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Policy integration, coherence and governance in Dutch climate policy

A multi-level analysis of mitigation and adaptation policy

S. van Bommel
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ABSTRACT

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This report assesses the integration of climate policy in Dutch public policy at the national, regional, local and area level. The national analysis focuses on the horizontal integration of climate policy in national government programmes, adaptation and mitigation strategies and specific policy instruments. Special attention is being paid on the vertical integration in the water policy sector. The regional analysis focuses on the province of South-Holland and the local analysis focuses on the municipality of Rotterdam. As a complementary approach, a case study is performed in the Zuidplaspolder. This case study reveals the practical implications of climate policy integration for policy implementation in a specific area. The report also suggests means to enhance climate policy integration and to improve policy coherence and it gives suggestions on methods to study policy integration, coherence and governance.

Keywords: Adaptation, Climate policy, Coherence, Environmental policy, Governance, Mitigation, Multi-level governance, Policy integration, Water policy

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Preface

On 7 May 2007, the Partnership for European Environmental Research (PEER) composed of seven environmental research organisations (Alterra, CEH, Cemagref, JRC-IES, NERI, SYKE and UFZ) published a joined statement: 'Climate change and sustainable development – an unprecedented challenge for the research community'. In this statement, the PEER members proposed a joint initiative to analyse and explore novel approaches to mitigation and adaptation, inviting regional, national, European and global research partners to participate in this initiative. The aim is to build an open European platform that brings together expertise and exchanges information on the best approaches to mitigate and adapt to climate change (see also: <http://peer-initiative.org/html/obj454.html>).

As a follow-up to this statement, PEER launched in November 2007 two joint projects: Comparative Analysis of European National Adaptation Strategies and Policy Integration, Coherence and Governance. This report is one of the deliverables of the latter project. It is intended to function both as a separate study of climate policy integration and coherence in the Dutch public administration and as a comparative case among several country studies produced as part of the project. A separate synthesis report will illustrate more widely the cross-country and cross-sectoral challenges to climate policy integration and coherence.

This country report was financed by Alterra and the research programme Kennisbasis 2: Klimaatverandering.

We wish to thank all the people who have contributed to this country study by interviews and by commenting on drafts of the report.

Wiebren Kuindersma and Séverine van Bommel

Summary

This report contains the country study of the Netherlands for the PEER project on Policy Integration, Coherence and Governance, initiated by the Partnership for European Environmental Research (PEER): a cooperation between seven different European research institutes. Within this cooperation, we focus on climate policies. Climate policy is usually divided into adaptation and mitigation. Adaptation is about adapting to the consequences of climate change, such as extreme weather conditions, floods and water scarcity. Mitigation deals with policy measures to prevent climate change, such as sustainable energy sources, reduction of greenhouse gas emissions and storage of CO₂.

This research project focuses on the three aims of the overall project in the specific context of climate policy in the Netherlands. The three research aims are:

1. Assess the degree of policy integration in different policy sectors and determine key coherence problems between climate policies and other policies;
2. Suggest means to enhance climate policy integration and improve policy coherence;
3. Develop concepts and methods by which policy integration, coherence and governance can be studied.

Climate policy integration can be defined as the incorporation of the aims of climate change adaptation and mitigation into all stages of policy making in other policy sectors. Policy coherence implies that incentives and signals of climate policies and other policies provide target groups with signals that are not conflicting.

In order to be able to assess the degree of policy integration and coherence in the Netherlands, we had to make some methodological choices. We have chosen to assess the degree of policy integration and coherence by analysing:

- Horizontal policy integration and coherence at the national level (Chapter 4)
- Vertical policy integration and coherence in the national water policy (Chapter 5)
- Horizontal policy integration and coherence in the Province of South-Holland and the municipal of Rotterdam (Chapter 6)
- Vertical policy integration and coherence in the water policy of the Province of South-Holland and in the municipal water policy of Rotterdam (Chapter 7).

This assessment has been complemented by a case study. For this purpose, we have selected the Zuidplaspolder as a specific case study that deals with climate change adaptation, mitigation and water policy in practice.

The second research aim is addressed in the concluding chapter by reflecting on the findings from our study and making recommendations on possible ways to improve policy integration and coherence.

The third research aim is elaborated upon in the theoretical framework which is composed of the two central terms: policy integration and policy coherence.. To measure policy integration, we have developed a framework with five criteria: inclusion, consistency, weighting, reporting and resources. Policy coherence is assessed in terms of whether climate policy and other policies complement or conflict with each other (Chapter 2 and Chapter 9).

The study was undertaken using semi-structured interviews and a desk study on different policy documents and available research reports.

Chapter 5 deals with coherency and the integration of climate change in the national government's general strategies, in its specific mitigation and adaptation strategies and in specific policy instruments. We have seen a major inclusion of climate change adaptation and mitigation issues in the latest coalition agreements and programmes for government. Consistency and weighting is currently the issue of negotiation and debate. Specific policy instruments such as Environmental Impact Assessments (EIA) and the Dutch Water Test focus on the inclusion of, respectively, environmental objectives and consequences and water objectives and consequences in specific projects and plans. Both instruments have a voluntary character and do not force decision makers to follow the advices that stem from these EIAs and Water Tests. Besides these instruments, climate change objectives have been included in the Building Decree, covenants with local and regional governments on mitigation, multiple covenants with other public and private actors, educational programmes and research programmes.

Chapter 6 deals with the vertical integration of climate policy in the national water policy. This policy field deals primarily with adaptation issues. We show that the inclusion of adaptation within the water policy dates back to the mid nineteen nineties, although adaptation to climate change was in general not an explicit policy issue before 2005. This early inclusion of climate change in water policy means that the consistency of water policy with climate adaptation is high. Within the new water policy, climate adaptation has become the central objective. Most inconsistencies arise in relation to other policy objectives and become visible when the spatial claims of this new water policy are confronted with other spatial claims (nature, housing, agriculture, etc.). Nonetheless, the national water policy is characterised by a lack of instruments that oblige the weighting of water and climate issues over these other economic interests and corresponding land-use claims. Responsibility for weighting these water issues is transferred down to decision makers in integrated projects and regional governments. Policy evaluations of the 'old' water policy (2000-2006) show that water-adaptation issues are not prioritised within decision making on locations for development projects (housing, industry, etc). It is only in the actual designs of these development areas that water adaptation issues (e.g. retention) are included and weighted seriously.

Chapter 7 deals with the specific integration of climate policy within the general policy of the Province of South-Holland and the municipality of Rotterdam, and within their water policy. Our analysis shows that climate adaptation and mitigation

have been included in the general provincial policy strategy for the next four years, although no attention is paid to it in the corresponding strategy for Rotterdam. However, both the Province of South-Holland and the city of Rotterdam have issued strategies on mitigation and adaptation in recent years. In both cases, adaptation has mainly been integrated within their water policy documents. Meanwhile, it appears that adaptation issues that are not directly related to water and land-use issues have received very limited attention until now. Mitigation has been integrated in the provincial and municipal environmental (or energy reduction) plans. Climate change is included within these plans and is an important motive for additional ambitions on CO₂ reduction and sustainable energy production. We have seen that the municipality of Rotterdam in particular even exceeds the national ambitions on emission reduction with their plan to reduce CO₂ emissions by 50% by 2025. Rotterdam's ambitions on mitigation have been included in the multi-level and multi-actor Rotterdam Climate Initiative. Within this initiative, the municipality participates together with private companies (from Rotterdam harbour), environmental groups, other regional and national governments and the EU. Most inconsistencies within the adaptation and water policies and other policies occur in relation to competing land-use claims. The province deals with rural areas in particular and thus with competing land-use claims from agriculture, nature development and (new) urban development.

Chapter 8 discusses the case of the Zuidplaspolder. The Zuidplaspolder is the lowest area in the Netherlands (7 metres below sea level) and thus is considered to be very vulnerable to climate change and rising sea levels. At the same time however, the western part of the Netherlands is the most densely populated and fastest urbanising region in the country. Therefore the agricultural Zuidplaspolder is also under tremendous pressure to urbanise. The Zuidplaspolder case shows how regional governments together with other regional actors tried to integrate climate adaptation issues with urbanisation. This project is an interesting example of how these conflicting land-use claims can be combined in practice. The most remarkable outcome of this case study is that the obvious inconsistency between climate adaptation and building houses in low polders was considered to be a problem only at the national level and could be overcome at the level of this specific local case. This shows that local case studies can lead to totally different conclusions than analysis from a general, national perspective.

Chapter 9 sums up the major conclusions of this report and makes some recommendations on policy instruments and future research. The major conclusions are:

- *Inclusion* - In recent years, climate change has been included in national and regional government programmes and in different policy sectors (energy, traffic, water, spatial planning and education).
- *Consistency* - Both climate change mitigation policy and climate change adaptation policy in the Netherlands pay explicit attention to coherence problems in terms of win-win areas. There are definitely win-win situations but there are also conflicts. Many of these conflicts have to do with land use.

- *Weighting* - Weighting climate issues is an aspect of policy integration that is underdeveloped in the Dutch national climate policy. As inconsistencies are hardly addressed in the current climate policy, neither does current policy discuss how the conflicts between climate policy and other policy sectors should be addressed.
- *Reporting* - Reporting refers to the importance of feedback for policy implementation. Most policy documents pay attention to the monitoring of policy outputs and policy outcomes, but, because most climate policy has been published only very recently, we cannot judge the effects of these reports on policy implementation.
- *Resources* - Resources refer to budgets and knowledge. With regard to budgets, considerable funding has been made available for climate mitigation and adaptation at the different levels of government. In most policy documents, these budgets do not cover the cost of implementing the policy plan. We did not, however, find any indication that budget is a limiting factor for climate policy at the moment. With regard to knowledge resources, we can conclude that the specific knowledge on climate change and climate policy is fragmented and often not available to policy makers. However, new research programmes such as Knowledge for Climate have recently been introduced to fill this gap. This programme does not merely focus on theoretical knowledge but also stimulates the interaction between science and practical (interactive) policy experiments.

Policy coherence – The most appropriate approach to promote coherence and coordination has been the subject of debate between adherents of a more centralised approach and adherents of a more diffuse approach. Most climate policy coherence seems to be stimulated by centralised approaches in the Netherlands. However, we have also observed that the centralised approach does leave room for regional solutions and voluntary actions (self-organisation). We can characterise the Dutch approach as multi-level co-governance: the higher levels supervise lower ones, but at the same time the lower levels have a certain degree of autonomy. Meanwhile, interest groups, private companies and other actors are also incorporated informally into the policy-making process. Responsibilities and power are spread over many organisations, overlapping and cross-cutting each other.

The recommendations on policy instruments focus on the most promising instruments identified in this study, and some weaknesses of the current instruments. These are:

- Obligatory inclusion of climate change objectives in the EIA and the Water Test
- Monitoring of climate change outcomes
- Cooperative governance
- Better science-policy interaction.

As regards concepts and methods to study policy integration, our study shows that a case study methodology can supplement a more top-down approach to analyse policy integration and coherence. Case studies provide alternative or supplementary insights and understanding of the success or failure of policy integration or implementation from a bottom-up perspective. We have shown that a case study

analysis can result in different conclusions than the top-down analysis of policy integration and coherence. Therefore, we plead for a combination of a case study methodology and top-down analysis of policy integration and coherence to study these issues in the future.

1 Introduction

Evidence about human impact on climate change is increasing. According to the IPCC report of February 2007 (IPCC, 2007), warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea levels. Most of the observed increase in globally averaged temperatures since the mid twentieth century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations. Global atmospheric concentrations of carbon dioxide, methane and nitrous oxide have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values determined from ice cores, spanning many thousands of years. The global increases in carbon dioxide concentration are due primarily to fossil fuel use and land-use change, and those of methane and nitrous oxide are primarily due to agriculture (Nienhuis, 2008).

Global warming is considered an important issue in Dutch policy also. In the Netherlands, where 25% of the land is below sea level and 60% of the population live in this area, the predicted sea-level rise seriously threatens the Dutch. The need for climate policy is now widely acknowledged. At the same time, there is a growing appreciation that the policy context in which climate change decisions are made must be considered because, first of all, climate policy alone will not be able to secure climate policy objectives, and therefore each policy sector must take on board climate policy objectives if these are to be achieved. The integration of climate change concerns into other policy areas has been referred to as policy integration (Lafferty & Hovden, 2003).

Second of all, in addition to policy integration, policy coherence is important to secure climate change objectives. Policy coherence refers to the synergy between different policies. Policies in areas such as agriculture, water, transport, energy and others have a profound impact on climate change, yet they often work at cross purposes. Policy coherence aims to ensure that government policies are mutually supportive, or at least not contradictory.

Third of all, the actual importance of policy integration and coherence for climate change will depend on concrete actions taken, partly in terms of management or regulation, but mainly in terms of operations. These actions are always local, but they have regional impacts. Furthermore, measures undertaken or suggested at the EU level (e.g. EU Green Book) interact with those originating at the national and regional levels; thus policy integration and coherence is part of multi-level governance.

The perceived need for policy integration and coherence at various policy levels has undoubtedly become more acute, but the evidence base is still weak and there are still no accepted methods for achieving it (Urwin & Jordan, 2008). This research

addresses the issues of policy integration, coherence and multi-level governance surrounding climate change in the Netherlands. It is part of a larger European research project on climate policy integration, coherence and governance carried out by the Partnership for European Environmental Research (PEER). The research has three aims:

1. Assess the degree of policy integration in different policy sectors and determine key coherence problems between climate policies and other policies;
2. Suggest means to enhance climate policy integration and improve policy coherence;
3. Develop concepts and methods by which policy integration, coherence and governance can be studied.

Chapter 2 presents the theoretical framework within which this report is constructed and discusses the key concepts underpinning the research. Chapter 3 explains the methodology adopted to complete the research tasks. Chapter 4 discusses the Dutch context and institutional responsibilities. This chapter describes the Dutch administrative structure, the political situation, the specific Dutch barriers to, and promoters of, climate mitigation and adaptation, and the key climate change challenges.

Chapter 5 discusses horizontal policy integration and coherence at the national level. It assesses integration and identifies coherence problems with regard to the Balkenende IV programme for government, the coalition agreement arrived at by the political parties that constitute the current government, the climate change strategies, the Strategic Environmental Assessment (SEA), the Regulatory Impact Assessment (RIA), cross-compliance and other policy instruments.

Chapter 6 discusses vertical policy integration and coherence at the national level. It assesses policy integration and coherence in the water sector. Chapter 7 discusses the regional and local context. It discusses the integration and coherence of the climate policy of the Province of South-Holland and the Municipality of Rotterdam.

