Master's Thesis – master Sustainable Development

Water and Ground Governance on Multiple Levels: an ex-ante assessment of the Netherlands's new 'Water and Ground Steering' policy framework

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Statement of originality

I declare that this is an original report and that the thesis is entirely my own work. The text and work presented in this document are original, and no sources other than those mentioned in the text and its references have been used in the thesis.

Abstract

Amid the increasing severity of floods and dwindling land availability, the management and governance of water and ground have moved up the social and political agendas. The importance of adequate cooperation and coordination between different governance levels, both vertical and horizontal (i.e., multi-level governance or MLG) that are concerned with water and ground management is increasingly being recognised. The Netherlands has a long history with, mainly water-related, MLG policies of which the 'Water en Bodem sturend' (Water and Ground steering or WBS) policy framework is the latest. WBS aims to steer spatial planning policymaking to accommodate the limits of the water and ground systems in the Netherlands. This research revolves around an ex-ante assessment of the WBS policy framework and thereby also attempts to bridge the knowledge gap concerning evaluating the effectiveness of MLG policies. The corresponding research question reads: *"What governance strategies are able to enhance the effectiveness of a MLG policy, and to what extent?"* The research question consists of two parts. Firstly, it seeks to determine how the effectiveness of MLG policies can be assessed. Secondly, it attempts to distinguish the governance strategies that can enhance the measured policy effectiveness.

Based on scholarly literature, a novel analytical framework was developed that can assess the effectiveness of MLG policies. An embedded case study analysis was adopted, in which the overarching MLG structure of the Netherlands was the context and the unit of analysis was the WBS policy framework. Furthermore, three sub-units were selected, namely the provinces Noord-Holland, Utrecht and Overijssel. Subsequently, WBS-related documents were gathered and 15 interviews were conducted with policy advisors from the provinces or individuals who have knowledge of the policy framework. The documents and interviews were qualitatively coded and analysed using the developed analytical framework.

The research found that WBS scored worst on the 'are the short-term and long-term effects of policies accounted for?' and 'are the different problem frames comprised into a common perspective?'. Hence, the employed governance strategies focused mainly on the mentioned indicators, as this could yield the most improvements to the effectiveness of WBS. A combination of connectivity and temporal strategies were used to address the shortcomings of WBS regarding said indicators. This study demonstrated that the effectiveness of a MLG policy (framework) can be assessed and highlighted the potential of employing governance strategies to enhance the effectiveness.

Abbreviations and acronyms

Abbreviation or acronym	Original Dutch wording (if applicable)	Definition
CSA		Case study analysis
FRM		Flood Risk Management
IFRM		Integrated Flood Risk Management
IPO	Interprovinciaal Overleg	Interprovincial Deliberation
GGOR	Gewenst Grond- en Oppervlaktewater Regime	Desired Ground and Surface Water Regimes
GHG		Greenhouse Gas
MLG		Multi-Level Governance
Ministry of I&W	Ministerie van Infrastructuur en Waterstaat	Ministry of Infrastructure and Water Management
MTon		Megatonne or 1 million tonnes
NOVEX	Nationale Omgevingsvisie Extra	National Environment Strategy Extra
NPLG	Nationaal Programma Landelijk Gebied	National Program Rural Area
PPLG	Provinciaal Programma Landelijk Gebied	Provincial Program Rural Area
VEMW	Vereniging voor Energie, Milieu en Water	Association for Energy, Environment, and Water
Vewin	Vereniging van Waterbedrijven in Nederland	Association of Water Companies in the Netherlands
WBS	Water en Bodem sturend	Water and Ground steering
WUR		Wageningen University & Research

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Preface and acknowledgments

This thesis was written as part of the master Sustainable Development at Utrecht University and the product of a six-month research process, during which several people have helped me. I want to highlight some of them. First and foremost, I would like to express my gratitude to my supervisor, Dr. Ir. Dries Hegger for his generous help and guidance. Our biweekly meetings were of great service to me and the feedback on my preliminary work documents I sent, guided me in the right direction. Furthermore, I would like to thank Marijke de Jong, who, using her contacts in the provincial government of Utrecht, put me in touch with potential interviewees, which kickstarted the interview process. Thirdly, I would like to thank my second assessor, Dr. Carel Dieperink, who gave helpful feedback on my research proposal, which helped further the research. Lastly, I would like to express my gratitude to the interviewees, without whom this research would not have been possible.

I hope you will enjoy reading this thesis.

Pieter van der Molen
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1. Introduction

1.1 Background

Water, or more specifically, floods and droughts, are ranked among the most fatal natural disasters throughout humanity's history. Although they have become less deadly, earthquakes have overtaken them in this aspect, they can still cause severe social and economic damage (Ritchie, 2022). Relatively recently, a period of drought afflicted the U.S., lasting from 1998 until 2014, and these are expected to become more frequent and severe (NIDIS & NOAA n.d.). Morever, in the U.S., floods are associated with 100 deaths annually. Between 1998 and 2014, the Federal Emergency Management Agency spent just short of €50 billion to repair or replace damages to public infrastructure (Denchak, 2019). These growing costs are mainly associated with the increasing severity of floods and dense socio-economic activities in floodplains (den Boer et al., 2019). Last year, Australia witnessed its worst recorded flood disaster, affecting around 16,000 people. Similarly, floods ravaged the countryside of Sudan and Pakistan, leaving whole villages without a home (Potts, 2023). Closer to home, the river basins of the Meuse, Ahr, and Erft in the Netherlands, Germany, and Belgium, in July of 2021, experienced heavy precipitation, causing the rivers to burst out of their banks. In the end, 296 people lost their lives (Cornwall, 2021). The growing economic activity near water bodies is related to the growing human and material costs of floods (den Boer et al., 2019). Densely populated areas, particularly, are increasingly at risk from the rivers in the hinterland, the rising seas, and more intense rainfall. In densely inhabited countries where land is scarce, like the Netherlands, striking a balance between increasing economic activity and the risks of floods has been a growing headache for planners (Klijn et al., 2015)

As water- and ground-related problems have become more common and severe, water and ground management and governance have moved up the social and political agendas (Edmond, 2023). This is especially apparent with flood risk management (FRM), as it has entered the social and political debates more frequently and has become a focal point for scientific research (Alexander et al., 2016). Simultaneously, there has been a paradigm shift from 'defending against floods' towards 'living with water' (Zevenbergen et al., 2008). This transition has been dubbed Integrated Flood Risk Management (IFRM) (den Boer et al., 2019). IFRM underscores that adequate cooperation and coordination between different governance levels, both vertical and horizontal, that are concerned with water management and governance is vital. An integrated approach regarding FRM aims to harmonise economic, housing, and spatial planning goals by engaging the different governance levels and through effective allocation of government funds (van Herk et al., 2015). The popularity is illustrated by the adoption of the Water Directive of the EU, which also incentivised member states to integrate similar IFRM policies at home. One such program is *Ruimte voor de Rivier* (Room for the River) in the Netherlands, instituted in 2007, which was the starting point for the shift of Dutch flood risk management towards 'living with water' (Zevenbergen et al., 2013). These examples of IFRM illustrate the emphasis on cooperation and coordination between different governance levels. Hence, IFRM and the examples can be regarded as a multi-level governance (MLG) practices (den Boer et al., 2019). MLG is a concept that was first coined

in the EU's Committee of the Regions and can be interpreted as a governance structure that aims to increase coordination and cooperation between governance levels to increase the effectiveness of policies (Coopenergy Consortium, 2015).

Adopting the abovementioned Room for the River policies marked the beginning of a long list of IFRM programs in the Netherlands, of which the latest is called 'Water en Bodem sturend' (Water and Ground steering or WBS). WBS was introduced by the Ministry of Infrastructure and Water Management (Ministry of I&W) in a letter to parliament in November 2022, and aims to steer spatial planning policymaking to accommodate the limits of the water and ground systems in the Netherlands. It is not (yet) a concrete policy, but rather a policy ambition that intends to offer a framework that facilitates the spatial planning processes by taking into account the water and ground systems. Hence, from here on out, it will be called 'the WBS policy framework'. This policy framework details an array of structuring choices and measures for the coming decades that are concerned with the water and ground systems, built-up area, and several specific regions with differing soil types (Harbers & Heijnen, 2022). Besides these structuring choices, the policy framework includes a set of guiding principles that function as the foundation of the document and attempt to comply with the advisory reports of the Deltacommissaris (Glas, 2021) and Johan Remkes (2022). The former was commissioned by the Ministry of I&W and the *Ministerie van Economische Zaken en Klimaat* (Ministry of Economic Affairs and Climate Policy) to address housing and climate adaptation issues. The report emphasises that besides mitigation the government should also remain committed to adaptation in cooperation with private parties. The latter document argues that rural areas should be provided with a long-term strategy for spatial planning, which should alleviate their uncertainty. The guiding principles of the WBS policy framework that resulted from these two reports read as follows:

1. do not shift the responsibility to others;
2. consider extremes;
3. coherent approach to tackling flooding and drought;
4. multi-layered security;
5. less land cover, less digging and no pollution;
6. integral approach for the living environment;
7. comply or explain – in principle, the different governance bodies should adhere to the structuring choices and measures, but in particular and justified cases, they can deviate from them.

The WBS policy framework is a prime example of a MLG policy. Although it is issued by the national government, the provincial and municipal governments and water authorities will carry most of the responsibility to make the policy framework a priority for the spatial planning decision-making in their respective regions (comply) or justify a diverging approach (explain). As of now, European regulation, specifically directive 2000/60/EG that aims to ensure the quality of ground- and surface water, is a concrete policy

that must be complied with (EC, 2000). Moreover, as mentioned, the WBS is an answer to the advisory reports of Remkes (2022) and Glas (2021), mentioned and discussed above, indicating the horizontal coordination between (quasi-) governance levels.

During the construction of the WBS policy framework, the Ministry of I&W requested an independent review of WBS, by a commission of professors and other experts led by the knowledge institute Deltares and Wageningen University & Research (WUR). The recommendations of the research mainly revolved around specifying the ambitions of the policy framework and elaborating on the 'comply or explain' and 'not shifting responsibilities' principles.

1.2 Research gap

It has become a common truism that complex social-ecological dynamics, such as FRM, require adaptive approaches that involve all concerned governance levels. Hence, MLG has become a widely studied research subject in regard to water and ground management/governance (Pahl-Wostl, 2015). The popularity of the MLG framework in relation to FRM can be seen after a quick search on Google Scholar ["multi-level governance" AND "flood risk management"] that yields 207 results. A majority of these studies analyse the water governance structures of countries, regions or cities using a descriptive, explorative, diagnostic, and/or prescriptive approach (den Boer et al.,2019; Pahl-Wostl et al., 2020; Pahl-Wostl, 2009; Nykvist et al., 2017; Ingold et al., 2019; Wehn et al., 2015; Handayaniet al., 2023; Salman & Hurlbert, 2022). The literature stresses the complexity and uncertainty associated with MLG (den Boer et al., 2019) and attempts to untangle this web by addressing MLG from multiple angles. Pahl-Wostl et al. (2020), adopt a theoretical approach by constructing a diagnostic and solution-oriented framework to assess the coordination and cooperation of MLG by providing several guiding hypotheses. Pahl-Wostl (2009), acknowledges the importance of the adaptive capacity factor of MLG and argues that more diverse and complex governance regimes are better able to adjust to gradual or immediate changes. Adding to this, den Boer et al. (2019) addresses the social learning component of multi-level (flood risk) governance by developing a conceptual framework that describes supporting conditions for said learning. The authors employ their framework to analyse the Dutch Room for the River programme and conclude that personal commitment and interpersonal trust are key prerequisites for social learning. Nykvist et al. (2017), Handayaniet et al. (2023), and Salman & Hulbert (2022), adopt the above-described, diagnostic, conceptual, and analytical frameworks and employ them in case study analyses. Ingold et al. (2019) contribute to the theoretical debate by linking key environmental problem characteristics to the appropriate governance strategies to enhance the effectiveness of environmental policies. These prominent authors and articles in the MLG research field, illustrate that there is extensive knowledge regarding the overarching (water and ground) governance of countries, regions, and cities. However, a relatively underexposed sector in this scientific debate is the assessment of the effectiveness of specific policies that concern multiple horizontal and vertical governance levels. Ingold et al. (2019) are the exception to this, as they do create a conceptual framework that addresses the effectiveness of environmental problem policies (Ingold et al., 2019)

As mentioned, the WBS is an example of a MLG policy since it covers multiple horizontal and vertical governance levels to tackle an environmental problem. The scientific debate regarding MLG revolves mainly around the theoretical foundation of MLG, yet the practical component is relatively underexposed, i.e., whether concrete policies that concern multiple vertical and horizontal governance levels yield the outcomes they were designed to achieve. In short, the knowledge gap is concerned with the assessment of the effectiveness of MLG policies. Regarding the WBS policy framework it is relatively new, so it has yet to be determined if it is ultimately effective. However, an assessment of the WBS policy proposal to gauge whether it is likely to achieve its intended effect, i.e., tackling spatial planning challenges by making the limits of the water and land systems steering, is possible. Moreover, WBS is new in that it attempts to make, more than in the past, the physical boundaries of the water and ground systems leading in future policymaking. In short, the ex-ante assessment of the novel WBS policy framework can help fill the literature gap concerning the evaluation the effectiveness of MLG policies. In this study, the effectiveness of a MLG policy (framework) is based on the ability to deal with uncertainty, connecting public/private sectors, connecting jurisdictions, connecting short and long-term effects, and acknowledging different problem frames.

1.3 Research objective

The research attempted to bridge the above-mentioned gap in the MLG research area and contribute to the debate. To execute this, the briefly described WBS policy framework of the Ministry of I&W was assessed using an analytical framework (presented in chapter 2) and governance strategies were provided to enhance its effectiveness. These governance strategies address shortcomings of policies by connecting sectors, jurisdictions, space, and time. These strategies are further elaborated on in chapter 2 and applied to the WBS framework in the discussion. As mentioned above, WBS was relatively recently introduced, hence, the study consisted of an ex-ante assessment. Because the research assessed, ex-ante, a MLG policy framework (the WBS policy framework) and determined what governance strategies could enhance its effectiveness, the research had both an evaluative and prescriptive character. Based on this objective the research question reads: *"What governance strategies are able to enhance the effectiveness of a MLG policy, and to what extent?"* The research question consists of two parts. Firstly, it seeks to determine how the effectiveness of MLG policies can be assessed. Secondly, it attempts to distinguish the governance strategies that can enhance the measured policy effectiveness.

In order to answer the main research question, first, a methodology for assessing a MLG policy must be established. Next, using said methodology, the strengths and weaknesses of the WBS policy framework should be discerned. Lastly, the appropriate governance strategies should be integrated with the MLG policy to enhance the effectiveness of the policy framework. In sum, the following sub-questions needed to be answered:

1. *"Which criteria and indicators to, ex-ante, assess the effectiveness of the WBS policy framework can be derived from the literature concerning MLG?"*

2. *"Based on these effectiveness criteria and indicators, what are the strengths and weaknesses of the WBS policy framework?"*
3. *"What governance strategies are relevant to enhance the effectiveness of the WBS policy framework?"*

Sub-question 1 is concerned with the first part of the main research question, while sub-questions 2 and 3 address the second part of the main research question.

1.4 Scientific relevance

The scientific relevance lends itself from the above-mentioned research gap concerning the effectiveness of specific MLG policies, such as the WBS policy framework and the aforementioned novel characteristics of the framework in Dutch governance. The research contributed to the scientific debate by expanding on the underexposed component of MLG literature, discussed above through conducting an ex-ante assessment of the potential effectiveness of a specific MLG policy. Moreover, the research used the governance strategies of Ingold et al. (2019), which were originally intended to address environmental governance challenges in general. The research examined if these strategies can be used for MLG policies more specifically.

Furthermore, the research employed the environmental problem characteristics of, again, Ingold et al. (2019) to assess, ex-ante, the effectiveness of WBS. This assessment framework has yet to be applied to the WBS policy framework which adopts a MLG approach. Moreover, an analytical framework was constructed based on the concepts addressed in the article by Ingold et al. (2019). Hence, the research contributed to the MLG debate by providing a novel analytical framework that can be employed in other case studies.

1.5 Social relevance

The social relevance lends itself from the fact that water and soil can be found all around us and connects everything, making them crucial, yet highly complex, components in the transition towards a sustainable future. Hence, it can be argued that water and ground management and governance, and more specifically FRM, lies at the center of the UN Sustainable Development agenda (Pahl-Wostl et al., 2020). Since, water and ground management are deviously complex topics, the OECD (2011) recognises and advocates that to tackle water and ground issues, coordination between different governance levels is a prerequisite, i.e., an MLG approach. This multi-level characteristic of the desired water and ground management and governance structures can be found in the Sustainable Development Goal (SDG) 6, specifically sub-goal 6.5 (UN, 2016a) and SDG 15, specifically sub-goal 15.1 (UN, 2016b): *"By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate"* and *"By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements"* The research attempted to contribute to the MLG debate by assessing the WBS, ex-ante, and suggesting policy strategies. If these governance strategies ultimately prove to be able to enhance the effectiveness, they can be

applied to other similar MLG policies if the circumstances allow it. Indeed, the proposed research will contribute to the scientific debate and, thus, hopefully, convince policymakers that the effectiveness of MLG policies can be enhanced using the governance strategies.

Furthermore, specifically for the Netherlands, the 2021 summer floods in Limburg gave the relevant authorities a wake-up call and emphasised the necessity of a continuous search for more effective FRM structures and policies. The research contributed to this process by assessing the new WBS policy framework and proposing governance strategies to enhance the effectiveness of the framework.

1.6 Outline

This research first presents the conceptual design, including the research framework, relevant theories and concepts, conceptual framework and analytical framework (chapter 2). In the, subsequent methods section, the research strategy, data collection and analysis and research ethics are discussed (chapter 3). In chapter 4 the case study and sub-units are introduced. Thereafter, in chapter 5, the results are presented and in chapter 6 said results are discussed. The paper is concluded with a brief summary of the conducted research and the research questions and sub-questions are answered (chapter 7).

2. Conceptual research design

This chapter details the conceptual design of the proposed study. Firstly, the research process is visualised in the form of a research framework. Next, the relevant theories and approaches are explained, after which the conceptual framework is illustrated and discussed. Lastly, the analytical framework is presented. By constructing said analytical framework the first sub-question *"Which criteria and indicators to, ex-ante, assess the effectiveness of the WBS policy framework can be derived from the literature concerning MLG?"* was answered.

