawings, sketches, maps, and posters. These products have been used as input for conversations between the project team and stakeholders but also between different members of the project team. The designed products can contribute to communicating plans to and creating support from stakeholders. Moreover, the products can make plans more concrete and tangible for stakeholders which supports the participation process. When people engaging in the participation process understand the plans, they will consequently be able to provide suitable input which in turn strengthens plans (Burby, 2003). Because the landscape architect cannot be present in all meetings with stakeholders, the designed spatial products can talk for them. In this way, the spatial products are a method of communication.

Secondly, they have acquired the role of boundary spanner. The landscape architects carried a connecting role in the Dijkteam as well as between the Dijkteam and the external stakeholders. In conversation with local residents and stakeholders, solutions have been found that have increased the spatial quality of plans. "*Sometimes*", the landscape architect mentioned, "*local residents do not precisely know what they want but through conversation, their wants become clear*". The landscape architect (R4) adds that: *"you cannot find a good solution when there is no one to discuss it with"*. In this situation, the landscape architect can be a boundary spanner between the desires of the local

residents and stakeholders and the rather technical design made by the landscape architect or technical designers in the Dijkteam.

Furthermore, the landscape architect can be regarded as a boundary spanner between the different disciplines in the Dijkteam. They stimulate the integrality in the project team, connecting for example the technical, financial, environmental and spatial aspects of the project. In order to take on this role of boundary spanner in the project team, the landscape architect must be allowed to take this place which has been the case in Stadsdijken Zwolle. This connecting role, protecting the integrality in the project team, is important to make decisions on the design. In Stadsdijken Zwolle this was the case, the landscape architect (R4) says: *"the integrality has always been part of it which is not self-evident is this kind of projects. This is an important aspect but, therefore, also a unique one"*.

Different factors contribute to making the landscape architect successful in increasing spatial quality. First, "*the landscape architect has to be involved from the start of the project. When they are involved from later on in the project, their contribution will not have added value*", the design leader substantiates (R3). Second, they have to be embedded and be an integral part of the project team. The project manager acknowledges the latter, stating that "*the role of the landscape architect needs to be top-down anchored in the project team*" (R8). Third, budget has to be reserved to enable the landscape architect. Otherwise, all the aspects that add spatial quality will be eliminated eventually. As the design leader states: "*the client has to be aware what he wants to pay for spatial quality"* (R3).

A critical note on the role of the landscape architect in the project team, is the amount of responsibility for spatial quality in their hands. The landscape architect states that: "s*patial quality should maybe be regarded as more important by the client. It is formulated as one of the main objectives, however, there is no one who checks it or is accounted for it. The compliance of spatial quality is rather limited"* (R4).

Possibly another landscape architect or an objective party as a Quality Team, next to H+N+S would have strengthened the position of the landscape architect in the project team. Besides, this would have offered a sparring partner for H+N+S to discuss the design with. The urban planner from the municipality of Zwolle (R11) notes that in the future, the municipality could occupy the role of sparring partner. Next to strengthening the position of the landscape architect, this can facilitate the collaboration between the project and the municipality and, consequently, create a more integral approach. Opportunities for area development can then possibly be seized. However, the municipality would therefore have to be on board of the project from the imitation phase.

<u>Community workers "Travers Welzijn Zwolle"</u>

The role of community workers "Travers Welzijn Zwolle" in the project is supporting the inhabitants of the surrounding neighborhood Holtenbroek in the participation process. The community workers made sure that parties from the neighborhood became involved and represented themselves in the participation process. The collaboration between WDOD and Travers Welzijn started at the beginning of the project. Travers had been involved in neighborhood participation processes before. Inhabitants of the neighborhood indicated that they were not content with their participation in the past because they did not feel heard and not all inhabitants were reached. When the Stadsdijken Zwolle project started, Travers was asked to join again because of their large network in the neighborhood and their

affinity with these kinds of projects, the community worker narrates (R6). Accordingly, an objective was to make the neighborhood feal heard again.

An important factor to make the participation process successful, according to the community worker (R6), is to join already existing groups and activities. The community worker (R6) mentions that sometimes it was a challenging role as intermediary between the neighborhood and the project because the objective of the waterboard, good integration of the dike in its environment, at times clashed with the wishes of the neighborhood. Nonetheless, the environmental manager (R2) states that Travers evidently contributed to increasing spatial quality, especially with regard to the experience of the inhabitants.

4.6 The meaning-making process of spatial quality

Initial ambition on spatial quality in Stadsdijken Zwolle

The main system objectives formulated at the start of the project are 1) water safety, 2) integration of the dike in its current environment with conservation of current spatial quality and functionality, and 3) realizing synergies. The first objective has the function of flood protection, the second of integration into its environment, and the third of increasing spatial quality (WDODelta, 2018). Hence, the ambition for spatial quality is conservation of the current spatial quality and connecting synergies to the project. The specific interpretation of the concept has been left rather free and up to the landscape architects. Keeping in mind the motto 'sober and effective' of the HWBP, who subsidizes the project for 90%, spatial quality was not allowed to worsen but also not necessary to increase. Especially the second objective is determinative for the ambition on spatial quality and steers how spatial quality is managed in this project, the landscape architect (R4) mentions. *"The spatial quality is not allowed to decrease but we also do not find it interesting to increase it. That is a large difference with projects in the past, like Room for the River (Ruimte voor de Rivier) projects."* (R4). Still, there is the objective of connecting synergies aiming to increase spatial quality.

Making meaning of spatial quality in practice: Stadsdijken Zwolle

If a project aims to achieve spatial quality, it is important to make the concept specific for its context (Busscher et al., 2019). Therefore, this study tried to unravel the meaning-making process of spatial quality in the context of Stadsdijken Zwolle.

In the conceptualization of spatial quality in chapter 2.2, it is noted that spatial quality is rarely defined in explicit terms. A definition of what makes a space 'qualitative' is lacking (Khan et al., 2014). Moreover, what makes a space qualitative, is based on personal biases. Space and its quality are filtered through preconceptions of the perceiver (van den Brink et al., 2019). However, in conceptualizing spatial quality, a reference to the Vitrivius triplet is often made which declares that good design is comprised of three elements: utilitas (functionality), firmitas (firmness/solidity), and venustas (beauty) (Klijn et al, 2013). This triplet has also been used in the Room for the River program

where it is translated to hydraulic effectiveness, ecological robustness, and cultural meaning and aesthetics (Klijn et al., 2013).