Chapter 8 describes the results of the Zuidplaspolder case study and incorporates an examination of horizontal and vertical policy integration and coherence at the provincial and local level, with specific reference to the water sector. It deepens our analysis by assessing the degree of policy integration and coherence not just in policies but also in outputs and outcomes. In other words, it shows how policy integration and coherence manifest themselves in practice.

Chapter 9 wraps up the findings, draws some overall conclusions and makes some recommendations. The conclusions address the degree of climate policy integration in different policy sectors (with a special focus on the water sector), and determine key coherence problems between climate policies and other policies at different levels. The recommendations suggest means – such as institutions, processes (e.g. EIA) or measures - to enhance climate policy integration and improve policy coherence, within the context of multi-level governance. The recommendations also suggest means to further develop concepts and methods by which policy integration, coherence and governance can be studied.

2 Theoretical framework

As this study was part of a European project, it was important to have a joint perception of the research task and the work required. To facilitate this process, the following understanding of the key concepts was provided as a starting point (for a more elaborate description see the joint report).

2.1 Policy integration

Based on the definition of policy integration by Underdal (1980) and environmental policy integration by Lafferty and Hovden (2003: 9), climate policy integration can be defined as:

- the incorporation of the aims of climate change adaptation and mitigation into all stages of policymaking in other policy sectors (non-environmental as well as environmental);
- complemented by an attempt to aggregate expected consequences of climate change adaptation and mitigation into an overall evaluation of policy, and a commitment to minimise contradictions between climate policies and other policies.

To evaluate the degree of climate policy integration, one has to focus the evaluation and ask where policy integration should be found. On the assumption that there is a political commitment to integrate a climate policy objective into other policies, this should be reflected at the level of policy strategies (general ones such as government programmes, but also sector-specific, e.g. transport strategies) as well as at the level of the instruments (e.g. laws, taxes, support schemes, information material, etc.) by which the strategies are implemented. Because the idea of policy integration is not just to change bureaucracies but actually to achieve climate change mitigation and adaptation, it is essential to extend the examination to include policy outputs and outcomes. If climate change is integrated into educational policies, this should be reflected in the material used in schools, in the teaching and ultimately in the knowledge of the pupils. If policy integration is a good way to promote climate change mitigation and adaptation, the more knowledgeable pupils will act differently as grownups.

Policy integration can be divided into horizontal policy integration and vertical policy integration. Horizontal policy integration refers to cross-sectoral measures and procedures by the government, or some government body, e.g. a commission, carried out to mainstream or comprehensively integrate climate change mitigation and adaptation aims into public policies. Typical means include broad climate change strategies and the integration of climate policies into the preparation and adoption of new regulations and the annual state budget. Vertical policy integration refers to the integration of climate policies into a specific sector. It includes sector-specific strategies and decisions made at ministerial level, but also climate policy integration

into the strategies, measures and actions taken by the different agencies under the supervision of a ministry. Vertical policy integration can be assessed at just one level, but it also refers to integration through many levels (i.e. national, regional, local).

Some criteria are required to assess the degree of policy integration (Table 2.1). Such criteria can be developed based on the definition provided (more details are available in Mickwitz et al., forthcoming).

Table 2.1 Summary of the criteria used to assess policy integration

Criterion	Key question
<i>Inclusion</i>	To what extent are direct as well as indirect climate change mitigation and adaptation impacts covered?
<i>Consistency</i>	Have the contradictions between the aims relating to climate change mitigation and adaptation and other policy goals been assessed and have there been efforts to minimise revealed contradictions?
<i>Weighting</i>	Has the relative priority of climate change mitigation and adaptation impacts compared to other policy aims been decided and are there procedures for determining the relative priorities?
<i>Reporting</i>	Are there clearly stated evaluation and reporting requirements for climate change mitigation and adaptation impacts (including deadlines) <i>ex ante</i> and have such evaluations and reporting happened <i>ex post</i> ? Have indicators been defined, followed up and used?
<i>Resources</i>	Is internal as well as external know-how about climate change mitigation and adaptation impacts available and used?

Based on Mickwitz et al., forthcoming

The first criterion is the *inclusion* of integrated climate change aspects. Some degree of inclusion is a prerequisite for the other criteria utilised. To integrate a policy, it is essential that different policy instruments are consistent with each other, or as expressed by Lafferty and Hovden (2003: 9), there should be ‘a commitment to minimise contradictions’. The second evaluation criterion is thus the *consistency* of the integrated climate change aspect in relation to other aspects.

Some have argued that, when there are conflicts between different policy aims, environmental issues should be prioritised (the second part of the Lafferty and Hovden definition). This argument is based on the view that environmental concerns cannot be balanced with other objectives, because they relate to the preserving of the carrying capacity of nature, i.e. the basis for any survival (Lafferty & Hovden, 2003). In the case of climate change it is clear that emissions of gases contributing to climate change will always occur. At the same time it is also obvious that there are other societal aims as well and some of these will be in conflict with the aims to mitigate and adapt to climate change. Some of these conflicts can be resolved, whereas others have just to be treated in such a way that they can be lived with. The third criterion is thus the *weighting* of the integrated climate change aspect with respect to other aspects.

The fourth criterion, *reporting*, is based on the recognised importance of feedback for policy implementation. Reporting addresses the degree to which strategies include specifications *ex ante* about how climate change aims are to be followed up and reported. The reporting also takes into account the information on climate change mitigation and adoption actually included in *ex post* assessments of policy instruments utilised to implement them.

Finally policy integration is not just about intentions; it requires knowledge and resources as well. It is not always an easy task to recognise the links of a strategy or the impacts of an instrument on climate change mitigation and adaptation. Policy integration at all levels is thus dependent on the know-how of the people involved, the time they have to spend on these aspects and the resources that they have at their disposal to use experts. The fifth criterion is thus the *resources* for integrating climate change aspects.

2.2 Policy coherence

Policy coherence is often taken to imply that various policies ‘go together’ because they share a set of ideas or aims. As pointed out by May et al. (2006), policy coherence is a relative term, but at the same time it cannot be directly measured. Policy coherence can be studied based on the policy sector (substantive area, e.g. energy, transport, etc.), the target group (industry, energy producers, etc.) or the geographic area. Whereas some view policy coordination, consistency and coherence as synonyms, Jones (2002: 391) argues that coherence goes further than the other two concepts in ‘systematic promotion of mutually reinforcing policy actions across government departments and agencies creating synergies toward achieving the defined objective.’ Whinship (2006), however, stresses that policy coherence is not primarily about choosing between conflicting aims, but rather about enabling a process through which both aims and means can be redefined so that new win-win situations can be determined.

In this study we mainly use the term policy coherence, but, when used, policy consistency is regarded as a synonym. Policy coherence is used to imply that incentives and signals of different policies – climate as well as other - are providing target groups with signals that are not conflicting. The focus of coherence versus conflict will be on the incentives and signals to mitigate or adapt to climate change. Policy coordination is one of the means to achieve coherence.

There has also been a debate in the literature about the most appropriate approach to promote coherence and coordination. In particular, there has been a discussion around whether the approach should be centralised or diffuse (Russel & Jordan, 2007). According to Russel and Jordan (2007: 3): ‘centralised approaches are mainly based around minimising the amount of discretion that departmental policymakers have when dealing with cross-cutting issues.’ These approaches may easily reduce the opportunities for departmentalism, but they could burden central actors and provide too little flexibility to consider sectoral specificities. Diffuse approaches propose that

coordination should above all be a task for departments, with the central actors becoming involved only in cases where truly contradictory aims exist between departments. Russel and Jordan argue that the advantages of diffuse approaches are that they are more flexible, can utilise departmental expertise and specific characteristics of the sectors. Whereas some view centralised and diffuse approaches as rivals, others see them as complementing each other.

A special aspect of coherence is cross-compliance, a concept adopted in the context of the EU's common agricultural policy (CAP) (e.g. Varela-Ortega & Calatrava, 2004). Cross-compliance implies that farmers receiving support are obliged to respect, e.g., environmental regulations. In other words one policy, i.e. CAP, is used to ensure compliance with another policy, i.e. environmental policy. Conceptually, cross-compliance could be taken to mean ensuring compliance of one policy through another policy. In this study, cross-compliance means ensuring compliance of climate change mitigation through any other policy.

3 Methodology

The research tasks required three types of approach. First, we studied horizontal policy integration and coherence to get insight into cross-sectoral measures and procedures by the government, or some government body, e.g. a commission, carried out to mainstream or comprehensively integrate climate change mitigation and adaptation aims into public policies. To do so, we studied the current Dutch administration's programme for government, climate change strategies and policy instruments such as the Strategic Environmental Assessment (SEA), the Regulatory Impact Assessment (RIA) and others. We investigated the extent to which climate policy is integrated in these policy strategies and instruments on the basis of its inclusion, consistency, weighting, reporting and resources.

Second, we studied vertical policy integration and coherence of climate policy in the water sector. We studied sector-specific strategies and decisions made at ministerial level, but also climate policy integration into the strategies, measures and actions taken by the different agencies and at different levels under the supervision of a ministry. Again, we investigated the extent to which climate policy is integrated in the water sector on the basis of its inclusion, consistency, weighting, reporting and resources.

Last but not least, we used a case study approach to zoom in on a specific region. The advantage of the case study is that it can close in on real-life situations; this allowed us to gain a sharpened understanding of the manifestations of policy integration and coherence in practice (see Yin, 1984). We used the following criteria to select our case study:

1. climate policy should be an explicit concern in the area;
2. different policy themes should meet, showing how contradictions or win-win situations among policy sectors manifest themselves in practice;
3. the area should represent a specific Dutch problem in relation to climate change.

On the basis of these criteria, we selected the Zuidplaspolder as a case study area. Zuidplaspolder is the deepest polder¹ in the Netherlands (seven metres below sea level). Under the current water management system, the western part of the Netherlands, including Zuidplaspolder, is still sinking. At the same time, the western part of the Netherlands is the most densely populated part, and therefore the Zuidplaspolder is under tremendous pressure to urbanise. These factors contribute to making the Zuidplaspolder extremely vulnerable to climate change. In the Zuidplaspolder, we investigated the extent of climate policy integration and coherence on the basis of inclusion, consistency, weighting, reporting and resources.

¹ A polder is a large tract of land containing farms and villages encircled by dykes. The dykes offer flood protection, but they also turn the polders into enormous 'bathtubs' with bottoms that slowly, inexorably sink.

In this research we collected different kinds of material, especially documents and interviews (for an overview of the interviews see the appendix). The documents served to provide a first understanding of policy integration and coherence. The policy documents were collected by means of a literature search in the library of Wageningen University and Research Centre and on the Internet. On the basis of this first understanding, we engaged in semi-structured interviews to get a more in-depth understanding of policy integration and coherence. The interviews were guided by a list of topics and issues that we wanted to discuss with our respondents. We engaged in seven interviews of one to one and a half hours each. Our respondents were selected by means of snow-ball sampling: respondents suggested future respondents from among their network. The interviews were tape recorded and transcribed to make sure that everything said was captured.

4 Institutional context and key climate change challenges

4.1 Administrative structure

The Netherlands is a constitutional monarchy with a parliamentary system. Its organisation can be described as a decentralised unitary state with a three-tier administrative structure (see also Huitema et al., 2003). The three tiers are the national government, the provinces and the municipalities. The state is said to be decentralised because responsibilities are delegated from the national to lower levels of government. These lower levels have a certain degree of autonomy (Kortman, 2007, Van Dijk, 2008).

Decentralisation can be structured into autonomy for the lower-tier government bodies, or co-governance, such as when lower-tier government bodies are required by the national government to provide regulation and administration (Article 124 of the Constitution). So although the Dutch system of government is not hierarchical, higher-tier government bodies supervise lower-tier ones: both the national and provincial governments have supervisory tasks.

The Netherlands has a decision-making culture centred on consensus (Lijphart, 1984). It can be called a consensus democracy. In policymaking, not only does the national government consult decentralised governments, but interest groups are also incorporated informally into the policy-making process. A famous example is the polder model, in which the government cooperates with employers and employees. Consultation, consensus and compromise are key words in the decision-making culture of the Netherlands. From the viewpoint of the formal institutional structure, it is not surprising that there is a lot of informal cooperation between organisations. Responsibilities and power are spread over many organisations, overlapping and cross-cutting each other (Van Dijk, 2008).

This consensus-centred democracy, combined with decentralisation, typically reinforces policy integration at the regional and local level. At the higher levels of organisation, governments avoid making clear-cut 'yes' or 'no' decisions. These decisions are left to the regional and local level.

4.2 Political situation

The current Dutch coalition cabinet called the Balkenende cabinet or Balkenende IV is formed by the political parties Christian Democratic Alliance (CDA), Labour Party (PvdA), and Christian Union (CU). The cabinet succeeded the third Balkenende cabinet and was installed by Queen Beatrix on 22 February 2007. It was named Balkenende IV after Prime Minister Jan Peter Balkenende. The cabinet is scheduled to be in office until 2011.

The present government has thirteen ministries, each with their own tasks:

1. Ministry of General Affairs (the Prime Minister Office) (AZ)
2. Ministry of the Interior and Kingdom Relations (BZK)
3. Ministry of Foreign Affairs (BuZa)
4. Ministry of Defence (Defensie)
5. Ministry of Economic Affairs (EZ)
6. Ministry of Finance (Financiën)
7. Ministry of Justice (Justitie)
8. Ministry of Agriculture, Nature and Food Quality (LNV)
9. Ministry of Education, Culture and Science (OCW)
10. Ministry of Social Affairs and Employment (SZW)
11. Ministry of Transport, Public Works and Water Management (V&W)
12. Ministry of Health, Welfare and Sport (VWS)
13. Ministry of Housing, Spatial Planning and the Environment (VROM)

Table 4.1 Ministries' policy areas relating to climate policy issues

Ministry	Policy areas that have links to climate change issues
Ministry of Housing, Spatial Planning and the Environment	Housing policy Spatial planning policy Environmental policy Trade in greenhouse gas emissions
Ministry of Transport, Public Works and Water Management	Water management policy Transport infrastructural policy
Ministry of Agriculture, Nature and Food Quality	Agricultural policy Nature policy Forest policy
Ministry of Foreign Affairs	Foreign relations Trade policy Development aid
Ministry of Economic Affairs	Industrial policy Innovation policy Energy policy Entrepreneurship, market and consumers Joint implementation
Ministry of Education, Culture and Science	Scientific research Education and public campaigns

Table 4.1 shows the responsibilities and links relating to climate issues. In relation to climate change, the direct obligations in respect of climate change are divided between the Ministry of Housing, Spatial Planning and the Environment, the Ministry of Transport, Public Works and Water Management, the Ministry of Agriculture, Nature and Food Quality, the Ministry of Economic Affairs, and the Ministry of Foreign Affairs.

