ID 1591 | ACHIEVING SPATIAL QUALITY IN INTEGRATED PLANNING: AN EVALUATION OF THE DUTCH 'ROOM FOR THE RIVER' PROGRAM USING QUALITATIVE COMPARATIVE ANALYSIS

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ABSTRACT: In line with recent trends towards area-oriented planning, flood risk management has seen a shift from a water control strategy towards a water accommodation strategy. In the Netherlands, this resulted in the policy program Room for the River. The projects in this policy program are expected to achieve two key objectives: first, the accommodation of higher flood levels, i.e., water safety, and second, improving the spatial quality of the riverine areas. Whilst research has shown that the program is successful with respect to increasing water safety, less is known about its second objective. This paper thus has two aims: (1) assessing the extent to which the program has been able to achieve spatial quality and (2) identifying the conditions that explain this. To these aims, archival and survey data were collected, and analyzed using Qualitative Comparative Analysis (QCA). The analysis shows that there are various combinations of conditions for achieving spatial quality. We conclude that these different combinations entail different strategies, and that by means of those, the program management has been successful in achieving spatial quality in the Room for the River program.

KEYWORDS: Area-Oriented Planning; Program Theory Evaluation; Project Evaluation; Project Management and Organization; Qualitative Comparative Analysis; Room for the River; Spatial Quality

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1 INTRODUCTION

Recently, flood risk management in the Netherlands has seen a strategic reorientation from controlling the water, by constructing and maintaining flood defenses such as dams and dikes, towards a strategy that stresses the accommodation of the water (Jong & Van den Brink, 2013; Meyer, 2009; Wiering & Arts, 2006). This reorientation is characterized, first, by an increasing importance of spatial planning in flood risk management (Jong & Van den Brink, 2013; Van Buuren, Edelenbos, & Klijn, 2010; Wiering & Immink, 2006): when possible, spatial planning solutions are preferred over technical solutions (Van Buuren, Edelenbos, et al., 2010). Second, in the new strategy, the physical water system conditions the water management and not the other way around (Van Buuren, Edelenbos, et al., 2010). Thus, water management has become increasingly area-oriented; flood risk management is now planned conjunctively with other spatial policy objectives such as transport, nature, and agriculture (Van Buuren, Edelenbos, et al., 2010; Wiering & Driessen, 2001; Wiering & Immink, 2006). This trend towards area-oriented planning can be observed in other fields as well, such as transport infrastructure planning (Heeres, Tillema, & Arts, 2012).

The proliferation of area-oriented planning is visible in the Dutch € 2.362 billion policy program 'Room for the River' (Rijke et al., 2012). In this program, Rijkswaterstaat[1], provinces, municipalities, and regional

[1] Rijkswaterstaat is the executive agency of the Dutch Ministry of Infrastructure and the Environment. It is responsible for the design, construction, management, and maintenance of the main infrastructure facilities, including the waterway network and systems (Rijkswaterstaat, 2012).

water authorities (i.e., water boards) are cooperating in the implementation of 34 projects (Ministerie van Infrastructuur en Milieu, Ministerie van Economische Zaken, & Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2016; Ruimte voor de Rivier, 2016c). The objective of the policy program is twofold: first, the accommodation of higher flood levels, i.e., water safety, and second, improving the spatial quality of the riverine areas. Although the program's midterm evaluations concluded that this dual objective proved effective in terms of the achievement of integrated solutions that address both water safety and spatial quality (Hulsker et al., 2011; Van Twist et al., 2011), the evaluations also stressed that the projects still had to be implemented. Currently, the program is close to completion. As part of its final evaluation, this paper presents the evaluation of the program's instruments that were deployed to achieve spatial quality. Given the program's status as an international frontrunner in integrated planning and water management (Zevenbergen et al., 2013), this evaluation bears relevance to the international academic community as well.

The program's dual objective can be seen as the incarnation of the area-oriented planning approach in Dutch flood risk management. Whereas recent research on area-oriented planning has indicated that the approach is taking root (Heeres, 2017), scholars have also warned that it is demanding and easily abandoned when policymakers are confronted with the high (transaction) costs that come with it (Hijdra, 2017). Generally, when complexity in spatial planning increases – e.g., in terms of multiple objectives and the inter-sectoral and inter-organizational cooperation required to achieve those – under time and budget pressures, the tendency to simplify and revert to old routines increases (Salet, Bertolini, & Giezen, 2013; Verweij, Teisman, & Gerrits, 2017). This was also reflected upon in the midterm evaluation of the Room for the River program: "the water safety objective is strongly supported and it is endorsed by the national politicians, but the spatial quality objective is generally seen increasingly as a luxury that is costly and mainly focused on new nature in the river areas, whereas simultaneously budgets are cut on new nature in other areas" (Van Twist et al., 2011, p. 15).[1] Therefore, this paper has two aims: (1) to assess the extent to which the Room for the River program has been able to achieve the spatial quality objective, and (2) to identify the conditions that explain this.

To these aims, we collected archival and survey data and analyzed it using Qualitative Comparative Analysis (QCA) (Rihoux & Ragin, 2009; Schneider & Wagemann, 2012). Specifically, we applied QCA in its capacity as a method to evaluate the program theory of Room for the River (cf. Varone, Rihoux, & Marx, 2006). QCA has recently been introduced in the fields of spatial planning (Verweij et al., 2013) and water management (e.g., Huntjens et al., 2011). QCA is well-suited to comparatively analyze a medium-n of cases and to identify combinations of conditions for explaining a certain outcome of interest. Moreover, QCA systematizes and formalizes the comparative process, thereby increasing the rigor and transparency of the comparison.

This paper is further structured as follows. In the next section, the background of the Room for the River program is provided, including results of its midterm evaluations (Section 2). In Section 3, the program theory is elaborated, focusing on the program's instruments that were deployed to achieve spatial quality. Next, the data and method are explained in Section 4. The analysis and results of the QCA are presented in Section 5. In Section 6, conclusions are drawn and the results are discussed.

2 THE 'ROOM FOR THE RIVER' PROGRAM

2.1 BACKGROUND OF THE PROGRAM

After a flooding and two near-dike breaches in 1993 and 1995, the Dutch national government decided to increase the flood safety levels of the country's main rivers: the Rhine, the Meuse, and their branches including the Waal and the IJssel (see Zevenbergen et al., 2013). Figure 1 provides an overview of the rivers and their average discharges. The expected increase in river discharges, partly due to climate change, caused a shift in focus from dike reinforcements towards creating room for the rivers. This was accompanied by a growing awareness of the economic, ecological, and landscape value of the river areas, resulting in an increasing focus on spatial quality. This led to the introduction of the Room for the River program (Ruimte voor de Rivier, 2007).

[1] This quote is translated from Dutch.

Figure 1: Map of the partition of Rhine and Meuse water among the various branches of their delta 2000-2011 (source: Maximilian Dörrbecker, Wikipedia)

The program was given a legal basis with the so-called 'Spatial Planning Key Decision' (in Dutch: Planologische Kernbeslissing; PKB) in 2007 (Ruimte voor de Rivier, 2007). The PKB enabled the government to formulate an integrated policy approach on the level of a whole river area, so as to take into account the different spatial functions and processes within it conjunctively (Ruimte voor de Rivier, 2007). The PKB is structured around two objectives. The first objective is to improve the protection of the river basins against floods. Specifically, the aim is to accomplish a minimum discharge capability of 16,000 m3/s for the Rhine at Lobith. The required discharge from the Rhine into the IJssel is 250 m3/s (Ruimte voor de Rivier, 2007). The PKB's secondary objective is to improve the spatial quality in the river areas. Following the so-called 'National Spatial Strategy' (in Dutch: Nota Ruimte) (see Priemus, 2007), the Room for the River program aims to maintain the unique character of the particular river basin, focusing on ecological, cultural-historical, economical, and aesthetic values (Ruimte voor de Rivier, 2007). The program has a budget of € 2.362 billion (Ministerie van Infrastructuur en Milieu et al., 2016) and consists of 34 projects. In the program, these projects are coined 'measures' and they can be found along the river Rhine and the Rhine's branches the Waal, IJssel, and Nederrijn. This is shown in Figure 2 (Ruimte voor de Rivier, 2016c). The measures include, amongst others, floodplain excavations, dike relocations, and 'depoldering' (Ruimte voor de Rivier, 2007, 2016a), as shown in Figure 3. Currently, 26 projects have been completed (Ruimte voor de Rivier, 2016a).

Figure 2: The measures (projects) in the 'Room for the River' program (source: Ruimte voor de Rivier, 2016c)

The program is coordinated by the 'Program Directorate Room for the River' (in Dutch: Programma Directie Ruimte voor de Rivier; PDR), which is part of Rijkswaterstaat.3 Within the PDR, the 'Cluster

Spatial Quality' (in Dutch: Cluster Ruimtelijke Kwaliteit; Cluster RK) is responsible for the coordination of the program's second objective, focusing on directing, facilitating, and monitoring the different projects in achieving spatial quality. The Cluster is supported by the so-called 'Quality Team' (Q-team), which has an advisory role (Collignon-Havinga et al., 2009; Klijn et al., 2013).

The program followed a decentralized approach: the individual projects are managed by various appointed governmental bodies. These include municipalities, provinces, water boards, and Rijkswaterstaat. Each individual project is developed in a planning phase and a realization phase. The Cluster RK and the Q-team visit and advise the projects during both phases. The Cluster RK furthermore assesses the projects at key moments in their development, i.e., after the development of a design that marks the end of the planning phase and at the end of the realization phase (Collignon-Havinga et al., 2009; Feddes & Hinz, 2013).

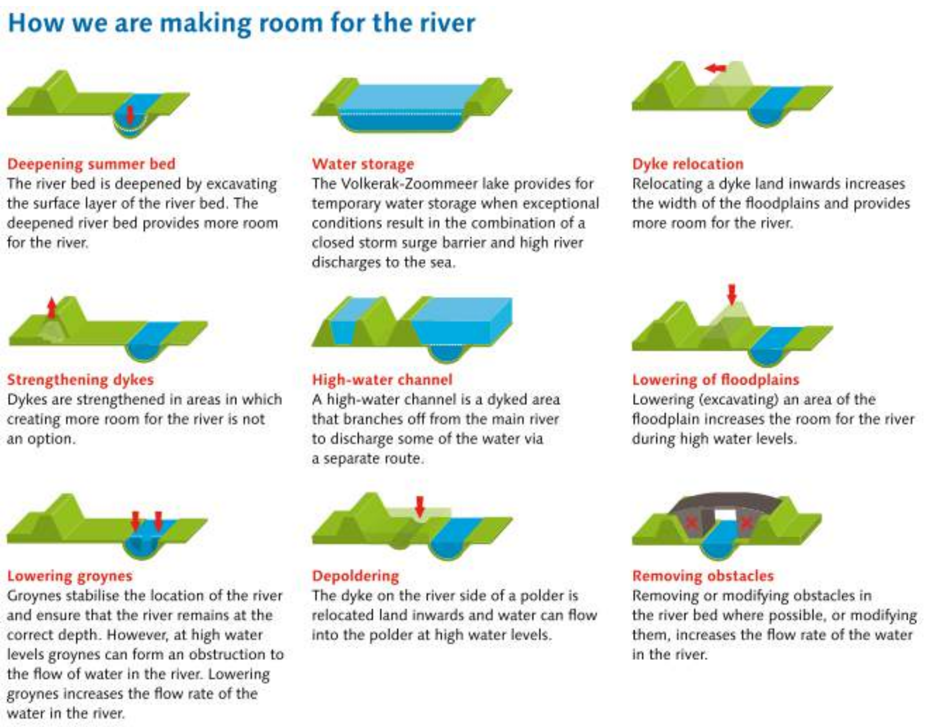

Figure 3: The different types of measures in the 'Room for the River' program (source: Ruimte voor de Rivier, 2016b)

2.2 PREVIOUS EVALUATIONS OF THE PROGRAM

During the implementation of the Room for the River program, several midterm evaluations were conducted, focusing on how spatial quality was included in the different projects. In 2011, Van Twist et al. (2011) evaluated the program's general progress regarding the PKB-objectives, also giving attention to the instruments used to achieve them. They concluded that, in general, the involved persons were satisfied with the multi-level organizational structure of the program, where the central and strategical steering of the PDR was combined with the decentral implementation of projects. Swift implementation was enabled by taking account of future project phases, appointing the Q-team, and by the facilitating role of the PDR. Furthermore, the combination of binding administrative agreements with informal meetings supported projects in remaining on track.