In Stadsdijken Zwolle, an assessment framework on the different variants of the dike strengthening assignment (*beoordelingskader varianten*) has been established. At the end of each design loop, the different design variants are assessed on the criteria in this framework. One of these criteria is spatial quality, described by the Alliantie as future value, user value, and experiential value, based on the Vitrivius triplet as described in chapter 2 (Dijkzone Alliantie Zwolle, 2019). Subsequently, by means of conducting interviews, knowledge on how this concept is discussed and implemented in practice is established.

In discussing spatial quality in practice, it is important to recognize that differences in personal backgrounds and specializations may influence the way people interpret the concept. The environmental manager and the social worker are in contact with stakeholders and people living in the neighborhoods surrounding the project. They consider the social aspect as an important part of spatial quality; the space has to be designed keeping in mind the people that make use of it. The dike has to function as the outdoor space for the people living there (R2, R6). The landscape architect supports the social aspect, saying that people are a crucial part of the perception of a design. Moreover, it is a basic right of people to live in a pleasant environment (R4). Besides, with a background in landscape design, the landscape architect has a view on what spatial quality means as a concept and what it means in a dike strengthening project (R4). People in the project that are also highly involved with the design of the project, among which the design leader, the urban designer from the municipality, the project managers, are able to describe what spatial quality means to them and what it means for the project (R3, R7, R8, R11). People in the project that are of greater distance to the design, do not express such an apparent view on spatial quality, among which are the board member and the constructor. The constructor emphasizes the practical side of a design that contributes to the quality in his opinion (R9). He explains that in his eyes spatial quality also means that the environment "*remains clean and uncluttered which can be achieved by regularly placing bins that are well accessible*" (R9).

In relation to the project Stadsdijken Zwolle, the following descriptions of spatial quality are portrayed.

Firstly, spatial quality is frequently described as functional. The space has to correspond with how it is used. The dike should be integrated into the environment in a way that justifies its current functionality and users which adds to the livability of the area (R2, R3, R4, R5, R7). It should be designed with the users of the environment in mind (R2, R4, R6, R7, R9). This aspect of the description of spatial quality can be seen in relation to the user value, as part of the Vitrivius triplet.

Second, as part of the element experiential value, spatial quality is repeatedly described as integration and alignment of the dike into its environment (R3, R7, R10, R11). This should be established with a design that embodies simplicity, unity, logic, and is often about doing less rather than more (R4, R7, R10, R11). This corresponds with the following statement of the advisor on heritage and spatial quality (R10): *"the dike is the piece of art. It does not require a cherry on top".*

However, this sometimes clashes with the wishes from residents in the neighborhood, collected through the participation process, whose requests often involve different objects on and around the

dike (R6). The advisor on heritage and spatial quality (R10) explains: *"spatial quality should not be seen as strengthening of the dike plus as many synergies as possible because that is not what spatial quality entails. Spatial quality is when looking at the dike within a larger context, what are then the right solutions for the dike? How to keep it looking calm and naturally, as if it was never designed in the first place".* Moreover, the design has to be connected to the specific context of the area, creating or associating with the local identity (R2, R3, R7, R10, R11).

Next, green is an important aspect of spatial quality, especially in this project where much attention is given to the conservation of historical trees (R1, R2, R6). Lastly, the space should be well maintained in order to be of high spatial quality (R2, R9).

Maintenance also component of the third category, that is future value. Low maintenance adds to the quality of an area (R9) and is also part of the criteria in the plan of action (*Plan van Aanpak*) phrased as Life Cycle Costs. The design has to be manageable and maintainable (Dijkzone Alliantie Zwolle, 2019). Furthermore, the design should be robust (R2, R8) and sustainable (R1, R2, R8) in order to last a long time. Lastly, the design is also prepared for future synergies in order to increase the future value. The design should be linked to the current situation but also to a possible future situation (R4).

However, spatial quality results from a coherence between the different trajectories. "*They should not be designed as separate entities but as a whole. The dike has to be approached from a broader perspective, thereby increasing the scope of the project. Besides coherence between the different trajectories, the three elements of the definition of spatial quality, experiential value, user value, future value, must not be seen as separate but as coherent*", the advisor on heritage and spatial quality (R10) tells.

<u>Final spatial quality in Stadsdijken Zwolle</u>

Three levels of spatial quality are formulated, that are from low to high spatial quality (Havinga & der Nederlanden, 2018):
1. Spatial integration
2. Spatial integration with synergies
3. Area development

The ambition on spatial quality at the start of the project was defined by WDOD as integration of the dike in its current environment with conservation of current spatial quality and functionality, and realizing synergies (WDOD, 2018). With that in mind, most interviewees state that within the limits of what was possible, the ambition on spatial quality realized. In Stadsdijken Zwolle, the achieved level of spatial quality can be described as spatial integration combined with some synergies. In total, five synergies have been seized in the project. Hence, the spatial quality has ended up in the project on a medium level as spatial integration with some synergies.

The following five synergies have been integrally assimilated into the design (Dijkteam Zwolle, 2021):
1. Replacement of the sheet pilings of the Directorate-General for Public Works and Management (*Rijkswaterstaat*) alongside the "Zwolle-IJsselkanaal";
2. Preparations for creating a recreational route alongside the "Zwolle-IJsselkanaal" in the future;

3. Integration of a footpath on the “Zwarte Water” boulevard in collaboration with the municipality. Arrangements on financing and realization are made in collaboration with the municipality in the final design (*DO*) phase;
4. Rearrangement of the environment of the neighborhood farm “Klooijenberg”. Some of the wishes and requirements of the municipality and local inhabitants, gathered through the participation process in collaboration with Travers Welzijn, are taken into the final design (*DO*) phase. Arrangements on financing and realization are made in collaboration with the municipality and Travers Welzijn in the final design (*DO*) phase;
5. Pumping station “Westerveld” is renewed on its current location and made migratable for fish.

Nevertheless, the interviewees state there was potential for more synergies (R2, R4, R5, R8, R10, R11). One of these, is the opportunity for area development in the beginning of the project. However, this opportunity has not been taken due to possible project overrun in time and budget. This relates to the article by Busscher et al. (2019) which explains that in projects where budget and time are in threat of overrunning, spatial quality is often put away as unnecessary luxury.