4.3 Barriers to and promoters of climate mitigation and adaptation

Climate policy has a long history in the Netherlands. The Netherlands was one of the first countries to develop a national climate policy in the early 1990s. In 1992, the Rio Declaration was signed and that signalled the start of the discussions on greenhouse

gas emissions in the Netherlands. Climate change has always been framed as an environmental problem and was made the responsibility of the Ministry of Housing, Spatial Planning and the Environment, which, in the Netherlands, is not the most powerful ministry. There is a trade-off between climate mitigation aims and economic liberalisation. From a climate change mitigation perspective, certain taxes would be desirable, whereas from a market perspective liberalisation would be desirable. This resulted in a power struggle in which choices had to be made. The problem of climate change was made relatively harmless by approaching it as an environmental problem².

In addition, although climate policy has already existed for nearly 20 years, it only focused on climate mitigation. It paid very little, or no, attention to climate adaptation. It was difficult to get climate adaptation onto the political agenda because some actors felt that this would mean that the Netherlands was accepting climate change and would therefore pay less attention to climate mitigation. Climate adaptation was only accepted as a political item in 2005 after a vote of confidence in the national parliament. This vote of confidence stated that long-term developments (>2020), such as climate change, were inadequately addressed by current policy. In a response to this vote of confidence, the national government together with the provinces, the municipalities and water authorities developed the Climate Adaptation Strategy (which was accepted by the Ministerial Council in November 2007).

4.4 Key climate change challenges

4.4.1 Adaptation

In relation to adaptation, the greatest climate change challenge in the Netherlands is the risk of flooding in the western part of the Netherlands. This area has been protected against, or reclaimed from, the sea, but it is also an urban environment with a high population pressure. The environmental history of the Netherlands covers the legacy of human intervention, the inescapable fate of reclaimed, but nevertheless subsiding and sinking polders, 'bathtubs' attacked by numerous floods, reclaimed in the Middle Ages and unwittingly exposed to the rising sea level and the increased amplitude between high and low water in the rivers. The river channels, constricted and regulated between embankments, lost their flood plains, silted up, degraded and incised. Cultivation of raised bog deposits led to oxidation and compacting of peat and clay, resulting in progressive subsidence and flooding; arable land had to be changed into grassland and wetland. For millennia, muscular strength and wind and water powers moulded the country into its basic form. The present-day delta is a large wetland several metres below sea level, where humans 'keep their feet dry' only by the application of advanced technical means. An additional threat comes from below, the groundwater level irresistibly pushed upwards by the rising sea, but artificially lowered by technical means. This means that climate change adaptation is very important for keeping the area dry.

² Based on an interview with Rob Swart, an expert on international climate change mitigation. Interviewed on 10 July 2008 in Wageningen.

At the same time, the Netherlands is the most densely populated country in Europe. The country has a land area of 34,000 and over 15.5 million inhabitants (more than 450 people per km²). These characteristics show that the Netherlands is one of the most urbanised deltas in the world. The urbanised area is still increasing, especially in the western part of the Netherlands (Neven et al., 2005). However, this is also the lowest part of the Netherlands and therefore the risk associated with flooding is very high. Because of climate change, the risk of flooding will increase, making water management (see Chapter 6) a top item on the climate-change must-fix list.

4.4.2 Mitigation

In relation to climate change mitigation, the most important challenge is the reduction of greenhouse gas emissions. The required emission reductions can only be achieved if the energy sector is subjected to fundamental changes in the long term, necessitating carefully chosen strategies in the short term. Realising a transformation of current energy production practices is challenging, given the long lifetime of existing energy infrastructures and the lead times associated with the development and deployment of new non-carbon technologies. Furthermore, important uncertainties exist, e.g. relating to the cost of new and renewable energy technologies and the availability of fossil fuels. Although the production of renewable energy is increasing, total production is still limited as compared to non-renewable energy. Also, new plans for energy production include the construction of new coal-fired power plants. Because of these plans, emissions will probably be higher than planned.

Despite high ambitions, nuclear technology never really developed in the Netherlands. From the very start, nuclear technology was contested and became the subject of power games. Two reactors, one 50 MW and the other 450 MW, were connected to the grid and several more were planned. Social protest and aversion was mitigated by a nationwide energy debate. In 1986, Chernobyl interrupted and finally stopped the Dutch nuclear ambitions. Twenty years after Chernobyl, the debate about the nuclear option has been re-opened in the context of climate change, security of supply and resource independence. The Netherlands has added its name to the growing list of European countries that might build nuclear power stations to help meet their greenhouse gas targets. Some time ago, the government decided to postpone a sensitive decision on whether to build a new nuclear power station in the Netherlands until after the next elections. It was clearly hoping that the move would put a lid on the discussion about the issue which divides the cabinet. But it has not. At the beginning of September 2008, the discussion flared up again when the Christian Democrats stated that they were prepared to consider the construction of a new nuclear power plant. The Labour Party, however, said it wanted nothing to do with new nuclear plants. This shows that the parliament is divided on this matter. What is interesting, however, is that environmental arguments were primarily used as arguments against nuclear energy in the past, but the need to reduce CO₂ emissions has now introduced nuclear energy as a possible solution.

The Netherlands was one of the first countries in Europe to formulate climate change mitigation policies. As far back as the late 1980s, the first climate change mitigation policy was formulated. However, although the Netherlands is a forerunner in the formulation of climate change mitigation policy, it is rather slow in implementing it efficiently. Popular measures, such as investing in renewable energy, which can count on substantial political support among voters, are not always the most efficient ones according to experts. There is a tension between rationality and political symbolism.

5 Horizontal policy integration and coherence at the national level

5.1 Government programmes and strategies

The main outlines of Dutch government policy are set down in the coalition agreement and the Balkenende IV programme for government (see section 4.2). When the new government was formed, the parties that made up the new ruling coalition hammered out the policies that would be pursued for the next four years. On 7 February 2007, a coalition agreement was reached by the Christian Democratic Alliance (CDA), the Labour Party (PvdA) and the Christian Union (CU). These plans, and the principles on which the policies are based, were set out in the coalition agreement. This statement was delivered by the Prime Minister to the House of Representatives of the States General when he presented the new government and outlined the main plans for its term of office. The analysis of climate policy integration in government programmes and strategies focuses on the Balkenende IV programme for government (Ministerie van Algemene Zaken, 2007a) and the coalition agreement (Ministerie van Algemene Zaken, 2007b) of 7 February 2007.

The Balkenende IV government has formulated ambitious goals for climate policy. Climate change issues are first and foremost addressed in Chapter 3 of the programme for government. This chapter on a sustainable environment deals with both mitigation and adaptation issues. It is characterised by the following policies:

- 800 million euros additional spending on renewable energy (as both the PvdA and the CU proposed).
- Pollution will be taxed more heavily (as both the PvdA and the CU proposed).
- A tax on airline tickets totalling 350 million euros (as all parties proposed).
- No new investments in nuclear energy (as the CU and the PvdA proposed).

With regard to climate mitigation, the government aims at reducing the emission of greenhouse gases by 30% by 2020 as compared to 1990. It also aims for a reduction in energy use of 2% per year and a 20% use of renewable energy by 2020. The coalition cabinet wants to take measures so that these targets can be reached. These include the development and introduction of new energy-efficient technology as well as the introduction of market-based instruments. The coalition cabinet distinguishes four elements that can realise its climate mitigation ambitions:

1. Systems that put a price on CO₂ emissions: for large users such a system already exists, namely, the European trade in greenhouse gas emission rights. The Dutch government wants to extend and hone this European system in dialogue with the trade and industry sector;
2. Increased development of standards: the Dutch government wants to introduce standards for cars and devices. This policy will partly have to come from Europe, but the Dutch government itself wants to introduce standards and labels for buildings and houses. It also wants to introduce a mandatory percentage of sustainable energy in the energy supply to buildings and houses.

3. Fiscal ‘greening’: the Dutch government wants to promote products and services that contribute to the climate goals. It is thought that this will provide a direct incentive for people to make the right choices, e.g. the government wants to increase taxes on environmentally unfriendly cars.
4. Promoting new techniques: the Dutch government wants to promote techniques that are now still economically unviable such as sustainable production of electricity (Balkenende IV programme for government, 2007).

The opposition parties (especially Green Left and the social liberal democrats, D66) criticise the climate policy, arguing that it is highly dependent upon not-yet-existing European policy. The extent to which the Dutch can reach their targets depends on the ambitions and success of European climate policy. One of the uncertain factors, for example, is the potential resistance of the European car industry to new standards for passenger cars. Also, new energy-efficiency demands for devices and light bulbs, within the framework of the eco-design directive, have not yet been agreed upon. In addition to European standardisation and labelling of devices and cars, the carbon emissions trade plays an important role. In particular, the price of carbon emission rights will be a determining factor for the success of Dutch climate mitigation policy.

With regard to climate adaptation, the government acknowledges that water is a dominant and structuring element in spatial planning in the Netherlands. In the light of climate change, renewed attention is being paid to water management. This includes the construction of safe dykes and a strengthening of the coastal guard. The safety risk of flooding will be reduced by improving the condition of weak dykes along the coast, as well as implementing the policy programme Space for Rivers. A long-term strategy will be formulated to reduce the safety risk of flooding. Also on the basis of climate change scenarios, a decision-making tool will be developed to guide spatial planning. Last but not least, the government aims at realising its objectives with regard to desiccation in nature conservation areas.

The government budget proposal in the Balkenende IV programme for government includes a specific allocation of funds to climate change mitigation measures of 1,096 million euro to be spent over a four-year period. These mitigation measures are connected to the energy sector and do not include a specific budget allocation for climate adaptation measures.

The coalition agreement does include concerns with climate change, but these are not specified. Perhaps this is due to the character of the coalition agreement. It is an agreement on the main points of policy for the coming four years. In the agreement, it is mentioned in general that we are increasingly confronted with climate change. Climate change measures are presented as a general part of sustainability policy.

Table 5.1 summarises the horizontal climate policy integration in the Balkenende IV programme for government and the coalition agreement with reference to how they meet the criteria for assessing such integration: inclusion, consistency, weighting, reporting and resources (see section 2.1).

Table 5.1 Horizontal climate policy integration in the Balkenende IV programme for government and the coalition agreement

Criterion	Balkenende IV programme for government	Coalition agreement
Inclusion	Climate change is frequently mentioned in pages 10-17, 32-39.	Climate change is included. It is mentioned in a general way on pages 4, 8 and 20.
Consistency	Consistency with other policy goals is not explicitly discussed.	Consistency with other policy goals is not explicitly discussed.
Weighting	Weighting climate change objectives against other policy objectives is not explicitly addressed in the programme. A special section is dedicated to climate mitigation, namely, section 3.1 In this section, climate mitigation is considered part of the energy policy. Climate adaptation is not explicitly mentioned, though a part of the programme deals with issues relating to climate adaptation, such as floods.	Weighting climate change objectives against other policy objectives is not explicitly addressed in the programme.
Reporting	Reporting is not discussed, although always on the third Tuesday of September the Dutch government presents its policy plans and budgets for the coming parliamentary year. The Minister of Finance submits the National Annual Financial Report (FJR) and the ministerial annual reports to the House of Representatives on Accounting Day. The FJR looks back at the financial and economic situation that year and reviews the government's financial management. The FJR compares the actual situation with the projections made earlier in the Budget Memorandum.	Reporting is not discussed.
Resources	<u>Finance:</u> For climate mitigation, the programme for government budgets 1,096 million euros to be spent over a four-year period. There is no specific budget for climate adaptation. <u>Knowledge:</u> Knowledge as a resource is not discussed.	<u>Finance:</u> Resource allocation is not specified in the document (see the programme for government). <u>Knowledge:</u> Knowledge as a resource is not discussed.

5.2 Climate change strategies

As already mentioned in section 4.3, climate policy has a long history in the Netherlands. The first policy plan to pay attention to climate change dates back to 1989. This National Environmental Policy Plan (NEPP1) aptly titled 'To Choose or To Lose' (*Kiezen of Verliezen*) was presented on 25 May 1989 to the Second House of the Dutch Parliament (VROM, 1989). The NEPP1 is a very ambitious, comprehensive plan designed to guide future policymaking. This first explicit reference to climate change presented it first and foremost as an emissions problem.

In 1994 the Dutch government published the Netherlands' National Communication on Climate Change Policies (VROM, 1994). The communication outlines the particular characteristics of environmental problems in the Netherlands, provides an in-depth inventory of emissions, presents the domestic strategies to reduce emissions and assesses the results. The document also advocates the particular international approaches favoured by the Dutch, such as joint implementation and international cooperation to finance sustainable development in developing states. Subsequent documents have altered these goals because CO₂ emissions have continued to escalate. Later publications include 'The Second Netherlands' Memorandum on Climate Change in 1996, updated in 1998. The Netherlands has had to revise its goals and policies in order to aim for a more realistic timetable in which to reduce its CO₂ emissions. The targets for CO₂ reduction were not achieved and the emission levels of CO₂ were even 6% higher (Bollen et al., 2005). Two significant policy documents were published in 1999 and 2000 that redefine the goals and efforts of the Netherlands. In June 1999, Part I of the Netherlands' Climate Policy Implementation Plan devoted to domestic measures was published. In March 2000, Part II devoted to international measures was published. The parts are consciously divided between domestic and international climate policies, and present policies to reduce emissions.

In 2001, the Fourth National Environmental Policy Plan titled 'Where There's a Will There's a World' (*Een Wereld en een Wil*) takes a point of departure which states that global temperatures should not rise beyond 2 degrees above pre-industrial levels, and that Europe should reduce its emissions by 40-60% by 2030. To achieve this, the Netherlands aims to promote renewable energy, enhance energy efficiency and develop new energy technologies. For this, a transition agenda has been developed (Task Force *Energietransitie*, 2006) and different sectors are now participating in this agenda. The latest development with regard to climate change mitigation is the formulation of the Clean and Efficient plan in 2007 (Clean and Efficient, 2007).

Greenhouse gas emissions are monitored by the Environmental Assessment Agency (MNP) in order to meet international reporting obligations of the Kyoto protocol. The Environmental Assessment Agency coordinates the annual compilation of the Emissions Register on behalf of the Ministry of Housing, Spatial Planning and the Environment (VROM) and the Ministry of Transport, Public Works and Water Management (V&W). The Emissions Register was established in cooperation with a number of institutes, including Statistics Netherlands (CBS) and the Netherlands Organisation for Applied Scientific Research (TNO).

This analysis of climate change strategies focuses on the two most recent policy documents: one on climate adaptation (the National Programme for Spatial Adaptation to Climate Change: ARK) (ARK, 2007) and the previously mentioned climate mitigation plan (Clean and Efficient, 2007).