In addition to the general evaluation by Van Twist et al. (2011), Hulsker and colleagues (2011) specifically reviewed the planning phase and its results regarding spatial quality. The decentralized implementation of the projects accommodated an integrated approach in which water safety and spatial quality were combined, although the evaluators were critical on the extent to which this integration was sufficiently captured in the administrative agreements. Ensuring spatial quality was facilitated by combining formal and informal instruments, focusing on both the content and the process of the projects. Instrumental was the development of an integral design created by an interdisciplinary team, with an important role for the landscape architect. The design is a content- focused instrument, which received less public resistance when local stakeholders were involved in its development process. It was further concluded that the project-based implementation approach might have decreased the coherence between the projects on the program level of the whole river area.

The third midterm evaluation focused on the realization phase (Feddes & Hinz, 2013). It was found that achieving spatial quality was subject to various frictions, inter alia in translating the design and spatial quality requirements into realization contracts, especially so when the implementing agency also created parts of the design. It was further concluded that designers and landscape architects can play an important role after the planning phase in safeguarding spatial quality during implementation. It was finally observed that the design was legally secured, binding the implementer to the spatial quality requirements. Instead of focusing on the legal requirements, though, the Cluster RK often applied a more informal strategy for safeguarding spatial quality where they tried to communicate the integral meaning and value of the projects.

3 THE PROGRAM THEORY OF 'ROOM FOR THE RIVER'

Public programs or policies are based on (often implicit) assumptions about the outcome to be achieved by the policy and the conditions and actions required to that end (Varone et al., 2006). A policy or program, such as Room for the River, can be understood as a theory in the sense that:

> *"…It describes a cause-and-effect sequence in which certain program activities (administrative outputs) are the instigating causes and the social benefits (policy outcomes) are the effects that they eventually produce. (…). The model of causality of a public policy is always a normative representation of the 'operation' of society and the State. Proof of its validity comes through implementing and evaluating the effects of public policies" (Varone et al., 2006, p. 219).*

Program theory evaluation is a form of realistic evaluation (Astbury & Leeuw, 2010; Blamey & Mackenzie, 2007; Pattyn & Verweij, 2014). In realistic evaluation, policy programs are presented as CMO-configurations: a program consists of Mechanisms (M) which are intended to produce an Outcome of interest (O) in a certain Context (C). In the present evaluation, we apply QCA as a method for realistic evaluation (cf. Befani, Ledermann, & Sager, 2007; Befani & Sager, 2006). This requires that the program theory is operationalized in terms of an Outcome (Section 3.1) and C/M-conditions (Section 3.2) that potentially produce this outcome. In the present evaluation, the instruments deployed by the Room for the River program represent the M-conditions.

3.1 OUTCOME: SPATIAL QUALITY

In the Room for the River program, spatial quality is defined in three dimensions: use value, experience value, and future value (Ruimte voor de Rivier, 2015; Terra Incognita, Bureau Stroming, SAB, & Alterra, 2009).[1] Use value refers to the utility, efficiency, and effectiveness of a physical structure and its surrounding space, experience value refers to the perception and experience of it, and future value refers to the robustness and sustainability of the structures and the space (Hooimeijer, Kroon, & Luttik, 2001). This conceptual triplet is derived from ancient Roman author and architect Vitruvius, who said that structures should exhibit three qualities; they should be useful (utilitas), beautiful (venustas), and solid or robust (firmitas) (Hooimeijer et al., 2001). In the program, area- oriented planning has been an important point of departure to increase spatial quality along these dimensions. That is, by integrating water safety with other spatial policy objectives including economy, nature, and recreation, the use, experience, and future values are believed to increase (Ruimte voor de Rivier, 2015). The 'Vitruvius Triplet' was translated by the Q-team into the coherence between hydraulic effectiveness, ecological robustness, and cultural meaning and aesthetics (see Klijn et al., 2013).

The spatial quality was assessed by the PDR at two moments in the projects: spatial quality at the end of the planning phase – which we abbreviate in this paper as SQ_PLAN – and spatial quality at the end of the realization phase for the PKB-objective as a whole – which we abbreviate in this paper as SQ_PKB (see

[1] In Dutch: gebruikskwaliteit, belevingskwaliteit, and toekomstkwaliteit.

also Table 3). For the planning phase, the spatial quality is expressed in the design of the spatial plan, i.e., the quality of the design. This was assessed in the program in terms of sufficiency (see Table 3). For the realization phase, the spatial quality is found in the “concrete result” of a project (Klijn et al., 2013, p. 291), that is, whether the intended plan was realized. It concerns the relative improvement of spatial quality compared to the baseline situation prior to the initiation of the program (see Table 3).

Various instruments were deployed in order to achieve spatial quality. These instruments were deployed in a certain project context. Together, the instruments and context are, in QCA-terms, the ‘explanatory conditions’ for spatial quality. Figure 4 provides an overview of the conditions in the Room for the River program theory. The conditions are further elaborated in Section 3.2 and subsequently operationalized in Section 4 (Table 3).

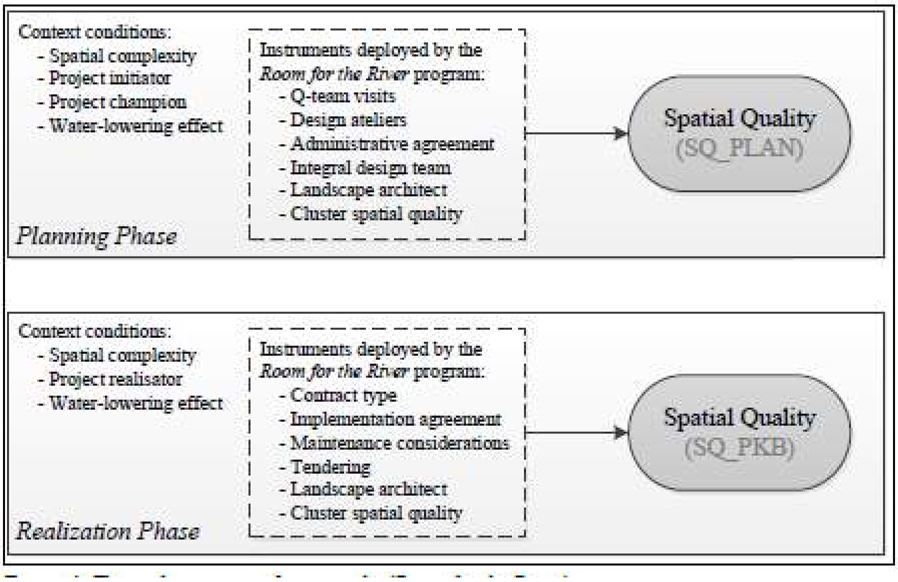

Figure 4: The explanatory conditions in the ‘Room for the River’ program

3.2 EXPLANATORY CONDITIONS: CONTEXT AND INSTRUMENTS

The projects in the Room for the River program are developed in two phases: a planning phase and a realization phase. In the planning phase, spatial designs are developed that are aimed at improving spatial quality. In the realization phase, the spatial designs are implemented and the projects are constructed. In the two phases, different instruments are deployed, under different context conditions, to achieve these goals. Because spatial quality achieved in the designs might not materialize in the “concrete result” (Klijn et al., 2013, p. 291) of the project at the end of the realization phase, separate analyses will be conducted for the two phases (see Section 5).

3.2.1 EXPLANATORY CONDITIONS: PLANNING PHASE

The first context condition is Spatial Complexity (PLAN_SC). In area-oriented planning approaches, spatial quality is expected to increase through the integration of different spatial policy objectives related to, e.g., water, transport, nature, and agriculture (Heeres, 2017; Van Buuren, Edelenbos, et al., 2010). This integration is expected to lead to synergy gains. However, it also increases complexity as different spatial functions may impose different, possibly conflicting, demands on the spatial design (Verweij et al., 2013). Hence, integrated approaches are more complex than solutions that only involve the embedding of flood risk measures in the existing landscape (Rijkswaterstaat, 2007). In the Room for the River program, three general types of measures are distinguished (see Figure 3):

- Technical measures, e.g., strengthening dikes.
- Measures within the banks, i.e., the ‘wet area’ inside the banks that is not protected against floods (in Dutch: buitendijkse maatregelen), e.g., lowering floodplains.

- Measures beyond the banks, i.e., measures in the area behind the dike where residential areas can be found (in Dutch: binnendijkse maatregelen), e.g., dike relocation and depoldering.

Whereas the measures within the banks generally have a more technical nature, the measures beyond the banks mostly concern complex integrated area-based planning projects, involving multiple spatial functions and often implying the realization of a new water concept. In fact, the measures beyond the banks represent the reorientation from the water control strategy towards the water accommodation strategy (Alberts, 2009). For instance, the dike relocation at Lent, as part of the project Ruimte voor de Waal (see Appendix 1), involved the demolition of existing structures including dwellings (Projectgroep Dijkteruglegging Lent, 2007). This increased the impact and complexity of the project in terms of, inter alia, political sensitivity, but it also offered opportunities to redesign the area in such a way that spatial functions are conjunctively addressed, allowing for synergy gains (Van Buuren, Edelenbos, et al., 2010; Verweij et al., 2013). In the present evaluation, we take the type of measure as a proxy for spatial complexity (see Table 3). The expectation is that more complex measures lead to higher spatial quality in the spatial design.

The second context condition is the Project Initiator (PLAN_INI). The project initiator is formally responsible for completing the project (Rijke et al., 2012). In the Netherlands, a broad distinction is made between general, territorial governments (in Dutch: algemeen bestuur) and functional governments (in Dutch: functioneel bestuur) (Raad voor het Openbaar Bestuur, 2015). The projects in the program can be initiated by either of them. The functional governments concern the water authority at the local level (i.e., a so-called water board) or Rijkswaterstaat at the national level, both of which have a strong orientation towards water safety. The mandate of Rijkswaterstaat, though still primarily focused on water safety, is somewhat broader since it is involved in determining the goals of Dutch water management on the strategic level (Ministerie van Infrastructuur en Milieu & Ministerie van Economische Zaken, 2015). The general, territorial governments in the program concern the local municipalities and the regional provinces. The municipal and provincial governments are charged with integrally balancing the various interests, of which water safety is only one amongst others (Unie van Waterschappen et al., 2011). Whereas the municipal governments are concerned with balancing interests on the local level, the provinces act as ‘area directors’ (in Dutch: gebiedsregisseur) on the regional level, allowing them to orchestrate the integration of different spatial policy objectives on the level of a whole river area. Hence, the expectation is that when general, territorial governments – and provinces above all – are initiating the project, this will contribute to higher spatial quality.

The third context condition is the Project Champion (PLAN_CHAMP). Project champions are persons outside the initiator’s project team, who “do not have to do what they do to aid the project; they go well beyond their expected and traditional job responsibilities” (Pinto & Slevin, 1989). They can be local champions (e.g., Raadgever et al., 2016), such as an alderman who encourages a project team to increase spatial quality, or persons from national governments such as Rijkswaterstaat. Project champions can play an important role in successfully developing projects (Pinto & Slevin, 1989). In the United Kingdom, for example, project champions were key in the promotion of environmental restoration in river management (Adams, Perrow, & Carpenter, 2004) or sustainable urban drainage systems (Alexander et al., 2016). Traditionally, water management is a technocratic discipline dominated by engineers (Van Buuren, Edelenbos, et al., 2010); a project champion who focuses on spatial design considerations can then, so is the expectation, contribute to higher spatial quality, as opposed to a situation where a project champion is absent.