In the spatial integration plan, the status of the preliminary design (*VO*) is determined. The spatial integration plan is a visual elaboration of the Spatial Quality Framework (Ruimtelijk Kwaliteitskader), the Memo on Basic Principles for the Spatial Design (*Uitgangspuntennotitie Ruimtelijk Ontwerp*), and the Advice on Spatial Quality (*Advies Ruimtelijke Kwaliteit*) (Dijkteam Zwolle, 2021a). It provides an elaboration of spatial quality which is refined in the final design (*DO*). The document states that “*to achieve a qualitative spatial integration it is crucial to think integrally and multidisciplinary about use of materials, consistent use and detailing of road-surfacing, furnishings, plants, hydraulic engineering objects, stairs, fencing, etcetera*” (Dijkteam Zwolle, 2021a, p.16).

Figure 6 shows the trajectory with the desired visual quality per area.

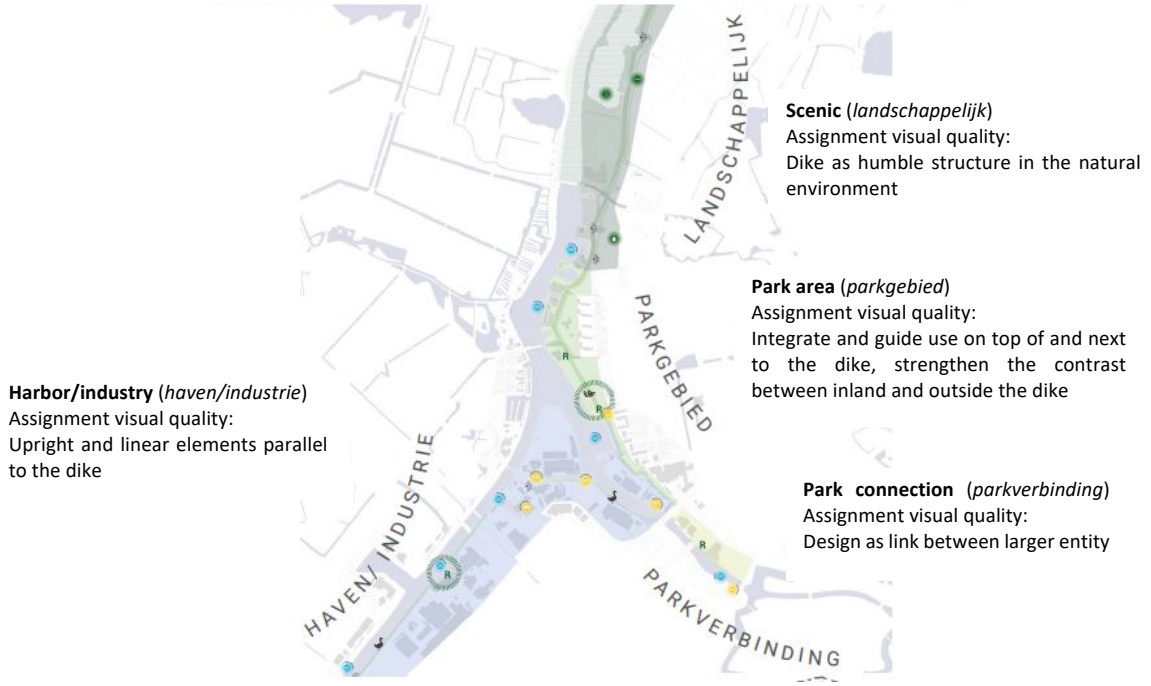

***Figure 6**: visual qualities per area of the trajectory (Dijkteam Zwolle, 2021a)*

Figure 7 shows a visual representation of three of the above-mentioned areas. Besides, Dijkteam Zwolle (2021a) provides an explanation of the important visual qualities of the area are described which have been taken in mind in the creation of the design.

Harbor and industrial area
(*haven en industrie gebied*)

Iconic qualities for this area:
- Rectilinearity of canal
- Characteristics of the harbor and industry, in combination with recreation
- Linear elements (fencing, road-surfacing, etcetera)

Outline of the park
(*parkrand)*

Iconic qualities for this area:
- Tree meadow and existing green structures
- Activities and destinations in a park setting
- Contrast between the green zone of neighborhood "Holtenbroek" versus natural floodplains
- Accessible foreland and connection with water

Scenic area
(*landschappelijk gebied*)

Iconic qualities for this area:
- Grand nature view, wet foreland with reed
- Preservation of asymmetrical "Zuiderzeedijk"-profile as much as possible (gentle outer slope, steep inner slope)
- Dike is positioned high in the landscape with view onto its surroundings

***Figure 7**: presentation and substantiation of visual qualities for different areas in the trajectory (Dijkteam Zwolle, 2021a)*

4.7 Looking back: lessons learned from Stadsdijken Zwolle

Discussing the lessons learned from Stadsdijken Zwolle, the interviewees provided us with valuable insights for future flood risk management projects. First, some general lessons to increase spatial quality are discussed. Second, lessons specifically related to the instruments are presented.

Two general lessons learned to increase spatial quality are detected from Stadsdijken Zwolle.

Firstly, "*the ambition on spatial quality should be made more concrete at the start of the project and, subsequently, filtered through the whole organization*", the permit manager (R5) explains. This is important to make sure everyone is familiar with the ambition and is on the same page. In the Stadsdijken Zwolle project not everyone was acquainted with the ambition on spatial quality. The project manager (R8) mentions that: "*spatial quality is anchored in the objectives and a very competent landscape architect is on board. Still, if a clear ambition on spatial quality would have been established, it would have made it a bit easier because ambition provides direction. A clear ambition contributes to*

a broader view on spatial quality. Nonetheless, establishing such a clear ambition is only possible when determining a dual objective of water safety and spatial quality".

Secondly, a more integral approach with a larger scope can deliver opportunities to the project that can possibly increase spatial quality (R3, R8, R10). In order to achieve this, a vision on the area should be established (R8, R10). A spatial quality framework on municipal or waterboard-level could be part of this (R4). RWS-Ontwerpt (2020) acknowledges this need for integral scope determination in their report: "*because tasks and ambitions in an area can be undertaken in various ways and at different paces, there is a risk of projects obstructing each other if they are not coordinated, while they might be able to reinforce each other*" (RWS-Ontwerpt, 2020, p.8).