2.1 Research framework

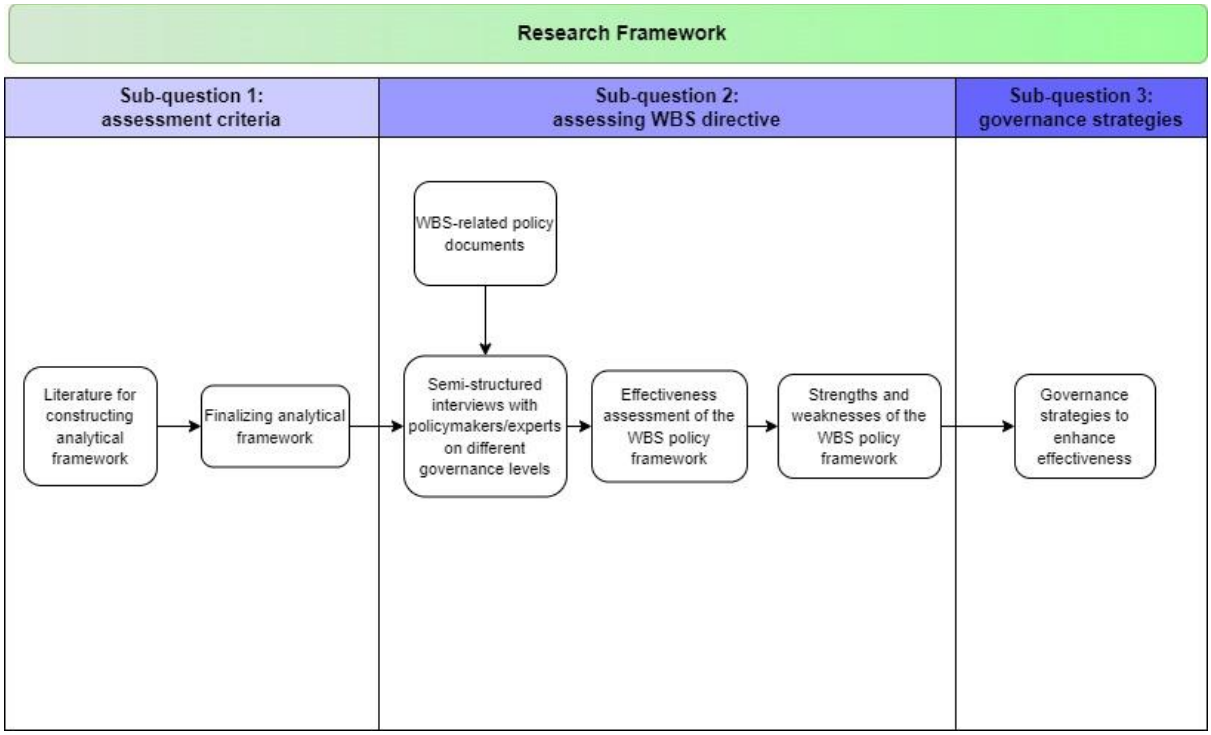

Figure 1: *visualisation of the research framework*

The first step consisted of constructing and finalising the analytical framework. The criteria and indicators in this framework functioned as the foundation for the subsequent interview questions. In the next phase, relevant policy documents surrounding the WBS policy framework were gathered. The subsequent part of this step entailed the actual interviews with policy advisors and experts concerned with the WBS framework. During step two, the gathered primary and secondary data was assessed using the developed analytical framework. This evaluation of the WBS policy framework regarding its effectiveness uncovered the strengths and weaknesses of the policy framework, which, in step three, was used to match the different governance strategies to the WBS policy framework in order to enhance its effectiveness.

2.2 Relevant theories and concepts

2.2.1 Water and ground governance

Water governance is concerned with the interactions between governance institutions, social groups, and other parties that are involved in designing water management policies. The proposed research defines water governance as: *"a range of political, institutional and administrative rules, practices and processes (formal and informal) through which decisions are taken and implemented, stakeholders can articulate their interests and have their concerns considered, and decision-makers are held accountable for water management"* (OECD, 2018, p. 4). These parties' interactions occur horizontally and vertically, i.e., between sectors and between governance levels, respectively.

Ground, or land-use, governance is concerned with the interactions between governance institutions, social groups, and other parties involved with allocating land/ground for designated uses. These include nature, tourism, industry, agriculture, energy, transportation and water. Due to the wide variety of sectors, ground governance is inherently subjective to MLG, as a broad spectrum of different governance bodies are involved with said sectors (OECD, n.d.).

Water governance and land-use, or ground, governance are important concepts since the research will be relevant for the overarching scientific debates.

2.2.2 Multi-Level Governance

As mentioned in the introduction, the research interpreted MLG as a governance structure that involves all relevant governance levels during policymaking (Coopenergy Consortium, 2015, p. 2). The precise definition that inspired the research reads: *"Multilevel governance concerns the vertical and horizontal integration of governance systems, necessary to enable efficient policy making, service delivery, and cohesive leadership by and among all spheres of governance."* (UN, n.d.). MLG is especially relevant to water and ground management, since, as argued by Vincent Ostrom, a MLG structure is a prerequisite for providing adequate public service provision, e.g., water and ground management/governance (Hooghe & Marks, 2003).

2.2.3 Policy effectiveness

Ingold et al. (2019) explicitly connects policy effectiveness with environmental governance, e.g., MLG policies that address water and ground problems. Hence, their assessment criteria and policy strategies were deemed adequate for the research aim of this study. This research acknowledges that effectiveness remains among the most useful criteria for assessing public policies. It interprets it as*"... the capacity of public policies, and of the actors introducing and implementing them, to tackle the problem and reach defined goals"* (Ingold et al., 2019, p. 1822). More specifically, the proposed research adopts the 'effectiveness as problem solving' notion of Young (1994). Here, Young (1994) argues policies are often designed in response to the emergence of problems, yet how this problem is framed may vary between different parties and time scales. This emphasis on differing

problem frames and mismatch between time periods fits the definition Ingold et al. (2019) adopt. This approach to effectiveness differs from 'effectiveness as goal attainment', as 'effectiveness as problem solving' aims to address the underlying problem, while the other aims to tackle the 'symptoms' of a problem.

This research also adopts the assertion by Ingold et al. (2019), that the 'effectiveness as problem solving' of MLG policies concerning environmental problems can be hindered by three environmental problem characteristics: uncertainty; mismatch across sectors, levels, space and time; and plurality of norms, values, and interests. In order to make an environmental policy effective, these environmental problem characteristics need to be addressed. This will be elaborated on in the following sections.

2.2.4 Conceptual framework

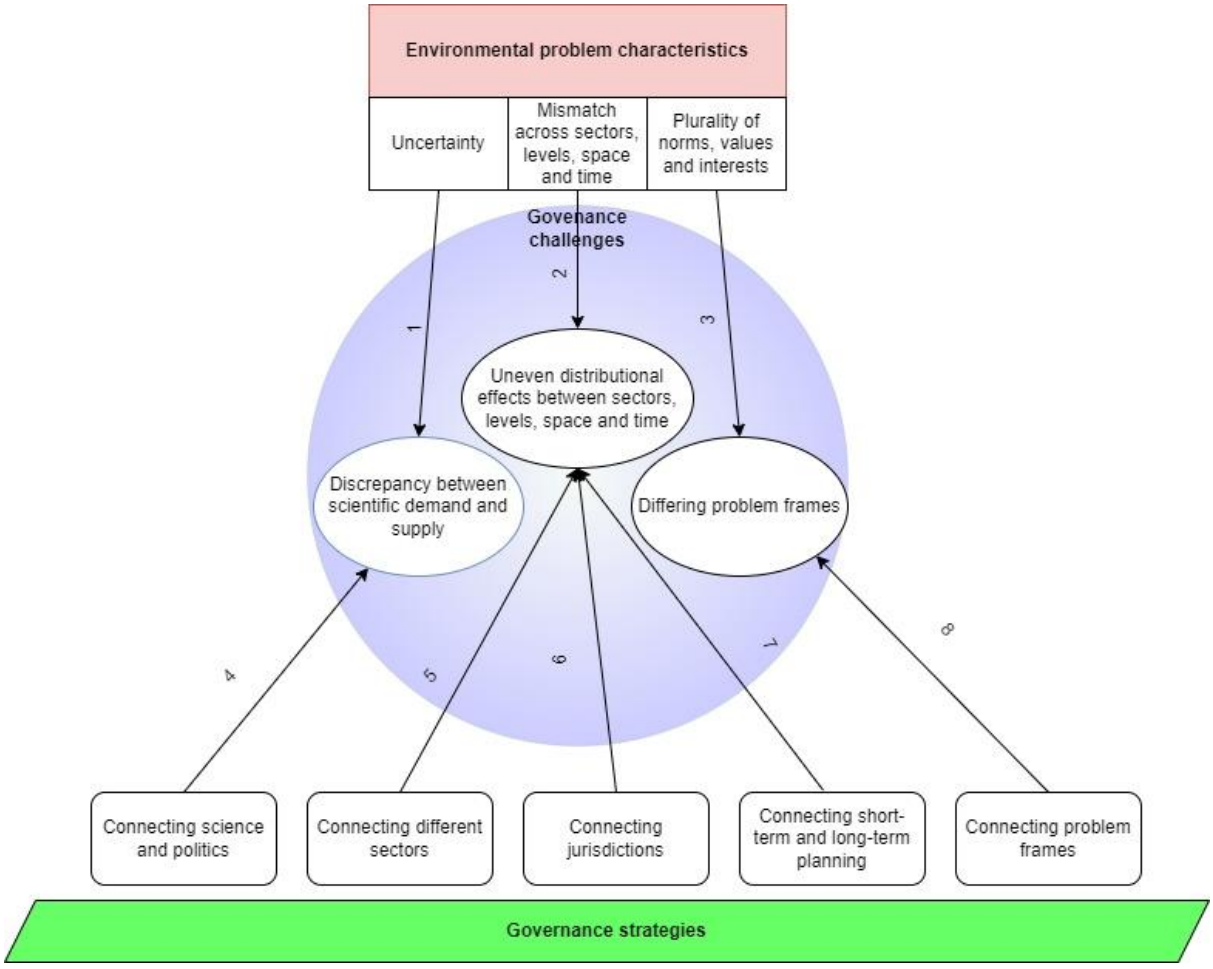

Figure 2: *visualisation of the environmental problem conceptual framework*

Figure 2 visualises the conceptual framework based on Ingold et al. (2019). The three abovementioned environmental problem characteristics cause, similarly, three governance challenges. Accordingly, arrows 1-3 signify a causal relationship. Six different governance strategies can be employed to tackle these governance challenges and enhance the effectiveness of policies. Hence, arrows 4-8 signify which governance strategies can tackle

which governance challenges. Arrows 1-3 are concerned with the first sub-question: *"Which criteria and indicators to, ex-ante, assess the effectiveness of the WBS policy framework can be derived from the literature concerning MLG?"*. The criteria are based on the environmental problems characteristics, since said characteristics can affect the effectiveness of a MLG policy. The indicators are based on the governance challenges because, when they are overcome, it indicates that the MLG policy is effective. Using these criteria and accompanying indicators the strengths and weaknesses concerning the effectiveness of a MLG policy (in this case the WBS policy framework) can be discerned, i.e., the second sub-question: *"Based on these effectiveness criteria and indicators, what are the strengths and weakness of the WBS policy framework?"* Arrows 4-8 are concerned with the governance strategies that can enhance the effectiveness of MLG policies designed to address environmental problems, i.e., the third sub-question: *"What governance strategies are relevant to enhance the effectiveness of the WBS policy framework?"* In sections 2.2.4.1 and 2.2.4.2, the different components of the conceptual framework are elaborated on. The criteria and indicators are combined into an analytical framework in section 2.3.

2.2.4.1 Governance challenges. As mentioned earlier, to enhance the effectiveness of environmental governance policies, such as the WBS policy framework, Ingold et al. (2019) first address the three main environmental problem characteristics. These characteristics must first be discerned, before the effectiveness of a policy that attempts to tackle an environmental problem can be enhanced. The first characteristic is uncertainty, which refers to the non-trivial degree of the complexity of environmental problems, making it inherently difficult to understand them. Next, mismatches across sectors, jurisdictions, space, and time are distinguished, meaning that there can be a discrepancy between those who cause environmental problems and those who experience the consequences of said problems. Lastly, the authors identify the plurality of norms, values, and interests, referring to the different problem frames between governance levels, sectors, and individuals. These problem characteristics each cause a governance challenge that hinders effective policy design. They are, respectively: 1) discrepancy between scientific demand by policymakers and scientific supply be researchers; 2) uneven distributional effects between sectors, jurisdictions, space, and time; 3) differing problem frames.

2.2.4.2 Governance strategies. Several governance strategies can be employed to address the abovementioned environmental problem characteristics and their related governance challenges of a particular environmental issue and enhance the effectiveness of the policies designed to address the respective environmental problem. These strategies are mainly concerned with connectivity, i.e., linking governance levels, institutions, sectors, and individuals to address the environmental problem characteristics (Ingold et al., 2019). The governance strategies, discussed next, address the governance challenges specifically, which can make a policy more effective.

Connecting science and politics: Oftentimes, policymakers tend to substantiate their policy choices with scientific knowledge, yet this is challenging since many natural processes are unpredictable, and scientists do not automatically prioritize policy-relevant research.

Connecting different sectors in policy design and institutional arrangements: Environmental problem policies commonly distinguish between the sources of the problems and the victims. However, if a problem is cross-sectoral, policies that only target a specific sector will be inadequate. Hence, to increase the effectiveness, policies must be designed cross-sectoral.

Connecting different jurisdictions: The effects of environmental problems can be spatially distant, hence, the concept of functional regulatory spaces was introduced to address issues by connecting different policy sectors in different institutional territories.

Connecting long-term planning to short-term action: Natural disasters require an immediate response from the responsible authorities. However, the long-term aspect also demands attention as these disasters can be prevented or mitigated by long-term planning for such events. Thus, the short- and long-term responses need to be connected.

Connecting different problem frames: The trend to include all stakeholders in the policymaking process is commendable. However, integrating all the different problem frames has proven difficult.

2.3 Analytical framework

Table 1: *analytical framework for assessing policy effectiveness. Source: adapted from Ingold et al. (2019)*

Criterion	Short description	Indicator
Adequately dealing with uncertainty.	Environmental problems are often shrouded in uncertainties regarding causes, effects, and solutions. This can be solved by connecting science with politics.	Is the scientific supply and political demand for evidence-based policies adequately coordinated?
Adequately matching across sectors, jurisdictions, space and time	The effects of environmental problems often are distributed unevenly across sectors, jurisdictions, space, and time. Coordination amongst public/private sectors and jurisdictions and between short-term and long-term planning is vital to ensure effective policy solutions.	Are all concerned public/private sectors involved in the policy design process? Are all concerned jurisdictions involved in the policy design process? Are the short-term and long-term effects of policies accounted for?

Acknowledging homogeneity/plurality of norms, values and interests	Environmental problems are framed differently between different actor groups. Connecting these varying norms, values, and interests is vital for effective policies	Are the different problem frames comprised into a common perspective?

As mentioned, the framework is adapted from Ingold et al. (2019) and is divided based on the three problem characteristics, i.e., the criteria. Each characteristic is accompanied by one or more indicator questions (last column), of which the answers give an indication of the effectiveness of the studied policy, i.e., the indicators. A precondition for an effective environmental policy is a sufficient understanding of the characteristics of the problem at hand (Ingold et al., 2019). Hence, the indicators can provide an adequate assessment of effectiveness.

It is important to note that although the indicative questions are designed to retrieve results as precise as possible, they are not concrete measurements and will require informed judgement to interpret the results.

3. Methodology

This chapter will first elaborate on the research strategy, followed by a discussion of the data gathering process. How this data is analysed is explained in the subsequent section. Next, the case study comparison process is explicated. The internal and external validity of the research is discussed in the following section and this chapter is concluded by the research ethics of this study.

3.1 Research strategy

As mentioned, the research objective of the study was to fill the void in the MLG concept, regarding the assessment of specific policies by evaluating the WBS policy framework and providing governance strategies to enhance the effectiveness of this policy framework. The corresponding research strategy can be derived from this objective: a case study analysis (CSA). The research interpreted a CSA as: *"... analyses of persons, events, decisions, periods, projects, policies, institutions, or other systems that are studied holistically by one or more methods. The case that is the subject of the inquiry will be an instance of a class of phenomena that provides an analytical frame—an object—within which the study is conducted and which the case illuminates and explicates."* (Thomas, 2011, p. 513). In the context of the research, a CSA allowed to ex-ante, assess to what extent the WBS policy framework was effective, and propose policy strategies to enhance its effectiveness. Hopefully, the lessons learned from the case studies can be applied to similar policies, while the newly constructed analytical framework contributed to the scientific debate concerning MLG.

The research employed a single case study, specifically an embedded case study. An embedded case study contains several sub-units of analysis. In relation to the research, the context was the overarching MLG structure within the Netherlands, the unit of analysis was the WBS policy framework, and the Dutch provinces Noord-Holland, Utrecht and Overijssel were the sub-units. These provinces were chosen, because the WBS letter to parliament addresses these regions specifically, since the limits of the water and ground systems have already been reached in those areas (Harbers & Heijnen, 2022). The areas are: 1) low-lying fen areas in Noord-Holland, Utrecht and Overijssel; 2) salinizing coastal areas in in Noord-Holland; 3) high sandy soils in Utrecht and Overijssel. The research adopted this case selection and conducted interviews with policy advisors and experts from the provincial councils and water authorities with the three differing soil types; to be more precise the provincial councils of Utrecht, Overijssel and North Holland and the water authorities Stichtse Rijnlanden, Drents Overijsselse Delta and Hollands Noorderkwartier (figure 3). Besides being mentioned in the WBS letter to parliament, it can also be argued that the insights resulting from the analysis of said sub-units can, to a certain extent, be translated to the other Dutch provinces, because of the shared political and governance landscape.