The fourth context condition is the Water Lowering Effect of a project (PLAN_WAT). This condition reflects the program’s water safety ambitions. Water safety can be understood as the primary and initial objective of the program and spatial quality is the secondary objective that conditions the measures that are chosen in the project (Ruimte voor de Rivier, 2007; Groenendijk et al., 2016; Hulsker et al., 2011). Initially, as prescribed in the PKB (see Section 2.1), the projects were required to develop three alternative measures: one with a maximum water lowering effect, one with a maximum improvement of spatial quality, and one with the lowest costs (Hulsker et al., 2011). This, however, was at odds with the integrated approach of combining the objectives of water safety and spatial quality. In the end, most projects have been able to develop a more integrated approach in their planning phases after all; the midterm evaluation showed that this resulted in effective solutions with spatial quality (Hulsker et al., 2011). Altogether, as the two objectives are supposed to be interlinked, the expectation is that the water lowering effect of a project can influence the degree of spatial quality realized in the spatial plans, but whether this influence was actually positive of negative is not clear. The QCA-analysis can shed light on this.

The first instrument condition is the influence of the Q-Team (PLAN_QT). The Q-team is an advisory team, which was chaired by the State Advisor for the Landscape (in Dutch: Rijksadviseur voor het Landschap), and which consisted of five specialists with different disciplinary backgrounds: landscape architecture, urban planning, river engineering, ecology, and physical geography (Klijn et al., 2013; Q-team, 2012). The Q-team was tasked with producing "independent recommendation[s] on enhancing spatial quality; i.e., on request as well as unasked, and unrestrained by formal governmental or institutional opinions. (…). The Q-team 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. 289). Of particular importance were the visits of the team to the projects, where suggestions to further improve spatial quality were provided (Collignon-Havinga et al., 2009). Previous evaluations of the Room for the River program indicated that the Q-team contributed to increasing the spatial quality in the project designs (Hulsker et al., 2011; Van Twist et al., 2011).

However, for the planning phase, no explicit expectation can be formulated about the relationship between the number of visits by the team and spatial quality (SQ_PLAN). That is, on the one hand, more visits are supposed to increase spatial quality. On the other hand, however, a high number of visits could also indicate an initial low spatial quality requiring additional efforts of the Q-team. The QCA-analysis may shed light on which is actually the case. For the realization phase (SQ_PKB), for which spatial quality is measured relatively (see Table 3), the expectation is that a higher number of visits increases spatial quality.

The second instrument condition is the Design Ateliers (PLAN_DES). Design ateliers are a form of interactive planning where different participants co-design the projects (Heeres et al., 2016). Such co-design processes have the potential to improve the quality of spatial planning outcomes (see e.g., Enserink & Monnikhof, 2003; Lamers et al., 2010). In general, stakeholder involvement can also reduce resistance to the project and increase stakeholder satisfaction (see e.g., Roth & Warner, 2007; Verweij et al., 2013). Design ateliers can play an important role in this (Van Buuren, Klijn, & Edelenbos, 2012). The previous midterm evaluation of the Room for the River program in fact indicated that sufficient and timely participation in several projects "has led to a significantly better spatial quality" (Hulsker et al., 2011, p. 47; see also Van Twist et al., 2011, p. 14).[1] In the abovementioned Ruimte voor de Waal project, for instance, the design process resulted in "improvements to the quality of the area as well as to the technical functioning of the channel in terms of water safety" (Heeres et al., 2016, p. 424). A recent evaluation of three major water safety policy programs in the Netherlands (including Room for the River) likewise concluded that (local) participation can increase support and improve spatial planning designs (Groenendijk et al., 2016). The expectation thus is that when the design ateliers were well-timed and sufficiently organized, this resulted in a more interactive, inclusive process approach where local knowledge is mobilized leading to improved spatial quality.

The third instrument condition is the concretization of the spatial quality objective in an Administrative Agreement between the public partners (PLAN_AGR). The "administrative agreements about the division of tasks and cooperation must ensure rapid and effective implementation of measures" (Van Stokkom, Smits, & Leuven, 2005, p. 81). The partners include Rijkswaterstaat and, normally, regional governments such as water boards and provinces. For each project, an administrative agreement is signed which outlines the framework within which the project is to be developed. This agreement is an important instrument for securing spatial quality in the projects (Collignon-Havinga et al., 2009). Previous midterm evaluations indicated that the dual objective of the Room for the River program was recorded well in the project agreements, but the integrated approach towards achieving the dual objective was not (Hulsker et al., 2011; Van Twist et al., 2011). As said above, initially the projects were required by the PKB to develop three alternative measures, which was at odds with the integrated approach of combining the objectives of water safety and spatial quality. Hence, the expectation is that it is not so much important that the spatial quality objective is stated in the agreement; what is important is that spatial quality is specified beyond the general notion that it has to be taken into account. If this is the case, this is expected to provide extra impetus for achieving spatial quality.

[1] This quote is translated from Dutch.

The fourth instrument condition is the Integral Design Team (PLAN_INT). Traditionally, designers are the top-down mechanistic experts in charge of developing a technical design focused on the optimization of territorial solutions, which in the present study would imply a strong focus on optimizing the design for water safety; the designers work rather independently and become ad-hoc involved only when their expertise is required at a certain stage in the planning process (Heeres et al., 2016; Vos, 2014). However, creative and innovative solutions are more likely to emerge in multidisciplinary teams where various competences, knowledge, and skills are combined through interactive processes of knowledge sharing and creation (Alves et al., 2007; Fong, 2003). The multidisciplinarity is important because “spaces and places do not have singular identities but can have multiple identities” (Heeres et al., 2016, p. 413), including those related to water safety and spatial quality, and multidisciplinarity allows for observing and combining these in an integrated planning solution (Heeres et al., 2016; Klijn et al., 2013). In the Room for the River program, multiple disciplines were involved in the design for the projects. The integral design team consists of a spatial designer, a river expert, an ecologist, a geologist, a cultural historian, and a cost expert (Hulsker et al., 2011). The expectation is that, by involving multiple disciplines, synergies can be achieved resulting in designs with higher spatial quality.

The fifth instrument condition is the role of the Landscape Architect (PLAN_LAND). The landscape architect played an important role in the planning phase (Klijn et al., 2013). From a more traditional architectural perspective, “spatial design is often understood as a product, with a strong focus on the content of plans and designs” (Heeres et al., 2016, p. 412). In that capacity, landscape architects in Room for the River are involved in creating a specific spatial quality plan. In these instances, the landscape architect was only asked by the project team to deliver a specific product rather autonomously. From a spatial planning perspective, designs are “a way to manage a wider creative process of arriving at decisions and action” (Heeres et al., 2016, p. 412). In that capacity, the landscape architects, as members of the integral design teams and with input from the design ateliers (cf. Van Buuren et al., 2012), were not only asked to deliver a product but played an important role in the interactive planning process as well. The expectation is that the landscape architect in the second capacity can contribute more to the realization of spatial quality in the planning phase.

The sixth instrument condition is the involvement of the Cluster Spatial Quality of the Room for the River program in the individual projects (PLAN_CLUS). The Cluster RK is responsible for the coordination of the program’s spatial quality objective and facilitates the projects herein. To this purpose, it uses various resources, ranging from more formal assessments of plans to a helpdesk where projects can go to for questions and assistance (Collignon-Havinga et al., 2009; Hulsker et al., 2011). The midterm evaluation indicated that the Cluster’s role as a facilitator, “without sitting on the designer’s seat”, was influential in achieving spatial quality (Hulsker et al., 2011).[1] The expectation thus is that the more closely the Cluster was involved in a project as facilitator and guardian of spatial quality, the higher the achieved quality of the project design.

3.2.2 EXPLANATORY CONDITIONS: REALIZATION PHASE

The three context conditions in the realization phase are Spatial Complexity (REAL_SC), the Project Realisator (REAL_REA), and the Water Lowering Effect of a project (REAL_WAT). For these conditions, the same program theory applies as detailed for spatial complexity, project initiator, and water lowering effect in the planning phase (see Section 3.2.1). Regarding spatial complexity, the chosen measures designed in the planning phase (e.g., strengthening dikes, lowering floodplains, or depoldering) are also the measures that have actually been realized at the end of the realization phase (see Tables 1 and 2). However, with respect to the project realisator, i.e., the administrative body responsible for acquiring permits, tendering, and the contracting of private parties for the realization of the plans (Rijke et al., 2012), this is not necessarily the same administrative body that also acted as project initiator.[2] Regarding the water lowering effect, it should be mentioned that the actual effect realized at the end of the realization phase can be higher or lower than the prospected effect at the end of the planning phase.[3]

[1] This quote is translated from Dutch.
[2] Compare the data for the conditions PLAN_INI and REAL_REA in Tables 1 and 2.
[3] Compare the data for the conditions PLAN_WAT and REAL_WAT in Tables 1 and 2.

The first instrument condition is the Contract Type (REAL_CON). Contracts are formal arrangements that legally bind the implementation actors. In the Room for the River program, four contract types have been used (Feddes & Hinz, 2013):

- Traditional 'RAW' contracts, where the project realisator specifies the technical design including the "underlying calculation of materials needed and construction time" (Lenferink, Tillema, & Arts, 2013, p. 617) to be implemented by the private contractor (Feddes & Hinz, 2013).
- Engineering and Construct (E&C) contracts, where the contractor is now responsible for working out the technical and logistic details of the design (Feddes & Hinz, 2013; Lenferink et al., 2013).
- Design and Construct (D&C) contracts, where the contractor becomes responsible for the whole design and not just the working out of the details of the design (Feddes & Hinz, 2013; Lenferink et al., 2013).
- Plan, Design, and Construct (PD&C) contracts, where the private contractor, in addition to the design, is now also responsible for the spatial planning process (PIANOo & Unie van Waterschappen, 2016; Ruimte voor de Rivier, 2015).

The PD&C contract is the most inclusive one in that it integrates different phases of project construction into a single agreement. It allows the private contractor to (partially) parallelize and align the processes of planning, design, and construction, allowing for faster, more efficient, and higher quality project realization (Lenferink et al., 2013; PIANOo & Unie van Waterschappen, 2016; Ruimte voor de Rivier, 2015). In terms of inclusiveness, the D&C contract comes second, followed by the E&C, and the RAW contracts. The expectation is that the more inclusive the contract, the higher the quality that can be achieved.

The second instrument condition is the concretization of the spatial quality objective in a Realization Agreement between public partners (REAL_AGR). The realization agreement outlines the framework of ambitions, collaboration, and responsibilities within which the project is to be implemented. Specifically, it describes "the quality, budget, time, market approach, project control methodology, and risk distribution between [the] region and Rijkswaterstaat" (Rijke et al., 2012, p. 374). This agreement is an important instrument for the successful implementation of the program's projects (Groenendijk et al., 2016). The midterm evaluation of the realization phase identified as a success factor the degree to which the spatial quality objective is specified in this agreement beyond a general reference to the design resulting from the planning phase (the so-called 'SNIP-3' document), that is, whether or not a "brief description is included of what is essential for the spatial quality of the plan" (Feddes & Hinz, 2013, p. 34).[1] The expectation thus is that it is not so much important whether the spatial quality objective is referred to or not in the realization agreement (because it always is); what is important is that spatial quality is specified beyond the general notion that it is important. If this is the case, this is expected to provide extra impetus for achieving spatial quality as it implies that spatial quality is more strongly safeguarded.

The third instrument condition is the inclusion of Maintenance Considerations in the realization phase (REAL_MAIN). The early consideration of maintenance issues is important to prevent high maintenance costs after project realization (e.g., Van Vuren, Paarlberg, & Havinga, 2015), to ensure that plans are realistic and that designs are of a good quality (Rijke et al., 2012), and to ensure that spatial quality after project realization conforms to the preferences of the local communities – e.g., some people prefer wilder landscapes whilst others prefer well-kept landscapes (Buijs, 2009). In the Room for the River program, maintenance plans were drafted in the so-called 'SNIP-3' document (see above) at the end of the planning phase, which plays an important role in anchoring spatial quality (Van Herk et al., 2015). In some projects, these plans were updated during the realization phase to ensure the continued focus on spatial quality. The previous midterm evaluation indicated that spatial quality is easily lost out of sight, especially when projects transition from one phase to the next (Hulsker et al., 2011). It is therefore expected that when the maintenance plans were updated during the realization phase, this contributes to a better safeguarding of spatial quality.