When enlarging the scope in an integral manner, the municipality has to be involved more intensely and from the initiation of the project (R4, R8, R10, R11). Light is shed on the interests from different stakeholders and partnerships can be established in a timely manner (RWS-Ontwerpt, 2020). This will provide opportunities for the municipality to find budget in time to link their development to the larger area development. The landscape architect of the municipality of Zwolle (R11) confirms this, saying that "*although we really want to link developments to the project, it takes municipalities a lot of effort finding budget for this*". He (R11) emphasizes the importance of "*creating an integral plan and not letting partial interests prevail*".

Keeping the scope large also applies to the project itself. According to the advisor on heritage and spatial quality from the waterboard (R10) it is important to not lose sight of the project as a whole in the course of time and prevent becoming focused on sections. The advisor (R10) states that *"the scope can always be expanded"*.

Furthermore, the most important lessons learned, specifically per instrument, are shown in table 4.

***Table 4**: lessons learned from Stadsdijken Zwolle per instrument*

Instrument	**Lessons learned**
Design sessions	Is experienced as successful. Should be organized in future projects again (R3, R4).
Participation process	Is experienced as successful and can be organized in the same manner in future projects. Note: continuity of the staff involved in the participation process is hard to secure because of the long run of the project (R6, R11).
Quality Team	Had an advising role in this project which was valued positively (R4, R10). Their influence on spatial quality can possibly be higher when adjusting their task/role in projects.
Plan of Action	No lessons learned
Spatial Quality Framework	A spatial quality framework or vision on spatial quality on, for example, waterboard or municipality level, can contribute to higher spatial quality (R4, R8)
Memo on Basic Principles for the Spatial Design	No lessons learned

Two phases contract	More price competition by assessing on other aspects next to tariffs (R1)
Subsidy	More budget for the municipality to join integral project. Possibly a national incentives fund on spatial quality? (R8, R11)
	The HWBP's motto "sober and effective", and the corresponding subsidy scheme, can stand in the way of achieving higher spatial quality (R8)
Landscape architect	The landscape architect has to take place in the design team in order to safeguard their role of spatial designer (R4)
	Support from an external objective party with mandate on the subject of spatial quality can prove helpful (R4, R11)
Travers Welzijn Zwolle	The role of Travers in the participation process, connecting the neighborhood residents to the project, is positively experienced (R2, R11)

4.8 Key results

In conclusion, the initial ambition on spatial quality in the project, defined as conservation of current spatial quality in combination with connecting synergies to the project has been lived up to. Accordingly, the final spatial quality can be described as spatial integration in combination with some synergies. In making meaning of spatial quality in Stadsdijken Zwolle, this meaning can be summarized as integration of the dike into its environment, radiating simplicity, logic, and unity, as well as providing an extension of the living environment to local residents. A conclusion on the instruments used in Stadsdijken Zwolle and what makes them successful, is shown in table 5.

***Table 5**: key results derived from empirical analysis*

Nodality	**Design sessions** Internal design sessions were organized by the design leader. In these sessions, all disciplines integrally co-created the design. These sessions support in getting all persons in the project team on the same page.	**Factors of success** Willingness of the participating persons to listen to each other, be open to each other's story, and co-create in an investigating manner
	Participation process The stakeholder team organized an extensive participation process. The process was positively experienced, the residents felt	**Factors of success** Associating with already existing initiatives in the neighborhood to connect local residents to the project

	heard. Besides, the Dikethinkers, formed by intrinsically motivated persons, co-created and provided feedback on the designs.	
	Quality Team Quality Team had an advisory role on spatial quality. Especially the period before feedback moments were valuable because it helped the design team to focus on the spatial quality.	**Factors of success** Having a multidisciplinary Quality Team
Authority	**Plan of Action** Focuses on process with the main objectives of minimum (financial) risks and maximum predictability. Also describes how synergies will be successfully integrated in the process. Did not in itself contribute to improving spatial quality.	**Factors of success** No factors of success defined
	Spatial Quality Framework Established in the exploration phase. Based on an area scan and the provincial quality framework. It is a spatial analysis of the project area. Provides direction to the design team.	**Factors of success** Concretize spatial quality for the project and secure the role of the spatial quality framework throughout the different phases in the project
	Memo on Basic Principles for the Spatial Design This memo is an update of the Spatial Quality Framework	**Factors of success** In each phase of the project, requirements established in the memo have to be verified.
Treasure	**Two phases contract** Market combination is responsible for plan elaboration as well as realization phase. Contractor therefore co-creates, resulting in realizable designs. Also, Knowledge does not get lost in transition from one to the other phase. Besides, price	**Factors of success** A waterboard with administrative courage (*bestuurlijk lef*). Also, thought needs to be given to other securing principles, to make sure the project does not overrun in budget.

	determination is done after the design is completed which can help in securing spatial quality.	
	Subsidy 90% of the budget is subsidized by the Delta Fund (50% HWBP, 40% collective of waterboards). This is only allowed to invest in water safety which is an obstacle in increasing spatial quality.	**Factors of success** No factors of success defined
Organization	**Landscape architect** Played important role in creating and securing spatial quality. Role of creating spatial products such as the spatial quality framework and the designs. Role of boundary spanner in internal design sessions as well as in the participation process, connecting the external stakeholders to the project.	**Factors of success** Involved from the start of the project. Integrally embedded in the project team. Budget has to be available to enable the landscape architect to create spatial quality.
	Travers Welzijn Zwolle Supported the local residents from neighborhood Holtenbroek in the participation process. Role of boundary spanner between the project and the neighborhood.	**Factors of success** Join existing initiatives in the neighborhood.

5. Conclusion and reflection

5.1 Introduction

The general aim of this research is to analyze how spatial quality can be secured in the process of flood risk management projects. In their advice the College of State Advisors (2020) state that the HWBP should not focus solely on flood protection but also spatial quality because the program "is a chance to create added value for the society" (College van Rijksadviseurs, 2020, p. 8). Furthermore, to create flood resilient cities, integration of water management and spatial planning is needed. Therefore, we need to shift from fighting the water towards living with the water (Restemeyer et al., 2015).

In this transition, it is first necessary to understand how spatial quality is negotiated in practice. Second, an analysis of what instrument have been used in practice to increase spatial quality is needed. Accordingly, the research question is posed as followed: *"How is spatial quality negotiated in practice and how can policy instruments contribute to improving spatial quality in flood risk management projects?"*

To provide an answer on this research question, a literature review on the concept of spatial quality and on (typologies of) policy instruments has been performed. Second, a qualitative single-case study has been executed. This study focuses on the HWBP, specifically on the project Stadsdijken Zwolle.