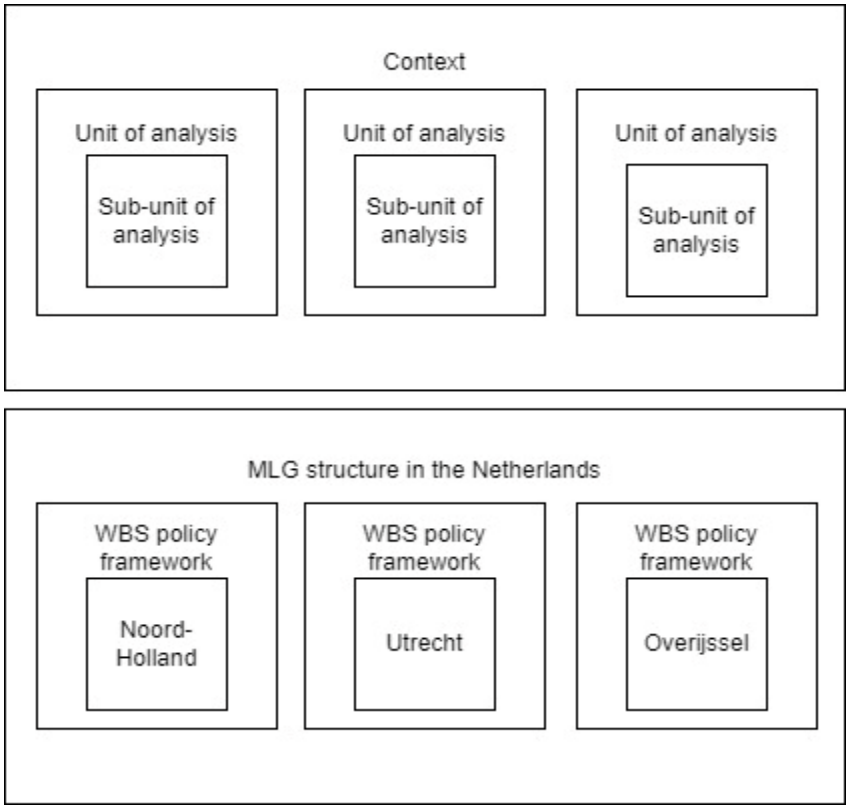

Figure 3: *visualisation of the CSA design*

3.2 Data collection

The first step of the study consisted of desk research. Based on MLG literature, the analytical framework from section 2.3 was constructed. The analytical framework was used on a combination of primary and secondary data. Regarding the latter, policy documents concerning the WBS framework were collected from national and provincial (including the abovementioned water authorities) sources (table 2). Not all sub-units had released specific documents pertaining to WBS; in those cases, policy documents that are related to the WBS framework and/or water and ground management were used. The primary data was gathered by conducting 15 interviews with policy advisors and other actors who possessed knowledge of WBS (table 3 and 4). The individual interviewees were identified using the network of this thesis' supervisor, Dr. ir. Dries Hegger, a contact at the provincial government of Utrecht and using the official websites of the provincial governments and water authorities. Furthermore, during the subsequent interviews, the respondents gave the contact information of other possible interviewees. Most of the interviewees were contacted using this snowballing method (Simkus, 2023). Because of the mentioned snowballing method and the first interviewees being from Utrecht, the majority of the interviewees are from said province. The interviews had a semi-structured nature to allow a tailored approach for each interviewee. All the interviews lasted between 30 and 45 minutes. The interviews were conducted in Dutch to accommodate the interviewees and also transcribed in Dutch. The quotes used in the results were, for the purpose of this study, translated into English. The general interview guide can be found in Appendix A. Of the 15 interviews, 14 were conducted via Microsoft Teams and one face-to-face.

As mentioned, the majority of the interview questions were based on the indicators from the analytical framework. However, during the first interviews, it became apparent that regarding three indicators connected to the first two criteria, the interviewees could not specifically answer the related questions, as they talked around them. Regarding the 'is the scientific supply and political demand for evidence-based policies adequately coordinated?' indicator, the interviewees mostly referred to scientific cooperation. Concerning the indicators for the second criterion, 'are all concerned public/private sectors involved in the policy design process?' and, 'are all concerned jurisdictions involved in the policy design process?, the interviewees mainly referred to public cooperation between governance bodies (public sector) and cooperation with the private sector. The uncertainty of the interviewees can be attributed to the relatively recent introduction of the WBS policy framework. To adapt to the responses of the first interviewees and accommodate the subsequent interviewees, it was decided to rephrase the questions and, consequently the indicators as follows: 'is the scientific cooperation for evidence-based policies adequately coordinated?' and 'is the public and private cooperation adequately coordinated?' These rephrased indicators stayed both true to the essence of the original indicators and also accommodated the interviewees.

Table 2: *Documents used in analysis.*

Province	**Title**	**Description**
Noord-Holland	PPLG (Noord-Holland, 2023)	This documents discusses the challenges the province faces and the goals it set for itself to make the rural area liveable and healthy
	Sessie "Water en Bodem sturend" tbv PPLG Noord-Holland (Joustra et al., n.d.)	This document discusses how the WBS policy framework fits within the PPLG of Noord-Holland
	Klimaatstresstest Landbouw en Natuur: Noord-Holland boven het Noordzeekanaal (SWECO & WUR, 20202)	This document discusses the result from a conducted climate resilience test for Noord-Holland
Utrecht	PPLG (Provincie Utrecht, 2023)	This document discusses the challenges the province faces and the goals it set for itself to make the rural area liveable and healthy
	Bodem- en Waterprogramma Provincie	This document discusses Utrecht's aims to achieve

	Utrecht 2022-2027 (Provincie Utrecht, 2022a)	healthy water and soil systems
	Uitvoeringsstrategie Landelijk Gebied (Provincie Utrecht, 2022c)	This document discusses the implementation strategy of the PPLG
Overijssel	PPLG (Provincie Overijssel, 2022b)	This documents discusses the challenges the province faces and the goals it set for itself to make the rural area liveable and healthy
	Water en bodem sturend in de provincie Overijssel: hoofdlijnenkader (Broersma et al., 2023)	This document explores the implications and opportunities of the WBS policy framework for Overijssel
	Overijssel voor elkaar! Fundament voor de nieuwe Omgevingsvisie (Provincie Overijssel, 2022a)	This environment strategy discusses how the province intends to address climate change, the nitrogen crisis, housing problems and water-related problems
National	Kamerbrief Water en Bodem sturend (Harbers & Heijnen, 2022)	This is the letter to parliament that introduces the WBS policy framework and discusses what it entails
	Position paper IPO (2023)	A paper by all 12 provinces that conveys their perspective on WBS to the national government
	Nationaal Programma Landelijk Gebied (Ministerie van BZK et al., 2022)	This document discusses how the national government aims to address issues concerning nature, climate, soil and water.
	NOVEX (Ministerie van BZK)	This document discusses how all the governing bodies must collaborate to spatially design the Netherlands

3.2 Data analysis

The primary and secondary data was analysed using qualitative interpretive analysis (QIA) coding, more specifically deductive coding, employing the NVivo software licensed by Utrecht University. This approach starts with a set of codes that are used to distinguish different themes (Delve, n.d.). In the case of the conducted research, the different indicators from the analytical framework formed the initial set of codes, yet changed into the rephrased indicators for the first and second criteria, as discussed above: adequately coordinating scientific cooperation; adequately coordinating public/private cooperation; accounting for short- and long term effects; and compromising different problem frames into a common perspective.

3.2.1 Case study comparison

After the data analysis, the results were discussed separately for each sub-unit (province). To guarantee a standardized comparison among the cases, a grading system was created based on the interview and document analysis. Each case was graded either 'low', 'medium' or 'high' based on the policy effectiveness indicators (figure 4). Employing this grading scheme allowed for a comprehensive comparison between the cases. This, in turn, exposed the key differences and similarities between Noord-Holland, Utrecht, and, Overijssel and highlighted in what areas WBS could be enhanced.

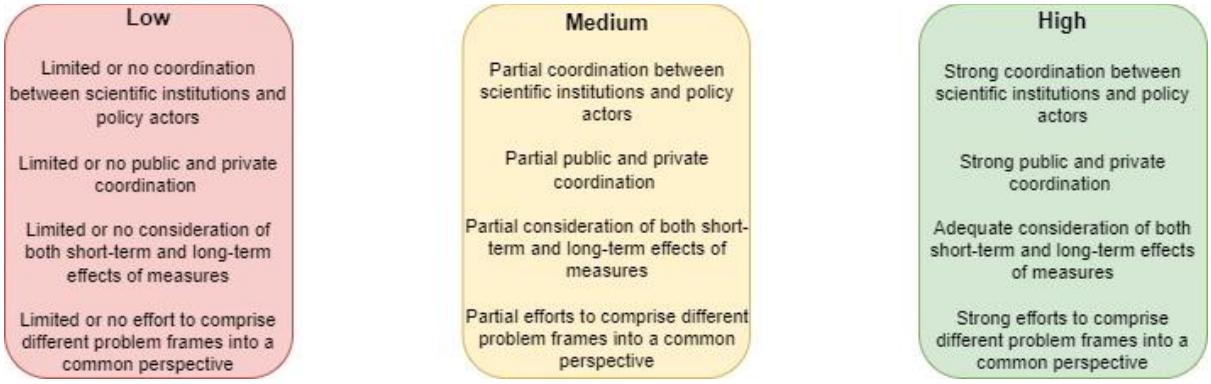

Figure 4*: grading scheme employed to compare case studies*

For reference, Table 3 lists the anonymised interviewees and the region and governmental body they work in.

Table 3*: anonymised list of interviewees*

Interviewee ID	**Region**	**Province/water authority**
Interviewee 1	Noord-Holland	Province
Interviewee 2	Noord-Holland	Water authority
Interviewee 3	Noord-Holland	Province

Interviewee 4	Overijssel	Province
Interviewee 5	Overijssel	Water authority
Interviewee 6	Overijssel	Water authority
Interviewee 7	Overijssel	Province
Interviewee 8	Utrecht	Water authority
Interviewee 9	Utrecht	Water authority
Interviewee 10	Utrecht	Province
Interviewee 11	Utrecht	Water authority
Interviewee 12	Utrecht	Water authority
Interviewee 13	Utrecht	Water authority

Two interviewees did not work at either a provincial government or a water authority (Table 4).

Table 4*: anonymised list of interviewees not working for a provincial government or water authority*

Interviewee ID	**Work field**
Interviewee 14	Environmental law jurist
Interviewee 15	Ministry of Infrastructure and Water management

3.3 Internal and external validity

Achieving high external validity, or transferability is notoriously difficult in the case of qualitative research (Ravelo, 2023). Despite the inherent challenges related to qualitative research, this study has employed two strategies to ensure adequate external validity. Firstly, triangulation of data and methods allowed for the derived results to be more easily extrapolated to other case studies (Verschuren & Doorewaard, 2010). Secondly, the developed analytical framework was designed to be also applicable to other MLG policies.

The research's internal validity was ensured by carefully documenting the data and discussing the gathering methods (Halfman, 2019). The data an sich, the gathered documents, interview recordings, and transcriptions, were, during the research process, stored on the hard drive of a laptop and will be deleted after the thesis is graded, per the ethics guidelines.

3.4 Research ethics

During the data collection, the research will adopt a ‘do not harm’ principle, meaning that participants of the study will not experience any inconveniences. To ensure this, the research objective was discussed with the interviewees. They were informed that participation was voluntary, that they could withdraw their participation at any time, and that their personal information and responses would be anonymised per data protection legislation. Furthermore, the interviewees had a chance to ask questions about the interview before it started. The interviewees were also asked if they would like to receive this thesis after the submission date, and the majority of the interviewees indicated that they would like to receive the thesis. Lastly, during the research process, I did not encounter any ethically irresponsible decisions.

4. Case introduction

This chapter first briefly explains what provincial governments and water authority entail, how they are structured, and what responsibilities they have. After that, a short overview of the Dutch history of water governance and management is given, which transitions into a discussion of the WBS policy framework. Lastly, the three sub-units will be introduced.

4.1 Introducing the WBS policy framework and its background

4.1.1 Provincial government

Each province of the Netherlands, of which there are twelve, has its own legislative assembly, which consists of a number of directly elected representatives that is proportionate to their population number. Electing the representatives takes place every four years and in turn they elect the provincial executive (Ministerie van BZK, 2021). The last body in this provincial trifecta is the King's commissioner, who, together with the provincial executive, acts as the daily executive body and is monitored by the provincial council (Parlement.com, n.d.-a).

The provincial government has a broad spectrum of responsibilities that are mostly concerned with the spatial planning of the region (Brandes, 2023). Additionally, it is tasked with supervising the water authorities located within the province, which will be discussed next (Parlement.com, n.d.-a).

4.1.2 Water authority

Similar to the provincial government, water authorities operate on a regional scale and are responsible for the water management and governance of their corresponding jurisdictions (Ministerie van BZK, 2016). The Netherlands is surprised of 21 water authorities, of which each has a general council, an executive board, and a dike reeve (dijkgraaf). The general council is elected every four years, simultaneously with the provincial council, and monitors the daily executive board. Each water authority is headed by a king-appointed dike reeve (Ministerie van BZK, 2016).

The diverse set tasks of a water authority range from managing the water level in canals, rivers and lakes to dike maintenance, to ensuring water supply (Ministerie van AZ, 2021).

Provinces and water authorities operate closely together on a range of topics since the provincial government has the final say regarding water safety, water quality, and groundwater extraction. The water authorities manage their respective jurisdictions to achieve the goals set by the province (Van Hoorn & Niezen, 2023).

4.1.3 'Water en Bodem sturend' policy framework`

The Netherlands has a long and double-sided history with water. On one hand living in the delta, of the rivers Rhine, Meuse, and Scheldt has allowed the Dutch to enter global trade relatively early. Yet, on the other hand, the Netherland's proximity to the sea and the many rivers and canals that cover its land means that the threat of floods is always present (Mostert, 2020). Living adjacent to the sea, rivers and lakes meant that the early inhabitants of the delta, now the Netherlands, had to find ways to protect themselves. The earliest evidence of this were dwelling mounds (artificially elevated hills) that originated in 250 B.C. (Rijkswaterstaat, 2019). However, it was not until 900 A.D. that large scale dike construction started, which was necessitated by peat excavations that, over time, significantly lowered the surface level in the western part of the Netherlands. This land subsidence kickstarted the never-ending struggle of the Dutch to keep their feet dry. Despite growing water defence works, large-scale sea and river floods still occurred, which made it clear that the defence against floods should be better organized, i.e. water authorities (de Jonge, 2009). The first evidence in literature of the precursors to water authorities dates from the 12th century, yet only in the 13th century did organizations that democratically choose agricultural sector representatives emerge. Around that time, there were a multitude of similar governance structures all around the region that cooperated to differing extents. This changed following a series of devastating floods and the invasion of the French republic in 1795, establishing the Batavian Republic. Centralists ideas settled in the republic, and in 1798, new legislation was introduced that centralised all water governance structures and institutionalised the Rijkswaterstaat to coordinate these efforts (Kuks, 2009). Although water management became more centralised in the late 18th century, local and regional water authorities were still fragmented and inward-looking. However, the catastrophic floods in 1916 and 1953 made them aware that larger and integrated authorities would be more effective (Brainich von Brainich-Felth, 1993). In the second half of the 20th century, the central government took further steps in attempting to integrate the different water management institutions. Rijkswaterstaat, water authorities and provincial governments, introduced new legislation in the form of the *Eerste Nota Waterhuishouding (*First National Policy Memorandum on Water Management) and the *Wet Verontreiniging Oppervlaktewateren (*Surface Water pollution act). In the 1980s, this integrative approach was continued with the adoption of the second and third National Policy Memorandum on Water Management which stimulated cooperation amongst water authorities and advocated the notion that surface and ground water were interconnected. Moreover, these policies emphasized the importance of the physical components of water and ground systems (Kuks, 2009). Van der Brugge et al. (2005) argue that connected to this integrative approach was the growing realisation that ecological values are inherently linked to water management. The authors assert that the end of the 1980s marked a transition point for Dutch water management, characterised by adopting an ecological approach towards said water management practices. This change in perspective is ascribed to the increasing awareness of environmental problems, catalysed by the 'Limits to Growth' report by the Club of Rome (van der Brugge et al., 2005).

The in chapter 1 introduced Room for the Rivers policy framework from 1995, is a manifestation of this integrative and ecological transition within Dutch water management and can be regarded as an early precursor to WBS. The Room for the Rivers policy stressed the importance of coordination between land use planning and water management. It advocated that riverbanks should be widened to prevent floods, which significantly differs from the until then standard approach of artificial defences. Furthermore, it emphasized the importance of cooperation amongst different levels of the government in order to streamline the implementation of Room for the Rivers, i.e., multi-level governance (Voogd & Woltjer, 2009). A few years later in 2003, the *Gewenst Grond- en Oppervlaktewater Regime* (Desired Ground and Surface Water Regimes or GGOR), was introduced, again advocating for an integrative approach to water management and governance that takes into account the physical environment. Following dialogue between provincial governments, water authorities and municipalities this policy stipulated that areas are ascribed preferred (ground)water levels to which land uses should be adapted. Again, coordination amongst different government levels was required, i.e., MLG (Claessen et al., 2003).

In line with the developments presented above, the WBS policy framework can be regarded as a continuation of the integrative approach that started in the 1980s and was introduced as the limits of the water and ground systems came into view. Hence, it can be argued that WBS is not a novel concept; in fact, already in 2000, the commission Tielrooij issued a report that introduced the Netherlands to the principle of making water and ground systems steering. The recommendations made by the commission were later elaborated in the spatial planning memorandum of 2004 (Broersma et al., 2023). Similarly to the previous policies, WBS aims to adopt the physical systems, in this case, the water and ground systems, as boundary conditions for future spatial developments. What WBS entails can be best illustrated by the guiding principles of the policy document, which were also presented in the introduction:

1. do not shift the responsibility to others;
2. consider extremes;
3. coherent approach to tackling flooding and drought;
4. multi-layered security;
5. less land cover, less digging, and no pollution;
6. integral approach for the living environment;
7. comply or explain – in principle, the different governance bodies should adhere to the structuring choices, but in particular and justified cases they can deviate from them.

Besides these guiding principles, the letter to parliament also included a set of structuring choices, 33 in total, for the coming decades that are concerned with the water and land systems, built-up area, and several specific regions with differing soil types (Harbers & Heijnen, 2022). These structuring choices are accompanied by measures. The first 18 choices

aim to secure sufficient amounts of clean water for current and future generations, e.g., working towards a drinking water consumption of 100 litres per capita in 2035 and limiting the cool water discharges into rivers. Choices 15 to 20 are concerned with healthy and efficiently used soil, e.g. the state, in cooperation with municipalities, will develop instruments that give them more say in the allocation of land uses. Choices 21 to 24 target the built-up areas, e.g., construction in locations intended for water storage will stop. Choices 25 to 27 concern fen areas, e.g., water authorities should aim for a groundwater level between 20 to 40 centimetres below the surface. Choices 28 and 29 deal with salinized coastal areas, e.g., the national government and water authorities will attempt to supply salinized areas with fresh water. Choices 30 to 33 are concerned with high sandy soils, e.g., surplus water must be retained longer (Harbers & Heijnen, 2022).