As mentioned in section 4.3, until recently it was difficult to get climate adaptation onto the political agenda. For much of the past two decades, the mere idea of adapting to climate change was problematic for the Netherlands, which was advocating emissions reductions. The core assumptions underlying climate-change mitigation policy were in conflict with the goal of increasing resilience to natural climate change and variability. But perspectives have changed. With ARK, adaptation is again seen as an essential part of climate policy alongside greenhouse gas mitigation.

Figure 5.1 reflects the increasing public interest in climate change as evidenced by articles in Dutch newspapers over the period 1990-2006.



Figure 5.1 Number of articles on climate change in newspapers *Trouw*, *AD*, *NRC-Handelsblad*, *Financieel Dagblad*, *Volkskrant* and *Parool* illustrating the climate change hype in the early 21st century (Hajer, 2007).

The Netherlands' consensus democracy is also reflected in the formulation of climate policy. The formulation of the National Adaptation Strategy, for example, resulted from cooperation between the Ministry of Housing, Spatial Planning and the Environment (VROM), the Ministry of Transport, Public Works and Water Management (V&W), the Ministry of Agriculture, Nature and Food Quality (LNV), the Ministry of Economic Affairs (EZ), the Association of Provincial Authorities, the Association of Dutch Municipalities, and the Association of Water Boards. The formulation of the latest climate mitigation policy document *Clean and Efficient*, for example, resulted from cooperation between the Ministry of Housing, Spatial

Planning and the Environment, the Ministry of Transport, Public Works and Water Management, the Ministry of Agriculture, Nature and Food Quality (LNV) and the Ministry of Economic Affairs.

5.2.1 Climate mitigation

Robust targets have been defined in the coalition agreement, both for the reduction of greenhouse gases and for efficiency and renewable sources. The Clean and Efficient programme was created to help achieve the strategic goals that underlie the targets formulated in the coalition agreement. During its 100-day introduction period, the new government spoke extensively with all economic sectors and social parties. Many of these had already initiated their own plans, studies, models, projects and concrete measures to fight climate change (Clean and Efficient, 2007). As the Clean and Efficient programme is a cooperation between VROM, V&W, LNV and EZ, it can be considered the result of cross-ministerial cooperation on a committee especially established for this purpose.

The Dutch government is making every effort to realise ambitious climate targets in this programme: a 30% reduction in greenhouse gas emissions by 2020 as compared to 1990 (see Figure 5.2). This target includes CO₂ produced during the combustion of fossil fuels as well as the non-CO₂ greenhouse gases, such as nitrous oxide and methane which are by-products of agriculture and certain industrial processes. These climate targets are closely linked to energy-saving measures and the introduction of renewable energy sources (Clean and Efficient, 2007).

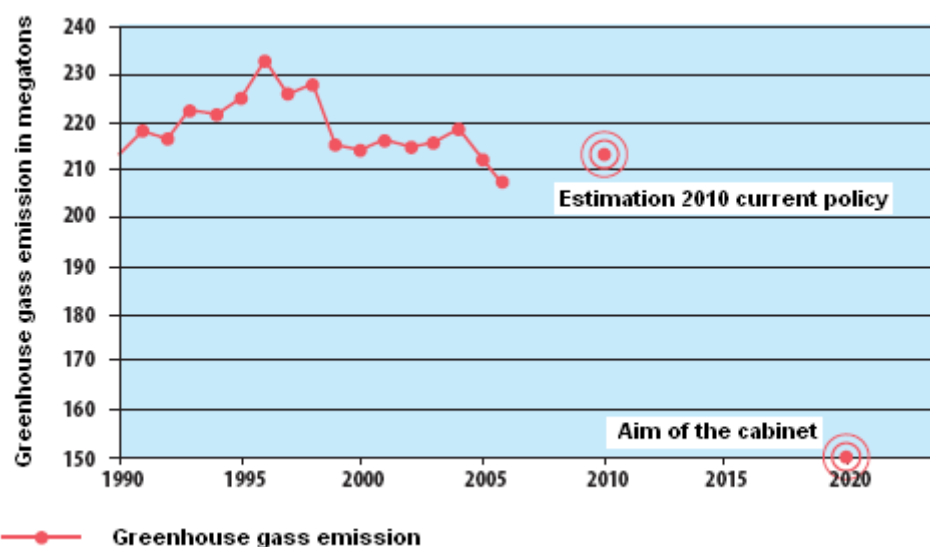


Figure 5.2 Ambition of the Dutch government with regard to the reduction of greenhouse gases (Clean and Efficient, 2007).

The national government will sign conventions with the built environment sector, the energy companies, industry, the traffic and transport sector and agriculture. All

three levels of government (national, municipal and provincial) have a contribution to make. The degree to which the sectors will contribute depends on the technical capabilities in those sectors and the extent of the costs. The so-called cost curves (the degree to which CO₂ avoidance in euros/tonnes becomes more expensive as the goals become more ambitious) vary for each sector. By taking this into account, the burden can be shared in an efficient and fair way. Where necessary, the government will provide support or secure results with its own instruments (Clean and Efficient, 2007).

It is not easy to break a trend; after all, trends develop for a reason. The government believes that it is possible to break trends with a balanced mix of measures, cooperation and policy instruments, with the focus on energy efficiency, renewable sources and clean fossil fuel: with measures that are now ready to be introduced; with measures that need a few more years to develop before they can be implemented fully; and with measures that require a somewhat longer innovation period; with policy instruments that are already embedded in the legal system and, in due course, with policy instruments that still need further development; with activities that the Netherlands can decide upon autonomously, but also with measures that are decided on in a European context. The Netherlands can influence the formulation of these measures, but its vision alone is not decisive (Clean and Efficient, 2007).

In the Clean and Efficient programme, the government will use market instruments such as climate-change-based taxation and climate-change-based subsidies – for example, subsidies for renewable energy. Renewably generated energy is more expensive than conventional energy; how much more expensive depends on the oil price, the price of emission rights and the technology used. To reach the target of 20% renewable energy by 2020, it is necessary to temporarily compensate the financial gap for renewable energy. To do this, a new subsidy scheme will be introduced in 2008. Alongside the subsidy, tax instruments will also be used to achieve the targets set by the Clean and Efficient programme. It is thought that this measure will stimulate citizens, companies and organisations to live, travel and work more efficiently and sustainably and to invest in more sustainable facilities and energy-saving technology. A number of green measures were announced in the coalition agreement. These will be included in the 2008 fiscal plan. They include a tax on air tickets, greater differentiation of the BPM (*Belasting van Personenauto's en Motorrijwielen*: a tax on cars and motor cycles), a higher tax on electricity (first taxation) and diesel, and a bonus for very efficient company cars. With a view to the 2009 fiscal plan, in 2008 the government will be making additional proposals for a substantial tax greening. The revenue from the additional tax-greening measures will be redirected as much as possible, resulting in a shift rather than an intensification of the tax burden. It will be examined in detail how specific positive environmental incentives can be built into the tax system.

In addition to market incentives, if possible and relevant, standards will be introduced for energy efficiency, CO₂ emissions and sustainability. Standards can function as minimum requirements for organisations that are lagging behind. The idea is that phased standards that become stricter in the course of time can stimulate

innovations. Global and European standards disrupt the international playing field less than national standards and are therefore preferred, but the use of Dutch standards is also possible. For example, the standardisation for new buildings (EPC/EPN) is being determined nationally, and one of the standards in the Environmental Management Act is that an energy-saving option must be implemented if it has a payback time of less than five years. Energy labels and energy standardisation for appliances are important instruments in helping to achieve the energy-saving target. The labels must continue to adapt to technical developments. In the context of the EU, the aim is for stricter standards for vehicles, air-conditioning systems and electrical appliances. With a mix of standardisation and stimulation, the government aims to ensure that many more efficient light bulbs and electrical appliances are used and are widely accepted in households and in public spaces during this government's term of office. A lighting taskforce composed of producers, retailers and lighting users will be set up. In the taskforce, concrete agreements will be made to switch to the most efficient lighting for public, office and domestic lighting in the course of this government's term of office. The relevant agreements will go further than the agreements made in the context of the EU. By 2020, energy consumption by appliances will have been reduced by 40% compared to unaltered policy.

At the moment, the government is investing in subsidies. Experts feel that subsidies are not the most efficient way of achieving climate change mitigation. Therefore, the amount of money spent by the government on climate change mitigation does not mean anything unless we know how efficiently it is spent.

In relation to horizontal policy integration and coherence, our analysis shows that climate mitigation policy in the Netherlands does not pay explicit attention to coherence problems. Coherence with other policy goals is represented as involving no contradictions at all. Climate mitigation policy deals extensively with win-win areas in the housing sector, the energy and industry sector, the traffic and transport sector and the agriculture and horticulture sector. The Clean and Efficient programme does not discuss how the conflicts between climate adaptation policy and other policy sectors should be addressed.

A closer investigation³, however, shows that, although there are definitely win-win situations, there are also contradictions between climate mitigation policy and some other policy sectors. Bio fuels present a good example of a win-win situation for agricultural policy and climate change mitigation. In terms of climate change mitigation, bio fuel is very important for the production of synthetic gas and fuel. In terms of agriculture, demand for bio fuel can increase the price of agricultural products. On the other hand, bio fuels (especially second generation bio fuels) may create a trade-off between nature conservation and food production. It may well be that bio fuels compete for space with nature conservation and food production. The housing sector and climate change mitigation can also be mutually beneficial.

³ Based on, among other things, an interview with Jip Lenstra who has been involved in the Dutch mitigation policy from the late 1980s onwards, interviewed on 12 August 2008 in Petten.

Consumers want houses to be as efficient as possible with regard to energy use, so they want their houses to be well insulated. Low energy use is also the aim of climate change mitigation. However, most conflicts between climate mitigation policy and other policy goals seem to be related to economic development and/or the availability of new technologies. What further complicates the issues is that win-win areas and potential conflict are closely related. If the technologies are available, then energy-saving measures in industry may be very compatible with economic development, but as long as new technologies are not available yet, or not cost efficient yet, then energy-saving measures in industry may entail a trade-off with economic development. This also applies to the production of renewable energy. At the time of writing, technologies to produce renewable energy are still very expensive as compared to other energy production technologies. The most important win-win areas as well as the most important contradictions are listed in Table 5.2.

Table 5.2 Horizontal climate policy coherence in the Clean and Efficient programme

Coherence and win-win areas between climate policy and other policy areas	Potential conflicts between climate policy and other policy areas
Agricultural policy and climate change mitigation. Bio fuels reduce greenhouse gas emissions and increase the price of agricultural produce.	Nature conservation and climate change mitigation. Bio fuels may compete for space with nature conservation.
Housing policy and climate change mitigation. Both consumers and climate change mitigation specialists want houses that are energy efficient.	Replacing fossil fuel with bio fuel vs. international development. Production of food will compete for space with production of bio fuel. The demand for bio fuel may lead to increased food prices and therefore it may lead to hunger in some developing countries.
Reduction of traffic jams and a reduction in greenhouse gas emissions	Renewable energy production vs. spatial planning. Windmills and the production of solar energy require space, but other sectors such as water, nature and agriculture also require space. This may lead to spatial planning conflicts.
	Energy saving measures in industry vs. economic development. Currently not enough technologies are available on the market.

Source: Clean and Efficient, 2007.

In the Netherlands, the view among climate mitigation experts is that there is a trade-off between policy integration and efficiency³. They argue that carbon capture at power plants is one of the most cost effective ways to reduce greenhouse gas emissions. The technology has been known since the late 1980s but is still not used in the Netherlands because, as it is a highly sectoral measure, it has little symbolic value. Carbon capture at power plants means that it no longer matters if coal is used in the power plant. There is little public support for these kinds of measures. There is more public support for measures such as the production of renewable energy. More money is spent on renewable energy than on carbon capture. According to experts, such measures have a high symbolic value but are not very cost effective. Whether or not the integration of climate mitigation aims into another sector is desirable depends on the degree to which a sector is exposed. If a sector is operating on an international market, then it is very difficult to factor environmental costs into the price of its products. If the Dutch government, for example, required the steel industry to invest in climate change mitigation, this industry might move to a other

country with less strict conditions. In less exposed sectors, such as the housing sector, it is easier to factor environmental costs into prices. Therefore, different sectors require different measures to mitigate climate change.

5.2.2 Climate adaptation

One of the predictions of climate change (among many other scenarios) is increased rainfall in winter, resulting in higher water levels in delta rivers (in this case specifically the **Rhine-Meuse Delta**). More dynamic changes in water levels might favour the origination of rare habitats, such as flood-plain forests, natural levees and river dunes. A scenario with considerably decreasing rainfall in summer results in lower discharge from the large rivers, causing problems for navigation. Low discharges combined with higher temperatures have a negative effect on water quality and the availability of cooling water for power plants. In combination with sea-level rise, lower discharges cause an increase of salt intrusion in the South West and Central Delta, the former tidal area (Nienhuis, 2008).

As mentioned in section 5.2, in an effort to climate proof spatial planning in the Netherlands, the State took the initiative to draw up the National Programme for Spatial Adaptation to Climate Change (ARK) in close cooperation with other parties in 2007. An explicit decision was made to mainstream climate change adaptation aims into public policies instead of framing climate change adaptation as a new policy field. So, climate adaptation in the Netherlands meant making changes in numerous sectors including water, infrastructure and transport, investment, rural areas, leisure, nature, agriculture, national reserves, urban areas, public health and energy⁴. The predicted impact of climate change was a subject that had already been firmly rooted in flood prevention policy and anti-flooding measures. However, ARK estimates that the impact on other sectors is likely to be at least as dramatic, and therefore these sectors also require adaptation measures. Several sectors are far from being climate proof⁴. The adaptation measures will, for example, have important implications for the use of space in the Netherlands, including the selection of locations for new construction, establishing a business, transport and energy security (ARK, 2007). This means that sectors such as the transport sector or the energy sector still require a substantial amount of work.

Because of the decision to mainstream climate change adaptation aims into public policies, the National Adaptation Strategy pays explicit attention to coherence problems and win-win areas. It discusses these for several sectors, namely, the traffic and transport sector, nature, agriculture, water, energy, health, housing, recreation and industry. The most important win-win areas as well as the most important contradictions are listed in Table 5.3. The National Adaptation Strategy has not yet made explicit choices. At the time of writing, the actors are involved in a negotiation in which the relative priority of climate change adaptation impacts compared to other

⁴ Based on an interview with Pieter Bloemen, the project manager of ARK, interviewed on 14 July 2008 in the Hague.

policy aims is being decided. This negotiation is part of the formulation of the National Adaptation to Climate Change Agenda. This agenda is being formulated by representatives of the ministries, provinces, municipalities and the water boards. Policy coherence and integration often require difficult decisions. Important decisions have to be made with regard to who wins and who loses. This requires a helicopter view of spatial planning: policy aims with regard to water, nature, agriculture, urbanisation, transport, etc. should be coherent. Not everything is possible and financial means are limited, so choices will have to be made. These decisions concern questions such as, how to deal with urbanisation, which transportation means and what infrastructure designs are most climate proof, where new corridors should be planned and which nature reserves should be joined together, how much space is needed to ensure safety from flooding, what sweet water/salt water ratio is sustainable, how strategic investments can be made and innovation promoted.