The fourth instrument condition is the extent to which spatial quality was included in the Tender Document of the project (REAL_TEN). The tendering documents play an important role in anchoring spatial quality (Feddes & Hinz, 2013; Van Herk et al., 2015). In the projects, "spatial quality was a selection criterion in tender procedures and was detailed in accompanying ambition documents" (Van Herk et al., 2015, p. 93). However, the projects differed in the extent to which this criterion was anchored in the tender documents

[1] This quote is translated from Dutch.

(Feddes & Hinz, 2013). For instance, the extent to which private contractors are rewarded for including spatial quality depends on whether or not spatial quality was a so-called ‘EMVI-criterion’ (Ruimte voor de Rivier, 2015), i.e., ‘Economically Most Advantageous Tender’ (see Rijkswaterstaat, 2016).[1] In the project Ruimte voor de Waal, for instance, spatial quality was an EMVI-criterion (see Table 2), which made it an explicit requirement for the project design by the private contractor (Brouwer, Schouten, & De Vries, 2017). The expectation is that when spatial quality requirements are more explicitly included in the documents, this has a positive influence on the realization of spatial quality.

The fifth and sixth instrument conditions are the role of the Landscape Architect (REAL_LAND) and the role of the Cluster Spatial Quality (REAL_CLUS). For these conditions, the same program theory applies as detailed for the equivalent PLAN_LAND and PLAN_CLUS conditions in the planning phase (see Section 3.2.1). For both conditions, the expectation is that closer involvement of the landscape architect or Cluster RK implies that spatial design consideration are taken into account more during the realization phase. This is of particular importance since in the realization phase, financial considerations often start to dominate the process (see e.g., Verweij, 2015a).

4 DATA AND METHOD

The QCA-approach for this evaluation consisted of five steps (Rihoux & Lobe, 2009; e.g., Verweij, 2015b). In the first step, the cases were selected. The Room for the River program consists of 34 projects. Currently, 26 projects have been completed; 8 projects are still being realized (Ruimte voor de Rivier, 2016a). Initially, 23 projects were selected for this evaluation because these were completed and because Rijkswaterstaat had archival data available for these projects (see Appendix 1). For the final analyses, only those projects were selected for which data on all the conditions were available (see Tables 1 and 2). This means that for the planning phase, 20 projects were analyzed (see Table 1) and for the realization phase, 19 projects were analyzed (see Table 2).[2]

In the second step, the data were collected. The first data source is written documents from the archives of the Room for the River program. The data were collected by one of the researchers, in the period September 2016 to April 2017. Access to the data was provided by Rijkswaterstaat. The collection of the data and the construction of the conditions (see Section 3) evolved iteratively (cf. Berg-Schlosser et al., 2009; Rihoux & Lobe, 2009). That is, the collection of documents and the regular meetings between the researchers and the program managers from Rijkswaterstaat who commissioned the present evaluation, progressively provided insights into the program’s theory, and this, in turn, informed the researchers about the data that needed to be collected. The second data source is questionnaires. Since the archives did not provide data on all the conditions, a small survey was sent out to project managers to collect additional data. The relevant project managers for the survey were identified by the program managers from Rijkswaterstaat. The survey data were collected in the period April 2017 to May 2017. After all the data were collected, two data matrices were constructed: one for the planning phase (i.e., Table 1) and one for the realization phase (i.e., Table 2).

In the third step, the cases were calibrated. Calibration is the process of transforming the raw project data from the data matrices (Tables 1 and 2) into scores between 0 and 1 by clustering similar cases per condition (Ragin, 2008; Schneider & Wagemann, 2012). Basically, per condition, cases are ranked from high to low, after which (program) theory and/or cluster analysis are/is used to group the cases: projects within a group are considered similar cases and projects from different groups are considered dissimilar cases. The quantification that occurs here serves to ensure a systematic and transparent comparison. For instance, spatial quality after the realization phase (SQ_PKB) was assessed by the ‘Program Directorate Room for the River’ with a five-value scale: worsened, not improved, barely improved, improved, and strongly improved (see Table 3). This five-value scale was calibrated into 0.0 (worsened), 0.3 (not improved), 0.6 (barely improved), 0.8 (improved), and 1.0 (strongly improved). The middle value of ‘barely

[1] In Dutch: Economisch Meest Voordelige Inschrijving.

[2] Note that the projects’ names as publicly known and communicated about (see Ministerie van Infrastructuur en Milieu, Ministerie van Economische Zaken, & Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2016; Ruimte voor de Rivier, 2016a) are sometimes different from how they are internally administrated, managed, and monitored by Rijkswaterstaat (see Appendix 1). For the case names of the projects, we adopted the names as internally administrated by Rijkswaterstaat. For clarification purposes, we also provide the project labels under which they are known in the public policy documents (see Appendix 1).

improved' is calibrated as 0.6, expressing that it is still more positive than negative, but not overly positive.[1] The calibration rules for all the conditions are provided in Table 3. The calibration process resulted in the calibrated data matrix provided as Appendix 2.

In the fourth step, the calibrated data matrix (Appendix 2) was transformed into so-called 'truth tables' (see Appendices 3 to 6) using the QCA-package in R (Duşa, 2007, 2016). A truth table sorts the empirical cases over the logically possible configurations; it is the core of the QCA-analysis (Schneider & Wagemann, 2012). Each row in the truth table presents one logically possible configuration. The number of truth table rows is determined by the formula 2k, where k stands for the number of explanatory conditions included in the analysis. First, each of the 20 or 19 cases was assigned to one of the truth table rows. Then, based on the cases in the truth table row, the truth table row was assigned a score on the outcome. Each row in the truth table can thus be read as a statement of sufficiency: when the row was associated with spatial quality, that particular configuration was considered sufficient for the outcome to be produced (Rihoux & Ragin, 2009; Schneider & Wagemann, 2012).

The fifth step was the truth table minimization using the QCA-package in R (Duşa, 2007, 2016). This involved the pairwise comparison of truth table rows that agreed on the outcome and differed in but one of their conditions (Schneider & Wagemann, 2012). The condition in which two truth table rows differed was logically redundant: whether the condition was present (i.e., a score of 1.0) or absent (i.e., a score of 0.0), the outcome was produced irrespectively. This fifth step resulted in minimized solution formulae that show which combinations of necessary and/or sufficient conditions are related to the achievement of spatial quality (see Tables 4 to 7 in Section 5). A condition is necessary when it has to be present for the outcome to occur. Necessary conditions are identified in a separate analysis prior to the truth table minimization (Schneider & Wagemann, 2010).

It should be stated that the third to fifth steps have been an iterative process, as is normal in QCA (Berg-Schlosser et al., 2009; Rihoux & Lobe, 2009). For instance, if a truth table contained cases that agreed on all the conditions (i.e., are in the same truth table row) but contradicted on the outcome, then this so-called 'contradiction' had to be resolved (Schneider & Wagemann, 2010). This was done by, inter alia, recalibration, removing conditions from the analysis, or excluding the contradictions from the truth table minimization (Rihoux & De Meur, 2009).

Case label	Conditions									Outcome
	Context Conditions				*Instrument Conditions*					
	PLAN_SC	*PLAN_INI*	*PLAN_CHAMP*	*PLAN_WAT*	*PLAN_OT*	*PLAN_DES*	*PLAN_AGR*	*PLAN_LAND*	*PLAN_CLUS*	*SQ_PLAN*
Case_01	Dijkverlegging	Municipality of Nijmegen		27	3		No			Sufficient
Case_02	Kribverlaging	Rijkswaterstaat	No	9 (μ)	11	1,5	No	4	5	Sufficient
Case_03	Langsdammen	Rijkswaterstaat	Yes (Importance: 8/10)	9 (μ)	11	0	No	7	4	Insufficient
Case_04	Dijkverlegging; Uiterwaardvergraving	Water board Rivierenland	Yes (Importance: 6/10)	11	6	Multiple	Yes	8	8	Sufficient
Case_05	Uiterwaardvergraving	Municipality of Gorinchem		5	2		Yes			Sufficient
Case_06	Ontpoldering	Rijkswaterstaat	Yes (N/A)	30	6	Many	Yes	8	No role	Sufficient
Case_07	Ontpoldering	Province of Noord-Brabant	Yes (Importance: 6/10)	30	3	6	No	6	0	Sufficient
Case_08	Berging	Rijkswaterstaat	Yes (N/A)	7 (μ)	7	> 10	No	7	N/A	Insufficient
Case_09	Uiterwaardvergraving	Rijkswaterstaat	No	2	5	2	No	6,5	Limited	Insufficient
Case_10	Uiterwaardvergraving	Rijkswaterstaat	No	3	5	2	No	6,5	Limited	Insufficient
Case_11	Uiterwaardvergraving	Rijkswaterstaat	No	6	5	2	No	6,5	Limited	Insufficient
Case_12	Obstakelverwijdering	Rijkswaterstaat	No	5	5	2	No	6,5	Limited	Insufficient
Case_13	Uiterwaardvergraving	Province of Utrecht	No	6	7	3	No	9	6	Sufficient
Case_14	Dijkverlegging	Water board Veluwe	Yes	35	10	Multiple	No	4	4	Insufficient
Case_15	Dijkverlegging	Water board Veluwe	Yes	29	10	Multiple	No	4	4	Insufficient
Case_16	Uiterwaardvergraving	Municipality of Deventer; Province of Overijssel	Yes (Importance: 7/10)	14 (μ)	6	6	Yes	9	6,5	Sufficient
Case_17	Dijkverlegging	Municipality of Zwolle	No	8	4	Many	Yes	8	1	Sufficient
Case_18	Uiterwaardvergraving	Province of Overijssel		15	4		Yes			Sufficient
Case_19	Zomerbedverlaging	Rijkswaterstaat	Yes (Importance: 8/10)	29	8	Many	No	8	7	Insufficient
Case_20	Uiterwaardvergraving	Rijkswaterstaat	Yes (N/A)	7	7	Few	Yes	Low	Positive	Insufficient
Case_21	Dijkverbetering	Water board Rivierenland	No	0	7	5	No	5	7	Insufficient
Case_22	Dijkverbetering	Water board Rivierenland	No	0	1	0	No	9	9	Insufficient
Case_23	Dijkverbetering	Water board Brabantse Delta	No	0	3	0	No	Low	8	Sufficient

Table 1: The data matrix for the planning phase
Marked cells indicate missing data. Cases with missing data are not included in the analyses.

[1] A value of 0.5 is not possible in QCA, because it indicates that a case is ambiguous and thus cannot be used in the analysis (Schneider & Wagemann, 2012).