This chapter starts with the link between the theoretical framework in chapter 2 and the observations from the case study in chapter 4. Then, recommendations for future flood risk management projects are made based on the lessons learned from practice. Next, a reflection on the used theory and methodology is given. Lastly, suggestions for further research are proposed.

5.2 Main findings

The empirical reflection is divided in two sub-sections. In the first section, an answer is provided on the first part of the research question: "***How is spatial quality negotiated in practice?***". In the second section, an answer is provided on the second part of the research question: "***How can policy instruments contribute to improving spatial quality in flood risk management projects?"***. Combined, these questions provide insight into how to improve spatial quality in flood risk management practice.

5.2.1. How is spatial quality negotiated in practice?

In literature, spatial quality is often defined in relation to the Vitrivus triplet: utilitas (functionality), firmitas (firmness/solidity), and venustas (beauty) (Klijn et al, 2013). These three elements translate into user, future-, and experiental value (Ruimte voor de Rivier, 2015). In the Room for the River program, these values are made specific for spatial quality in flood risk management. This results in

the following three criteria: hydraulic effectiveness, ecological robustness, and cultural meaning and aesthetics (Klijn et al., 2013).

In the Plan of Action for Stadsdijken Zwolle, established by the market combination, spatial quality is described as future value, user value, and experiential value (Dijkzone Alliantie Zwolle, 2019). This is one on one derived from the Vitruvius triplet. Hence, at the start of the project, the definition of spatial quality corresponds with literature.

In describing spatial quality in practice, differences in personal backgrounds and specializations can influence the way people interpret the concept. People occupied with the participation process generally have the interest of the inhabitants and stakeholders in mind when thinking of spatial quality. When describing spatial quality, they refer to a space that is designed with the users of that space in mind. People occupied with the design of the project have a clear picture on what spatial quality means for them and the project. In this case, integration of the dike within its environment and a design that represents simplicity, unity, and logic. Sometimes, these two different perspectives on spatial quality can clash. In the participation process, preferences are announced that do not always fit in the image of the designers. However, in Stadsdijken Zwolle, there are also examples where the participation process enriched the design. One of these examples is the idea of a stakeholder to bring businesses in the industrial area inlands by changing the line of the dike. In the end, all parties agree on creating a design that associates with the local identity. To achieve spatial quality, an area-specific approach is crucial. Lastly, this project made use of a two phases contract where the executor (*uitvoerder*) is involved in the plan elaboration phase. In the negotiating of spatial quality, the executor mainly keeps in mind the feasibility of the design and whether the designed space is easy to maintain.

The result that how spatial quality is described is dependent on someone's background and specialization, leads us back to the literature where van den Brink et al. (2019) state that how the landscape is perceived depends on personal biases. Therefore, it is important to consider who is going to be involved in the project as this influences the concretization of spatial quality. Establishing an inclusive, integral design process can help in considering spatial quality from different perspectives.

The program-level, the HWBP, influences the ambition on spatial quality in Stadsdijken Zwolle. The spatial quality is not allowed to worsen but improvement is also not mandatory. The project's design has to correspond with the program's motto "sober and effective". If the HWBP adopts a dual objective of water safety and spatial quality, similar as the Room for the River program, possibly a higher level of spatial quality can be achieved.

On the project-level, the main objectives have been formulated at the start of the project as followed: 1) water safety, 2) integration of the dike in its current environment with conservation of current spatial quality and functionality, and 3) realizing synergies. The function of the third objective is increasing spatial quality (WDODelta, 2018). However, the second objective probably says more about the ambition on spatial quality than the third. Conservation of the current spatial quality does not imply increasing the spatial quality.

Although, it is mentioned that more synergies could have been included, the three main objectives as described above are accomplished with the current design. Comparing the ambition on spatial quality

in Stadsdijken Zwolle with the three ambitions levels, as described in the report by Havinga & de Nederlanden (2018), the achieved ambition can be described as somewhere between the basic and medium level of spatial quality: spatial integration with a few synergies. If a higher level of spatial quality is to be achieved, the ambition should shift from spatial integration in combination with synergies towards area development.

5.2.2. How can policy instruments contribute to improving spatial quality in flood risk management projects?

Policy instruments "are the 'tools of government' the mechanisms and techniques used to implement or give effect to public policies" (Salomon, 2002 in Howlett & Rayner, 2007, p. 2). They are a means to reach policy goals. Instruments, or a combination of instruments, can be operated to increase spatial quality in flood risk management projects (Verweij et al., 2021). This study operated the policy instruments according to the NATO-typology which is a governance-/resource-based categorization. Four categories were distinguished: nodality (information), authority (legal power), treasure (financial means), and organization (capacity and capability of government) (Hood & Margetts, 2007; Howlett & Rayner, 2007).

In the figure 6, an overview was provided on the (policy) instruments operated in Stadsdijken Zwolle, according to the NATO-typology. A combination of instruments is employed to increase spatial quality in Stadsdijken Zwolle. Some of these instruments do not by definition serve the purpose of increasing spatial quality but did contribute to this to some extent. Others did not contribute or even obstructed increasing spatial quality. Below, conclusions on the contribution of instruments to spatial quality are elaborated, arranged according to the NATO-typology.

<u>Nodality</u>

The first instrument in the category nodality are the design sessions. Design sessions were organized in the Room for the River program as well as in Stadsdijken Zwolle. In both, the design sessions were part of the participation process. In this form of interactive planning, "policy makers, project managers and stakeholder codesign, discuss and debate local challenges and possible solutions" (Busscher et al., 2019, p.4). The design sessions had an integral approach, stimulating the waterboard, stakeholders and experts to look across their discipline and try to find synergies with the aim of creating added value for the future project (RWS-Ontwerpt, 2020).

However, in Stadsdijken Zwolle next to external design sessions, also internal design sessions were organized from the start by the design leader, the person responsible for the design team. These external design sessions had an integral character, putting different disciplines at the same table to co-design. According to the design leader (R3), "*these sessions are the only way to get everyone on the same page*". The main difference between the design sessions in Room for the River and Stadsdijken Zwolle is thus the organization of design sessions only with internal expertise. The integral design sessions had an important share in the improvement of spatial quality.