Table 5.3 Horizontal climate policy coherence in the ARK programme

Coherence and win-win areas between climate policy and other policy areas	Potential conflicts between climate policy and other policy areas
Water retention and nature can reinforce recreation and tourism. Areas with water and nature are important recreational sites.	Nature and landscape vs. traffic safety. For nature one would want low-lying roads, for safety and evacuation purposes, one would want roads on dykes.
Nature and water quality can reinforce each other. Good water quality is important to certain species.	Biodiversity vs. water retention if planned badly. If water quality is low, then this can be detrimental to nature. In such a case, water and nature compete for the same space
Water retention and biodiversity can reinforce each other when planned well. When planned well, water retention can fight desiccation and therefore improve the quality of nature.	Agriculture vs. water retention. Both compete for the same space.
	Health vs. space for urban development. When the temperature increases, more green space is required in urban areas to keep these cool. This green space competes with space required for urban development.
	Urban development vs. safety. Water retention and urban development compete for the same space.

Source: ARK, 2007.

It is planned to finish the agenda by the end of 2008. After that, the next phase will focus on the formulation of the implementation programme and the actual implementation itself. A first indication of how different functions are weighted is given by the National Programme for Spatial Adaptation to Climate Change which encapsulates an entire scenario regarding the demand for space based on continuing growth of the population and the economy. The aim is to reserve sufficient space in the event that the highest predictions become reality. Exact figures are not relevant here, but the demand for space for housing, business and infrastructure is predicted to increase by an average of 32% in the 2000-2030 period. In the case of recreation and sport, the increase will be 175%, and for water 64%. Space for agriculture will

reduce, being predicted to shrink by around 14% (two-thirds of land in the Netherlands is used for agricultural purposes).

Although the State initiated ARK, it did not want the programme to be interpreted as something that concerns exclusively the national government. The programme was meant as an outline; the details and implementation of the programme were agreed in close consultation with other parties. In drawing up ARK, the State hoped to mobilise all stakeholders in the effort to climate proof the Netherlands. It felt that climate proofing the country was something that required the cooperation of state, business community, civil-society organisations, citizens and other authorities. Consequently, provinces, municipalities and water boards were closely involved in shaping and implementing the ARK programme activities. The ARK Steering Committee therefore consisted of directors representing the four ministries most involved in ARK – V&W, LNV, EZ and VROM - and representatives from the Association of Provincial Authorities (IPO), the Association of Netherlands Municipalities (VNG) and the Association of Water Boards (UvW). The business community and civil-society organisations were also invited to play an active role in the ARK programme. The best form of cooperation was considered together with individual businesses and organisations (DuraVermeer, Shell, the Netherlands Water Partnership (NWP), the Netherlands Society for Nature and the Environment, the Red Cross, etc.) and trade associations (Confederation of Netherlands Industry and Employers [VNO-NCW], HERE, etc.).

5.3 Strategic environmental assessment

The Netherlands has quite a long history of environmental planning (ICON, 2001) where environment is integrated into decision making through the Environmental Impact Assessment Decree (EIA Decree in 1994) in the Environmental Management Act and the various national environmental policy plans (Dalal-Clayton and Sadler, 2005). The EIA Decree has established itself as a strong environmental tool for the Dutch. In the historical context, the use and implementation of environmental impact assessment in the Netherlands goes back to the formative stage of such assessment, wherein under the EIA Decree there was an obligation to carry out an EIA for a number of spatial, sectoral plans and programmes. These included national plans on waste management, electricity production, land development and drinking water supply, regional plans on waste management, and the location of new housing and industrial areas. Traditionally, these plans were developed in open, structured processes, including public participation and consultations with environmental and other agencies.

Since July 2004, Strategic Environmental Assessment (SEA) is mandatory in Europe for certain plans and programmes as a result of EU Directive 2001/42/EC. Consequently, the EIA regulations in the Netherlands were modified: for projects, a different regime is now in place than for plans, whereas originally both were treated in the same way. Also, SEA is now mandatory for more plans than before. In

general, the new Dutch SEA legislation closely follows the EU Directive, with a few exceptions:

- Publication of the start of the combined SEA/plan process is mandatory.
- The Netherlands use a positive list of plans and programmes for category 1 plans.
- An independent assessment of the SEA is required in the case of plans that are likely to have a significant impact on a protected nature area.

In the remainder of this section, we discuss not only the SEA but also the broader EIA because the EIA is carried out for both plans and programmes. The goal of the EIA is to provide the information needed to fully weigh up the environmental impact before decisions are taken on plans and projects with major environmental consequences. The assessment states the environmental consequences of a plan or project and gives any possibly more environmentally friendly alternatives.

The EIA for specified plans and programmes follows a mandatory process, including examination of alternatives, public involvement in the scoping and review phases and review of the quality of the information by the independent Netherlands Commission for Environmental Assessment (NCEA). The NCEA is an independent expert committee involved in all EIAs and a number of SEAs, checking compliance with legislative requirements for EIAs and the quality of information provided. It is a foundation with its own budget funded through government subsidies. When a new EIA needs to be carried out, the NCEA invites leading experts to join a working group to advise the competent authorities. At the beginning of the EIA, the working group advises the decision makers – government ministers and provincial and municipal councils – on the relevant environmental aspects that need to be considered in the specific project or plan. Usually the decision makers accept this advice and charge the initiator of the plan or project to pay attention to these aspects in the Environmental Impact Statement (EIS). The EIS is usually prepared by a consultant. When finished, the report is sent back to the NCEA working group of experts who check the quality of the environmental information in plans and projects that must follow the EIA procedure. Currently, each year about 150 EIA procedures start in the Netherlands. As the NCEA advises twice during the EIA procedure, the NCEA gives approximately 300 advices per year.

A simplified visualisation of the Dutch EIA procedure is presented in Figure 5.3.

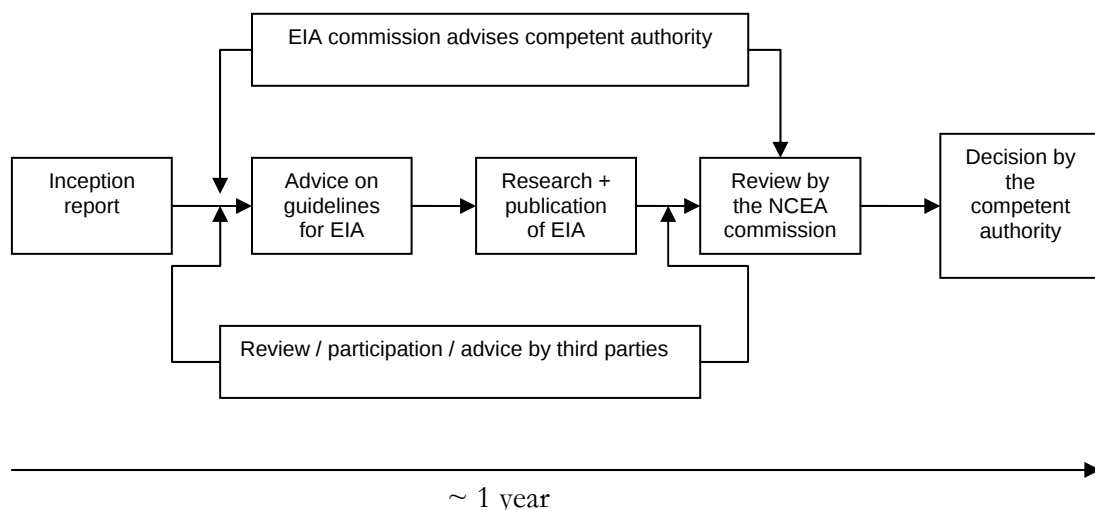


Figure 5.3 Simplified scheme of the EIA procedure in the Netherlands (Koormneef et al., 2006).

Until recently, climate change did not play a major role in the EIA. However, an NCEA working group has now formulated how to deal with climate mitigation and adaptation. If plans and projects can be expected to contribute to a relatively large increase in greenhouse gases, the NCEA requires attention to be paid to mitigation. These plans and project are, for example, industrial projects, power plants, agricultural projects, airport projects, etc. In those cases, the EIA should provide insight into:

- Emission of greenhouse gases (CO₂ as well as CH₄, NO₂ and F gases) and the possible mitigating measures that can be taken;
- Energy efficiency and the possibilities of combining functions (using heat and energy that is produced for other functions). When power plants are planned in a CO₂ capture-ready way, the NCEA requires insight into where the pipes are planned, where the storage facility is planned, alternatives and their environmental risks as well as possibilities to reduce these risks;
- The extent to which the plans or projects contribute to the implementation of national, provincial, municipal or sectoral policy targets with regard to greenhouse gas reduction;
- The chain in which the initiative functions. The NCEA wants to get insight into the emissions relating to the input and the output.

The NCEA always checks whether adaptation to climate change is an important factor (or should be an important factor) in the decision-making procedure. This will depend on:

- The (local) effects on the climate in the short term as well as in the long term;
- The characteristics of the area where adaptation is planned;
- An estimation of the risks;
- The way in which additional short-term costs relate to long-term costs (if no adaptation measures are taken). If no measures are taken, management costs may increase or expensive measures may need to be taken because there is no room for other functions such as water storage.

The NCEA requires spatial adaptations to be congruent with the goals in the National Adaptation Strategy. If adaptation proves to be an important factor, the NCEA requires attention to be paid to how the risk of damage can be minimised while liveability, spatial quality and safety are maintained or increased. The NCEA also requires attention to be paid to the way in which the plan or project can interfere with required adaptation measures, e.g. by means of spatial claims that make water storage impossible. It is also important to know whether the plan or project could increase the climate change adaptation risk, e.g. by:

- Building in an area that is vulnerable to flooding in the event of a dyke being breached;
- Cutting trees or draining water in large cities, thereby increasing the consequences of heat waves;
- Increasing the paved surface, thereby potentially increasing the consequences of flooding.

To decrease the vulnerability of climate-proof spatial planning, the NCEA recommends risk management and leaving room for natural processes. Risk management means that, in the decision-making process, attention should be paid to when and how the projects or the plans will be evaluated in order to find out if predicted effects occur or not. Leaving room for natural processes means that locations should be identified, and their development planned, taking into account the specific characteristics of an area and its vulnerability to climate change.

As it is not obligatory to select environmentally friendly alternatives, the EIA is first and foremost a communication and awareness-raising instrument. If good arguments can be presented for it, a less environmentally friendly alternative can be selected. EIA can be considered an *ex-ante* evaluation of plans and projects.

Table 5.4 summarises horizontal climate change integration in the EIA with reference to the criteria used to assess such integration (see section 2.1).

Table 5.4 Horizontal climate policy integration in the Environmental Impact Assessment

Criterion	Environmental Impact Assessment
Inclusion	The EIA makes sure that climate change is included in the decision-making process where relevant. A working group, consisting of leading experts, decides which aspects need to be considered in relation to a certain plan or project. This working group is initiated by the NCEA. The NCEA gives advice to the competent authority who makes the decision.
Consistency	The EIA identifies the possible contradictions and win-win situations and discusses various alternatives to deal with these.
Weighting	The final decision-making responsibility remains with the competent authority. The competent authority has to weight the various interests (within the legal framework). The EIA elaborates on the alternative chosen and argues why this is considered the best alternative.
Reporting	The evaluation is usually carried out by external consultants. The report's content is checked by the NCEA for compliance with legislative requirements for EIA and the quality of information provided (has the essential environmental information for decision making been presented?).
Resources	<u>Finance</u> : The average cost of EIA procedures ranges between 70,000 and 100,000 euro and normally takes about one year to conclude. These figures

Criterion	Environmental Impact Assessment
	are indicative as cost and duration are highly dependent on the type of project. The initiator pays. The NCEA is a foundation with its own budget funded through government subsidies – this in order to guarantee its independence and quality. <u>Knowledge:</u> The NCEA invites leading experts to join a working group to advise the competent authority on the EIA project. At the beginning of the EIA, the working group advises the decision makers – government ministers and provincial and municipal councils - on the relevant environmental aspects that need to be considered in the specific project or plan. When finished, the report is sent back to the NCEA working group of experts who check the EIA according to established protocols.

5.4 Regulatory impact assessments

In addition to the EIA, in 1996 the E-test was introduced to assess the environmental aspects of legislation. The E-test is part of the Regulatory Impact Assessment (RIA). Whereas the EIA deals with plans and projects, the E-test is concerned with regulation.

The history of the RIA in the Netherlands starts with the formulation of the Competitiveness, Deregulation, and Legislative Quality Programme (also known as the MDW programme). This is a cornerstone of the political agenda of the new government that has the aim of reducing the compliance and administrative costs of business. The intention was to introduce tighter evaluations of proposed legislation, to further a more productive economy and effective administration (Formsma, 1997).

The Commission for Regulatory Reform, a ministerial commission chaired by the prime minister, was established to review existing and draft legislation. Both environmental and economic impacts of legislation were to be integrated. Four instruments were formulated to identify the possible effects of draft legislation and ensure that the transparency and quality of decision making is improved by timely information. Together, these four instruments form the Dutch RIA. These instruments comprise:

- the business effect test (BET) which identifies the consequences for economic sectors,
- the environmental test (E-test) which identifies the potential impacts on the environment,
- the feasibility and compliance test which identifies the consequences for authorities involved in implementing and upholding the legislation, and
- the cost-benefit analysis (CBA) which identifies the capitalised economic consequences for society.

After five years, in 2001, the Ministry of VROM commissioned an independent evaluation of the performance of the RIA, focusing on its procedural and organisational aspects and the content and quality of information (DHV, 2001). The major conclusion of the evaluation was that the RIA was used primarily for

instrumental purposes and limited in its effectiveness. During the first five years, the RIA had led mainly to the inclusion and highlighting of environment-related information in explanatory memoranda to draft bills. However, this information played only a limited role in policy making and contributed little to the environmental improvement of draft laws and regulations or to the transparency of this process. Often, the RIA was carried out at the end of the formulation process when the various actors had already agreed upon the legislation (and therefore the space for adjustments on the basis of the RIA was often limited). The evaluators recommended that the number of policy tests and appraisals should be streamlined in order to improve the quality and transparency of decision-making processes and linked to sustainability appraisal (within the framework of the National Strategy for Sustainable Development) and the specifications contained in Directive 2001/41/EC. In that context, attention had also to be given to reporting the results of environmental appraisal to ensure the anticipated environmental effects were clearly recognisable and taken into account in the policy-making process in a transparent manner.