Case label	Conditions								Outcome
	Context Conditions			*Instrument Conditions*					
	REAL_ SC	*REAL_ REA*	*REAL_ WAT*	*REAL_ CON*	*REAL_ MAIN*	*REAL_ TEN*	*REAL_ LAND*	*REAL_ CLUS*	*SQ_PKB*
Case_01	Dijkverlegging	Municipality of Nijmegen	34	D&C	Yes	EMVI-Criterion	Close Involvement; Influential	Influence 5; Involvement 4	Strongly Improved
Case_02	Kribverlaging	Rijkswaterstaat	9 (µ)	D&C	No	Limited	At Distance	Influence 6 (µ); Involvement 7	Strongly Improved
Case_03	Langsdammen	Rijkswaterstaat	9 (µ)	D&C	No	Limited	Not Involved	Influence 6,5 (µ); Involvement 8	Locally Improved; Regionally Worsened
Case_04	Dijkverlegging; Uiterwaardvergraving	Water board Rivierenland	12	E&C	Yes	Limited	At Distance	Influence 9; Involvement 8	Strongly Improved
Case_05	Uiterwaardvergraving	Municipality of Gorinchem	11	E&C					Strongly Improved
Case_06	Ontpoldering	Rijkswaterstaat	24 (µ)	D&C	Yes	Yes; EMVI-Criterion	At Distance	Influence 8; Involvement 8	Strongly Improved
Case_07	Ontpoldering	Water board Brabantse Delta	27	D&C	Yes	No	At Distance; Low Influence	Influence 6; Involvement 0	Strongly Improved
Case_08	Berging	Water board Brabantse Delta	10	E&C	Yes	Limited	Varied For Different Project Parts; In General Influential	Influence 3,5 (µ); Involvement 2	Barely Improved Brabant Side; Improved Zeeland Side
Case_09	Uiterwaardvergraving	Rijkswaterstaat	3	PD&C	No	No EMVI; Hard Requirement	At Distance; Low Influence	Influence 4,5 (µ); Involvement 8	Strongly Improved
Case_10	Uiterwaardvergraving	Rijkswaterstaat	3	PD&C	No	No EMVI; Hard Requirement	At Distance; Low Influence	Influence 4,5 (µ); Involvement 8	Barely Improved
Case_11	Uiterwaardvergraving	Rijkswaterstaat	3	PD&C	No	No EMVI; Hard Requirement	At Distance; Low Influence	Influence 4,5 (µ); Involvement 8	Improved
Case_12	Obstakelverwijdering	Rijkswaterstaat	13	PD&C	No	No EMVI; Hard Requirement	At Distance; Low Influence	Influence 4,5 (µ); Involvement 8	Strongly Improved
Case_13	Uiterwaardvergraving	Rijkswaterstaat	8	D&C	No	EMVI-Criterion	Limited Involvement	Influence 5; Involvement 0	Strongly Improved
Case_14	Dijkverlegging	Water board Veluwe	31	D&C	No	No	Involved; Moderate Influence	Low Importance	Strongly Improved
Case_15	Dijkverlegging	Water board Veluwe	26	D&C	No	No	Involved; Moderate Influence	Low Importance	Strongly Improved
Case_16	Uiterwaardvergraving	Water board Groot Salland; Water board Veluwe	14 (µ)	E&C	Yes	No	At Distance; Low Influence	Influence 5; Involvement 0	Strongly Improved
Case_17	Dijkverlegging	Water board Groot Salland	9	E&C					Strongly Improved
Case_18	Uiterwaardvergraving	Water board Groot Salland	14	E&C					Strongly Improved
Case_19	Zomerbedverlaging	Province of Overijssel	41	D&C	Yes	Yes; EMVI-Criterion	Involved; Moderate Influence	Influence 8,5 (µ); Involvement 7	Improved
Case_20	Uiterwaardvergraving	Rijkswaterstaat	7	D&C	Yes	No	Not Involved	Important Stimulating Role; Involvement N/A	Strongly Improved within Project Scope; Overall Improved
Case_21	Dijkverbetering	Water board Rivierenland	0	RAW	No	No	Very Limited Involvement	Influence 2; Involvement 2	Strongly Improved
Case_22	Dijkverbetering	Water board Rivierenland	0	PD&C					Strongly Improved
Case_23	Dijkverbetering	Water board Brabantse Delta	0	RAW	No	Limited	Limited Involvement	Influence 8; Involvement 0	Improved

Table 2: The data matrix for the realization phase
Marked cells indicate missing data. Cases with missing data are not included in the analyses.

Condition	Raw data	Our calibration	Explanation of our calibration
Outcomes			
Spatial Quality in planning phase (SQ_PLAN)	Archival data; data from assessments by the PDR. No standardized scale was used by the PDR to assess the spatial quality after the planning phase. The data are largely qualitative descriptions.	0.0 = insufficient 1.0 = sufficient	In the absence of a standardized scale and because the data are qualitative, we only broadly distinguished between two categories: insufficient and sufficient. Cases were coded as 0.0 or 1.0 based on the PDR's qualitative descriptions.
Spatial Quality in realization phase (SQ_PKB)	Archival data; data from assessments by the PDR. The PDR assessed the overall spatial quality (of the projects as a whole) relative to the PKB-objective. The PDR used a five-value qualitative scale: strongly improved, improved, barely improved, not improved, and worsened (see Table 2).	0.0 = worsened 0.3 = not improved 0.6 = barely improved 0.8 = improved 1.0 = strongly improved	The cross-over point is set at 0.6, because 'barely improved' still indicates a positive score, but not overly positive. Because the program's objective is to increase spatial quality, the category 'not improved' is calibrated into a negative score. Projects that were assesses with scores in-between two qualitative categories (i.e., Cases 03, 08, and 20; see Table 2) were calibrated by averaging their quantitative scores (see Appendix 2).
Conditions planning phase			
Spatial Complexity (PLAN_SC)	Archival data; data from the public website of the program.[16] Nine different measures can be found across the projects. These are shown in Figure 3.	0.0 = technical measures 0.7 = *buitendijkse* measures 1.0 = *binnendijkse* measures	The measures beyond the banks (in Dutch: *binnendijkse maatregelen*) are most complex and calibrated as 1.0. These measures are: depoldering, dike relocation, and high water channels. Technical measures do not concern the involvement of multiple spatial functions and are hence calibrated as 0.0. These measures are: dike strengthening, lowering groynes/*langsdammen*, removing obstacles, and deepening summer beds. The measures within the banks (in Dutch: *buitendijkse maatregelen*) are more complex than technical measures, because different functions become involved, but less complex and less politically sensitive than the measures beyond the banks, because usually the current water safety concept is maintained. They are calibrated as 0.7. These measures are: lowering floodplains and water retention. In the case of multiple measures (i.e., Case 04; see e.g., Table 1), the most complex measure is used for the calibration.
Project Initiator (PLAN_INI)	Archival data; data from the administrative agreements. In principle, only one administrative body acts as the project initiator. There are four possible initiators: water boards, Rijkswaterstaat, municipalities, and provinces.	0.0 = water boards 0.3 = Rijkswaterstaat 0.7 = municipality 1.0 = province	General territorial governments (i.e., provinces and municipalities) are more area-oriented than functional governments (i.e., Rijkswaterstaat and water boards). Provinces are most area-oriented and hence calibrated as 1.0. The functional governments are less area-oriented. Of the two, the water boards have a narrower mandate than Rijkswaterstaat and are hence calibrated as 0.0. In one project there were two initiators (i.e., Case 16; see Table 1); this case was calibrated by averaging the quantitative scores.
Project Champion (PLAN_CHAMP)	Survey data. Project managers were asked whether or not a project champion was present and how important s/he was (on a scale from 1 to 10) for achieving spatial quality in the spatial design.	0.0 = project champion absent 1.0 = project champion present	When a project champion was present, this is calibrated as 1.0. When a project champion was absent, or when project managers indicated that the champion was unimportant (score of 5/10 or lower), this is calibrated as 0.0.
Water Lowering Effect (PLAN_WAT)	Archival data; data from the 'Spatial Planning Key Decision' document. The water lowering effect is measured as the aimed water level reduction in centimeters.	0.0 = ≤ 8.8 cm 0.3 = 8.9 to 17.5 cm 0.7 = 17.6 to 26.2 cm 1.0 = ≥ 26.3 cm	In the absence of a standardized scale or theoretical expectations about the water lowering effect on spatial quality, we performed a cluster analysis with the Tosmana threshold-setter (Cronqvist, 2016). When multiple values were provided within a project for different locations (Cases 02, 03, 08, and 16; see Table 1), the water lowering effect was averaged. We tested for multiple thresholds, indicating 17.5 cm as the cross-over point.
Q-Team (PLAN_QT)	Archival data; data from Q-team reports. The condition is measured as the number of visits as documented in the final report of the Q-team after the planning phase.	0.0 = ≤ 3.5 visits 0.3 = 3.6 to 6 visits 0.7 = 6.1 to 8.5 visits 1.0 = ≥ 8.6 visits	In the absence of a standardized scale of precise theoretical expectations on the number of visits for achieving high spatial quality, we performed a cluster analysis with the Tosmana threshold-setter (Cronqvist, 2016). When a single visit included multiple projects (i.e., Cases 02&03, Cases 09-12, and Cases 14&15; see Table 1), these visits were counted for each project. We tested multiple thresholds, indicating 6 visits as the cross-over point. Because the cross-over point indicates ambiguity,[13] Case 06 and 16 with 6 visits were further examined using the survey data; this showed that the importance of the Q-team for spatial quality was low in Case 06 (score of 1/10) and high in Case 16 (score of 7/10). Hence, Case 06 is calibrated as 0.3 and Case 16 as 0.7.
Design Ateliers (PLAN_DES)	Survey data. Project managers were asked how many design ateliers were organized, how important the ateliers were (on a scale from 1 to 10) for achieving spatial quality in the spatial design, and whether or not the number of organized ateliers was sufficient.	0.0 = no ateliers 0.7 = few but sufficient (1 to 3) ateliers 1.0 = many ateliers (≥ 6)	In the absence of any standard or minimum number of design ateliers and because the project managers used various and different ways (both qualitative and quantitative) in response to the survey question, we broadly distinguished between three categories. For projects with only a few ateliers (1 to 3 ateliers) the project managers consistently indicated this was 'sufficient' and these cases are hence calibrated above the cross-over point. Cases with 6 or more ateliers are calibrated as 1.0 because there is a clear gap between cases with 3 ateliers and cases with 6 ateliers.
Administrative Agreement (PLAN_AGR)	Archival data; data from the administrative agreements. In the administrative agreements, the spatial quality objective was either generally mentioned ('no' specification) or it was specified.	0.0 = general notion spatial quality 1.0 = spatial quality specified	Cases where spatial quality was concretely specified are calibrated as 1.0. Cases where spatial quality was only generally referenced are calibrated as 0.0.
Integral Design Team (PLAN_INT)	Survey data. Project managers were asked which of the six disciplines were involved in the projects.	N/A	Because in all the projects (nearly) all disciplines were involved, this condition is not included in the analysis (no variation).
Landscape Architect (PLAN_LAND)	Survey data. Project managers were asked in which way the landscape architect was involved in the project, how satisfied they were with the architect's involvement, and the extent to which they were an integral member of the project team (on a scale from 1 to 10, where 10 indicates maximal process-oriented involvement).	0.0 = landscape architect focused on planning product 1.0 = landscape architect focused on planning process	Because some respondents (Cases 20 and 23) assessed the role of the landscape architect qualitatively (see Table 1), we only broadly distinguish between two categories. Cases with a score of 6.0 or higher are calibrated as 1.0 because this indicates that the role of the landscape architect is more process-oriented than product-oriented. The respondents' answers to other (qualitative) questions on the role of the landscape architect further corroborate this calibration.
Cluster Spatial Quality (PLAN_CLUS)	Survey data. Project managers were asked about the extent to which the Cluster Spatial Quality contributed to achieving spatial quality in the spatial design (on a scale from 1 to 10). Additional questions focused on the specific instruments deployed by the Cluster, i.e., the formal assessments, the helpdesk function, and the spatial quality manual.	0.0 = limited or negative contribution 1.0 = important contribution	Because some respondents (Cases 06, 09-12, and 20) provided a qualitative assessment of the involvement of the Cluster Spatial Quality (see Table 1), we only broadly distinguish between two categories. Cases where the involvement was scored 6.0 or higher are calibrated as 1.0, because this indicates an important contribution rather than a limited or negative contribution of the Cluster. Data for Case 08 were ambiguous (see Table 1), but the case was calibrated as 0.0 as the data did not clearly indicate importance of the Cluster.
Conditions realization phase			
Spatial Complexity (REAL_SC)	Same as PLAN_SC (see above).	Same as the calibration of PLAN_SC	Same as the calibration of PLAN_SC (see above).
Project Realisator (REAL_REA)	Archival data; data from the realization agreements. In principle, only one administrative body acts as the project realisator. There are four possible realisators: water boards, Rijkswaterstaat, municipalities, and provinces.	Same as the calibration of PLAN_INI	Same as the calibration of PLAN_INI (see above).
Water Lowering Effect (REAL_WAT)	Archival data; data from the 'Room for the River' progress report (2016a). The water lowering effect is measured as the realized water level reduction in centimeters.	0.0 = ≤ 10.2 cm 0.3 = 10.3 to 20.5 cm 0.7 = 20.6 to 30.8 cm 1.0 = ≥ 30.9 cm	Similar to the calibration of REAL_WAT. When multiple values were provided within a project for different locations (Cases 02, 03, 06, and 16; see Table 2), the water lowering effect was averaged. We tested for multiple thresholds, indicating 20.5 cm as the cross-over point.