In these sessions, the landscape architects served as a boundary spanner by connecting the different perspectives in visual products such as sketches. These products also helped the different disciplines

to understand each other. The role of boundary spanner is not new to the landscape architect who already had a connecting role in the design process in the Room for the River program (Havinga & der Nederlanden, 2018). Nevertheless, the design leader may as well be considered a boundary spanner, connecting the different disciplines by organizing the internal design sessions. However, to draw conclusions about this, more research should be done on the role of design leader in the design team. If the design leader can take up the role of connecting different disciplines, it is important for future projects to have a design leader that possesses boundary spanning capacities. Besides having knowledge about design, landscape, etcetera, also social capacities like networking skills and social-emotional competences are necessary (van den Brink et al., 2019).

The second instrument in this category is the participation process which was organized in Stadsdijken Zwolle as well as in the Room for the River program. As explained earlier, external design sessions were organized where the project team and stakeholders co-created to connect interests and discuss local challenges and possible solutions.

Stadsdijken Zwolle organized an extensive participation process with the inhabitants of the area. A thinktank was initiated called "Dikethinkers" ("*Dijkdenkers*"). People that were intrinsically motivated to participate in the co-creation process, took place in this thinktank. Also, people from interest groups took part in the Dikethinkers. Several meetings were planned throughout the project where the designs were discussed. This is an addition to the nodality instruments with reference to literature.

Furthermore, the approach of the participation process was, next to organizing walk-in meetings to provide information on the project, to associate with already existing initiatives. Organizing a walk with the local women's club or a bootcamp session on the dike. Joining already existing initiatives helped the project to reach inhabitants they would normally not reach. This is an addition to the participation process and provides valuable lessons for future participation processes. An important role in this process was occupied by the social workers of Travers Welzijn Zwolle. Their role is discussed in the category organization.

The third and last instrument in this category is the Quality Team. The Quality Team for Dikes Overijssel (*Kwaliteitsteam Dijken Overijssel*) is an organization established by the province of Overijssel in 2017. The role of the team is to advise on spatial quality in flood risk management projects. The involvement of the Quality Team in Stadsdijken Zwolle is limited. They observed and advised the project from a distance in a facilitating role. This contrasts with the Quality Team in the Room for the River program (called Q-team) which was organized on program-level. Also, their role is different in contrast to Stadsdijken Zwolle. The Q-team Room for the Rivers was "*commissioned to coach the planners and designers, to peer review the designs and plans, and to report to the minister about the Spatial Quality achieved*" (Klijn et al., 2013, p.1). Especially the last element of reporting, indicates the formal procedures on assessment of the achieved spatial quality which is absent in the Stadsdijken Zwolle project. According to Klijn et al. (2013), the combination of informal coaching and formal procedures results in the high quality of designs. A dual objective can be a solution to command spatial quality as well as water safety.

Authority

The instruments used in the category authority in Stadsdijken Zwolle correspond largely with previously used instruments in Room for the River. However, a difference is that spatial quality is not required to increase in Stadsdijken Zwolle and, as a result, there is no extra attention given to increasing spatial quality in the Plan of Action. Moreover, no administrative arrangements on spatial quality were found in this case study. These were used in the Room for the River program to concretize the spatial quality objective, divide tasks and arrange cooperation between public partners (Busscher et al., 2019).

However, attention to spatial quality was given through the establishment of a spatial quality framework in the exploration phase. The framework was based on an area scan and the provincial framework on spatial quality. At the start of the plan elaboration phase, this framework was reconsidered and updated to the current water safety standards and project definition, resulting in the Memo on the Basic Principles of Spatial Design. Nonetheless, it is recommended to create a spatial quality framework on municipal- or waterboard-level to acquire insight into local and regional qualities.

Treasure

WDOD applied a two phases contract to the Stadsdijken Zwolle project which means that the market combination, 'Dijkzone Alliantie Zwolle', is responsible for the plan elaboration phase as well as the realization phase. The executing party is already on board in the plan elaboration phase. The hypothesis is that it supports securing spatial quality from the plan elaboration phase into the realization phase. These types of inclusive contracts were also used in the Room for the River program. After evaluation of this program, it was concluded that the utilization of inclusive contracts was promising for spatial quality. However, expectations on the desired level of spatial quality in a project had to be coordinated between all stakeholders to make it successful (Havinga & der Nederlanden, 2018). This confirms the results of this study. Using a two phases contract does not per definition result in a higher level of spatial quality.

Still, this study observed two aspects of a two phases contract that can help increase spatial quality in practice. First, the realization of the design is kept in mind during the design process because the contractor is already on board. As a result, designs are created with spatial quality that is achievable to realize. Second, the price is determined after the designs are established which could be in favor of the spatial quality incorporated in the designs.

After price determination, the subsidy is granted by the HWBP. However, the designs have to conform to the motto 'sober and effective' to be granted the subsidy. This can form an obstacle to increasing spatial quality. Financial means and spatial quality stay in conflict.

Lastly, the municipality often struggles to find budget to connect their developments to other projects. Therefore, developments in the area should be analyzed at the very start of a projects to make sure all stakeholders can find the necessary financial means. Integral early scope determination can help connecting developments to achieve a higher level of spatial quality (RWS-Ontwerpt, 2020).

Organization

The last category of instruments represents the boundary spanners in Stadsdijken Zwolle.

The landscape is an organization instrument used to increase spatial quality in the Room for the River program as well as in Stadsdijken Zwolle. In the Room for the River program, the landscape architect played a prominent role in increasing spatial quality. The landscape architect was responsible for securing, directing and was accountable for the spatial quality in the projects. Besides, the landscape architect played various boundary spanner roles in the Room for the River program (Havinga & der Nederlanden, 2018; van den Brink et al., 2019). This corresponds with Stadsdijken Zwolle where the landscape architect also performed a boundary spanning role, connecting stakeholders and different disciplines and expertise. They created a bridge between the project team and the external world. This was successfully executed by means of their generalist knowledge and the spatial products they established. A difference in Stadsdijken Zwolle, is the connecting role the landscape architect had in the internal design sessions. They connected different disciplines in the project team and technical, financial, environmental, and spatial aspects into a design. A difference between the two settings, is the back-up of the Q-team supplied with mandate while the Quality Team performed only an advising role.

A second boundary spanner is Travers Welzijn Zwolle. This organization of social workers, focused on the neighborhood Holtenbroek which is located in the projects' scope, provided the inhabitants with a voice in the participation process. This instrument is an addition to literature. It was experienced positively and is, therefore, recommended to apply again in participation processes.