In the current coalition agreement of the government (this government resigned recently, which is discussed below), there are no funds reserved for WBS. However, a majority of the structuring choices and measures can be financed with other budgets, such as the *Deltaprogramma Zoetwater (*Delta Programme Fresh Water) and the *Programma Internationaal Riviermanagement* (Integral River Management Programme). Moreover, WBS is closely connected with the *Nationaal Programma Landelijk Gebied* (National Programme Rural Area or NPLG), for which a transition fund is reserved. The monitoring responsibilities of WBS lie with the Ministry of I&W. Moreover, it will assist provincial governments and water authorities with the execution of the measures and with the employment of said funds. To ensure and maintain a transparent process, the Ministry of I&W will issue an annual update on the developments surrounding WBS (Harbers & Heijnen).

The letter to parliament, containing the structuring choices and measures, was only the start of a process to make water and ground systems steering. Until July 1st, 2023, the national government coordinated, with the provincial governments and water authorities, how water and ground systems could become boundary conditions for their *Provinciaal Programma Landelijk Gebied* (Provincial Program Rural Area or PPLG). On the first of July, 2023, all provinces received an *Gebiedsprogramma* (Provincial Guideline) in the context of the NPLG. The Ministry of I&W afterward assessed how the measures in the provincial guideline correspond with the structuring choices of WBS and allocated funds accordingly. To ensure that the momentum of WBS is not lost, together with the water authorities, the Ministry of I&W will develop an updated and more stringent water test (Harbers & Heijnen, 2022). However, this process is most likely delayed by the recent resignation of the Dutch Government (July 7, 2023). The new House of Representatives elections are planned for the 22nd of November, 2023, after which a group of political parties will attempt to form a coalition. The previous coalition negotiations took 279 days (Parlement.com, n.d.-b) and it cannot be said with certainty that WBS will be prominently represented in the new coalition agreement.

To conclude, WBS can be regarded as the product of the integrative and ecological transition that started in the 1980s and allows the national government, or more specifically the ministry of I&W, to take a more directing role in spatial planning practices and

consequently water and ground management of the Netherlands, through the structuring choices and measures. This contradicts the current subsidiary approach to spatial planning adopted around the turn of the century. Until the 21st century Dutch spatial planning culture enjoyed a high reputation worldwide. The layout of the Netherlands was mainly designed at the national level. This, however, changed with the introduction of the *Nota Ruimte* (Memorandum Spatial Planning). This new vision on spatial planning stipulated that spatial planning decision-making should take place at the appropriate level. This meant that the national government allocated more responsibilities to the provinces, water authorities and municipalities to design their regions, including water and ground management (Roodbol-Mekkes & van den Brink, 2015). Because WBS was introduced relatively recently, it is too early to tell how this centralised approach will develop WBS. Moreover, it is uncertain if this centralised approach will also be adopted in the coalition agreement of the new national government.

4.2 Three regional sub-units

In section 4.2.1, 4.2.2, and 4.2.3, the sub-units of the embedded case study are introduced: Noord-Holland, Utrecht and Overijssel. Each section will begin with a map of the province and the relevant soil types, after which the corresponding environmental problems are discussed, and the policy (frameworks) that attempt to address these issues are introduced. Subsequently, the efforts of the provincial government and water authorities to align the current policies and regulations are discussed. Each section ends with a brief conclusion.

4.2.1 Noord-Holland

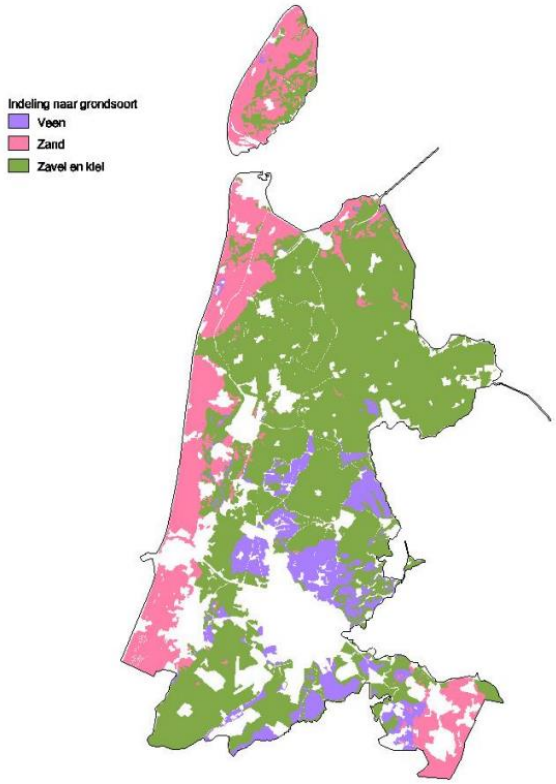

Figure 5: *map of soil types in Noord-Holland. The salinizing areas (pink) are mostly located in the western part of the province, while the fen areas (purple) are clustered around Amsterdam (the white lower part). Source: Rietra et al. (2004)*

The limits of the water and ground systems of several soil types are nearing or are already exceeded. Hence, these are explicitly addressed in the WBS letter to parliament (Harbers & Heijnen, 2022). Of these soil types, two can be found in Noord-Holland, namely fens and salinizing coastal areas (the purple and pink areas in figure 5, respectively). Regarding the former, in 85% of all fen areas in the Netherlands there is land subsidence caused by oxidation, drought, and groundwater extraction, which increases the chances of flooding. Moreover, as fens oxidize, they can emit considerable amounts of greenhouse gasses (GHGs) (Harbers & Heijnen, 2002). Noord-Holland is similar to the rest of the Netherlands, as it also experiences land subsidence in fen areas. Noord-Holland specifically contains 19.900 ha of fen area, and it is estimated that Noord-Holland emits 0,17 Mton of CO_2-equivalents annually (Kruisselbrink, 2022). Concerning salinizing coastal areas, 14% of land in the Netherlands is salinized or risks being salinized in the future (Harbers & Heijnen, 2022). Being a littoral province, Noord-Holland is heavily affected by salinization. The phenomenon especially afflicts the following regions: the mudflat Island Texel (the island in the upper part of figure 5), north-lying sandy soils, Wieringermeer (located in the north-eastern part of the province), and Noord-Kennemerland (north-west of Amsterdam) (SWECO & WUR, 2020).

The provincial government of Noord-Holland recognizes the risks of land subsidence and oxidation in fen areas. To combat these environmental problems, the province presented

the first concept version of their *Regionale Veenweide Strategie* (Regional Fen Area Strategy), in which a broad spectrum of measures is introduced to prevent further land subsidence and reduce GHG emissions (Noord-Holland, 2022). Because of the introduction of WBS, the province aims to make the fen area strategy more stringent (Joustra et al., n.d.). This is in concurrence with the Dutch *Klimaatakkoord* (Climate Accord), which stipulates a reduction of 1 Mton of CO_2-equivalents in 2030 (Ministerie van EZK, 2019). Concerning the salinizing areas, the province, and water authorities supply the salinized areas with fresh water. However, some regions will inevitably experience salinization, anyway. This can be attributed to climate change, a rising sea level, and prolonged periods of drought (Harbers & Heijnen, 2022). Similar to the fen area in Noord-Holland, the salinization of specific regions is extensively discussed in the PPLG (Provincie Noord-Holland, 2023).

The provincial government, together with the corresponding water authorities, are still contemplating how WBS fits into their current plans and which policy plans should be adapted. They are explicitly exploring how WBS should be addressed in the following policy (frameworks): PPLG, *Nationale Omgevingsvisie Extra* (National Environment Strategy Extra, NOVEX; areas that are designated for considerable overhaul in land uses (van der Velden, 2022)), *Metropoolregio Amsterdam (*Metropolitan Region Amsterdam) and *Regionaal Programma Water* (Regional Programme Water) (Joustra et al., n.d.). In the concept version of the PPLG of Noord-Holland, WBS is a focal point, and several structuring choices are selected as the most relevant for the province: sufficient fresh water, a vital and efficiently utilized soil, and the structuring choices regarding fens and salinizing coastal areas (Provincie Noord-Holland, 2023).

To conclude, Noord-Holland is experiencing land subsidence and oxidation in the fen areas and salinization in the coastal areas. To address these issues, the provincial government and water authorities have implemented various policies. However, it is unknown whether these policies enhance each other or fragment the governance landscape and potentially obstruct effective efforts to combat these environmental problems. Furthermore, the provincial government and water authorities are still exploring how to align the WBS policy framework with existing spatial planning and water and ground management regulations.

4.2.2 Utrecht

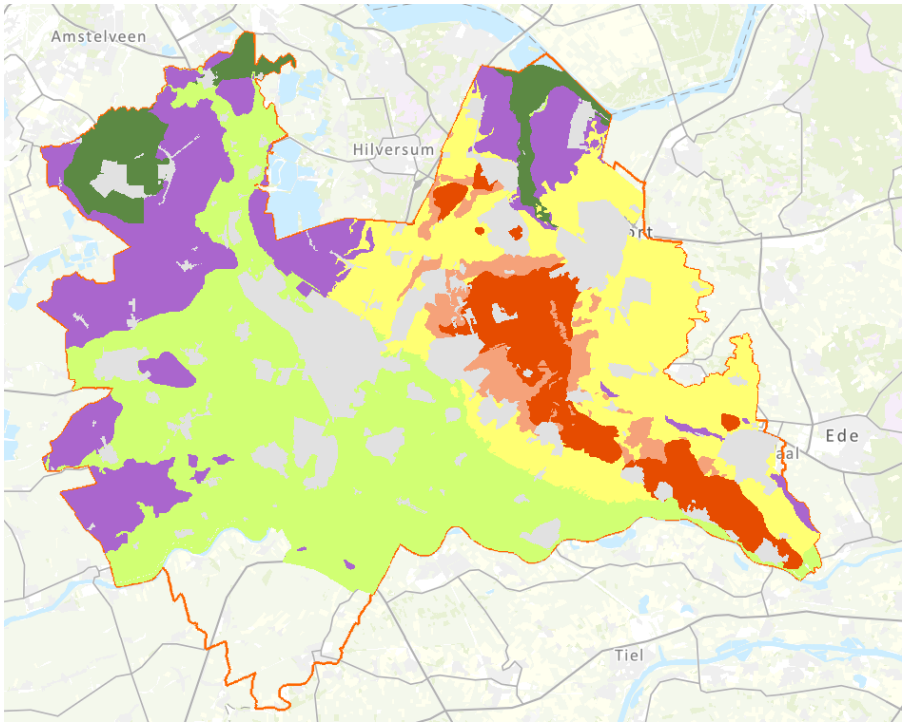

Figure 6: *map of soil types in Utrecht. The fen areas are scattered in the western part of the province (purple) and the high sandy soils are located in the easter region (yellow). The city of Utrecht is located in the middle. Source: Atlas (n.d.)*

Utrecht has both fen areas and high sandy soils (the purple and yellow areas in figure 6, respectively). The fen areas are primarily found in the western part of the province and Eemland (the north-eastern part of the province). They are afflicted by mostly the same phenomena as the fen areas in Noord-Holland, i.e., land subsidence and oxidation. Annually the fen areas emit 0,36 Mton of CO_2-equivalents (Provincie Utrecht, 2022b), while also experiencing 2 to 10 mm of soil subsidence (Provincie Utrecht, n.d.-a). Dutch high sandy soils are plagued by water and soil quality and biodiversity problems caused by excessive usage of fertilizers and pesticides and sewage discharges (Harbers & Heijnen, 2022). In Utrecht the high sandy soils retain and filter rainwater. However, due to more extended periods of drought and housing construction this function has been, to a certain extent, impeded (Provincie Utrecht, 2022a).

To address the GHG emissions from fen areas and the land subsidence, the provincial government has, similar to Noord-Holland, adopted a Regional Fen Area Strategy. In this policy document, the provincial government sets out to reduce the emission by 0,12 Mton of CO_2-equivalents in 2030 and halt the land subsidence rate at 50% (Provincie Utrecht, n.d.-b). Regarding the high sandy soils, the province aims, together with the private actor *Zoetwatervoorziening Oost-Nederland* (Fresh Water Supply East Netherland), to increase water retention in these areas (Kruisselbrink, 2021)

Another contentious area is polder Rijnenburg, a low-lying region near highways, Utrecht City and Leidsche Rijn (HDSR, 2022). Hence, it was designated as an area to construct 25.000 houses (PosadMaxwan, n.d.). However, a debate has emerged about whether building in Rijnenburg is in line with the principle of making water and ground system steering since it is prone to floods due to its low-lying nature (HDSR, 2022).

Similar to Noord-Holland, WBS plays an integral part in their concept version of the PPLG, released July 5th, 2023 (Provincie Utrecht, 2023). Another policy framework that will most likely have many interfaces with WBS are the goals set by the *Kaderrichtlijn Water* (Guiding Framework Water) for the Province of Utrecht. Utrecht, specifically, has to ensure the quality of drinking, ground, and surface water and draft an integral approach for the river basins of Rijn-West and Rijn-Oost (Provincie Utrecht, n.d.-b). Lastly, the *Bodem- en Waterprogramma provincie Utrecht 2022-2027* (Ground and Water program Utrecht province 2022-2027), which sets out the goals and ambitions of the province concerning sustainable management of vital and healthy water and ground systems, has obvious connections with WBS (Provincie Utrecht, 2022a)

To conclude, Utrecht's provincial government and water authorities are attempting to combat the GHG emissions from fen areas and the accompanying land subsidence. Moreover, the quality of the province's high sandy soils is deteriorating, reducing its ability to retain and filter water. Several policies and regulations are instituted to address these environmental problems. However, similar to Noord-Holland, it is uncertain if the differing policy frameworks enhance or contradict each other. Another contentious subject in the province are the plans to construct houses in the low-lying polder Rijnenburg, which raises the question whether housing development in the area can be carried out responsibly. In contrast to Noord-Holland, Utrecht has already published their (concept version of) the PPLG (Provincie Utrecht, 2023), in which the WBS principle is prominently featured, suggesting that the provincial government has been able to align WBS with other policies concerning water and ground management.

4.2.3 Overijssel

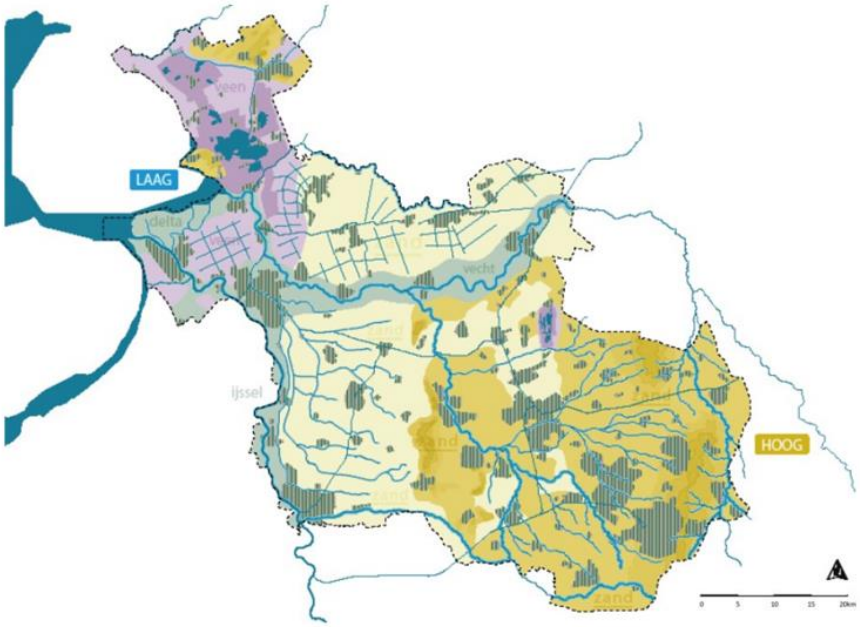

Figure 7: *map of soil types in Overijssel. The fen areas (purple) are primarily situated in the western part of the province, while the high sandy soils are located in the southeastern region. The urban areas are in the western and southeastern parts of the province. Souce: Broersma et al. (2023).*

Akin to Utrecht, Overijssel also contains fen and high sandy soils (the purple and yellow areas in figure 7, respectively). Again, like the fen areas in Noord-Holland and Utrecht, Overijssel also experiences land subsidence and the emission of GHGs. In Overijssel, ca. 1,5 million m^3 of fen oxidizes annually, which causes an emission equal to 250,000 ton CO_2-equivalents per year (Broersma et al., 2023). Moreover, the related land subsidence can accrue to 1 cm a year in some parts of the fen areas and increases the risk of flooding during/after extreme weather (Ploeg, 2018). The accompanying costs for the province, water authorities, and municipalities are estimated to be between 5 and 10 million euros, annually (Broersma, 2023). The high sandy soils in Overijssel are experiencing extended periods of drought, as the agricultural sector extracts water at a higher rate than the groundwater is supplied. Morever, precipitation is not retained sufficiently. This combination of factors is deteriorating the water quality (Broersma et al., 2023).

The provincial goverment and water authorities aim to contribute to the Dutch Climate Accord's goal of reducing emissions from fen oxidation with 1 Mton of CO_2-equivalents by 2030 (van Staveren, 2020). To achieve this, the province, in coherence with the WBS measures, will stabilise the groundwater level between 20 to 40 cm below ground level. This will reduce oxidation and subsidence (Broersma et al., 2023). Concerning the high sandy soils, the province aims to address this issues in the foundation for the environment strategy by retaining more water in wet periods to increase the sponge function of the soil (provincie Overijssel, 2022a).

In June 2022, the provincial government of Overijssel published its vision for the *omgevingsvisie* (environment strategy) in which ‘water and ground as the foundation’ was one of the four steering principles. The document specifically mentions that this principle corresponds to the WBS goals set in the national coalition agreement of December 1st, 2021 (Provincie Overijssel, 2022a). Similar to the environment strategy, nature restoration (including healthy soils) and a robust water system are key pillars in the PPLG of Overijssel. However, WBS is not specifically addressed (provincie Overijssel, 2022b). Furthermore, the province issued a report by SWECO, a consultancy, that outlines the implications of the WBS policy framework for Overijssel and how the structuring choices and measures can be aligned with existing policies and regulations.

To conclude, Overijssel is experiencing fen oxidation and land subsidence. Simultaneously, the quality of the stored groundwater in high sandy soils is deteriorating. To address the issues, the provincial government and water authorities of Overijssel have decided to stabilise the groundwater level at 20 to 40 cm below surface level and enhance the sponge function of the high sandy soils. Upon initial examination, it appears that there are less intertwining policies and regulations, which could potentially decrease the chance of policies contradicting each other. Furthermore, of the three sub-units, Overijssel is the first province to publish a report that explicitly outlines the implications of the WBS policy framework, indicating a potential headstart with implementing the WBS measures.