Contract Type (REAL_CON)	Archival data. Four different contract types are present amongst the projects: RAW, E&C, D&C, and PD&C.	0.0 = RAW 0.3 = E&C 0.7 = D&C 1.0 = PD&C	The PD&C contract is the most inclusive one, followed by the D&C contract. These are hence calibrated as 1.0 and 0.7, respectively. The E&C and RAW contracts are non-inclusive contract types, but the first is more inclusive than the latter. They are hence calibrated 0.3 and 0.0, respectively.
Realization Agreement (REAL_AGR)	Archival data; data from the realization agreements. In the realization agreements, the spatial quality objective was either generally mentioned ('no' specification) or it was specified.	Same as the calibration of PLAN_AGR	Same as the calibration of PLAN_AGR (see above). This condition was in the end not included in the analysis.
Maintenance Considerations (REAL_MAIN)	Survey data. Project managers were asked whether or not the maintenance plan of the project was updated during the realization phase.	0.0 = maintenance plan not updated 1.0 = maintenance plan updated	When the maintenance plan of a project was updated, this is calibrated as 1.0. When this was not the case, this is calibrated as 0.0.
Tender Document (REAL_TEN)	Survey data. Project managers were asked to what extent spatial quality was included in the tender documents as criterion and whether or not it was an *EMVI*-criterion.	0.0 = not included 1.0 = included	When spatial quality was explicitly included in the tender documents as an *EMVI*-criterion – or as a hard requirement otherwise – this is calibrated as 1.0. When this was not the case, this is calibrated as 0.0.
Landscape Architect (REAL_LAND)	Survey data. Project managers were asked whether or not and in which way the landscape architect was involved in the project, how strong his/her influence was in achieving spatial quality (on a scale from 1 to 10), and how good his/her relationship was with the private contractor (on a scale from 1 to 10).	0.0 = no or limited involvement of landscape architect 1.0 = close or influential involvement of landscape architect	Because respondents varied in the way they answered the survey questions, we only broadly distinguish between two categories. When the landscape architect was not involved or only in a very limited way ('at distance' from the project), this is calibrated as 0.0. When the landscape architect was closely involved or influential, this is calibrated as 1.0.
Cluster Spatial Quality (REAL_CLUS)	Survey data. Project managers were asked about how close the Cluster Spatial Quality was involved with the project and the extent to which the Cluster was influential in achieving spatial quality in the project (both on a scale from 1 to 10). Additional questions focused on the specific instruments deployed by the cluster, i.e., the helpdesk function and the program-wide meetings.	0.0 = not involved, not influential 1.0 = involved, influential	Because some respondents (Cases 14, 15, and 20) provided qualitative assessments (see Table 2), we only broadly distinguished between two categories. The quantitative scores on involvement and influences were averaged. Subsequently, cases with a score of 6.0 or higher are calibrated as 1.0.

Table 3: Operationalization and calibration of the outcomes and the conditions
See: https://www.ruimtevoorderivier.nl/projecten/ (last accessed: May 1st, 2017)

5 ANALYSIS AND RESULTS

We first tested for necessity and found no single necessary conditions. The condition with the highest consistency score for necessity was the absence of REAL_WAT for the realization phase, with a consistency of 0.806. This does not meet the required 0.9 consistency threshold for necessity (Schneider & Wagemann, 2012). For the analysis of sufficiency, we performed truth table analyses.

For the planning phase, the truth table would consist of a total of 512 (i.e., 29) logically possible configurations, because there are in total 9 conditions (4 context and 5 instrument conditions). For the realization phase, the truth table would consist of 256 (i.e., 28) logically possible configurations, because there are in total 8 conditions (3 context and 5 instrument conditions). Because only a medium-n of cases is available for the analyses of both phases, this produced many so-called logical remainders. A logical remainder is a truth table row for which no or not enough empirical evidence (i.e., cases) is at hand (Schneider & Wagemann, 2012). These logical remainders are problematic, because the analysis of the truth table entails the pairwise comparison of truth table rows that agree on the outcome and differ in only one of their conditions (with many empty truth table rows, a very few pairwise comparisons can be made). Therefore, we performed separate analyses for the context and instrument conditions, for the planning and realization phases respectively. We thus conducted four analyses. The results of the analyses are shown in Tables 4 to 7.

For all the analyses, we have provided the complex solutions, as shown in the tables below. In the tables, the black circles ( ) represent the presence of a condition and white circles (O) represent the negation of a condition. Blank cells represent irrelevant (redundant) conditions. In generating the complex solutions, no logical remainders are included in the minimization of the truth tables (Schneider & Wagemann, 2012). Hence, we have not made any assumptions about logical remainders, i.e., empty truth table rows.

For the analysis of the context conditions in the planning phase (Table 4), the truth table consists of 16 configurations (24) of which 9 are empirically present (see Appendix 3). The consistency cut-off point ("Incl.") was set at 0.538 because all the cases in Configurations 16, 13, and 15 have the outcome (see Appendix 3); the other configurations are either contradictions or only cover cases that have the non-outcome.

For the analysis of the instrument conditions in the planning phase (Table 5), the truth table consists of 32 configurations (25) of which 12 are empirically present (see Appendix 4). The consistency cut-off point ("Incl.") was set at 0.769 because all the cases in Configurations 15, 16, 32, and 2 have the outcome (see Appendix 4); the other configurations are either contradictions or only cover cases that have the non-outcome.

For the analysis of the context conditions in the realization phase (Table 6), the truth table consists of 8 configurations (23) of which 5 are empirically present (see Appendix 5). The consistency cut-off point

("Incl.") was set at 0.846 because all the configurations have the outcome. Only one configuration constitutes a contradiction (i.e., Configuration 1) that is caused by Case 03. This is only a minor contradiction, as this case has a raw score on the outcome of 0.4. In that case, the spatial quality was improved locally, but it had worsened regionally (see Table 2). Moreover, the other 4 cases in that configuration do have the outcome. Hence, all configurations were included in the minimization of the truth table.

For the analysis of the instrument conditions in the realization phase (Table 7), the truth table consists of 32 configurations (25) of which 12 are empirically present (see Appendix 6). The consistency cut-off point ("Incl.") was set at 0.850 because all configurations have the outcome; only Configuration 18 constitutes a contradiction, which is caused by Case 03, and was hence not included in the minimization of the truth table.

	Path 1	Path 2
PLAN_SC	•	•
PLAN_INI	•	•
PLAN_CHAMP	•	
PLAN_WAT		O
Raw coverage	0.250	0.262
Unique coverage	0.163	0.175
Consistency	0.769	0.583
Cases	Case_16; Case_07	Case_13, Case_17; Case_16
Solution coverage: 0.425 | Solution consistency: 0.694		

Table 4: Results truth table analysis for context conditions in planning phase

	Path 1	Path 2	Path 3
PLAN_QT	O	O	
PLAN_DES	O	•	•
PLAN_AGR	O	•	•
PLAN_LAND	O	•	•
PLAN_CLUS	•		•
Raw coverage	0.125	0.300	0.212
Unique coverage	0.125	0.175	0.087
Consistency	0.769	1.000	1.000
Cases	Case_23	Case_06, Case_17; Case_04	Case_04; Case_16
Solution coverage: 0.512 | Solution consistency: 0.932			

Table 5: Results truth table analysis for instrument conditions in planning phase

	Path 1	Path 2	Path 3 (M1)	Path 4 (M2)
REAL_SC			•	•
REAL_REA	O	•	O	
REAL_WAT	O	•		•
Raw coverage	0.588	0.124	0.576	0.276
Unique coverage	0.194 (M1) 0.482 (M2)	0.071 (M1) 0.047 (M2)	0.182	0.147
Consistency	0.917	0.913	0.990	1.000
Cases	Case_02, Case_03, Case_12, Case_21, Case_23; Case 04, Case_08, Case_09, Case_10, Case_11, Case_13, Case_16, Case_20	Case_19; Case_01	Case_04, Case_08, Case_09, Case_10, Case_11, Case_13, Case_16, Case_20; Case_06, Case_07, Case_14, Case_15	Case_06, Case_07, Case_14, Case_15; Case_01
Solution coverage Model 1: 0.859 | Solution consistency Model 1: 0.930 Solution coverage Model 2: 0.824 | Solution consistency Model 2: 0.927				

Table 6: Results truth table analysis for context conditions in realization phase

	Path 1	Path 2	Path 3	Path 4	Path 5	Path 6	Path 7	Path 8 (M1)	Path 9 (M2)
REAL_CON	O	O	•	•	O		•	•	•
REAL_TEN	O	O	•	•	O	O	O	•	•
REAL_MAIN	•	•	O	•		•	O	•	
REAL_LAND		O	O	•	O	O	•		O
REAL_CLUS	O				O	O	O	•	•
Raw coverage	0.118	0.118	0.241	0.082	0.182	0.171	0.082	0.082	0.241
Unique coverage	0.041 (M1) 0.041 (M2)	0.041 (M1) 0.041 (M2)	0.241 (M1) 0.041 (M2)	0.041 (M1) 0.082 (M2)	0.106 (M1) 0.106 (M2)	0.094 (M1) 0.094 (M2)	0.082 (M1) 0.082 (M2)	0.041	0.041
Consistency	1.000	1.000	0.872	1.000	0.939	0.967	1.000	1.000	0.872
Cases	Case_16; Case_08	Case_16; Case_04	Case_13; Case_09, Case_10, Case_11, Case_12	Case_01; Case_19	Case_21, Case_23; Case_16	Case_16; Case_07, Case_20	Case_14, Case_15	Case_06; Case_19	Case_09, Case_10, Case_11, Case_12; Case_06
Solution coverage Model 1: 0.806 | Solution consistency Model 1: 0.938 Solution coverage Model 2: 0.806 | Solution consistency Model 1: 0.938									

Table 7: Results truth table analysis for instrument conditions in realization phase

6 CONCLUSIONS AND DISCUSSION

At the outset of this paper, we aimed (1) to assess the extent to which the Room for the River program has been able to achieve the spatial quality objective, and (2) to identify the necessary and/or sufficient conditions for achieving spatial quality. In Section 6.1 we address the first aim and in Section 6.2 we address the second aim.

6.1 HAS THE ROOM FOR THE RIVER PROGRAM ACHIEVED ITS SPATIAL QUALITY OBJECTIVE?

Using the advisory reports of the Q-team as input, the projects were assessed by the Cluster Spatial Quality of the Room for the River program after their planning phase and after their realization phase for the PKB-objective as a whole. The results indicate that at the end of the planning phase, 12 of the 23 projects (52%) still performed insufficiently (see Table 1). It should be noted that for the four Nederrijn projects (Cases 09-12), no clear final assessments were available. However, the available qualitative reports listed various improvement measures[1], indicating that the spatial quality was still insufficient at that point.

For the evaluation of the program's performance after the realization phase relative to the PKB-objective as a whole, the projects were assessed on a five-value scale (see Table 3). With the exception perhaps of the project Langsdammen Waal (Case 03) where, although it was improved locally, spatial quality had worsened on the regional level, there are no projects were spatial quality has worsened or not improved compared to the situation before the Room for the River program (see Table 2). Of the 23 projects, 20 projects have seen an 'improvement' (3 projects; 13%) or 'strong improvement' (17 projects; 74%). Whereas the previous midterm assessments of the program (Feddes & Hinz, 2013; Hulsker et al., 2011; Rijke et al., 2012; Van Twist et al., 2011) concluded that the Room for the River program enhanced spatial quality, the present evaluation confirms this on the basis of a larger set of projects that now also have been finalized.

6.2 WHAT ARE THE NECESSARY/SUFFICIENT CONDITIONS FOR ACHIEVING SPATIAL QUALITY?

Based on the results of the analysis, we conclude that there are no necessary conditions for achieving spatial quality. Based on the truth table analyses, we also conclude that there are no sufficient conditions, i.e., conditions that by themselves produce spatial quality: as can be observed from the results (Tables 4 to 7), at least two conditions are required to produce spatial quality in any situation. In the remainder of this section, we will discuss the results.