Lastly, the design leader, as director of the design team, possibly takes on the role of boundary spanner as well. However, this study has not focused enough on the role and tasks of this function to draw conclusions. Further research can show whether the design leader can be an addition to literature on boundary spanning in spatial planning.

5.3 Recommendations

Based on the conclusions, the following recommendations for increasing spatial quality in future flood risk management projects of the HWBP are proposed. The motion of members of the Dutch parliament de Groot & Bromet, adopted in 2020 by the Dutch parliament, asking to explore increased integration of spatial quality in water safety projects (AT Osborne, 2021). This corresponds with the advice of the CRa (College van Rijksadviseurs, 2020). This is a window for opportunity for research on increasing spatial quality in flood management practice. This study aimed to contribute to this political debate and accordingly proposes the following recommendations.

1. Concretization of spatial quality

In order to increase spatial quality, it is necessary to concretize what spatial quality means specifically for the project area. This task should be undertaken collectively with all stakeholders. An inclusive

design process collects different perspectives on spatial quality to create a thorough picture of what spatial quality means for a specific place. Also, creating common ground and coordinating expectations is essential to increase spatial quality. A spatial quality framework on waterboard- or municipal-level can be a result of this. Consequently, local and regional qualities are defined and are able to be given substance in planning projects. Lastly, the concretization of and expectations for spatial quality should be seeped through the project making sure everyone is on the same page.

2. Strengthen the position of the Quality Team

The Quality Team in Stadsdijken has a facilitating role, advising the project on spatial quality. Giving the Quality Team more power can contribute to increasing spatial quality in flood risk management projects. This power can take form in a reviewing role, besides their advising role. Formal procedures should be part of the HWBP where spatial quality is reviewed through a spatial quality assessment framework. This task can become a responsibility of the Quality Team. This provides them with a mandate to support the interest of spatial quality. Inspiration can again be taken from the Room for the River program where the Q-team performs an advising role as well as a reviewing role.

Because the Quality Team works on a provincial level, they have an overview of the area and developments taking place in this area. Therefore, the Quality Team can also support creating synergies between different developments in an area in a boundary spanning role between the different stakeholders.

3. Enlarge the scope

By doing area development instead of separate projects, higher levels of spatial quality can be achieved. Therefore, it is necessary to integrally determine the scope at the initiation phase of a project. Together with all stakeholders, among which the municipality, the task should be explored in relation to other developments in the area (RWS-Ontwerpt, 2020). Processes should be running parallel to each other to prevent projects from running over time and budget. The result is an enlarged scope and an integral vision on the area. Consequently, the level of spatial quality can be improved by shifting from spatial integration to area development (RWS-Ontwerpt, 2020).

4. More steering on spatial quality from program-level

The ambition on spatial quality of a project starts at the program-level. Projects have to comply with objectives of the program. Hence, the motto ‘sober and effective’ influenced the achieved spatial quality in Stadsdijken Zwolle. If the HWBP aims to take spatial quality into account in its goals, application of tools, and its assurance in the organization (HWBP, 2021), they may consider changing their ambitions as a first step. This movement has already started but can use a little push. This could be initiated by changing their motto from ‘sober and effective’ to ‘smart and effective’ as proposed by the CRa (College van Rijksadviseurs, 2020). Establishing a dual objective of water safety as well as spatial quality can be part of this tactic, where inspiration can be taken from the Room for the River program. A dual objective gives force to the spatial quality objective which seeps through the program and, accordingly, its projects. Besides, a dual objective can help decreasing the friction between budgets and spatial quality.

5.4 Contribution to literature

The most relevant theories in this study are spatial quality and policy instruments. Literature often defines spatial quality as user value, future value and experiential value. However, the concept remains fuzzy and subjective to the observant. Therefore, this study added to literature by unraveling the meaning-making process of spatial quality in practice, specifically for the project Stadsdijken Zwolle.

Besides, up to date there is little attention to policy tools or policy instruments in planning literature. Even though, policy instruments are necessary used develop spatial plans and implement their objectives, according to Stead (2021). Also, few attempts have been done to classify the variety of instrument available to planning practice. This study operates the NATO-typology which consists of the four categories: nodality, authority, treasure, and organization. Thereby, this research contributes to the operationalization of the NATO-typology specifically for flood risk management. This provides tools for flood risk management practice to increase spatial quality in its projects.

Moreover, literature pays largely attention to the Room for the River program. This study contributes by adding knowledge on instruments used in current flood risk management practice and analyzing what is the same, what is different, what are factors of success and where the room for improvement is.

5.5 Methodological reflection

Stadsdijken Zwolle was chosen as case study in this research. Reasons for this were 1) its location in the middle of a city with, accordingly, a lot of stakeholders, 2) a trajectory that runs through urban, nature, and industrial area, excluding a one-size-fits-all approach to spatial quality, 3) the two phases contract which could be interesting in its relation to spatial quality, and 4) because water professionals appointed this case as one with much attention to spatial quality. The selection of this case study certainly did not disappoint as it delivered outcomes that can inspire the transition to integrated flood risk management in practice. A critical note is that no information on the realization phase was gained because this phase did not start when executing this research. The actual realized spatial quality in Stadsdijken is therefore not known.

The literature review formed the base and provided background knowledge for the interviews and participant observation. Participant observation led to an insider perspective on the project and project's office. Attending meetings, for example the meetings that were part of the participation process, definitely added to the case-study. Also, meeting the project members at the project's office before interviewing them, helped breaking the ice and smoothened the interviewing process.

The interviewing process went well. Having a semi-structured interview guide provided a stable basis for the interview but also gave room for extra questions or sometimes adaptation of questions based on the person's function. The variety of persons interviewed added to knowledge the meaning-making process of spatial quality. This was also useful because the interviewees could complement each other on instruments used in the project as not every person was involved in all of them.

However, the participation observation and the interviews sometimes challenged the objectivity of the study. By staying with the factual results and only drawing conclusions as a last step in this research, the objectivity was guarded as much as possible.

5.6 Suggestions for further research

The first suggestion for further research, is to research flood risk management projects that are realized to add knowledge on the development of spatial quality in the realization phase to literature. This research focused solely on the project Stadsdijken Zwolle which was in the plan elaboration phase during time of studying the case. By doing further research on the realization phase of flood risk management projects, conclusions can be drawn on the contribution of the two phases contract to spatial quality. Also, it will provide knowledge on the actual realized spatial quality and whether spatial quality can still decrease in the realization phase.