A new procedure for environmental appraisal was approved by the Council of Ministers in October 2002 and became obligatory on 1 March 2003. This procedure included two main phases and a series of steps, together with a timeframe. In phase 1, the reasons for draft legislation are appraised in a so-called quick scan, before drafting starts. A coordination point acts as the 'front office' for this phase. In phase 2, the appraisal of effects is carried out for designated draft legislation. The Ministry of Justice is the 'front office' for phase 2. When the required timeline for an appraisal cannot be met, the responsible ministry agrees with the coordination point, or the Ministry of Justice, on an alternative schedule.

The Dutch approach to RIA, as we know it today, is characterised by this two-phase procedure. After the quick scan in phase 1, three checklists are used in phase 2 of which some questions cover the economic and business impact (BET checklists, 1997); other questions concern the environmental impact of proposed regulations (1996); the last set of questions deals with feasibility and enforcement (1995). The checklists are applied on a set of primary and secondary regulations. The set is identified by a specific working group, nominated by the Commission for Regulatory Reform. Of this primary and secondary legislation, only the ones whose impact is expected to be significant are reviewed. There are no clear standards to decide what is expected to be significant. Third level legislation (ministerial decrees) is not covered.

In relation to climate change, the questions that concern the environmental impact of the proposed regulation are most interesting (MVR, 2003). This category comprises four questions that need to be answered in the impact assessment:

1. What are the consequences of the proposed regulations with regard to energy use and mobility?
2. What are the consequences of the proposed regulations with regard to the use and management of fossil fuels?

3. What are the consequences of the proposed regulations with regard to waste and with regard to emissions to the air, soil and surface water?
4. What are the consequences of the proposed regulations with regard to the use of available physical space?

So, although climate change is not dealt with specifically, the environmental impact assessment does deal with issues that have links to climate change issues such as energy use. The clarification in relation to question 1 states that 'the use of fossil fuels goes together with an increase of carbon dioxide emissions. Carbon dioxide emissions are seen as one of the greatest causes of global warming. The energy policy of the government should aim at a limitation of greenhouse gases' (MVR, 2003: 29). This shows that although the expression 'climate change' is not used as such, the environmental impact assessment indirectly does include climate mitigation issues.

Thus, although climate adaptation is not an explicit part of the rules and regulations, one could argue that close relationships to climate change exist. At the moment, there are no initiatives to examine and/or adapt existing rules and regulations within the framework of climate proofing the Netherlands.

In practice, neither the impacts nor the methods used in the RIA seem to be standardised, because they have been developed in a location- and project-specific way. The RIA guidelines do address the issue of consistency. They state that 'when mapping (side) effects of the proposed regulation with regard to energy use, it is important to pay attention to coherence among different environmental objectives' (MVR, 2003: 29). The guidelines also make an explicit call for quantification of the effects and refer to several institutes that could provide such quantified information.

In each ministry, RIAs are carried on by department officials, where necessary with the support of external consultants. If no impact assessment is delivered, or if it is unsatisfactory, this will be recorded on the cover note with which the legislation is presented to the Council of Ministers. There are two central units officially responsible for the quality control of RIAs, with approximately 20 fulltime people working there. These are the Proposed Legislation Desk, a unit within the three responsible ministries (Justice, Economic Affairs, Environmental Affairs); and the Advisory Board on Administrative Burdens, an independent organisation.

Table 5.5 summarises the horizontal climate policy integration in the RIA with reference to the criteria used to assess this integration (see section 2.1).

Table 5.5 Horizontal climate policy integration in the Regulatory Impact Assessment

Criterion	Guidelines for the Regulatory Impact Assessment (2003)
Inclusion	Climate change is not mentioned directly. Indirectly, climate mitigation is addressed under the heading 'energy use'. Climate adaptation is not addressed.
Consistency	Consistency with other policy goals is not explicitly discussed, although the guidelines do mention that it is important that energy objectives are consistent with other environmental objectives.
Weighting	Energy use is addressed as one of the four questions on the checklist concerning the environmental impact. Weighting energy use objectives against other policy objectives is not explicitly addressed in the programme.
Reporting	The RIA is carried out by department officials. There are two central units officially responsible for the quality control of RIAs: the Proposed Legislation Desk, and the Advisory Board on Administrative Burdens.
Resources	<u>Finance</u> : There is no specific information on how the RIA is paid for. <u>Knowledge</u> : Knowledge as a resource is not discussed.

5.5 Cross-compliance

Cross-compliance means that one policy, i.e. CAP, is used to ensure compliance with another policy, i.e. environmental policy. Conceptually, cross-compliance could be taken to mean ensuring compliance of one policy through another policy.

In the Netherlands, cross-compliance is associated with agricultural policy by means of the so-called cross-compliance principle of the CAP since 2003. Cross-compliance enforces linkages between agricultural production and sustainability. Under this principle, farmers that receive payments in compensation for the decreased prices of a number of commodities – including cereals, milk, sugar and beef, conditional on meeting specified standards on environmental quality, animal welfare, veterinary restrictions, etc - must comply with 19 legislative acts that apply directly at the farm level in the fields of environment, public, animal and plant health, and animal welfare. Farmers will be sanctioned in the event of non-compliance (partial or entire reduction of direct support). Beneficiaries of direct payments are also obliged to keep land in good agricultural and environmental condition.

These conditions for 'good' agricultural and environmental management as defined by the EU member states are copied in the Netherlands. So, in the Netherlands, meaning was given to cross-compliance by requiring that farmers comply with the 19 European legislative acts. The only specific requirements that the Dutch government added to the European legislation concerned soil erosion (conservation and restoration of terraces and the development of wooded banks) and conservation of organic material for soil quality (it is prohibited to have uncultivated land). Because the Dutch government added only a few requirements to the European requirements, extra environmental gains are probably limited. Each year, 1% of all farmers that receive subsidies are evaluated according to the European Decree (no. 796/2004).

Table 5.6 summarises horizontal climate policy integration in relation to cross-compliance with reference to the criteria used to assess such integration (see section 2.1).

Table 5.6 Horizontal climate policy integration in relation to cross-compliance

Criterion	Ministerial guidelines on cross-compliance (2006)
Inclusion	Climate change is not specifically addressed.
Consistency	Consistency with other policy goals is not discussed.
Weighting	The weighting of climate change goals is not addressed.
Reporting	Each year, 1% of farmers are checked.
Resources	<u>Finance</u> : Resource allocation is not discussed. <u>Knowledge</u> : Knowledge as a resource is not discussed.

At the moment, climate change is not part of the Dutch cross-compliance. It is not mentioned in the guidelines for cross-compliance published by the Ministry of Agriculture, Nature and Food Quality (LNV, 2006). Neither is it an issue in the deliberations of the committee formulating the agenda for climate adaptation, nor is it mentioned as a policy instrument in the Clean and Efficient programme.

5.6 Other key means

5.6.1 Water Test

In addition to the Environmental Impact Assessment, the Water Test is the second legal instrument that policymakers can use to have climate change aims integrated in plans and projects. The Water Test is an important instrument for provinces and water boards to have influence on spatial plans seen from a water point of view. The objective of the Water Test is to guarantee that water interests are taken into account in spatial and land-use planning, so that negative effects on the water system are prevented or compensated for elsewhere. This integration of water in spatial planning works in two ways: a plan is assessed on its implications for the water system, and the restraints that the water system puts on land use are made explicit. The Water Test has the potential to be a good legal instrument to deal with climate change, but in order for it to become one, adjustments will be necessary. At the moment, the Water Test does not include climate change objectives and neither does it include means to weight climate change objectives against other policy objectives. New legislation with regard to the Water Test is anticipated and is expected to include climate change. In Chapter 6, the Water Test is discussed in greater detail.

5.6.2 Building Decree

In addition to the EIA and the Water Test, the Building Decree is a third legal instrument that policymakers can use to have climate change aims integrated in plans and projects. The technical building regulations in the Netherlands are laid down in the Building Decree (or Building Code: *Bouwbesluit*). These are uniform and performance-based regulations on the national level, with which all structures must

comply. Based on the Housing Act, which itself does not contain technical rules, the Building Decree is a general administrative order, issued by the central government. In the Building Decree, standards play an important role. These standards have been adapted in the requirements and contain the methods by which one can check whether a structure complies with these requirements. New regulations for the construction industry officially came into force on 1 January 2003. They include a revised Building Decree and the amended Housing Act, containing an updated list of structures for which a building permit is not required (VROM, 2003).

The decree contains the minimal technical building requirements deemed necessary from a public viewpoint and have to be complied with by anyone undertaking construction activities in the Netherlands. These requirements concern:

- safety (e.g. the mechanical strength, fire safety, user safety such as requirements for stairs, availability of emergency appliances);
- health (e.g. ventilation, sound insulation);
- usefulness (e.g. accessibility for disabled people, habitable space toilet compartment, communal store for domestic waste);
- energy saving (e.g. thermal insulation, energy performance, air tightness).

On top of the legally binding quality levels as determined in the Building Decree, a multitude of other 'voluntary' quality marks, certificates or labels for housing related aspects (*woonkeurmerken*) exist in the Netherlands, and can be obtained voluntarily by (potential) buyers, tenants, owner-occupiers, construction firms and project developers. The marks concern the quality of hidden or apparent deficiencies of new or existing dwellings: burglar-resistance of dwellings (provided by the police); sanitary facilities, central heating installations, boilers, etc.; building materials; energy efficiency; the quality of services of estate agents, valuers, notaries, mortgage intermediaries and banks, of care and welfare providers, and of housing associations and other landlords.

In relation to climate change mitigation, the Building Decree includes an energy performance standard (EPS). The EPS sets requirements regarding the energy performance of a house or (commercial) building. In the meantime, the standard in the Building Decree has been tightened several times, whereby the maximum permitted energy performance coefficient (EPC) for newly built housing has been decreased from 1.4 in 1995 to 0.8 in 2008. As a result of these measures, newly built houses save an average of 30% in energy. The standards for utility building have also been made stricter.

No specific chapter or translation of the Building Decree exists to reflect the climate change adaptation-related aspects of building in the Netherlands. For example, there is nothing in relation to floating homes. This lack of integration of climate change aims into the Building Decree is recognised by VROM, and at the moment a committee is looking into ways of making the Building Decree climate proof.

Table 5.7 summarises horizontal climate policy integration in the Building Decree with reference to the criteria used to assess such integration (see section 2.1).

Table 5.7 Horizontal climate policy integration in the Building Decree

Criterion	Building Decree (2003)
Inclusion	Climate change is not mentioned directly. Indirectly climate mitigation is addressed by means of the Energy Performance Standard. Climate adaptation is not addressed.
Consistency	Consistency with other policy goals is not discussed.
Weighting	The Energy Performance Standard just has to be met.
Reporting	Municipalities are responsible for implementing the Building Decree and monitoring the construction of new buildings. Application has to be made to municipalities for construction permits.
Resources	<u>Finance</u> : The costs associated with meeting the Energy Performance Standard have to be paid by the (new) owner of the building. <u>Knowledge</u> : Knowledge as a resource is not discussed.

5.6.3 Multi-level governance covenants

In relation to climate change mitigation, the Dutch government has drawn up an action plan to achieve the lowering of CO₂ emissions. This action plan accords an intermediary role to local and provincial authorities in the country: the municipalities and the provinces, in other words. Municipalities and provinces have both policy instruments and the means to implement them, and, moreover, they are in direct contact with citizens and businesses.

In relation to climate change adaptation, in November 2007, a climate covenant between the central government and the municipalities was signed. The Ministry of Housing, Spatial Planning and the Environment can now make subsidies available so that municipalities can release extra capacity for implementing the policy. A total of 37 million euro has been made available for the coming years. A covenant between the central government and the provinces is expected to be signed in September 2008. In these covenants, the tasks are clearly defined: broadly speaking, central government focuses on identifying the climate objectives – including basic standards - and furthermore acts as a facilitator, whereas the municipalities and the provinces will be the ones to implement the policy. In addition to these climate adaptation covenants, an agreement – called the National Water Agreement - between the national government, the provinces, the municipalities and the water boards was signed in 2003 with the intention of resolving the main problems of the water system by 2015. Chapter 6 discusses this National Water Agreement in greater detail.

5.6.4 Stakeholder cooperation: multi-actor covenants

As mentioned in Chapter 4, the Netherlands has a decision-making culture centred on consensus. In policy making, not only does the national government consult decentralised governments, but interest groups are also incorporated informally into the policy-making process. Because such stakeholder cooperation is considered vitally important, an attempt is made to form alliances with various stakeholder groups. The multi-actor covenants are seen as an alternative to regulation.

Furthermore, multi-actor covenants are usually preferred to regulation, but if the covenants do not work out, the government has regulation as a backup.

5.6.4.1 Climate change mitigation

In relation to climate mitigation, three predominant stakeholder agreements will be discussed. First of all, the industry sectors took part in the sustainability agreement with the government, which was signed in 2007. For all industry sectors, 'strategic roadmaps' or innovation agendas will be used to analyse how a target of 50% energy savings in the chain can be realised by 2030. The use of energy saving and chain efficiency in heavy, energy-intensive industry will be further worked out with the current participants of this benchmarking agreement. For medium-sized companies, the government wants intensification of the long-term agreements (including chain efficiency) and better enforcement of the existing environmental legislation. Where necessary, the option of standardisation (based on the Environmental Management Act) will also be deployed. The current long-term agreements (MJA) have proven successful and will in principle run to 2012. With the MJAs, an average efficiency improvement of 2% per year is being realised (within the company and in the chain).

Second of all, the Dutch government is entering into agreements with the operators of new coal-fired power stations, whereby the government will require the coal-fired power stations now being built to meet more exacting standards than those required under the EU measure governing the trade in emissions (Emissions Trading Scheme: EMS). From 2015 onward, there needs to be a very substantial CO₂ reduction in the power stations of the relevant operators. These agreements must be sufficient to convince the government that the necessary reductions are being achieved. The investors need to demonstrate how they propose to actually realise those reductions. Covenants will be signed whereby agreements will be made on the collection and storage of CO₂ underground.