6.2.1 PLANNING PHASE: IMPORTANT CONDITIONS AND EFFECTIVE STRATEGIES

Table 4 indicates that two configurations of context conditions can explain the achievement of a high spatial quality: a high spatial complexity together with a territorial government as project initiator and the presence of a project champion (Path 1), or a high spatial complexity, again with a territorial government as project initiator but now combined with a low water lowering effect (Path 2). These results indicate the importance of a high Spatial Complexity – i.e., measures within the banks (i.e., lowering floodplains and water retention) or measures beyond the banks (i.e., depoldering, dike relocation, and high water channels) – for the achievement of spatial quality in the planning phase (see Table 4). This is in support of the theoretical expectation that a higher complexity may allow different spatial functions to be addressed conjunctively, resulting in synergy gains (Heeres, 2017; Van Buuren, Edelenbos, et al., 2010; Verweij et al., 2013). The results also indicate the importance of having territorial governments – i.e., a municipality or a province – as Project Initiators. This is in support of the expectation that territorial governments may be more concerned with balancing different spatial interests than water boards or Rijkswaterstaat, who are more focused on realizing the water safety objective (see Section 3.2). Interestingly, the results show that

[1] These are the so-called 'Besluit Nederrijn3: Toets Ruimtelijke Kwaliteit' documents.

a Project Champion can indeed play an important role in achieving spatial quality (Path 1) – which is in support of the theoretical expectations (see Section 3.2) – but is not required by necessity (Path 2). In fact, in projects with a low Water Lowering Effect (Path 2), a project champion may help in promoting spatial quality (Case 16), but is not required (Cases 13 and 17). This could indicate that in projects with a low water lowering effect, there may be more latitude, that is, room to develop spatial solutions that maximize spatial quality, thus making the presence of a project champion who fights for safeguarding or promoting spatial quality less needed.

Table 5 shows that spatial quality can be achieved by means of three configurations of instrument conditions. The first strategy is to basically go 'all-in' and to maximize efforts to increase spatial quality (Path 3). Through a close involvement of the Cluster Spatial Quality, the landscape architect, and the Q-team[1], and through organizing design ateliers, and specifying spatial quality in the administrative agreement, a high spatial quality can indeed be achieved. We coin this strategy the going-all-in strategy. This strategy is effective, but may be less efficient in terms of the resources (time, budget, personnel) it requires. The results indicate two other strategies that are also effective and may be more efficient as well. In the second strategy, the efforts are focused on the role of the Cluster Spatial Quality. The Cluster operates on the program management level. Hence, we coin this strategy the program-as-guardian strategy (Path 1). Through a strong involvement of the Cluster Spatial Quality as a facilitator and guardian of spatial quality, less resources need to be devoted to the Q-team, design ateliers, spatial quality in the administrative agreement, and the involvement of the landscape architect. An alternative explanation of this strategy is that, when little energy is devoted in a project to achieving spatial quality by means of those project management instruments, it is required that the Cluster Spatial Quality steps in to steer the project in the right direction. The third strategy mirrors the program-as-guardian strategy. We coin it the project-as-driver strategy (Path 2). Here, the steering by the program management is less dominant, and the motor block for achieving spatial quality is formed by the projects themselves through organizing many design ateliers, explicating spatial quality in the administrative agreement, and a close involvement of the landscape architect.

It will be interesting to further study the types of program management present in the different strategies (cf. Buijs & Edelenbos, 2012; Busscher, 2014; Van Buuren, Buijs, & Teisman, 2010). Although this will require additional qualitative data collection and analysis, the program-as-guardian strategy seems to imply a type of program management in which the program monitors the projects and intervenes in the projects' scopes when progress towards spatial quality is hampered. Conversely, in the project-as-driver strategy, a much more facilitative type of program management seems to be in place. In this strategy, the role of the program does not seem to be to enforce projects to achieve spatial quality, but to enable and empower them in their ambitions to strive for spatial quality. Finally, the going-all-in strategy seems to implicate a program management that is pro-actively stimulating the projects to work towards improving spatial quality. In this strategy, the program seems to function more as a partner. Hence, it seems to adopt a type of program management somewhere in between the other two strategy types.

The results further indicate that with regard to the Q-Team, a low number of visits seems to be associated with the achievement of a high spatial quality (Paths 1 and 2). Whereas the previous evaluations of the Room for the River program indicated that the Q-team contributed to increasing the spatial quality in the project designs (Hulsker et al., 2011; Van Twist et al., 2011), we argued that a high number of visits could actually indicate a low initial spatial quality requiring additional efforts of the Q-team (see Section 3.2.1). Inversely, our results indicate that a low number of visits may be associated with a high initial spatial quality. Although follow-up analyses into the relationship between the involvement of the Q-team and the spatial quality in the realization phase are required to shed more light on this finding, our analysis does show – in contrast to the previous midterm evaluations that were based on fewer cases with less formalized research approaches – that many Q-team visits does not necessarily lead to high spatial quality in the planning phase. The Q-team does not seem to have been the core instrument around which the success of the Room for the River program revolved. In fact, our results indicate that the Design Ateliers, the Administrative Agreement, and the Landscape Architect are more important instruments for achieving spatial quality (Paths 2 and 3). The importance of these project-level instruments was also found in the previous midterm evaluations (Hulsker et al., 2011; Van Twist et al., 2011). It is also in support of

[1] The condition PLAN_QT is indicated as redundant in Path 3. However, the raw data show that for both Cases 04 and 16, the Q-team paid six visits to the projects, which is very close the cross-over point (see Table 3). Moreover, in Case 16, the survey respondent also assessed the Q-team's role in the planning phase as important with a score of 7/10 (see Table 3).

theoretical expectations about the importance of co-design and the involvement of multiple disciplines in spatial planning for achieving spatial quality (Heeres et al., 2016). Finally, the results indicate that the Cluster Spatial Quality indeed played an important role in achieving spatial quality in the planning phase (Paths 1 and 3), but that its efforts are less so required in projects where strong efforts are practiced by the projects themselves (i.e., the project-as-driver strategy; Path 2).

6.2.2 REALIZATION PHASE: IMPORTANT CONDITIONS AND EFFECTIVE STRATEGIES

Table 6 indicates multiple configurations of context conditions that can explain the achievement of a high final spatial quality: a functional government as project realisator combined with a low water lowering effect (Path 1), a territorial government as project realisator combined with a high water lowering effect (Path 2), a high spatial complexity combined with a functional government as project realisator (Path 3), or a high spatial complexity combined with a high water lowering effect (Path 4). The results indicate the variety of contexts within which projects have been realized; there do not seem to be unambiguous relationships between any of the conditions and the achievement of spatial quality. In different configurations, Spatial Complexity, the Project Realisator, and the Water Lowering Effect contribute to the achievement of spatial quality in different capacities. Interestingly though, projects with a low water lowering effect are often realized by a functional government (Path 1 and also partly Path 3) – i.e., a water board or Rijkswaterstaat – whereas projects with a high water lowering effect are often realized by territorial governments (Path 2 and also partly Path 4) – i.e., a municipality of province. This is perhaps counterintuitive in the sense that it may have had been expected that the functional governments are more focused on water safety and would hence be the realisator for the projects with a high water lowering effect (see Section 3.2). Although this would require additional qualitative data collection and analysis, an explanation of this result could actually be that in those projects where a high water lowering effect has been achieved, the goals of the water board or Rijkswaterstaat with respect to water safety have been satisfied, after which a municipality or province was then given the lead (or provided the latitude), within the scope set by the water lowering effect, to maximize spatial quality.

Table 7 shows that spatial quality in the realization phase can be achieved by means of nine configurations of instrument conditions. These results are puzzling in the sense that the sheer number of possible paths towards the achievement of spatial quality makes it difficult to draw clear and unambiguous conclusions. Taking into account as well the somewhat puzzling results of the analysis of the context conditions, a follow-up analysis may be required in which the number of conditions is decreased and in which the context and instrument conditions are combined in one comparative analysis (see Schneider & Wagemann, 2006). Still, some observations can be made. First of all, Paths 4 and 8 may again be characterized as going-all-in strategies. In those cases, the strategy was to nearly go ‘all-in’ and to maximize efforts to increase spatial quality with respect to deploying 4 out of 5 instruments. In particular, inclusive contracts – i.e., D&C or PD&C contracts – combined with the specification of spatial quality in the realization agreement and the updating of the maintenance plans, supplemented with either the close involvement of the landscape architect (Path 4) or of the Cluster Spatial Quality (Path 8), proved effective for achieving spatial quality. At least equally interesting is that in three cases, represented by Path 5, quite the opposite seems to have occurred. There, contracts were non-inclusive, spatial quality was not included in the tender documents as a criterion, and the landscape architect and the Cluster were not closely involved. With this strategy, which we tentatively coin the remote strategy, spatial quality was hardly safeguarded, but it was achieved nevertheless. This path perhaps points towards the importance of organizing for spatial quality in the planning phase, laying the fertile ground for the realization phase. It might be that in these cases, spatial quality had already been so well developed – both in terms of content (what is to be realized) as well as process (how will this be realized) – that spatial quality did not need specific attention anymore in the realization phase of the project. It also points to deviant cases that may be selected for further case study research (see Schneider & Rohlfing, 2016). The remaining configurations (Paths 1-3, Path 6-7, and Path 9) showcase various particular strategies. Two subsets of strategies may be distinguished here. One is what may be coined the limited-steering strategy. This strategy is represented by Paths 1, 2, and 6. In those cases, there was limited steering on the safeguarding or promotion of spatial quality and the steering that occurred was focused on updating the maintenance plans to ensure that maintenance considerations would be taken into account early in the realization process. The other strategy, represented by the remaining Paths 3, 7, and 9, may be coined the contract-steering strategy. In those cases, steering was less limited (although not ‘all-in’) and focused on the specification of spatial quality in tender documents and/or on project realization through inclusive contracts.

The results indicate that the various instruments applied in the Room for the River program's realization phase – i.e., Contract Type, the inclusion of Maintenance Considerations, the Tender Documents, the involvement of the Landscape Architect, and the involvement of the Cluster Spatial Quality – have contributed to achievement of spatial quality in different capacities. First, more inclusive contracts can indeed contribute to higher spatial quality (cf. Lenferink et al., 2013) but not necessarily so. Follow-up analyses may further delve into the question of whether and in what ways more inclusive contracts indeed stimulate a higher spatial quality. That is, it may well be that it is not so much the contract type per se that is important, but rather what is actually determined as the project scope in the contract, and the way contracts are managed and implemented (Verweij, 2015a). Second and likewise, updating the maintenance plans and the specification of spatial quality in the tender documents can indeed contribute to spatial quality, but much will depend on how the private contractors actually act upon what was agreed in the plans and documents. With respect to the involvement of the landscape architect, thirdly, it is noticeable that his/her role has been less prominent compared to the planning phase. In the planning phase, s/he was closely involved in fourteen of the projects and in the realization phase in just five of the projects. Finally, the results indicate that the Cluster Spatial Quality can indeed play an important role in achieving spatial quality in the realization phase (in particular Paths 8 and 9), but that its efforts are generally not required (Paths 2-4) or that projects even benefit from a remote role of the Cluster (Paths 1, 5-7).

6.3 IN CONCLUSION

Based on the results of the analysis, we have concluded that the Room for the River program has been successful in achieving spatial quality and we have identified different strategies that are effective to that end. On the basis of our research, we can also conclude that integrated area-based planning is indeed further developing in the Dutch river policy domain. In contrast to previous warnings about high transaction costs (Hijdra, 2017) and the tendency to simplify and revert to old routines when complexity increases (Salet et al., 2013; Verweij et al., 2017), we observed that in the context of the Room for the River program, spatial quality is no longer only seen "as a luxury that is costly and mainly focused on new nature in the river areas" (Van Twist et al., 2011, p. 15). Rather, various practical strategies have been developed for realizing the secondary objective of the Room for the River program in concrete water planning practices. Given the program's status as an international frontrunner in integrated planning and water management (Zevenbergen et al., 2013), these strategies may prove valuable for planning practices in other countries as well. As a final remark, we note that the analyses presented in this paper will be supplemented by in-depth case studies of projects that are representative of many of the paths identified through the QCA. These case studies will enable us to delve deeper into the intricate relationships between the conditions that constitute the paths towards the achievement of spatial quality.