5. Case evaluation

In the following sections, the results of the interviews and document analysis are expanded on and categorized per sub-unit, i.e., Noord-Holland, Utrecht and Overijssel. Each sub-unit will be discussed based on the policy effectiveness criteria and the corresponding indicators. The cases will be graded using the grading system explicated in the methodology section (figure 4). As mentioned in the methodology, quotes from the interviews will be woven through the text to illustrate the interviewees' impression of the WBS policy framework. Moreover, quotes from documents pertaining to WBS will complement the interview quotes, although the empirical data gathered from the interviews will carry a greater significance in shaping sub-conclusions. To accommodate the reader, tables 3 and 4 are also included below.

Table 3*: anonymised list of interviewees*

Interviewee ID	**Region**	**Province/water authority**
Interviewee 1	Noord-Holland	Province
Interviewee 2	Noord-Holland	Water authority
Interviewee 3	Noord-Holland	Province
Interviewee 4	Overijssel	Province
Interviewee 5	Overijssel	Water authority
Interviewee 6	Overijssel	Water authority
Interviewee 7	Overijssel	Province
Interviewee 8	Utrecht	Water authority
Interviewee 9	Utrecht	Water authority
Interviewee 10	Utrecht	Province
Interviewee 11	Utrecht	Water authority
Interviewee 12	Utrecht	Water authority
Interviewee 13	Utrecht	Water authority

Table 4*: interviewees not working for a provincial government or water authority*

Interviewee ID	**Work field**
Interviewee 14	Environmental law jurist
Interviewee 15	Ministry of Infrastructure and Water management

5.1 Noord-Holland

5.1.1 Adequately dealing with (un)certainty

Is the scientific cooperation for evidence-based policies adequately coordinated?

The WBS letter to parliament mentions multiple times, that adequate coordination of the cooperation with knowledge institutes is a prerequisite for making water and ground systems steering during policymaking, illustrated by these examples *"By 2030, together with municipalities and knowledge institutes, the soil substrate will be mapped and a sufficient consideration will be made of the ground and soil substrate in the Environment Strategies"* and *"This will be developed together with knowledge and research institutes, parties in the food production chain, regional governments and agricultural parties"*. (Harbers & Heijnen, 2022, p. 17). More specifically for Noord-Holland, their PPLG reiterates the necessity of data and information regarding water and ground systems: *"Together with the national government, knowledge institutes, and regional partners we will gather data and information that are required to monitor the progress, results and effects of our policy and measures."* (Provincie Noord-Holland, 2023, p. 49) However, the province also acknowledges that they do not have to start from scratch, as extensive know-how and expertise is readily available (provincie Noord-Holland, 2023). Although these statements about coordinating scientific cooperation are inherently true, they remain general without providing practical guidelines. An interviewee who works at the Ministry of I&W and is closely involved with the WBS policy framework underscores this: *"We will also start workshops with the Youth Climate Movement. So, we already have some things running there, and we also collaborate with engineering firms, but also, for example, with Deltares, which is developing a knowledge platform for us, specifically for data for maps to help civil servants, who quickly want to get a map that shows, for example, where fens are located, how high the groundwater level must be and where the high sandy soils are located."* And *"There is abundant knowledge about the soil and land subsidence, but the trick is to translate the knowledge and data to information, as to make it accessible to others"* (Interviewee 15).

This view that although more far-reaching cooperation with knowledge institutes is vital for robust water and ground systems, there is already a comprehensive knowledge base at the provincial and water authority level, is also felt by the Noord-Holland interviewees. Interviewees 1 and 2 argue that coordinating political demand and scientific supply with knowledge institutes already occurs. Moreover, interviewee 2 asserts that knowledge gathering is not a restricting factor, but the conversion into policies has been inadequate: *"... water authorities have, already, been investing in knowledge about water and ground for a long time"* and *"... then you assume that a lot of knowledge is not present, yet I can argue, and I also believe it, that the knowledge is already present and that the problem lies with the translation."* Interviewee 3 concurs and recognises the extensive cooperation, yet also underscores that more knowledge is required to give substance to the structuring choices and measures of WBS. Interviewee 1 also notes that governmental bodies have to adhere to strict procurement regulations. Hence, they cannot all of a sudden increase cooperation. The interviewees give a nuanced view compared to the WBS documents, arguing a

comprehensive knowledge base is already present, yet translating this into supportive data for the WBS structuring choices and measures has been insufficient.

To conclude, from the documents and interviews, it can be discerned that cooperation was already partially present. Although some level of coordination was present, it fell short from translating the existing knowledge into WBS policies. Consequently, dealing with uncertainties involving water and ground systems is hindered when the usage and translation of the knowledge base is not adequately coordinated. Because cooperation was already present, but the scientific insights were not translated, WBS scores medium on this indicator.

5.1.2 Adequately matching across sectors, jurisdictions, space and time

Is the public and private cooperation adequately coordinated?

WBS specifically addresses cooperation between different governmental bodies to integrate the structuring choices and measures from the letter to parliament in current and future policies: *"We will combat soil disruption caused by excavation and will reuse high-quality soil. Hence, we will maintain vital and healthy soils. Together with provinces and water authorities, the national government will initiate pilots to achieve this"* and *"Sufficient room around dikes, dams, dunes, and other water defense structures is necessary to continue strengthening these structures, even after 2050. Together with water authorities, provinces, and municipalities, we will achieve this by working on future-proof 'profielen van vrije ruimte' (*profiles of free space*)"* (Harbers & Heijnen, 2022, p. 15 & 11). Moreover, the Ministry of I&W also mentions coordination with (semi-)private partners: *"We will discuss the application of this principle with the Vewin* ('Vereniging van Waterbedrijven in Nederland' or in English 'Association of Water Companies in the Netherlands' in English) *and VEMW* ('Vereniging voor Energie, Environment and Water' or in English 'Association for Energy, Environment and Water'), *considering the diversity of water users, feasibility and how we can reduce water usage"* (Harbers & Heijnen, 2022, p. 8). Again, the national WBS documents consist mainly of superficial statements that lack detailed instructions. This can be partially explained by the fact that most measures and structuring choices will be implemented by regional governments that must adjust them to their respective regions' characteristics. Zooming in on Noord-Holland, the PPLG specifically iterates that a prerequisite for the effective implementation of WBS is adequate coordination of public and private cooperation: *"To implement WBS as good as possible when making spatial planning decisions, in the context of the PPLG, we will broaden the existing signal maps in collaboration with the water partners per region coherent with all the water and ground themes"* (Provincie Noord- Holland, 2023, p. 31). This quote illustrates that at the regional level, the coordination of public and private cooperation is already more specific.

In line with the above-described quotes, interviewee 2 emphasizes that adequately coordinated cooperation, especially public collaboration, is necessary if water and ground

systems are to be steering during future policymaking. According to the interviewee, there has been a notable improvement in the harmonisation between water authorities and the province: *"I believe it has gained a considerable boost, especially because you now force the province to adopt an active role."* However, currently, WBS cannot legally 'force' provincial governments and water authorities to cooperate with each other since it has not (yet) been anchored in the law. Interviewee 3 agrees with Interviewee 2 and has noticed that the urgency concerning the adequate management and governance of water and ground systems has increased in the last years due to droughts and floods: *"... the urgency appears only to increase, and the letter to parliament encourages discourse with each other"* This urgency could fade if severe droughts and floods remain absent, meaning that the coordination may diminish.

To conclude, the WBS documents remain, once more, general about public and private coordination, although province-specific documents provide more clarity. The interviewees do believe that WBS has caused more dynamic public and private coordination concerning water and ground management, yet do not provide arguments for lasting coordination. To maintain the current public and private coordination, legal arrangements can be made to ensure future cooperation. Because there are harmonising efforts, yet it is not guaranteed that this public and private coordination will last, WBS scores medium on this indicator.

Are the short-term and long-term effects of policies accounted for?

Unlike the previous two themes which were extensively addressed in the WBS letter to parliament, the integration of short-term actions and long-term planning is less conspicuous. It does not go beyond common adages such as *"do not shift the burden to future generations. This implies that we now have to consider ground and water issues, climate change and future management costs"* and *"by making choices now, we can influence how we want to deal with long term developments"* (Harbers & Heijnen, 2022, p. 3 & 2). Documents concerning WBS on a regional scale have a clearer view pertaining to this integration: *"The provinces prioritise the regional and local perspective, because this makes it clear which opportunities Water and Ground steering can offer a certain region for future proof development. The provinces will develop these regional perspectives in cooperation with other governance bodies and society. Water and Ground steering goes beyond some basis adaptations and solely technical solutions"* (IPO, 2023`, p. 1). A report by the STOWA, a research institute affiliated with the water authorities, recognizes that there are knowledge gaps, since *"Spatial planning instruments are suitable for short- to long-term plans (10-20 years), but do the instruments also work on the long-term (50 years)?"* (Klostermann & Veraart, 2022, p. 19). During a brainstorming session held by the provincial government of Noord-Holland concerning the integration of WBS into their PPLG, there was a specific focus on the long-term implications for changes in land use if water and ground systems were made steering (Joustra et al., n.d.). However, no approach was presented to integrate the immediate effects and future consequences. All these mentions recognise that

accounting for both short and long-term effects is vital, but they fail to offer guidelines, underscoring the inherent challenges.

Whereas the references to short and long-term planning in the documents pertaining to WBS remained general, the interviewees linked it with specific topics. Interviewees 2 and 3 argued that accounting for both short-term action and long-term planning is the hardest in the field of housing, as housing shortages are contemporary problems that can be partially solved by building in polders, yet result in issues in the future when extreme weather events become more frequent: *"... you do notice the tension with the housing problem and, as the water authority, we acknowledge the urgency, but our message is if the construction of housing is necessary, at least do it climate change proof"* (Interviewee 3). Interviewee 2 is less nuanced and iterates that WBS currently, does not sufficiently integrate short-term action and long-term planning, especially regarding housing. Interviewee 1 addresses a different sector, the sustainable energy field: *"There are several developments that are not yet included in the plan, like solar farms, which are essential for the energy transition in Noord-Holland."* The interviewees acknowledge the difficulties in integrating short- and long-term effects, sketching a more realistic picture compared to the WBS documents.

To conclude, unlike the WBS documents, the interviewees recognize the inherent challenges of offering a well-balanced assessment of short- and long-term effects and acknowledge that WBS currently falls short concerning this aspect.

5.1.3 Acknowledging homogeneity/plurality of norms, values and interests

Are the different problem frames comprised into a common perspective?

WBS aims to integrate the different problem frames from public and private parties concerned with water and ground management: *"The elaboration of the measures, discussed in this letter, requires the commitment and effort of all interested parties. It is about means, knowledge, and capacity. During the meetings, the different parties emphasized this because of the other developments that took place simultaneously."* (Harbers & Heijnen, 2022, p. 31). Especially the interests of the agriculture, environment, housing, and energy supply sectors are highlighted. However, in the letter to parliament, it is acknowledged that the aforementioned sectors can have conflicting priorities and problem frames: *"This region-specific customisation is also essential to find a balance when water quality and groundwater levels have conflicting interests, for example when high groundwater levels stimulate the extraction of nutrients and pesticides"* (Harbers & Heijnen, 2022, p. 23). Thus, it is recognised that there are differing problem frames that can have diverging interests, yet, at the moment, no effort has been made to comprise them into a coherent common perspective. The concept version of the PPLG of Noord-Holland (2023) underscores the importance of an integral approach to managing water and ground systems, making it one of their five guiding principles. However, the province does not offer a guideline to comprise them into a common perspective.

Interviewee 1 believes that currently the integration of different problem frames is too ambiguous: *"No, it is abstract and that is worrying."* The interviewee argues that this could hinder the further development of WBS. Interviewees 2 and 3 are less clear in their answers. Yet, the latter does assert that the agricultural and housing interests are subsidiary to the environmental problem frames as these are central in WBS. Besides these three problem frames, interviewee 1 highlights the strong connection between the energy sector and WBS, especially focussing on the planned solar parks. The interviewees do recognise the different problem frames, that are integral to WBS, yet, an adequate way forward to comprise them into a common perspective is not provided. This could indicate that making choices and prioritising interests over others is inevitable to prevent the process from grinding to a halt.

To conclude, from both the WBS documents and interviews, it can be discerned that although the relevant interests have been identified, it has been challenging to integrate them into a common perspective, even suggesting that making choices is unavoidable.

5.1.4 Summarising table

Table 5: *WBS scores Noord-Holland*

		Sub-unit
		Noord-Holland
Indicator	*Is the scientific cooperation for evidence-based policies adequately coordinated?*	Medium: Cooperation was already present, but the scientific insights were not translated
	Is the public and private cooperation adequately coordinated?	Medium: Presently there are harmonising efforts, yet it is not guaranteed that this public and private coordination will last
	Are the short-term and long-term effects of policies accounted for?	Low: WBS falls short in accounting for both the short- and long-term effects
	Are the different problem frames comprised into a common perspective?	Low: Integrating all relevant problems into one common view has proven to be challenging. Moreover, it cannot be guaranteed that certain interests will be excluded

5.2 Utrecht

5.2.1 Adequately dealing with (un)certainty

Is the scientific cooperation for evidence-based policies adequately coordinated?

Provincial governments and water authorities emphasise that a comprehensive understanding of the intricate connections between water and ground systems is a prerequisite for adequately implementing the water and ground steering principle. The STOWA foundation recognises that they do not fully grasp how these sub-systems interact (Klostermann & Veraart, 2022). The *Interprovinciaal Overleg* (Interprovincial Deliberation or IPO), an umbrella organization of the twelve Dutch provinces, also states that the goals of the WBS framework require an accessible knowledge infrastructure for all parties involved. Although some progress has been made, the IPO argues that a substantial amount of data and knowledge regarding water and ground systems is still only regionally and locally available and should be integrated nationally (IPO, 2023). In line with the Stowa and IPO, the provincial government, in their Bodem- en Waterprogramma Provincie Utrecht 2022-2027 (Soil and Water Programme Province Utrecht 2022-2027), a strategy report that is closely related to WBS, recognises the knowledge gaps concerning water and ground systems and aims to encourage cooperation with research institutes actively: *"We stimulate the process of knowledge development and knowledge sharing concerning trans-regional soil problems"* (Province Utrecht, 2022a, p. 47).

Whereas the reports and documents related to WBS and water/ground systems recognise shortcoming in the understanding of said systems and processes in Utrecht or, more generally, the Netherlands, interviewees 9, 10, and 12 put more trust in the existing knowledge base in the water authorities and the provincial government of Utrecht: *"You notice that there are a lot of technicians and hydrologists, who calculate everything, down to the last comma"* (Interviewee 12). Similarly, interviewees 9 and 10 argue that WBS does require a substantial knowledge base. Yet they believe that information and data concerning water and ground systems was already present before the introduction of the WBS policy framework: *"Look, for example, at Natura 2000 areas, there are all sorts of analyses conducted. Well, with state-of-the-art knowledge, it is being decided what is needed to maintain the quality of these areas"* (Interviewee 9) and *"I know, for example, that for the fen areas there already is a big knowledge program. Thus, even before the letter to parliament, there was already a comprehensive research project connected, and for other specific subjects there are also some research projects, to which certain knowledge institutes are also connected"* (Interviewee 10). These interviewees, thus, differ considerably from the WBS documents and believe that there is already a sufficiently extensive knowledge base present, resulting from adequate coordination, to implement the WBS measures. However, this risks underestimating the complexities of making water and ground systems steering in future spatial planning decision-making and could induce complacency.

On the other hand, interviewee 13 did notice an increase in the coordination of the collaboration amongst policy actors and scientific institutes, specifically regarding fens: *"Yes, I certainly believe that. This happens mainly on the fen area subject about land subsidence,*

regarding what measures can be taken to combat this. For this purpose, we have been working for a long time with universities and knowledge institutes. In conclusion, yes, I think it will stimulate cooperation." Interviewee 11 even asserts that the measures concerning water and ground systems dart ahead, while the research that backs these measures has not yet caught up: *"It is progressing too fast for the academia to stay up to date"*. Although it is praise-worthy that policies that aim to protect and (re)vitalise water and ground systems are being implemented at a fast rate, measures should be supported with robust scientific evidence that has also conducted a comprehensive risk analysis.

To conclude, some interviewees asserted that a comprehensive knowledge base already exists, which could function as the foundation for the WBS measures. This could indicate that until now the coordination between political demand and scientific supply was adequate. However, this could also result in complacency or policies that are adopted without the support of up to date scientific data. Coordination between scientific institutes and policy actors should be a continuous process. Hence, WBS scores medium on this indicator.

5.2.2 Adequately matching across sectors, jurisdictions, space and time

Is the public and private cooperation adequately coordinated?

The provinces have adopted the public, and private cooperation theme of the WBS framework, as they published an IPO position paper that not only emphasises harmonisation between provincial governments but also collaboration with national and local institutions. One of the main principles in the paper is *"collaborating to construct a future-proof perspective."* It is recognised that a climate robust interpretation of WBS requires coordination amongst local, regional and national governments (IPO, 2023, p. 4). Utrecht, specifically, also adopted this focus on mainly public coordination. In the already mentioned Soil and Water Programme Province Utrecht 2022-2027, the provincial government of Utrecht acknowledges that the water and ground system in Utrecht and their Water authorities are inherently connected with other regions of the Netherlands. Hence, they adopted the following philosophy: *"We offer room for developments that fit the qualities of Utrecht, from the principle 'local what is possible and provincial what is necessary' and with the emphasis on achieving the goals through collaboration"* (Provincie Utrecht, 2022a, p. 9). This steering principle forces Utrecht's province and water authorities to coordinate their actions with each other and neighbouring jurisdictions. This emphasis on collaboration can also be discerned in the *Uitvoeringsstrategie Landelijk Gebied* (Implementation Strategy Rural Area), which, besides other spatial planning topics focuses on water and ground systems (Provincie Utrecht, 2022c). Once more, these ambitions are commendable, yet they fall short of providing a concrete guideline to adequately coordinate public and private coordination.