Third of all, the Energy Transition Platform for the Built Environment is bringing many different lines together. This platform recently came up with the More with Less plan, in which the various players involved in the built environment specify their activities. This plan focuses on reducing energy consumption in existing buildings. The target for the entire built environment is 6 to 11 Mton/year of CO₂ emission reduction by 2025. The energy companies, housing corporations, construction companies and installation companies have devised the More with Less plan for existing buildings. This plan refers to homes and commercial and industrial buildings. The government will support this plan with a guarantee, for example, or a contribution to a revolving fund for low-interest loans (green credit). A central implementing organisation will then coordinate and create conditions. By implementing the plan, around 500,000 buildings will save 20 to 30% more energy up until 2011, and 300,000 buildings every year from 2012 onward. Also in 2011, 100,000 existing homes will be equipped with renewable energy sources such as solar boilers, heat pumps and solar electricity. To make this possible, the government will create a subsidy scheme with a limited term of validity. For end users, solar boilers

will be cost effective in four years' time, heat pumps in eight years' time and solar electricity in ten years' time. Partly based on proposals from the Energy Transition Platform for the Built Environment, the government will prescribe an innovation programme for new buildings and the renovation of existing buildings. It is intended that this will lead to the large-scale application of new technologies and concepts that reduce energy consumption in homes and buildings by more than 50% by 2020.

5.6.4.2 Climate change adaptation

In relation to climate adaptation, there have been no explicit stakeholder agreements or covenants yet. However, the National Programme for Spatial Adaptation to Climate Change can be considered a stakeholder cooperation itself, being a cooperation of four ministries, representatives from the Association of Provincial Authorities (IPO), the Association of Netherlands Municipalities (VNG) and the Association of Water Boards (UvW) as well as the business community, civil-society organisations, individual businesses and organisations (DuraVermeer, Shell, the Netherlands Water Partnership [NWP], the Netherlands Society for Nature and the Environment, the Red Cross, etc.) and trade associations (Confederation of Netherlands Industry and Employers [VNO-NCW]).

All in all, a rich patchwork of parties is emerging that will carry out a broad range of activities in the form of projects, programmes and (policy) processes. This image is very dynamic. The pursuit of climate-proof spatial planning in the Netherlands is in an exploratory phase. Parties are becoming acquainted with the subject, evaluating whether there are major risks or opportunities involved for them, and then deciding whether or not they will participate more intensively. In the process, it should become clear which subjects are high priority, which outline solutions have potential, and which parties and partnerships are suited to them.

5.6.5 Educational programmes

The number of social initiatives in relation to climate change is overwhelming. Citizens, interest groups and NGOs are all concerned about the climate problem and are taking part in a large number of initiatives and projects to help resolve the problem. The cabinet actively seeks to cooperate with these social initiatives. For example, it is now working together with the HERE (HIER) campaign. The HERE campaign is an initiative of more than 40 social organisations in the Netherlands, ranging from the World Wide Fund for Nature to UNICEF, and from the Red Cross to Greenpeace. They are realising climate change projects in the Netherlands and the rest of the world, and appealing to the Dutch population to change its behaviour. The aim of the HERE campaign is to create a situation by 2020 in which one million people in the Netherlands have a climate-neutral lifestyle. It is also focusing on climate change adaptation by means of so-called climate buffers (robust nature areas that can offer resilience to climate change).

5.6.6 Science-policy interaction

Research into adaptation is already being conducted, notably within the context of the BSIK (*Besluit subsidies investeringen kennisinfrastructuur*) programmes: Climate for Space (*Klimaat voor Ruimte*), Living with Water (*Leven met Water*) and Innovative Use of Space (*Vernieuwend Ruimtegebruik*). These research programmes receive grants from the Economic Structure Enhancing Fund (FES) under the BSIK. The initial results of this research were used in designing the 2007 ARK programme. The first year of that programme includes the development of the national adaptation strategy and agenda. In the interest of generating useful content for this first year, agreements were made concerning the three BSIK programmes. These programmes are now part of a partnership. The path that they will jointly follow within the framework of ARK has been dubbed 'Route Planner' (VROM, 2006). The research projects planned for the first year of the knowledge development course of ARK (Course 2) will be informed by the outcomes of Route Planner.

In 2007 the new Knowledge for Climate programme started. It builds on the BSIK programmes (such as Climate *changes* Spatial Planning, Living with Water and Habiforum) and international research programmes. Its aim is to make the knowledge and experience acquired available to areas outside the Netherlands. Knowledge for Climate is a scientific research programme that supports ARK and has a budget of 50 million euro awarded from the FES with the intention, through participation and co-financing, of establishing the content and scope of the research programme so that it forms the basis for a local, regional, national and international climate adaptation strategy. Not only is Knowledge for Climate a scientific research programme; it also aims to learn from the experiments of local people in practice. With regard to the latter, in the first phase, the research programme will focus on eight areas, called hotspots. Hotspots/regional knowledge lines are chosen based on 1) their economic importance and the importance of the investment agenda, 2) the impact of climate change, 3) the ambitions relating to innovation and adaptation, 4) national and international transferability. Hotspots are pilot projects in a sector or region in which climate change is an important issue in spatial planning and may entail a trade-off with other issues. In the hotspots, the actors are specifically experimenting with adaptation possibilities. The aim is to learn lessons from the experiments that can be used in other areas. The Zuidplaspolder (see Chapter 8) is one of the hotspots in the Knowledge for Climate research programme.

In addition to specific adaptation research, a great deal of knowledge will be developed in relation to the broader subject of climate change and its impact. Parties researching this subject include the National Institute for Public Health and the Environment (RIVM), the Royal Netherlands Meteorological Institute (KNMI), the Netherlands Environmental Assessment Agency (MNP), the Netherlands Organisation for Applied Scientific Research (TNO), the specialist departments of V&W and LNV, the University of Amsterdam, Utrecht University, Wageningen University and the Delft University of Technology. At present, knowledge development in this broader area is fragmented and compartmentalised. The specific knowledge needed to, for example, make investment decisions and policy lines more

climate proof is often not available. Take, for instance, knowledge about local climate impacts and the cost effectiveness of adjustments to investments. The prospects of action by the government, the business community, civil-society organisations and citizens are often, for many reasons, far from clear.

5.7 Conclusion

What can we conclude about horizontal policy coherence and the integration of change mitigation and adaptation with regard to inclusion, consistency, weighting, reporting and resources?

With regard to inclusion we can argue that climate change has become a hot issue over the last few years. Climate change mitigation used to be the sole responsibility of the Ministry of Housing, Spatial Planning and the Environment, a relatively powerless ministry. Over the last few year, other ministries have also become involved in climate change mitigation, such as the Ministry of Transport, Public Works and Water Management, the Ministry of Agriculture, Nature and Food Quality and the Ministry of Economic Affairs. Their involvement shows that climate change mitigation is gaining momentum. But it is not only climate change mitigation that is becoming increasingly important, we can also observe significant developments in relation to climate change adaptation, whereas only a few years ago climate change adaptation was excluded from the political agenda. Climate change adaptation measures often took the form of water management. However, a few years ago climate change adaptation became an official item on the political agenda. This shows that climate change adaptation is also gaining momentum.

With regard to consistency we can argue that there will always be inconsistencies. Dutch climate policy is now at the stage that climate change aspects are being weighted and compared to other policy issues. It is an explicit ambition to mainstream climate change mitigation and adaptation instead of developing a new policy sector on climate change. The importance of policy integration and coherence is recognised and, at the time of writing, various actors are working hard on establishing procedures for determining the relative priority of climate change mitigation and adaptation impacts compared to other policy, but these are not in place yet. In both climate change mitigation policy and climate change adaptation policy these inconsistencies are presented as opportunities and innovations. The discourse of opportunities and innovations avoids discussing the real issue of policy incoherence at the national level. In some cases, integration might not even be the best option. In highly exposed sectors it could entail a trade-off between efficiency and effectiveness, but without real discussion on the issue, climate policy runs the risk of becoming trapped in political symbolism.

With regard to weighting we can argue that, at the time of writing, climate policy is being implemented on a semi-voluntary basis. The government has chosen to stimulate climate-change-friendly choices, but not to enforce them. There are few rules and regulations that enforce climate policy. Climate change mitigation is mostly implemented by means of market-based instruments such as taxation, subsidies and

standards. So, even though climate-unfriendly choices will cost more, everyone is still free to make them. The climate change adaptation discussion mostly focuses on making the Environmental Impact Assessment, the Water Test and the Building Decree climate proof. These instruments do not enforce climate friendly choices either. They are first and foremost communication and awareness raising instruments.

With regard to reporting, there is a difference between climate change mitigation and climate change adaptation. In relation to climate change mitigation, we have seen that there is a long history of monitoring greenhouse gas emissions. In relation to climate change adaptation, monitoring and evaluation instruments have only recently been developed. Initiatives to weight climate policy aims include the integration of climate change adaptation aims into policy instruments such as the Strategic Environmental Assessment, the Regulatory Impact Assessment, the Building Decree and the Water Test. This includes the development of indicators.

With regard to resources, we have paid attention to knowledge resources as well as economic resources in our analysis. With regard to knowledge resources, we can conclude that the specific knowledge about climate change, climate policy and the impacts of climate change adaptation and mitigation instruments is fragmented and often not available. This means that, at the time of writing, there is also insufficient information available on policy inconsistencies and how to deal with them. At the same time, a number of initiatives have been undertaken to fill this knowledge gap. These initiatives include scientific research but also pilot projects (hotspots). This suggests that the importance of know-how about climate change mitigation and adaptation impacts is recognised, but the extent to which the newly generated knowledge will be able to meet knowledge demands remains unknown. With regard to economic resources, we can conclude that the Balkenende IV programme for government has made specific resources available for climate change mitigation measures. We can also conclude that the specific amount of money made available for climate policy is rather meaningless if we do not know how it is used. In addition to the amount of money made available, it is also important to pay attention to efficiency and effectiveness. In the Dutch case, most of the government budget is spent on subsidies, which are arguably not the most efficient and effective policy instruments.

6 Integration of climate policy in the national water policy

6.1 Policy integration and coherence in the water sector

6.1.1 Background to the water sector and water policy in the Netherlands

Water management has played an important role in the Netherlands for many centuries. This is not surprising, because large parts of the country are located below sea level (see Figure 6.1). From the thirteenth century onwards, people started to build dykes to protect the land from flooding by the sea and the rivers. This also made land reclamation possible for agricultural use. The introduction of the windmill (1250) made the drainage of lakes possible. The largest lake drainage was the Haarlemmermeer in 1852 (18,000 ha). In the twentieth century (1930-1968), large land areas were reclaimed from the sea for agricultural use. Examples are the Wieringermeer (19,500 ha), the Noordoostpolder (46,000 ha) and Flevoland (96,000 ha). The consequence of this water management is that the Netherlands now has about 3,000 polders.



Figure 6.1 Map of the Netherlands with the low areas (blue) and the higher areas (yellow).

6.1.2 Discursive shifts in Dutch water management (1950-1995)

Water policy in the second part of the twentieth century has been dominated by the flooding (by the sea) of large areas of land in the South West Delta in 1953. During this storm, 1,835 people lost their lives and 200,000 hectares of land were inundated. This shock event caused an enormous rise in political attention on the issue of Dutch coastal defence. Shortly after the flood, the national government issued the Delta Plan. The core of this plan was the construction of a number of large dams designed to enclose the estuaries in the south-western part of the Netherlands, so as to guarantee safety in the sea-flood prone areas (Meijerink, 2005).

In the mid nineteen seventies, the political discussion on the Oosterschelddedam caused a major policy change in Dutch coastal and water management. This dam would close the salt water estuary of the Oosterschelde and thus would transform it into a sweet-water 'lake'. Protests were raised by environmental groups, ecological scientists and fishermen. The result was an alternative plan for a semi-permeable dam. The key feature of this design is that in normal circumstances the dam is permeable, thus maintaining the tidal regime in the estuary, whereas it can be closed entirely during unusually high waters. From then on, the potential ecological impacts of coastal defence and water management projects have been assessed systematically, and taken into account in decision making (Disco, 2002). This is called integral water management.

The severe flooding along the Meuse and the nearly serious flooding along the Rhine in 1993 and 1995 have led to a renewed consideration of water management policy. This has been adequately described by Meijerink (2005: 1068): 'These shock events raised awareness that in the long term the Dutch would not be able to fight against the water with just higher dykes and better technical infrastructure. It was realised that too much land had been taken from the river and other water systems, and that the natural dynamics and water storage capacity of these systems had to be restored at least partly, to prevent future flood disasters. Besides the shock events of 1993 and 1995, the expected impact of climate change on flood vulnerability in the Netherlands has been an important trigger for the emergence of the new policy discourse "living with the water".'

These events led to a large-scale operation to reinforce the river dykes which was executed within two years (1995-1996). This remarkable schedule was possible because of the wide public support for these plans, a special Major Rivers Delta Act and the availability of the technical and organisational experience at government level to execute these plans (Driessen & De Gier, 1999). The near floods also led to a more fundamental policy change with the introduction of the planning strategy Room for the River in 1996. This strategy marked a new starting point for water policy because it abandoned the old idea that reinforcing the river dykes would be enough to contain the water. Instead, it introduced a new and more adaptive strategy for river management that aims to create more space for the river and lower the water levels by deepening the forelands of the rivers, displacing dykes further inland, depoldering and creating new flood channels. This strategy has important spatial implications, because it limits the possibilities for building in the summer beds of the river. This policy is still operational, although it has been slightly adjusted in recent years.

After 2001, the Room-for-the-River principles were translated into the general government strategy on (inland) water management. An important incentive was the report of the Commission for Water Management in the Twenty-First Century. It states that the way the Netherlands deals with water is inadequate for the future. Consequences of climate change, the rise of the sea level and increasing soil decline necessitate changes in water management. These changes consist of a move away from technical water management towards a broader (or adaptive) orientation

(Dicke, 2001). Instead of relying on dykes only, safety should be achieved by adopting retention basins and by designating calamity basins which can be flooded in the event of high water. Following this report, the Water Test was introduced in Dutch water policy. Spatial plans and building projects had to be subjected to this test, and projects with negative consequences for water management should not be pursued. The actual performance of the Water Test is examined in the next section.

This short overview shows that climate change was already an issue in Dutch water policy before the National Adaptation Strategy was formulated. Remarkably, the word ‘adaptation’ was not used, although climate change and its consequences were explicitly used as important arguments for policy change. We show later that the current climate policy, based on new scientific information on climate change and its effects, forces the water policy to adapt even further (in the same direction). For the few next years, water policy will continue to depend on the existing policy strategies and instruments, while new strategies and instruments are being developed.