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APPENDICES

Case label	Case name (in Dutch)	Type of measure (in Dutch)	Case name in 'Room for the River' progress report (2016a) (in Dutch)
Case_01	*Ruimte voor de Waal*	*Dijkverlegging*	*Dijkteruglegging Lent*
Case_02	*Kribverlaging Waal*	*Kribverlaging*	*Kribverlaging Midden-Waal; Kribverlaging Waal-Fort St. Andries; Kribverlaging Beneden Waal*
Case_03	*Langsdammen Waal*	*Langsdammen*	*N/A*
Case_04	*Het Munnikenland*	*Dijkverlegging; Uiterwaardvergraving*	*Uiterwaardvergraving Brakelse Benedenwaarden en Dijkverlegging Munnikenland*
Case_05	*Uiterwaardvergraving Bedrijventerrein Avelingen*	*Uiterwaardvergraving*	*Uiterwaardvergraving Avelingen*
Case_06	*Ontpoldering Noordwaard*	*Ontpoldering*	*Ontpoldering Noordwaard*
Case_07	*Ontpoldering Overdiep*	*Ontpoldering*	*Ontpoldering Overdiepse Polder*
Case_08	*Berging op het Volkerak-Zoommeer*	*Berging*	*Waterberging op het Volkerak-Zoommeer*
Case_09	*Nederrijn: Uiterwaardvergraving Doorwerthsche Waarden*	*Uiterwaardvergraving*	*Uiterwaardvergraving Doorwerthsche Waarden*
Case_10	*Nederrijn: Uiterwaardvergraving Middelwaard*	*Uiterwaardvergraving*	*Uiterwaardvergraving Middelwaard*
Case_11	*Nederrijn: Uiterwaardvergraving De Tollewaard*	*Uiterwaardvergraving*	*Uiterwaardvergraving De Tollewaard*
Case_12	*Nederrijn: Obstakelverwijdering Machinistenschool Elst*	*Obstakelverwijdering*	*Obstakelverwijdering Machinistenschool Elst*
Case_13	*Ruimte voor de Lek Vianen*	*Uiterwaardvergraving*	*Uiterwaardvergraving Honswijkerwaarden, Steurland Hagestein, Hagesteine Uiterwaard en Heeraswaard*
Case_14	*Dijkverlegging Cortenoever*	*Dijkverlegging*	*Dijkverlegging Cortenoever*
Case_15	*Dijkverlegging Voorsterklei*	*Dijkverlegging*	*Dijkverlegging Voorsterklei*
Case_16	*Ruimte voor de Rivier Deventer*	*Uiterwaardvergraving*	*Uiterwaardvergraving Bolwerksplas, Worp en Ossenwaard; Uiterwaardvergraving Keizers- en Stobbenwaarden en Olsterwaarden*
Case_17	*Ruimte voor de Rivier Zwolle: Dijkverlegging Westenholte*	*Dijkverlegging*	*Dijkverlegging Westenholte*
Case_18	*Ruimte voor de Rivier Zwolle: Uiterwaardvergraving Scheller-Oldeneler Buitenwaarden*	*Uiterwaardvergraving*	*Uiterwaardvergraving Scheller en Oldeneler Buitenwaarden*
Case_19	*Ruimte voor de Rivier IJsseldelta: Zomerbedverlaging Beneden-IJssel*	*Zomerbedverlaging*	*Ruimte voor de Rivier IJsseldelta, Gedeelte Zomerbedverlaging*
Case_20	*Uiterwaardvergraving Meinerswijk Arnhem*	*Uiterwaardvergraving*	*Uiterwaardvergraving Meinerswijk*
Case_21	*Dijkverbetering Steurgat*	*Dijkverbetering*	*Dijkverbetering Steurgat/Land van Altena*
Case_22	*Dijkverbetering Schoonhovense Veer-Langerak*	*Dijkverbetering*	*Dijkverbetering Lek/Alblasserwaard en de Vijfheerenlanden*
Case_23	*Dijkverbetering Amer/Donge*	*Dijkverbetering*	*Dijkverbetering Amer/Donge*

Appendix 1: Overview of the projects (cases) in the 'Room for the River' program

Case label	Outcomes		Conditions Planning Phase ("PLAN_X")[19]									Conditions Realization Phase ("REAL_X")[19]							
	SQ_PLAN	SQ_PKB	SC	INI	CHAMP	WAT	QT	DES	AGR	LAND	CLUS	SC	REA	WAT	CON	MAIN	TEN	LAND	CLUS
Case_01	1	1	1	0,7		1	0		0			1	0,7	1	0,7	1	1	1	0
Case_02	1	1	0	0,3	0	0,3	1	0,7	0	0	0	0	0,3	0	0,7	0	0	0	1
Case_03	0	0,4	0	0,3	1	0,3	1	0	0	1	0	0	0,3	0	0,7	0	0	0	1
Case_04	1	1	1	0	1	0,3	0,3	0,7	1	1	1	1	0	0,3	0,3	1	0	0	1
Case_05	1	1	0,7	0,7		0	0		1			0,7	0,7	0,3	0,3				
Case_06	1	1	1	0,3	1	1	0,3	1	1	1	0	1	0,3	0,7	0,7	1	1	0	1
Case_07	1	1	1	1	1	1	0	1	0	1	0	1	0	0,7	0,7	1	0	0	0
Case_08	0	0,7	0,7	0,3	1	0	0,7	1	0	1	0	0,7	0	0	0,3	1	0	1	0
Case_09	0	1	0,7	0,3	0	0	0,3	0,7	0	1	0	0,7	0,3	0	1	0	1	0	1
Case_10	0	0,6	0,7	0,3	0	0	0,3	0,7	0	1	0	0,7	0,3	0	1	0	1	0	1
Case_11	0	0,8	0,7	0,3	0	0	0,3	0,7	0	1	0	0,7	0,3	0	1	0	1	0	1
Case_12	0	1	0	0,3	0	0	0,3	0,7	0	1	0	0	0,3	0,3	1	0	1	0	1
Case_13	1	1	0,7	1	0	0	0,7	0,7	0	1	1	0,7	0,3	0	0,7	0	1	0	0
Case_14	0	1	1	0	1	1	1	0,7	0	0	0	1	0	1	0,7	0	0	1	0
Case_15	0	1	1	0	1	1	1	0,7	0	0	0	1	0	0,7	0,7	0	0	1	0
Case_16	1	1	0,7	0,85	1	0,3	0,7	1	1	1	1	0,7	0	0,3	0,3	1	0	0	0
Case_17	1	1	1	0,7	0	0	0,3	1	1	1	0	1	0	0	0,3				
Case_18	1	1	0,7	1		0,3	0,3		1			0,7	0	0,3	0,3				
Case_19	0	0,8	0	0,3	1	1	0,7	1	0	1	1	0	1	1	0,7	1	1	1	1
Case_20	0	0,9	0,7	0,3	1	0	0,7	0,7	1	0	1	0,7	0,3	0	0,7	1	0	0	0
Case_21	0	1	0	0	0	0	0,7	0,7	0	0	1	0	0	0	0	0	0	0	0
Case_22	0	1	0	0	0	0	0	0	0	1	1	0	0	0	1				
Case_23	1	0,8	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0

Appendix 2: The calibrated data matrix

Conf. No.	PLAN_SC	PLAN_INI	PLAN_CHAMP	PLAN_WAT	Outcome	N	Incl.	Cases
16	**1**	**1**	**1**	**1**	**1**	**1**	**1.000**	**Case_07**
13	**1**	**1**	**0**	**0**	**1**	**2**	**0.609**	**Case_13, Case_17**
15	**1**	**1**	**1**	**0**	**1**	**1**	**0.538**	**Case_16**
11	1	0	1	0	0	3	0.378	Case_04, Case_08, Case_20
12	1	0	1	1	0	3	0.365	Case_06, Case_14, Case_15
1	0	0	0	0	0	5	0.321	Case_02, Case_12, Case_21, Case_22, Case_23
4	0	0	1	1	0	1	0.130	Case_19
9	1	0	0	0	0	3	0.125	Case_09, Case_10, Case_11
3	0	0	1	0	0	1	0.103	Case_03

Appendix 3: Truth table for context conditions in planning phase for spatial quality[20]

Conf. No.	PLAN_QT	PLAN_DES	PLAN_AGR	PLAN_LAND	PLAN_CLUS	Outcome	N	Incl.	Cases
15	**0**	**1**	**1**	**1**	**0**	**1**	**2**	**1.000**	**Case_06, Case_17**
16	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**1.000**	**Case_04**
32	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1.000**	**Case_16**
2	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**0.769**	**Case_23**
28	1	1	0	1	1	0	2	0.500	Case_13, Case_19
25	1	1	0	0	0	0	3	0.333	Case_02, Case_14, Case_15
11	0	1	0	1	0	0	5	0.244	Case_07, Case_09, Case_10, Case_11, Case_12
4	0	0	0	1	1	0	1	0.231	Case_22
19	1	0	0	1	0	0	1	0.000	Case_03
26	1	1	0	0	1	0	1	0.000	Case_21
27	1	1	0	1	0	0	1	0.000	Case_08
30	1	1	1	0	1	0	1	0.000	Case_20

Appendix 4: Truth table for instrument conditions in planning phase for spatial quality[20]

Conf. No.	REAL_SC	REAL_REA	REAL_WAT	Outcome	N	Incl.	Cases
6	**1**	**0**	**1**	**1**	**4**	**1.000**	**Case_06, Case_07, Case_14, Case_15**
8	**1**	**1**	**1**	**1**	**1**	**1.000**	**Case_01**
5	**1**	**0**	**0**	**1**	**8**	**0.985**	**Case_04, Case_08, Case_09, Case_10, Case_11, Case_13, Case_16, Case_20**
1	**0**	**0**	**0**	**1**	**5**	**0.919**	**Case_02, Case_03, Case_12, Case_21, Case_23**
4	**0**	**1**	**1**	**1**	**1**	**0.846**	**Case_19**

Appendix 5: Truth table for context conditions in realization phase for spatial quality[21]

Conf. No.	REAL_CON	REAL_MAIN	REAL_TEN	REAL_LAND	REAL_CLUS	Outcome	N	Incl.	Cases
9	**0**	**1**	**0**	**0**	**0**	**1**	**1**	**1.000**	**Case_16**
10	**0**	**1**	**0**	**0**	**1**	**1**	**1**	**1.000**	**Case_04**
11	**0**	**1**	**0**	**1**	**0**	**1**	**1**	**1.000**	**Case_08**
19	**1**	**0**	**0**	**1**	**0**	**1**	**2**	**1.000**	**Case_14, Case_15**
21	**1**	**0**	**1**	**0**	**0**	**1**	**1**	**1.000**	**Case_13**
25	**1**	**1**	**0**	**0**	**0**	**1**	**2**	**1.000**	**Case_07, Case_20**
30	**1**	**1**	**1**	**0**	**1**	**1**	**1**	**1.000**	**Case_06**
31	**1**	**1**	**1**	**1**	**0**	**1**	**1**	**1.000**	**Case_01**
32	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1.000**	**Case_19**
1	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**0.900**	**Case_21, Case_23**
22	**1**	**0**	**1**	**0**	**1**	**1**	**4**	**0.850**	**Case_09, Case_10, Case_11, Case_12**
18	1	0	0	0	1	0	2	0.786	Case_02, Case_03

Appendix 6: Truth table for instrument conditions in realization phase for spatial quality[21]

ID 1643 | EVALUATING NEIGHBOURHOOD SUSTAINABILITY ASSESSMENT METHODOLOGY AS A LOCALIZATION TOOL FOR GLOBAL TARGETS

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ABSTRACT: In the last two decades, global sustainable development concerns have become more decisive on urban development strategies. This new order also created two major sub-processes. While the first one mainly covers the interpretation of major scale sustainable development goals into sub-national strategies, the second one includes providing a successful sustainability monitoring mechanism in coherence with national obligations for global sustainability targets. Sustainability assessment methodology (SAM) have gained importance by standing at the intersection of these two sub-processes. SAM tools have been developed in different geographies for monitoring and supporting sustainable development principles throughout the design and implementation processes. In this context, this paper presents a framework for the utilization of these methodologies in the localization of global sustainability targets through the case of Turkey. For this purpose, criteria of eight existing Neighbourhood Sustainability Assessment Tools (NSAT) were compared for obtaining a combined matrix. In the first stage, provided