The second suggestion relates to the NATO-typology. Some first steps are set in the research on policy instruments in planning literature and this study aims to contribute to that. However, more knowledge on the NATO-typology in relation to planning literature can help finding tools to improve planning, and therefore spatial quality, in practice.

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Appendices

Appendix 1: list of studied documents

Author	Year	Name
Dijkzone Alliantie Zwolle	2019	Plan of Action (*Plan van Aanpak*)
Dijkteam Zwolle	2021	Projectplan Stadsdijken Zwolle
Dijkteam Zwolle	2021	Note on spatial integration VO (*Integratienota VO*) (appendix 6 in Projectplan Stadsdijken Zwolle)
Dijkteam Zwolle	2021	Spatial integration plan including spatial maps (*Ruimtelijk inpassingsplan incl. ruimtelijke plankaarten*) (appendix 7 in Projectplan Stadsdijken Zwolle)
WDOD	2017	Stadsdijken Zwolle, Strategy for approaching the market: consideration contract-tender variant, version 1.0. *(Stadsdijken Zwolle, Marktbenaderingsstrategie: Afweging contract-aanbestedingsvariant, versie 1.0.*)
WDOD	2018	Preferred Alternative and requirements dike improvement (*VKA en Topeisen Dijkverbetering*)

Appendix 2: interview guide

Inleidend	- Wie ben ik? - Wat voor onderzoek doe ik? • Definiëren ruimtelijke kwaliteit • Definiëren instrumenten - Wie bent u? - Wat is uw rol binnen het project?
Definiëren Ruimtelijke Kwaliteit (RK)	- Wat betekent RK voor u (buiten uw werk om)? - En binnen Stadsdijken Zwolle? - Hoe zag u RK toen u in het project stapte en hoe ziet u dat nu?
Instrumenten	Het project kent verschillende fases ((voor-)verkenningsfase, planuitwerkingsfase, realisatiefase): welke instrumenten zijn er ingezet gedurende deze fases om RK te verhogen? - Kunt u dieper ingaan op dit instrument? - In welke fase is dit instrument gebruikt? - Wie waren hierbij betrokken?
Instrument mixes	- Werken deze instrumenten los van elkaar of versterken ze elkaar/vullen ze elkaar aan?
Success/fail factors	- Hoe heeft u deze instrumenten ervaren? - Wat zijn succesfactoren voor deze instrumenten? - Wat zijn faalfactoren voor deze instrumenten? Wat zijn hindernissen in het verhogen van RK?
Turning points	- Wat zijn gedurende het project belangrijke/beslissende momenten geweest voor RK? (mijlpalen, besluiten, gebeurtenissen, personen)
Reflectie	- Als u de ambitie over RK in het begin vergelijkt met RK in het Definitief Ontwerp: in hoeverre is die ambitie dan waargemaakt? - Zijn er kansen blijven liggen? - Zo ja, welke kansen zijn dit en hoe hadden deze kansen aangepakt kunnen worden? - Wat is succesvol verlopen en zou u weer zo doen en wat zou u de volgende keer anders doen?
Afsluitend	- Ben ik nog iets vergeten te vragen of is er iets dat u mij wilt meegeven?

Appendix 3: logbook attended meetings Stadsdijken Zwolle

Date	Meeting	Explanation
29-09-2021	Press briefing: presentation of final design	The press briefing took place in the Twistvliettoren (the former bridge keepers tower) in Zwolle. In this briefing, the final design (*DO*) was presented to the press, which consisted of three persons. After the presentation, there was time for questions from the press. Something that caught my attention, as it is important for spatial quality, is the amount of trees that has to be chopped for the project. This amount will also be communicated by the Dijkteam to the stakeholders.
05-10-2021	Day at the project office of Stadsdijken Zwolle	
	Coffee quarter (*koffiekwartiertje*)	A quiz on the project. This was an informal meeting.
	Meeting with the stakeholderteam	Discussing the preparations for the Dijkdenkers meeting that evening in the community centre of neighbourhood Holtenbroek.
	Meeting with the Dijkdenkers	Presentation of the final design for the Dijkdenkers in community centre Holtenbroek. After that, we discussed how they see their contribution to the project and how they see themselves contributing to the project in the future. Some stated that they feel they have really contributed to the plans by giving their input. Generally, all members of the Dijkdenkers were content with the participation process. One participant commented that he thought biodiversity did not get attention in this project and he would have preferred to see this otherwise.
26-10-2021	Day at the project office of Stadsdijken Zwolle	
	Coffee quarter (*koffiekwartiertje*)	The stakeholder manager tells about the final design and the instruments used to communicate the final design to the stakeholders. Among these instruments are the visualisations made by H+N+S. Moreover, there is a huge awareness of water safety as a consequence of the floods last summer. This seems to result in less friction with people because of the promise to be climate proof in 2050.
	Meeting with the stakeholderteam	There is a Quality Team of Dikes Overijssel. This is an independent team. Hermine der Nederlanden (who is on my

		list of people to interview) is the secretary of this team. They are involved with the (spatial) quality.
28-10-2021	Meeting with Environment Team (*Omgevingsteam*)	A heads up from the different fields 'design', 'ground affairs' and 'stakeholder management'. Design has finished the final design (*DO*) which is a milestone. There are still some questions about clients requirements (spatial quality requirements) which were sent late and what to do with those requirements. Also, the reuse of materials (circularity) has been touched upon. This is for example about the reuse of hardwood beams from the harbour in the benches on the dike.
09-11-2021	Day at the project office of Stadsdijken Zwolle	No specific meetings.
22-12-2021	Interface hour Design (*Raakvlakkenuurtje Ontwerp*)	Meeting once in two weeks to discuss the interfaces of the different designers. Taking part in these meeeting are: landscape architects, designer green embankments (*ontwerper groene keringen*), designer concrete embankments (*ontwerper harde keringen*), advisor water safety (*adviseur waterveiligheid*), design leaders (*ontwerpleiders*). In these meetings, specific details of the design are discussed. Everything is noted in a digital environment called Relatics. In this way, no tasks or details are overlooked. When someone needs input on something it is also written down in Relatics. Some discussed subjects are rather technical of nature, others more spatial. An example of technical subject is the placement of anchors in sheet piles. An example of a spatial subject is the side view/profile of trees at the harbour. Besides, the subject of social safety comes up, discussing a plan for the lightning. The phase where the project is in at the moment, is the draft definitive design.