Interviewees 8 and 13 have noticed increased cooperation between them and their public and private partners regarding water and ground management. Interviewee 13, who

works in a water authority illustrates this through his/her team's recent inclusion in a provincial core team tasked to produce a shared vision for the future of water and ground systems, which the interviewee believes happened because of the introduction of WBS. However, this offers no guarantee that the water authority will be included in future groups tasked with creating visions for their respective provinces. WBS is currently a hot topic, but, inevitably, other policy frameworks will be introduced, which could steal the limelight of WBS. Hence, it is vital that WBS should be anchored into the law, thereby safekeeping its structuring choices and measures. Interviewees 10 and 11 agree that WBS gave a boost to cooperation with the public sector, yet, also assert that considerable cooperation regarding water issues was already present: *"Well, in principle, it is stimulated, by the letter to parliament. What is more, we already cooperate a lot, especially with the water authorities and Rijkswaterstaat"* (Interviewee 10). Interviewee 9 concurs with the WBS documents that more comprehensive coordination amongst public and private partners is required, however, does not foresee this collaboration being realised without the necessary financial funds: *"I believe that money is necessary if you want to really collaborate."* This interviewee highlights an important limitation of WBS, since it is not accompanied with specific funds. The measures must be financed by adding them to other projects with access to financial resources. This dilutes the goals of WBS. On the other hand, it can be argued that because of the lack of WBS funds, provincial governments and water authorities are forced to adequately coordinate with other policy actors and programs to secure financial resources.

To conclude, most interviewees agree that public and private coordination is necessary to implement the WBS measures, yet also assert that this was already present for water and ground management. Moreover, water and ground interests have become more prominent in policymaking, meaning that different government levels are stimulated to coordinate their efforts to reach the WBS targets. Hence, WBS scores high on this indicator, with the caveat that it must be anchored in the legislature to maintain the momentum it currently has.

Are the short-term and long-term effects of policies accounted for?

In the Soil and Water Programme Province Utrecht 2022-2027, accounting for both short- and long-term implications is mentioned a multitude of times: *"We establish both the short- and long-term goal for the improvement of the water quality"* (Provincie Utrecht, 2022a, p. 22). However, interviewee 15, who is closely involved with WBS at the Ministry of I&W, acknowledges that it is challenging to untangle the intricate connections between short-term actions and long-term planning: *"It is hard to predict an effect after 100 years, so you have to learn to adapt to uncertainties, which makes it inherently complex."*

Most of the Utrecht interviewees did not specifically address the integration of short-term action and long-term planning; some respondents talked around it or, in the case of interviewee 11, admitted that they have not read the letter to parliament well enough. On the other hand, interviewees 8 and 13 did provide a clear answer. Interviewee 8 asserts that the long-term implications of the WBS measures are not accounted for enough: *"What is*

currently missing is a vision on the water system itself after 80 or 100 years?" (Interviewee 8). Interviewee 13 is similarly skeptical: *"There are some contradictions. All water authorities argue that you have to look 100 years ahead. Just because water and ground systems also date that far back, it needs another long-term approach. The letter to parliament launched the first measures, yet these need to be fine-tuned."* The nuance must be made that WBS is still in its early stages and will be elaborated on more, hopefully including a clearer account of short and long-term consequences. Lastly, interviewee 9 did not specifically mention acknowledging both short-term and long-term effects, however, did address polder Rijnenburg. The interviewee argued that the provincial government should abandon or alter the project if you consider the increasing severity and frequency of extreme weather events.

To conclude, the ambiguity and skepticism of the interviewees illustrate that, although WBS documents recognise that short-term and long-term effects should be accounted for, in practice, there are no readymade options to integrate the immediate effects and future consequences of WBS measures. Hence, WBS scores low on this indicator.

5.2.3 Acknowledging homogeneity/plurality of norms, values and interests

Are the different problem frames comprised into a common perspective?

In most documents related to WBS or water and ground systems more generally, the problem frames of the agriculture, housing, environment, and energy sectors are often most prominent. This can be seen in the IPO (2023), and STOWA (Klostermann & Veraart, 2022) papers, as these sectors and their interests regarding water and ground management are continuously addressed, especially the agriculture and housing sectors. This can also be attributed to the clout the agriculture and housing sectors have in the political center of the Netherlands, providing their lobby groups with disproportionate levels of influence. Interviewee 10 does recognise the attempt of the Ministry of I&W to integrate the interests of the mentioned sectors. Interviewees 9 and 11 also recognise that the problem frames of the abovementioned sectors are represented in WBS. However, they do see that the preferences of the national government percolating through: *"It remains a letter to parliament from the current administration, that includes the CDA* (Christian center party) *and the VVD* (liberal right-wing party) *and you can see their convictions in the letter"* (Interviewee 9). However, the aim of the structuring choices of WBS should eventually be met if they are converted into law. Hence, the political affiliations only pertain to deciding the approach to reach the goals. Interviewee 8 believes that these different problem frames and interests related to WBS are not complementary, and choices must be made: *"Well, I believe that many things are contradictory. The preservation of the amount of agricultural land is at odds with raising the groundwater levels ... So, it is a dilemma. the letter contradicts itself on many aspects, as well."*

To conclude, despite the different relevant problem frames (notwithstanding how they got the label 'relevant') being acknowledged by both the WBS documents and the interviewees, it is not addressed how their differing interests can be comprised into a common perspective. Hence, WBS scores low on this indicator.

5.2.4 Summarising table

Table 6: *WBS scores Utrecht*

		Sub-unit
		Utrecht
Indicator	*Is the scientific cooperation for evidence-based policies adequately coordinated?*	Medium: A comprehensive knowledge base was already present. However, this can induce complacency.
	Is the public and private cooperation adequately coordinated?	High: Public and private cooperation was already present, yet WBS interests have become more prominent in the policymaking area
	Are the short-term and long-term effects of policies accounted for?	Low: There are no readymade guides on how to account for and integrate short- and long-term effects
	Are the different problem frames comprised into a common perspective?	Low: No explanation is provided as to how the different problem frames can be comprised into a common view

5.3 Overijssel

5.3.1 Adequately dealing with (un)certainty

Is the scientific cooperation for evidence-based policies adequately coordinated?

As mentioned in the case description, even before the introduction of the WBS policy framework in November 2022, the provincial government of Overijssel published their foundation for the environment strategy. In this vision document for the province, they already adopted water and ground systems as boundary conditions for future spatial planning policies. The strategy emphasizes knowledge generation and sharing, regarding topics such as

water and ground systems, through knowledge hubs, i.e., the Cleantech Region (Deventer), and the University of Twente (Provincie Overijssel, 2022a). By even mentioning the institutes the province aims to cooperate with, they are further advanced than their Noord-Holland and Utrecht counterparts, yet, for now, it remains at the level of intentions. In their equally important PPLG, the province also adopts water and ground systems as a steering principle and, again, highlights knowledge generation through cooperation with knowledge institutes and the usage of local expertise (Provincie Overijssel, 2022b).

This focus on local knowledge is also underscored by interviewee 7, who believes that the WBS policy framework has not (yet) yielded the intended increase in knowledge generation and sharing through collaboration: *"There is theoretical and practical knowledge. Knowledge institutes represent, for me, the theoretical knowledge, and the experience we gain is practical knowledge by, for example, talking to a farmer*. Hence, interviewee 7 sees a vital role for the province, in relation to WBS, to adequately coordinate theoretical and practical knowledge. Furthermore, interviewee 4 and 6 assert that the coordination with scientific institutes was already tightly knitted, and the former sees the desired increase of scientific cooperation materialising only when the government frees funds: *"Conducting research is expensive in terms of money. Hence, we cannot do everything we want"* (Interviewee 4). This remark, highlighting the necessity for funds to finance scientific cooperation, rings true, as financial stimuli can narrow the gap between political demand and academic supply of scientific research. Interviewee 6 asserts that although *"Water and Ground steering is something we have been doing for years, we still believe that we lack expertise."* Interviewee 5, on the other hand, believes that WBS did indeed increase scientific cooperation since most of the structuring choices are general measures. Consequently, the WBS letter to parliament forces regional governments to expand on them for their specific jurisdictions and, hence, approach knowledge institutions: *"It would have been better if the national government had elaborated on the 33 structuring choices, yet, this has not happened. So, we hire an agency to determine each area's specific implications."* However, interviewee 7 says that although scientific cooperation should be praised, the knowledge generation is still on a local/regional scale and should be integrated nationally.

To conclude, the WBS documents and interviewees assert that adequate coordination is a prerequisite to implement the WBS measures, and the environment strategy of the province also details collaboration with specific institutes. The interviewees mostly argue that scientific coordination was already present before the introduction of WBS. This collaborative foundation can function as a basis for further developments or it can induce complacency. It is vital that WBS gets access to funds to finance the coordination of cooperation, to further the academic insights on which WBS can develop. Thus, it is unsure if the current scientific coordination can be elaborated on. Hence, WBS scores medium on this indicator.

5.3.2 Adequately matching across sectors, jurisdictions, space and time

Is the public and private cooperation adequately coordinated?

In the outline framework issued by the provincial government, for the impact of WBS for Overijssel, collaboration with their 'partners' is mentioned many times, mainly referring to the water authorities and municipalities that are (partly) located in Overijssel. In this cooperative alliance, the province has a coordinating role: *"The province adopts a coordinating role, where they mainly facilitate and stimulate the cooperation between parties"* (Broersma et al., 2023, p. 35). Here, the document gives a more minute description of how public and private cooperation will look regarding WBS, compared to the other provinces. The province will, according to the outline framework, adopt a coordinating role. Moreover, located adjacent to the German border, strengthening the cooperation with Germany concerning rivers that flow through both regions is emphasised (Broersma et al., 2023). In the environment strategy and PPLG, reinforcing existing collaborative partnerships are leading principles (Provincie Overijsse, 2022a; Provincie Overijssel, 2022b).

Interviewees 4, 5, and 7 have noticed more coordination with mainly, public institutes, as they argue that the letter to parliament created more dynamic interactions. In line with the recommendation by Broersma et al. (2023), according to interviewee 5, cooperation with neighbouring countries regarding water management has seen an uptick: *"Also on an international level, we try to put this on the agenda ... What can we learn from other countries that already experienced nuisance from too much water? Or what can we learn from countries that experience droughts?"* Including neighbouring countries in water and ground management projects is commendable, as state borders do not bind these systems. However, it could also lengthen policymaking processes, where quick decisions are necessary, as extreme weather events will become more frequent and severe.

Interviewee 4 believes that this strengthening of collaborative schemes concerning water and ground management results from the integration of WBS principles in the PPLG of Overijssel, meaning that adequate coordination is also dependent on PPLG. Similar to the previous indicator, interviewee 4 also asserts that the intent to increase collaboration is noteworthy, yet without funds, the interviewee expects that the expected cooperation will be lacking. Interviewee 5 agrees and already sees that not all institutes that approach the province and water authorities can be helped due to limited human capital. Interviewee 7 illustrates the increased public cooperation by mentioning the position paper published by the IPO (2023): *"The position paper about Water and Ground steering was drafted to make the priorities of the 12 provinces clear for The Hague."* However, it remains to be seen if the IPO can assert itself more prominently in the national political arena. Although the Ministry of I&W will most likely be more susceptible to their advances, it is unsure if the other ministries, who did not work on WBS, will be as eager. Interviewee 6 asserts that WBS has created the right conditions for more tight-knit public collaboration, but it *"depends on how the water authorities will implement it. All ingredients are present, and it is to the board what they will do with it."*

To conclude, it is currently too early to tell if WBS will indeed lead to adequate coordination of public and private collaboration. It is unsure if including international partners will enhance or slow water and ground management and if cooperation can be adequately coordinated without financial funds. However, the province has progressed further on this indicator compared to Noord-Holland and Utrecht, as they have adopted a coordinating role. Hence, WBS scores medium on this indicator.

Are the short-term and long-term effects of policies accounted for?

In the report by Broersma et al. (2023), two chapters are dedicated explicitly to elaborating on the future prospects for Overijssel concerning water and ground systems and guiding principles to achieve their long-term goals. This underscores that the province of Overijssel, in terms of WBS, addresses the implications of short-term actions for long-term planning. Likewise, the foundation of the environment strategy outlines a vision for Overijssel in 2050, which also addresses short-term environmentally responsible water and ground management to achieve a healthy system by 2050 (Provincie Overijssel, 2022a).

Interviewees 4, 5, and 6 all said that currently, the long-term implications of the short-term measures in the WBS letter to parliament are not considered thoroughly. According to interviewee 6, although WBS attempted to provide long-term guidance through the 33 structuring choices, most interests in the spatial domain have short-term characteristics. Interviewee 5 concurs and argues that most measures are focused on the short-term: *"I feel that it emphasises the short-term more"* Interviewee 7 is more nuanced and asserts that some structuring choices and measures do provide a handheld for the integration of short-term action and long-term planning. However, the interviewee also admitted that they encountered difficulties trying to integrate short- and long-term plans concerning water and ground management: *"I believe that the distinction between short-term and long-term is not clear everywhere. Most people focus on the long-term regarding water and ground systems. I also notice that with my fellow project leader, who also focusses more on the long-term, while I also emphasise that some things must also happen now."* Again, compared to the optimism of the WBS documents about the ability to account for both the short- and long-term effects of the measures, the interviewees are more doubtful in this aspect. This is a realistic attitude of the interviewees, as it is inherently more difficult to account for long-term consequences of policies, even though these immediate measures are necessary as well, to prevent degradation of water and ground systems.

To conclude, contradictory to the claims of the WBS documents, the interviewees were not confident that the short-term and long-term effects of WBS were adequately accounted for, which, in the current phase, is the accurate representation. Hence, WBS scores low on this indicator.

5.3.3 Acknowledging homogeneity/plurality of norms, values and interests

Are the different problem frames comprised into a common perspective?

In the report that outlines a vision for Overijssel regarding WBS, the problem frames of the agriculture, urban development, and the environment sectors are highlighted most prominently (Broersma et al., 2023). In the foundation of the environment strategy of Overijssel, the same sectors come to the foreground. Additionally, the interests of the mobility sector are discussed in regards to water and ground systems. This illustrates that besides WBS, these sectors also appear prominently in other policy frameworks. The interests of these sectors are labelled as important, yet, not integrated into one perspective.

Interviewee 5 believes that all relevant problem frames have been integrated into the WBS policy framework, which is commendable. However, the interviewee believes that by attempting to include all the varying interests, the different sectors can cherry pick the structuring choices and measures that advance their particular interests, which could create tensions. Interviewee 4 asserts that the WBS letter to parliament is more-or-less value-free, although interviewee 4 does foresee that tensions surrounding the nitrogen crisis could spill over to the WBS debate: *"Well, the polarisation that accompanies the nitrogen crisis could influence this."* It is unrealistic to assume that the WBS letter to parliament represents no specific interests, as the agriculture, housing, and environment sectors are clearly visible in the document. Embracing reality is crucial, as it is unproductive to ignore relevant problem frames. Interviewee 7 also argues that although the Ministry of I&W has managed to deliver a neutral document, there are tensions between the agricultural and environmental interests. According to interviewee 6 WBS places a dot on the horizon, and that the political preferences of the provincial governments, water authorities and national government decide how they get there: *"Luckily, we also talk a lot with the boards, regardless of who sits there and their political affiliation. You work towards a dot on the horizon, and depending on the political parties, you take a certain route to that dot."*

To conclude, despite some interviewees claiming that the WBS letter to parliament is value-free, the interests of mainly the agriculture, housing, and environment sectors are clearly featured in the documents. However, acknowledging the relevant problem frames is not the same as comprising them into a common view. Hence, WBS scores low on this indicator.

5.3.4 Summarising table

Table 7: *WBS scores Overijssel*

		Sub-unit
		Overijssel
Indicator	*Is the scientific cooperation for evidence-based policies adequately coordinated?*	Medium:

		Coordination of scientific cooperation was already present, and no funds are tied to WBS
	Is the public and private cooperation adequately coordinated?	Medium: Uncertain if including international partners will enhance or hinder WBS. The province has adopted a coordinating role.
	Are the short-term and long-term effects of policies accounted for?	Low: Presently, no adequate integration of short- and long-term effects
	Are the different problem frames comprised into a common perspective?	Low: Relevant problem frames are recognised. However, they are not comprised into a common view

5.4 Summary

Table 8: *Overview of the WBS scores*

		Sub-unit		
		Noord-Holland	*Utrecht*	*Overijssel*
Indicator	*Is the scientific cooperation for evidence-based policies adequately coordinated?*	Medium: Cooperation was already present, but the scientific insights were not translated	Medium: A comprehensive knowledge base was already present. However, this can induce complacency.	Medium: Coordination of scientific cooperation was already present, and no funds are tied to WBS
	Is the public and private cooperation adequately coordinated?	Medium: Presently there are harmonizing efforts, yet it is not guaranteed that this public and private coordination will last	High: Public and private cooperation was already present, yet WBS interests have become more prominent in the policymaking area	Medium: Uncertain if including international partners will enhance or hinder WBS. The province has

				adopted a coordinating role.
	Are the short-term and long-term effects of policies accounted for?	Low: WBS falls short in accounting for both the short- and long-term effects	Low: There are no readymade guides on how to account for and integrate short- and long-term effects	Low: Presently, no adequate integration of short- and long-term effects
	Are the different problem frames comprised into a common perspective?	Low: Integrating all relevant problems into one common view has proven to be challenging. Moreover, it cannot be guaranteed that certain interests will be excluded	Low: No explanation is provided as to how the different problem frames can be comprised into a common view	Low: Relevant problem frames are recognised. However, they are not comprised into a common view

Table 8 gives an overview of the scores derived from the document and interviewee analysis. The majority of the scores skewed to 'medium' (5) and 'low' (6). This indicates that, based on the chosen policy effectiveness criteria, WBS falls within the low to medium range, meaning that it currently falls short of the desired effectiveness standards. What immediately stands out is that all the sub-units scored 'low' on the 'are the short-term and long-term effects of policies accounted for?' and 'are the different problem frames comprised into a common perspective?' indicators. This will be elaborated on in the discussion.

5.5 Other recurring interview themes

The following sections will discuss the recurring critiques and recommendations that did not fit the analytical framework but, nonetheless, were deemed necessary to mention.

Ambiguity.

The most common critique from the interviewees concerning WBS is that it is ambiguous, which can also be nuanced due to the policy framework being relatively newly introduced. The interviewees still had numerous uncertainties about what WBS would precisely entail for their jurisdiction and how they should proceed: *"... a letter from the*

ministry arrived December last year? Or November? Yet, no further action has occurred" (Interviewee 5). The interviewees said that since the introduction, they have been waiting for an implementation strategy that details the next steps, provides policy instruments, and indicates where the responsibilities lie: *"We are basically waiting for an implementation strategy or program"* (Interviewee 10). Interviewee 13 argues that elaborating on WBS would also help the public understand what it will mean for them since as of now, *"People who are not closely working on water topics have heard about it, but do not specifically know what the consequences are."* Furthermore, according to several interviewees, the structuring choices and measures leave considerable room for interpretation, which risks WBS becoming a container term that can be used by a broad spectrum of parties to advance their own interests or it can become a substance less term asserts interviewee 6. Due to the noncommittal nature of WBS, interviewee 14 doubts if the aims stated in the letter to parliament will be achieved: *" You can set very ambitious goals. However, because the letter is non-committal, it is not certain if something will happen in reality."* This ambiguity also stretches to one of the core tenets of WBS: comply or explain. The letter to parliament only dedicates one paragraph to this principle (Harbers & Heijnen, 2022), hence leaving open how much regional governments can deviate from the structuring choices and measures: *"... because, comply is clear, but what is meant by explain? What does it entail? Which requirements need to be met?"* (Interviewee 14).

This critique regarding the 'comply or explain' principle of WBS echoes the review commission's recommendation, issued by the Ministry of I&W, that the goals, choices, and measures in WBS should be legally anchored. The report insists that deviating from the WBS guidelines should not be too easy, otherwise risking that digressions become the rule instead of the exception. Moreover, in the further development of WBS, it should be clear who is responsible for assessing explanations of policy deviations (Deltares et al., 2022).

Affirmation.

Despite the abovementioned critique, most interviewees praised the WBS policy framework as *"... a step in the right direction"* (Interviewee 9). They felt that it was an affirmation of the national government that their work concerning water and ground management was recognized and gave the provinces and water authorities *"the wind at their backs"* (Interviewee 8) to continue their efforts to responsibly manage water and ground system.

The affirming property of WBS, also gives provincial governments and water authorities more legitimacy to assert themselves on issues concerning water and ground systems. Provinces can more easily raise a topic on the national political agenda. Water authorities, which often assumed only a facilitating role to the provinces in spatial planning decision-making, have been able to throw their weight around more: *"You can also see now that water authorities are being more confident"* (Interviewee 2).

6. Discussion

This chapter will first discuss the results from chapter 5. Each sub-unit is compared based on the policy effectiveness criteria and the corresponding indicators. Thereafter the recurring themes are elaborated on. Next, the policy implications are presented, including a discussion of the governance strategies and international implications. Subsequently the theoretical implications are explicated. This chapter is concluded with a reflection on the research process.

6.1 Discussion of findings

6.1.1 Adequately dealing with (un)certainty

Is the scientific cooperation for evidence-based policies adequately coordinated?

WBS scored 'medium' on this indicator for all three sub-units, indicating that, at the moment, the policy framework is not sufficiently coordinating scientific cooperation to produce evidence-based water and ground management measures. In all three provinces, the WBS documents and interviewees suggested that a comprehensive knowledge base already existed. This was the main reason that all three provinces scored 'medium', as this provides a stepping stone for new research that can function as the foundation for WBS measures. From the Noord-Holland sub-unit, it became apparent that the translation component of policy research is insufficient for the WBS policy framework. This could suggest that, currently, the studies conducted by academic centers do not fit the research demand of the provincial government and water authorities of Noord-Holland. This would indicate that the coordination of scientific cooperation is not up to par. Another problem of WBS mentioned by the interviewees pertaining to this is that the WBS policy framework is not accompanied by financial funds. Academia and other research institutes have only limited access to funds to conduct studies, hence, not all research demands by provinces and water authorities pertaining to WBS can be fulfilled. If WBS does have accompanying financial funds, it could open up options for research centers to conduct studies necessary for WBS measures. Although monetary funds would stimulate scientific collaboration, it cannot foster good working relationships between provincial governments and water authorities on the one hand and research institutes on the other hand; this takes time. Nonetheless, as mentioned, the interviewees argued that a comprehensive knowledge base already existed, suggesting that the groundwork for these relationships already exists and can be developed upon.

Regarding the connection between the criteria 'adequately dealing with uncertainty' and the accompanying indicator 'is the scientific cooperation for evidence-based policies adequately coordinated?', it can be argued that when scientific collaboration is adequately coordinated (i.e., the scientific demand and supply are matching), the uncertainties revolving a policy can be adequately dealt with. Hence, concerning WBS specifically, not all uncertainties will be sufficiently addressed because the indicator scored medium for all three sub-units. However, addressing uncertainties does not only depend on the coordination of scientific cooperation. Other variables could be the presence of research institutes that have

experience with policy research, their knowledge of the area in question, and the quality of the research institute. These could be added to the analytical framework for future research.

6.1.2 Adequately matching across sectors, jurisdictions, space and time

Is the public and private cooperation adequately coordinated?

WBS scored 'medium' on this indicator for two sub-units (Noord-Holland and Overijssel) and 'high' for the sub-unit Utrecht, indicating that at the moment, the policy framework in Noord-Holland and Overijssel is not sufficiently coordinating public and private cooperation. Most interviewees in these provinces did notice more dynamic public and private coordination. However, not all were certain that this can be attributed to WBS. An explanation for the increased cooperation can be the provincial and water authority elections that were relatively soon after the introduction of WBS (WBS was introduced on November 25, 2022, and the provincial elections were on March 15, 2023). The run-up to elections is often characterized by uncertainty, which could induce more cooperation amongst public institutions, e.g., political parties within the provincial governments can approach water authorities to collaborate on certain topics during the election campaign, or vice versa. Some interviewees argued that the current increase in public and private coordination can be explained by WBS being a newly introduced policy framework, meaning that it currently has momentum. However, this will not last indefinitely, as the governance landscape can change rather quickly. An illustrative example is the recent government collapse in the Netherlands (as mentioned, the Dutch government resigned on July 7, 2023). It is unsure if WBS will have a similar prominent position in the new coalition agreement. This shows the importance of anchoring policies into the law to guarantee a lasting adoption of said policy. Another aspect that was brought up is international cooperation regarding WBS. The logic of this argument can be derived from the fact that rivers and soils do not adhere to national borders. Hence, coordinating the collaboration with other countries concerning water and ground management could increase the effectiveness of WBS measures since the vitality of the water and soil systems in other countries affect the Dutch systems. However, several policy frameworks already exist concerning water and ground systems on the EU level, e.g., the Water Framework Directive (EC, 2000) and EU Soil Strategy 2030 (EC, 2023). New policies establishing international collaboration could clutter the governance landscape concerning water and ground management and delay the WBS process. Instead, a collaboration agreement with only the neighbouring countries of the Netherlands, i.e., Germany, and Belgium, would be less complex and could ensure more effective implementation of WBS in the Netherlands.

What sets Utrecht apart from the other sub-units regarding the public and private coordination is that it has used the momentum of WBS to secure seats in core teams that produce the visions for the province. This could mean that WBS interests will obtain a prominent position in Utrecht's environment strategies and/or PPLG. Policymakers concerned with WBS in the other two provinces could also use the current momentum of the policy framework to secure seats on the tables that draw up the visions for their respective

provinces. Although, again, the momentum of WBS will not last indefinitely, thus, it should be anchored into the law to ensure an enduring impact.

Regarding the connection between the criteria ‘adequately matching across sectors, jurisdictions, space and time’ and the corresponding indicator ‘is the public and private cooperation adequately coordinated?’, it can be argued that when public/private cooperation is adequately coordinated responsibilities and externalities are evenly distributed over sectors. However, the criteria not only pertain to sectors, i.e., the public or private sector, but also to jurisdictions and space (the next indicator addresses time). As mentioned in the methodology, these two components were left out of the rephrased indicator to accommodate the interviewees, as they mostly referred to public/private cooperation. This could be explained by the relatively recent introduction of WBS, meaning that the interviewees did not have enough experience with the policy framework to form an idea about the jurisdictions and space components. Future research on WBS could attempt to include these two aspects when policy advisors have had more experience with the policy framework.

Are the short-term and long-term effects of policies accounted for?

WBS scored ‘low’ on this indicator for all three sub-units, indicating that the policy framework has not accounted for both short- and long-term effects. Both the national and provincial documents related to WBS only provided general accounts on how to account for short-term and long-term effects. The majority of the interviewees recognized the absence of guidelines to integrate immediate and future consequences of WBS measures. The interviewees mostly referred to specific tangible sectors where integrating short- and long-term effects: the agriculture, housing, nature conservation, and energy sectors. This illustrates the difficulty of addressing abstract concepts such as accounting for of short- and long-term effects in the context of the tangible water and ground systems, i.e. the physical focus of WBS on water and ground systems is less compatible with the inherent challenges abstract concepts. This lack of adequately addressing the short-term and long-term effects of WBS measures is worrying since it can be argued that the three other indicators are related to this indicator. Firstly, identifying the short- and long-term effects of WBS measures depends on adequate coordination of scientific collaboration. Secondly, integrating short- and long-term effects relies on the adequate coordination of public and private cooperation, since it necessitates data-sharing, harmonised adoption of policies and complementary measures. Lastly, it is vital that all the relevant different problem frames are identified and connected, to ensure that the short- and long-term effects can be properly aligned with said interests. This significance of the indicator ‘are the short-term and long-term effects of policies accounted for?’ underscores that it is vital that WBS comprehensively considers both the short- and long term-effects of the measures.

Regarding the connection between the criteria ‘adequately matching across sectors, jurisdictions, space and time’ and the corresponding indicator ‘are the short-term and long-term effects of policies accounted for?’, it can be argued that it when the short-term and long-term effects of a policy are adequately accounted for, said effects can be appropriately distributed over time to burden different generations evenly. However, as said, currently, the

short-term and, more notably, the long-term consequences of the WBS measures are not fully identified. Hence, future research can aim to identify the immediate and future consequences.

6.1.3 Acknowledging homogeneity/plurality of norms, values and interests

Are the different problem frames comprised into a common perspective?

WBS scored 'low' on this indicator for all three sub-units, indicating that the policy framework has not yet been able to comprise the problem frames into a common perspective. In all three provinces, the WBS-related document and the interviewees identified the relevant interests of the agriculture, housing, and environment sectors. The energy sector was also mentioned for the Noord-Holland sub-unit, specifically the existing and planned solar parks. This suggests that this province has already considered how WBS can be aligned with the sustainable energy transition. Although integrating more problem frames into one common narrative is a complex task, adopting it would be favorable given the inevitable energy transition. Besides identifying the relevant problem frames, the interviewees do not believe that the differing interests are comprised into a comprehensive and coherent perspective. Some even argue that certain problem frames warrant greater consideration, although they do not specify which interests they are referring to. Considering the current housing shortages and nitrogen crisis in the Netherlands, they likely refer to the housing and agriculture sectors. Although it is vital that the housing shortage and nitrogen crisis are addressed, this would demonstrate a short-term focus. This could come at the expense of long-term goals, e.g., environmental protection and the energy transition. The failure of integrating all the relevant problem frames and only highlighting the short-term interests could reduce the effectiveness of WBS.

Regarding the connection between the criteria 'acknowledging homogeneity/plurality of norms, values and interests' and the corresponding indicator 'are the different problem frames comprised into a common perspective?', it can be argued that when all the different problem frames are accounted for the accompanying norms, values and interests are acknowledged. However, after continually making compromises to include different problem frames, the resulting common perspective could be deprived of discernible interests. As a consequence, the relevant sectors may feel that their interests are not represented well enough in the common perspective, which could cause friction. A possible solution to this would be to consider the relevant interests for each individual WBS structuring choice and measure instead of incorporating all problem frames. This could potentially reduce the complexity. Future research on WBS or other MLG policies could examine the viability of this approach.

6.1.4 Other recurring interview themes

Ambiguity

The lack of elaborating documents concerning WBS risks losing momentum, which relates back to the critiques mentioned regarding the public/private coordination indicator. Without clear instructions for allocating the different responsibilities to the provincial governments and water authorities, it becomes challenging for these governmental bodies to publish strategic plans for their respective provinces aligning WBS with their region-specific

characteristics. The provincial government of Overijssel is the exception, as they have introduced an WBS outline framework for the province. Nevertheless, it remains relatively general. Moreover, as mentioned, the Dutch government resigned on July 7, 2023, which could mean that possible directives elaborating on WBS will be postponed. This poses the risk that the WBS policy framework will remain in the current state of preparatory and ambiguous limbo. A possible solution is that the House of Representatives could declare WBS not 'controversial,' meaning that this would allow the caretaking government to develop the WBS policy framework further.

The critique that the policy framework, and more specifically the 'comply or explain' principle, is ambiguous, is prominent in all three sub-units. Hence, it was decided to add it as an indicator to the existing analytical framework, referring to it as 'are the responsibilities adequately allocated?'. The scoring scheme is as follows:

Low: responsibilities are not adequately defined and allocated

Medium: responsibilities are defined and are allocated to some stakeholders, but not all.

High: responsibilities are clearly defined, and all stakeholders are allocated responsibilities.

Since, according to the interviewees, WBS has not clearly defined and allocated responsibilities, the policy framework scores 'low' on this indicator.

Affirmation

As mentioned in section 5.5, despite the interviewees expecting more directives, they were pleased with the first ambitious step in the right direction and that the policy framework gave them more legitimacy to address water and ground problems. WBS provided a vision for the future direction of water and ground management in the Netherlands. Here, again, the momentum must be maintained to try to prevent remaining in the current stage of the WBS process.

This positive critique that WBS provides a guiding vision for policymakers was present in all three provinces. Hence, it was decided to add it as an indicator to the existing analytical framework, referring to it as 'does the policy provide coherent and clear directions?' The scoring scheme is as follows:

Low: the policy provides no clear and coherent guiding directions

Medium: the policy provides general guiding directions

High: the policy provides detailed guiding directions

A majority of the interviewees did argue that WBS made the first step by placing a dot on the horizon, referring to making water and ground systems steering in spatial planning decisions. However, no clear guidelines are (yet) provided on how to reach that goal. Hence, WBS scores 'medium' on this indicator.

The criterion accompanying both indicators could be ‘clear and comprehensive structure and vision’. Subsequent research must verify if the new criterion, indicators, and scoring schemes are viable in the context of WBS or another MLG policy.

6.1.5 Revised analytical framework

Table 9 shows the new analytical framework that includes the new criteria and indicators and figure 8 shows the revised grading schemes.

Table 9: *revised analytical framework*

Criterium	Short description	Indicator
Adequately dealing with (un)certainty	Environmental problems are often shrouded in uncertainties regarding causes, effects, and solutions. This can be solved by connecting science with politics	Is the scientific supply and political demand for evidence-based policies adequately coordinated?
Adequately matching across sectors, jurisdictions, space and time	The effects of environmental problems often are distributed unevenly across sectors, jurisdictions, space, and time. Coordination amongst public/private sectors and jurisdictions and between short-term and long-term planning is vital to ensure effective policy solutions	Are all concerned public/private sectors involved in the policy design process? Are all concerned jurisdictions involved in the policy design process? Are the short-term and long-term effects of policies accounted for?
Acknowledging homogeneity/plurality of norms, values and interests	Environmental problems are framed differently between different actor groups. Connecting these varying norms, values, and interests is vital for effective policies	Are the different problem frames comprised into a common perspective?
Clear and comprehensive structure and vision	Environmental problems are complex problems that require a well-defined division of roles and vision	Are the responsibilities adequately allocated? Does the policy provide coherent and clear directions?

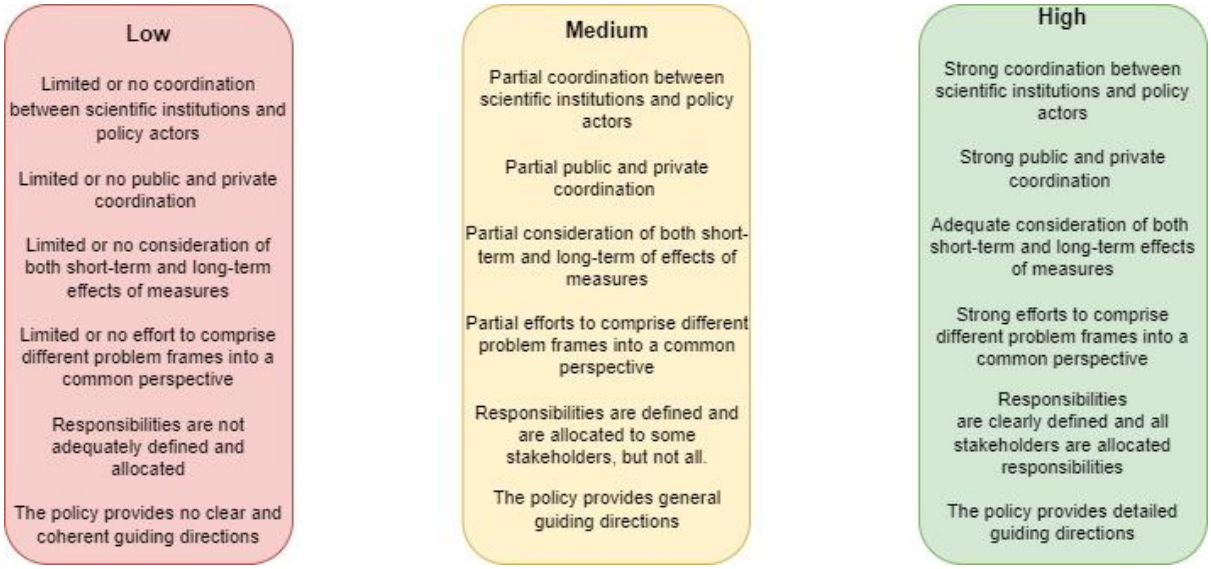

Figure 8: *revised grading scheme*

6.2 Policy implications

In the following paragraphs, the third sub-question of this research will be answered: *"What governance strategies are relevant to enhance the effectiveness of the WBS policy framework?"* First, the described governance strategies from chapter two will be employed to enhance the effectiveness of the WBS policy framework. Next, several recommendations will be presented regarding the novel indicators described in section 6.1.4. Lastly, the possibility of implementing WBS, or a similar MLG policy framework, in neighbouring countries will be reflected on.

6.2.1 Governance strategies

As mentioned in the methodology, this research will provide governance strategies, discussed in Ingold et al. (2019) to address the challenges WBS faces, described in section 6.1. Ingold et al. (2019) contend that the effectiveness of a certain policy can be enhanced by addressing its shortcoming by connecting actors, institutions, jurisdictions, and sectors. Hence, these governance strategies can also be labeled as connectivity strategies.

In the results, it became apparent that WBS scored 'low' on the 'are the short-term and long-term effects of policies accounted for?' and 'are the different problem frames comprised into a common perspective?' policy effectiveness indicators for all three sub-units. Therefore, concerning these indicators, WBS requires immediate governance strategies and employing these connectivity strategies will, most likely, yield the most benefits. Regarding the former indicator, water and ground management ask for both short- and long-term responses. Hence, addressing the connectivity of immediate effects and future consequences is vital (Ingold et al., 2019). Edelenbos et al. (2008) argue that short- and long-term effects can be adequately addressed by three forms of institutional embedding: representative-political (correspondence amongst the democratic processes and interactive processes of decision-making), administrative-bureaucratic (correspondence amongst the bureaucracy and interactive processes of governments) and executive (correspondence amongst the decision

making bodies and interactive processes). When these institutional forms are present and aligned, there is a higher chance that policymaking processes will adequately address short- and long-term effects (Edelenbos et al., 2008). Another aspect of connecting short and long-term effects is raising public awareness of water and ground problems and highlighting the risk of doing nothing. Leiserowitz (2006) argues that to address this challenge, it is crucial to close the discrepancy between policy preferences and risk perception. To achieve this, a large-scale and comprehensive survey must be conducted to assess the priorities and attitudes concerning water and ground management. Simultaneously, the public must be made aware of the inter-generational responsibility and the future consequences of inaction. Through underscoring these risks, the public may get more receptive towards not only policies that tackle current water and ground system issues but also policies that address future challenges. Effective water and ground management can be safeguarded by adequately addressing and connecting short-term and long-term effects, guided by public perceptions and recognising inter-generational responsibilities (Leisorowitz, 2006).

In section 7.2, it was established that the three other original indicators were all related to the ‘are the short-term and long-term effects of policies accounted for?’ indicator, warranting particular attention to this indicator. The paper by Pot et al. (2022) provides several temporal strategies to address acute (short-term) and creeping (long-term) threats. Here, three will be presented that were deemed beneficial for the WBS policy framework. The first strategy is timing, which refers to adequately and purposefully choosing the moment to take action. Concerning WBS, the provincial governments and water authorities could decide to not wait for further directions by the national government, which has been immobilized after its collapse. They could proactively begin elaborating on the WBS structuring choices and measures for their specific jurisdictions. The second strategy is called futuring, which refers to anticipating the unknown by outlining future scenarios and determining how they can be navigated towards or away from. Regarding WBS, the interviewees concurred that the policy framework is currently too focused on acute problems, e.g., the housing shortage and nitrogen crisis. Hence, it is vital that future scenarios and pathways are explored. Provincial governments and water authorities can draw up scenarios for their respective jurisdictions and align them with national scenarios. The last strategy is referred to as cyclical adaptation. This concerns implementing a regular cycle in which adopted policy measures are evaluated and adjusted. The WBS letter to parliament addresses the policy framework's monitoring component, but only in general terms. The last concrete date mentioned in the letter to assess the process concerning WBS is July 1, 2023. Hence, it would be beneficial to adopt a strict assessment and readjustment cycle that allows the WBS to adapt to novel developments.

Regarding the second indicator, ‘are the different problem frames comprised into a common perspective?’, if the relevant problem frames surrounding an environmental issue are not connected, the result could be policy conflicts or a stalemate. To prevent this, Driessen & Glasbergen (1995) suggest that instead of concentrating on compliance strategies and regulations to address environmental issues, the discourse should shift to a regional development perspective. The sustainable social and economic development opportunities are

highlighted instead of focusing on restrictive measures by adopting this paradigm. By broadening the perspective, more room is created for a wider variety of problem frames. This can also be applied to WBS. The policy framework should adopt a regional development viewpoint that underscores the potential benefits of sustainable water and ground management, thereby integrating the problem frames into one common development perspective (Driessen & Glasbergen, 1995). To support this connectivity strategy, a network analysis can be conducted to discern the relevant sectors and actors and their problem frames. Subsequently, regional development opportunities can be identified that would entice sectors and actors that have an interest in WBS to participate in the effort to create a common perspective (Prell et al., 2009).

WBS scored 'medium' on the indicators 'is the scientific cooperation for evidence-based policies adequately coordinated?' and 'is the public and private cooperation adequately coordinated?', with the exception being Utrecht, which scored 'high' on the latter indicator. Although this research acknowledges that the indicators discussed above require immediate attention, using the described connectivity and temporal strategies. The effectivity of WBS can also be improved by addressing these two indicators, albeit to a lesser extent. Regarding the first indicator concerning adequately coordinating scientific cooperation, it is vital that scientific demand emerging from epistemic uncertainty is addressed. Crona & Parker (2012) argue that the coordination between policymakers and scientists could be enhanced by instituting academic centers. These bridging organizations can help both groups connect, discuss, and align interests. The IPO and STOWA already exist in the governance landscape, but these are only for the provincial governments and water authorities, respectively. A forum where policymakers from the Ministry of I&W, provincial governments, water authorities and researchers could share data and knowledge and calibrate the scientific demand and supply regarding water and ground management, could benefit WBS.

Concerning the other indicator, 'is the public and private cooperation adequately coordinated?', the WBS measures cannot be effectively instituted by different governance levels or private sectors unilaterally. Coordination is required to guarantee that the measures are well-established. Ingold (2014) argued that national and local public/private dynamics often played a key role in initiatives addressing environmental problems. The author found that the intermediating actors were often the regional public/private sectors. These regional actors functioned as gatekeepers and aligned the interests of local and national actors. In the Netherlands, the provincial governments, and to a lesser extent, the water authorities, can be considered intermediary actors that could smoothen out national and local tensions.

The two new indicators that were translated from recurring themes from the interviews also necessitate a strategy to address them, more specifically the 'are the responsibilities adequately allocated?' indicator, since it was graded 'low.' The critique from the interviewees was in regard to the ambiguity surrounding WBS and the lack of a clear division of roles. An obvious answer to this critique from the interviewees is making a follow-up report which details which governance levels and institutes carry what responsibilities. This would ensure that the different governments are aware of their tasks, which would stimulate the process of implementing the WBS measures in their respective

jurisdictions. Accompanying this follow-up document could be tutorials created by the Ministry of I&W for policy advisors on the regional level. This would give colour to the contents of WBS and can make the policy advisors more enthusiastic. The *Vereniging van Nederlandse Gemeenten* (Association of Dutch Municipalities) has already made the first step, as they organised an online information session that detailed how policy advisors could integrate WBS into their plans for the municipality (VNG, 2023). This initiative can be extended to information sessions for provincial governments and water authorities, which could help policymakers understand what WBS means for their respective regions and what their responsibilities are. Furthermore, including the private sector would also be beneficial. The *Nederlandse organisatie voor toegepast-natuurwetenschappelijk onderzoek* (the Dutch organisation for Applied Scientific Research), Deltares and Geobusiness Nederland organised a symposium on what WBS can mean for private ventures (TNO, 2023).

The 'comply or explain' principle was also criticised as being too open-ended. This thesis proposes four measures:

1. Clearly define when it is allowed to deviate from the WBS structuring choices and measures and address to what extent they can deviate.
2. Clearly stipulate how the explanation must be designed. A standardised concept that governments fill in would ensure that all deviations are assessed equally.
3. Set limitations on how often a government can employ the 'explain' option. This will prevent abuse of the principle.
4. Actively inform the governments concerned with WBS of the necessity of the structuring choices and measures to reduce deviations from the policies.

Of course, these strategies to address the ambiguity of the WBS policy framework are mainly from the viewpoint of the Ministry of I&W. However, as said, the provincial governments and water authorities can also decide to assume the responsibility themselves to further develop WBS in their respective regions. The provincial government of Overijssel has already taken this initial step by issuing a report that outlines what WBS means for the province (Broersma et al., 2023).

6.2.2 International implications

WBS is a relatively new policy framework in the Netherlands. Hence, it will take some years to assess whether WBS will have achieved its goal of making water and ground systems steering in Dutch spatial planning decision-making. However, a pre-emptive and brief study if the MLG approach of WBS could also function in other countries is possible. The different governance levels in WBS are currently only national, regional, and local, yet the international level could also be included. The most apparent countries that could adopt a similar policy framework are neighbouring countries or nations within the river basin of the Rhine, Meuse and, Scheldt. However, not all countries in the basin of these rivers have similar socio-political and environmental structures as the Netherlands. At first glance, the most suitable countries are Belgium and Germany. Collaboration, knowledge sharing, and

capacity building between the Netherlands and Belgium and/or Germany could facilitate the expansion of WBS or a similar MLG approach to water and ground management in Belgium and/or Germany. After some time has passed, an evaluation can be conducted to assess if the MLG approach is suitable for these countries and perhaps could be exported to countries with different governance structures to tackle water and ground challenges worldwide.

6.3 Theoretical implications

The introduction mentioned that the scientific relevance lends itself from the research gap concerning the assessment of the effectiveness of specific MLG policies, such as the WBS policy framework and the novel characteristics of the framework in Dutch governance. The research has contributed to the scientific debate by evaluating that the effectiveness of WBS, a MLG policy framework, is not up to par. This illustrates that MLG policies can be assessed using the developed analytical framework. Thus, this thesis has advanced the practical side of MLG literature. Moreover, this study has shown that the governance, or connectivity, strategies by Ingold et al. (2019) can be applied to a MLG policy. However, it is too early to tell if the strategies will, over time, measurably enhance the effectiveness of WBS.

Furthermore, the academic literature on policy evaluation is saturated with analytical frameworks that evaluate a broad spectrum of policies. However, surprisingly, no analytical framework specifically evaluates the effectiveness of MLG policies. This research has constructed a novel analytical framework, based on Ingold et al. (2019), that does precisely this, thereby contributing to this scientific debate surrounding (MLG) policies. The (revised) analytical framework can be used in other case study analyses, which will help fine-tune the framework. Moreover, as mentioned in the previous section, WBS, or a similar MLG policy framework, can be employed in Germany or Belgium to address water and ground issues or other environmental problems. The created analytical framework could be used by the relevant authorities in Germany and Belgium to assess the effectiveness of the employed MLG policy, as the analytical framework has shown to be able to assess the effectiveness of a MLG policy.

In section 6.2.1, the temporal strategies of Pot et al. (2022) were employed to address the difficulty of integrating short and long term effects of the WBS measures. Since it was also established that the accompanying indicator relates to all the other indicators, illustrating its significance, this thesis suggests adding the temporal strategies by Pot et al. (2022) to the existing governance/connectivity strategies that can enhance the effectiveness of MLG policies. Adding these strategies will offer a more comprehensive set of options to address a broader array of MLG policies. Concerning the scientific coordination indicator, Head (2022a) thoroughly discusses how to address large and complex environmental issues by including stakeholders with different types of knowledge (e.g., practical and theoretical knowledge). In another article, Head (2022b) examines how policymakers tackle wicked problems, such as environmental issues. The author discerns seven approaches, of which the ‘stakeholder collaboration’ strategy is the most viable to add to the existing connectivity strategies of Ingold et al. (2019).

Since the policy evaluation component of MLG research is undersaturated, there is ample room for future research in this research field. This study can function as a stepping stone for future research, as the newly developed analytical framework can be employed in other case studies which would also help fine-tune the analytical framework. As this study can be categorised as an ex-ante assessment, a comprehensive effectiveness assessment that includes all provinces, after five years is suggested. This can be conducted in collaboration with the Ministry of I&W. Furthermore, as mentioned, this study suggests that a similar MLG policy framework could also function in Belgium or Germany. Hence, an (ex-ante) study could be performed in those countries.

6.4 Reflection on the research process

Reflecting on the research, several limitations can be discerned. Considering the reliability, or internal validity, of qualitative research, Robson (2002) argues that it mainly resolves around *"being thorough, careful and honest in carrying out the research"*. This is, of course, a subjective matter. However, all interviews have been recorded, documented, and transcribed. The documents used for the analysis can all be found in table 2. By documenting the research process, the researcher was forced to conduct an honest and thorough study. Concerning the study's validity, the researcher bias was kept to a minimum by strictly adhering to the research framework. However, a bias will inevitably percolate throughout the research (Noble & Smith, 2015). Furthermore, by following the semi-structured interview and not straying too far from the questions, the attempt was made to prevent the influence of the researcher on the interviewees, i.e., reactivity (Zahle, 2023). Besides adhering to the research framework and interview guide, the study triangulated the results by conducting both interviews and a document analysis, which reduces biases. Moreover, peer debriefing has identified flaws in the research process, which otherwise could have been missed (Kriukow, n.d.).

Another limitation is that the research did not have access to all WBS documents circulating in the provincial governments and water authorities, mostly because they were still concept versions, except for the provincial government of Overijssel, which provided their WBS outline framework. To address this, other documents concerned with the provinces' water and ground management and that were mentioned in the letter to parliament (e.g., the PPLGs) were collected and used in the analysis.

The timing of the research has, most likely, also influenced the interviewees' responses. Firstly, the WBS letter to parliament that introduced the policy framework was released relatively recently, on November 25, 2022. This meant that the interviewed policy advisors were still acquainting themselves with the contents and determining the implications for their respective jurisdictions. Consequently, the interviewees sometimes did not address WBS but referred to other policies that they were involved in, as they were more familiar with those. Secondly, the interviews were held relatively soon after the provincial government and water authority elections (March 15, 2023). As a result, there was still a lot of uncertainty about which political parties would make up the governing coalitions in the provincial governments and water authorities in Noord-Holland, Utrecht, and Overijssel. The

interviewed policy advisors of said governance bodies argued that since they were civil servants, their work on WBS would not depend on the coalition composition. However, it cannot be ruled out that the policy advisors were more cautious in their answers, awaiting the eventual composition of the coalition. Additionally, one of the interviewees (interviewee 15) works at the Ministry of I&W, which designed the policy framework, indicating a possible bias. The other interviewees were also closely involved with WBS, which may have resulted in a (subconscious) tendency to be more optimistic about the policy framework. The last timing-related limitation does not pertain to the interview responses, but to the changed political context in which the results should be interpreted. As mentioned earlier, the Dutch national government collapsed on July 7, 2023. As a result, it is uncertain if WBS will be included in the new government's plans and to what extent. This unforeseen force majeure is an important caveat that the reader should be aware of while interpreting the results and conclusions of this research. Additionally, regarding the reliability of the methodology, future studies on WBS that adopt a similar research approaches may not yield the same results due to the changed political situation.

Concerning the external validity of the findings, the research specifically focused on Noord-Holland, Utrecht, and Overijssel, which all have differing provincial characteristics, e.g., the differing soil type problems and varying composition of the governing coalitions. However, due to the common overarching political and governance system in the Netherlands, it can be argued that the results from this research can be extrapolated to the other Dutch provinces and hence, can be used as an initial survey to gauge how WBS is received and interpreted by policy advisors in the Netherlands. The theoretical implications derived from the research concerning MLG policies can, for the same reason, be extended to other Dutch MLG frameworks. Generalising the results for other countries may be challenging, as not all political systems can accommodate the subsidiary nature of MLG policies. However, as mentioned earlier, countries in North-Western Europe may find it easier to adopt to similar policies due to the similar governance structures.

Despite the abovementioned research caveats, the strengths should also be highlighted. The study adopted a qualitative approach, enabling the gathering of in-depth insights concerning WBS. The studied indicators regarding scientific coordination, public/private coordination, accounting for short- and long-term effects, and comprising problem frames into a common perspective are mostly subjectively interpreted and difficult to reduce to numbers. The qualitative method of conducting interviews, is a better approach for capturing the nuances of these indicators. Moreover, due to the semi-structured nature of the interviews, additional recurring themes were discerned that would likely, not have been found through the rigid character of quantitative research. Lastly, the interview results can provide valuable insights for the Ministry of I&W into the reception of WBS in regional governance bodies, which may not come to light during the evaluation of said ministry due to different power dynamics.

7. Conclusion

This study aimed to bridge the current knowledge gap concerning assessing the effectiveness of, specifically, MLG policies, which is a relatively underexposed component in MLG literature. To achieve this, the WBS policy framework, which can be characterized as an MLG policy, was assessed, concerning its effectiveness. The research question reads: *"What governance strategies are able to enhance the effectiveness of a MLG policy framework, and to what extent?"* This research question consists of two parts. Firstly, it aims to determine how the effectiveness of MLG policies can be assessed. Secondly, it attempts to discern governance strategies that can enhance the measured policy effectiveness. The accompanying sub-questions are: 1) *"Which criteria and indicators to, ex-ante, assess the effectiveness of the WBS policy framework can be derived from the literature concerning MLG?"*, 2) *"From this assessment, what are the strengths and weakness of the WBS policy framework?"* and 3) *"What governance strategies are relevant to enhance the effectiveness of the WBS policy framework?"*. To answer these questions, an embedded case study analysis was conducted consisting of three sub-units: Noord-Holland, Utrecht, and Overijssel. A novel analytical framework was constructed from literature on policy effectiveness and MLG that could assess the effectiveness of MLG policies (sub-question 1). The analytical framework was used to interview policy advisors from the three sub-units and to analyse the transcripts and a selection of WBS-related documents. From these methods, the strengths and weaknesses of WBS were distilled (sub-question 2). In the subsequent discussion of the results, governance strategies were discussed and proposed, which could enhance the effectiveness of the WBS policy framework (sub-question 3). The development of an analytical framework and subsequent assessment of a MLG policy framework, proved that said policy types can be assessed concerning their effectiveness, i.e., the first part of the research question. The second part of the research question was answered by providing four connectivity strategies and additionally three temporal strategies. In the case of the WBS policy framework, the connectivity and temporal strategies that addressed the 'are the short-term and long-term effects of policies accounted for?' and 'are the different problem frames comprised into a common perspective?' effectiveness indicators, will, most likely, benefit WBS the most, since the policy framework scored the lowest on these indicators.

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Appendix

A: general interview guide

This is the general interview guide used during the interviews. For each interviewee it was slightly altered to suit his/her occupation and relation to the Water and Ground steering policy framework. The interview guide only functioned as a directional aid and during most interviews different avenues were explored. Furthermore, the interviews were held in Dutch and the interview guide was, hence, also in Dutch, but translated in English to accommodate English readers.

Informed consent

General questions

- Can you tell something about yourself?
    - You work at ..., what is your function there and how is this related to Water and Ground steering policy (WBS) framework?
- What is your general impression of the WBS policy framework?
    - How do you interpret the policy framework?
    - Have you encountered any obstacles? Or opportunities?

Analytical framework questions

- The letter to parliament prescribes the cooperation between scientific institutes and various governmental bodies to further develop the measures and policies. In practice, have you noticed that this coordinating function has, indeed, led to more scientific cooperation? Has this coordination helped bridge knowledge gaps and uncertainties?
- The letter to parliament also prescribes the general cooperation amongst governmental bodies. In practice, have you noticed that this coordinating function has, indeed, led to more public/private cooperation?
- Do you believe that the policy framework has managed account for both the short-term and long-term effects of the WBS structuring choices and measures?
- Do you believe that the policy framework has managed to adequately comprise the different relevant problem frames into one common perspective?

Concluding questions

- Do you have any suggestions for the WBS policy framework?
- Are there any things you want to mention that I have not asked, but you deem important for my research?