6.1.3 The institutional framework of water management

Before exploring the integration of climate change in water policy, we need to explain something about the institutional framework of Dutch water management (Wiering & Crabbé, 2006). This is rather complicated because four governmental layers are responsible for water management: national government, provinces, municipalities and water boards. National coordination is a task of the Ministry of Transport, Public Works and Water Management (V&W). The Directorate-General for Public Works and Water Management (*Rijkswaterstaat*) is part of this ministry, but operates also at the regional level. The Directorate-General is responsible for the main state water system of large rivers, canals, coastal waters and estuaries. The Ministry of Housing, Spatial Planning and the Environment (VROM) coordinates spatial planning policy and environmental policy. As water management has a growing impact on spatial planning, this coordination has an impact on water management as well. At the regional level, the twelve provinces have important tasks in water management and spatial planning. In both policy areas, they are responsible for the translation of national policy into the policy of water boards and municipalities. Water boards are relatively autonomous government organisations at the regional level. The 27 water boards are responsible for regional water management. They deal with issues of both water quantities and water quality. Municipalities have important tasks in urban water management and they play a crucial role in spatial planning. Due to the complex division of roles and tasks between these governments, they are forced to work together on many projects.

6.2 Water policy strategies and instruments for adaptation to climate change

We have already stated that the national water policy has been adapting to climate change for some time now, even without mentioning the term itself. However, the

real new national water plan, which will focus on climate adaptation in particular, has yet to be published. Its publication is expected in 2009. The new water strategy is not fully worked out yet. We can, however, sketch the direction of this new policy based on the Water Vision (V&W, 2007) and the influential advice of the Delta Committee (Deltacommissie, 2008).

The current government's most recent policy strategy on water management was issued in September 2007. This Water Vision, a long-term perspective on water policy, has climate change as its central theme. It states that water policy needs a shake up, because: (1) more extensive knowledge of climate change is forcing the government to look beyond 2020 and prepare for developments beyond 2100, (2) water policy needs to be more internally coherent so that it can be linked more effectively to other policy fields, (3) the current water policy is reaching its limits and a fundamental transition is needed.

This vision is, however, just the first step to a new national water plan in 2010. '... this Water Vision marks the start of a process towards a sustainable, integrated plan for a climate-proof water management system in the Netherlands' (V&W, 2007: 17). This means that it lacks concrete measures and new policy instruments, but it contains some general policy directions for the new water plan (see also Table 6.1). Some subjects still need to be worked out. The report of the new Delta Committee on the future of the Dutch coast and other water safety issues that are related to climate change is an important step in this process.

Meanwhile, the concrete measures and policy instruments of the existing water management strategies continue to be important. We will elaborate on some of these policy instruments later.

Table 6.1 Climate policy integration in relation to Water Vision 2007

Criterion	Water Vision (2007)
Inclusion	Climate change is the central theme of this document. It is mentioned 80 times on most pages of this document of 86 pages.
Consistency	The consistency of this strategy has not been discussed. Most potential inconsistencies are 'solved' by emphasising the possibilities for innovations or for combining functions.
Weighting	Water (and thus adaptation) must be a more decisive factor in decision making on major issues in the fields of urbanisation, economic development, industry, nature, landscape and recreation. A set of climate-proofing criteria will be produced to ensure that the effects of climate change are factored into decisions on siting, the spatial organisation of areas or neighbourhoods and into the design of buildings and infrastructure. In the western, peat-meadow and low areas of the country, more drastic measures are needed and the principle 'function follows water' will be applied. This means that the old philosophy that water tables will be determined by the other functions (agriculture, housing) will be abandoned.
Reporting	Reporting is not addressed.
Resources	Resource use is specified in this report. However, most measures and projects have been mentioned in earlier government plans and resources have already been made available from the infrastructure fund. Extra resources are available (125 million euro) for the period 2007-2011. These resources are also part of the Balkenende IV programme for government (pillar 3).

The overall impression given by this Water Vision is that adaptation to climate change is highly integrated in this policy document. It shows the high ambitions of the national government to integrate climate adaptation ambitions into water policy. However, this vision is an incomplete government strategy. The implications of the vision are not clear yet, and painful choices on changes in land use or new government investments in water safety have yet to be made.

The second Delta Committee issued its advice in September 2008. Its name derives from the first Delta Committee that was formed after the disastrous flood of 1953. The government requested this second Delta Committee to advise on the protection of the coast and the entire low-lying part of the Netherlands against the consequences of climate change. The issue was whether arrangements could be made so that over the very long term (2100-2200) the Netherlands could be climate proof: safe against flooding, while still remaining an attractive place to live, to reside and work, for recreation and investment. The committee was not a political committee, but composed of different scientists and other experts under the chairmanship of Cees Veerman, the former Minister of Agriculture. The committee conducted its own research and consulted different societal actors.

The committee has concluded that we will have to expect a sea-level rise of 0.65 to 1.30 metres in 2100. This is based on the most extreme climate scenarios with a temperature rise of 6 degrees Celsius in 2100. By the year 2200, a sea-level rise can be expected of 2 to 4 metres. These extreme climate scenarios are the basic assumptions underlying the committee's advice.

The committee has focused mainly on water safety. It recommends maintaining the existing risk assessment as to when flooding might take place: once in 10,000 years in the western area, once in 4,000 years in other coastal areas and once in 1,250 years in the river areas. This risk assessment, together with the assumptions on climate change, implies that present flood protection levels for all dyked areas must be improved by a factor of 10. In some areas where even better protection is needed, the so-called Delta Dyke concept is promising. These dykes are either so high or so wide and massive that there is virtually zero probability that the dyke will suddenly and uncontrollably fail. All measures to increase the flood protection levels must be implemented before 2050.

Another recommendation is to maintain the flood protection off the coasts of Zeeland, Holland and the Wadden Sea Islands, by beach nourishments. This must be done in such a way that the coast can expand seaward in the next century. This will provide great added value to society in terms of more space for nature development, recreation and building at the seaside.

Other examples of recommendations are:

- Raise the water level in the IJsselmeer by a maximum of 1.5 metres.
- The decision of whether to build in low-lying flood-prone locations must be based on a cost-benefit analysis.

- The Rijnmond area (Rotterdam) requires multiple new storm surge barriers to assure the safety of this area and meanwhile maintain open access to the sea for Rotterdam harbour.

The Committee also advises strengthening the political-administrative organisation of water safety by:

- Providing cohesive national direction and regional responsibility for execution (ministerial steering committee chaired by the prime minister, political responsibility lying with Minister of Transport, Public Works and Water Management; the Delta director for cohesion and progress; regional administrators for interpretation and implementation of the individual regional assignments).
- Institute a permanent parliamentary committee on the theme.

The resources for the implementation of these recommendations will have to be considerable. They would require additional investments of between 1.2 and 1.9 billion euro a year until 2050 and a similar amount in the years after 2050 (until 2200). These costs should be financed by creating a Delta Fund, managed by the Minister of Finance. This Delta Fund could be financed out of natural gas benefits and state loans. Remarkably, the committee also recommends placing this fund outside governments budgets. This exceptional measure is intended to prevent short-term political considerations causing this budget to be used for other government objectives.

A Delta Act will anchor the political-administrative organisation, funding within the present political system and the current legal framework. This act must include the Delta Fund and its supply; the Director's tasks and authority; the setting up of a Delta Programme; regulations for strategic land acquisition; and compensation for damages or the gradual loss of benefits due to the implementation of measures under the Delta Programme.

The reactions of the government and most political parties have been predominantly positive. However, the attentive reader will note that the Delta Programme and the Delta Act were mentioned in the government reaction, but the Delta Fund was left out. This suggests that this issue is still disputed within the government. We should also be careful about drawing conclusions based upon this advice, because the real government plans will be issued in 2009 within the new national water plan. Only then can we see which recommendations will be implemented and which will not. Meanwhile, some discussion on the recommendations and the underlying assumptions has started among scientist and societal groups. Some environmental groups criticise the advice because of its lack of attention to mitigation. These groups want the national government to focus more on the prevention of climate change (mitigation) and proposed a Climate Act on CO₂ reduction rather than only a Delta Act on adaptation. Some scientists have criticised the committee for choosing the worst climate scenario as an assumption for their recommendation and disregarding other climate scenarios. Others have criticised the far-reaching consequences of the

recommendations for the landscape and the committee's one-sided engineering approach.

6.2.1 Instruments of the current water policy

As the new water policy is not yet fully worked out, we focus on the instruments of the existing water policy. The main advantage of this approach is that we can also discuss the effects of these instruments on actual decision making at the different levels of government. We elaborate on the following instruments:

- National Water Agreement (NWA) (*Nationaal Bestuursakkoord Water*)
- Water Test
- Area-based policy.

6.2.1.1 National Water Agreement

The NWA is an agreement between the national government, the provinces, the municipalities and the water boards. It was signed in 2003 with the intention of resolving the main problems of the water system by 2015. This agreement is voluntary and not legally binding.

Table 6.2 provides a distillation of the integration of climate policy as articulated in the text of this water agreement, with reference to the criteria used to assess such integration (see section 2.1).

Table 6.2 *Climate policy integration in relation to the National Water Agreement 2003*

Criterion	National Water Agreement (2003) and its actualisation (2008)
Inclusion	Adaptation to climate change is the principal motive for this agreement. It is also an instrument to stimulate inclusion of water objectives in regional water plans at the level of river basins (water boards) and urban water plans (municipalities)
Consistency	Inconsistencies between water policy and other policies are not really addressed in the NWA. Regional differences are emphasised. Inconsistencies have to be identified (and resolved) at the regional or city level in detailed regional water plans and urban water plans.
Weighting	Adaptation to climate change is one of the most important objectives of this NWA. The most important objective of the NWA is to increase the weighting of water policy objectives at all government levels.
Reporting	The NWA has to be evaluated in 2006 and in 2010. Monitoring is obligatory for all governments.
Resources	The NWA estimates total cost as 1.3 billion euro for the first period (2003-2007) and 8 billion euro in the long run (until 2050). These investments should be financed from existing government budgets. The actualisation of the NWA (2008) introduces some extra investments by the national government for projects that integrate the implementation of the Water Framework Directive with other government goals such as climate adaptation or nature (115 million euro) in 2009-2015. Projects have to be co-financed by lower-level governments.

The first evaluation of the NWA has already taken place (in 2006) (Landelijk Bestuurlijk Overleg Water, 2006). This means that we can give an indication of its

effects in the first years of implementation. The most important conclusions of this evaluation are:

- The cooperation between governments has been strengthened and has become institutionalised into regular meetings and more stable cooperation.
- Most water boards have gained insight into the problems experienced in regional water systems and have formulated regional water plans. This has clarified their tasks in relation to water retention and water storage at the regional level. In most cases, concrete decisions on these issues have not yet been taken and need to be discussed first with the stakeholders involved.
- One third of the municipalities had formulated an urban water plan in 2006. This is rather disappointing, because all municipalities had agreed to have formulated such a plan by 2006. Many municipalities found it hard to formulate such a plan due to insufficient manpower, a budget shortage and other municipal priorities.
- The inclusion of water objectives in spatial planning has increased as a consequence of these plans and the introduction of the Water Test (see section 6.2.1.2). However, this does not mean that water objectives have been given an increased weight compared to other interests. This is especially the case in decision making about locations (e.g. for house building) where economic interests (cost, location of existing infrastructure) still prevail. On the other hand, water objectives have been increasingly integrated (inclusion and weighting) in spatial decision making at the operational level such as the actual planning of house building at a chosen site (after the location has been chosen).

6.2.1.2 Water Test

The Water Test is an important instrument to strengthen the inclusion of water in spatial planning. It is a process instrument to ensure that water aspects are taken into account in spatial planning and spatial projects of the national government, the provinces or the municipalities. The Water Test legally obliges all these governments to request a 'water advice' from the relevant water manager (mostly the water board or the Directorate-General for Public Works and Water Management) and to include a water section in every new spatial plan. This means that water aspects are taken into account at an early stage of decision making.

Table 6.3 evaluates the Water Test with reference to the criteria used to assess the integration of climate policy (see section 2.1).

Table 6.3 Climate policy integration in relation to the Water Test

Criterion	Water test
Inclusion	Climate change is obviously included in the national water policy. The Water Test forces provinces and municipalities to include these water and climate objectives in their decision making on spatial plans.
Consistency	Climate adaptation is consistent with the national water policy. This means that the Water Test (if applied correctly) will stimulate the consistency between spatial planning and climate adaptation.
Weighting	The water test does not oblige initiators to weight water (or climate) objectives above other objectives. However, the assumption is that, when more information is provided on water implications, spatial plans will be more waterproof, or climate proof.
Reporting	The water test was evaluated in 2006.
Resources	No.

The evaluation of the Water Test in 2006 concludes that the Water Test was successful, because it included the water manager in spatial decision making at an early stage. This also means that these governments (e.g. municipalities) are provided with water knowledge and information that they often do not have themselves. This also stimulates the communication between spatial planners and water managers. The evaluation also states that the implementation of the Water Test could be improved. It is clear that the Water Test has insufficient effect on location choice for spatial plans. The Water Test has, on the other hand, substantial influence on the way the spatial plan is made concrete. This is consistent with the evaluation of the NWA. It seems that decision making about location continues to be dominated by other interests, usually economic. This is connected with spatial planners' assumption that water aspects can be mitigated in the final plan. Another weakness of the Water Test is that the water advice in many cases lacks clear, material criteria for including the water aspects in the spatial plan (Werkgroep Evaluatie Watertoets, 2006).

6.2.1.3 Area-based policy

Area-based policy is not really a policy instrument. It is more an approach to policy making and implementation that has evolved in Dutch environmental, spatial and rural policy over the last decades. It means that the lack of integration of sectoral policy at the national level is being tackled at the regional level; it also means, however, that the state does not impose general policies unilaterally but rather negotiates with regional and local authorities, interest groups, market parties and citizens. Sectoral policy initiatives (i.e. nature policy, agricultural policy, water policy, spatial planning) become integrated and adjusted to regional contexts. This is expected to enhance the support amongst parties involved and to improve the chances of successful implementation (Boonstra et al., 2006). The 2007 Water Vision labels this approach as 'integrated area development'. This means that the water policy also focuses on the regional scale to integrate its goals with other interests and other policy goals such as housing, agriculture, recreation, mobility, nature and industry.

Evaluations of the area-based approach have shown that this approach can be successful. However, often this also means that sectoral policy objectives (like water) are re-discussed (and re-negotiated) at the regional level. This can mean that bad decisions are prevented, but it can also mean that policy objectives that meet a lot of resistance will be only partially implemented. This has happened before with nature policy and the development of new nature areas on agricultural lands. It is not inconceivable that similar mechanisms will be put to work in the cases of large-scale depoldering or creating new lakes or rivers as elements of the new water policy. We focus on such a situation in our case study (Chapter 8).

Meanwhile, this approach also implies that policy making and implementation have increasingly moved from the national to the provincial or even local level. This area-based policy goes hand in hand with decentralisation from the national level to the provinces, which has recently occurred in rural policy but also in spatial policy. The philosophy is that the national government should only set out overarching strategic guidelines, and that concrete policies should be made as much as possible at the provincial or the local level (OECD, 2008). There is obviously a tension between this philosophy and the overwhelming number of sectoral policies. The European environmental directives (Habitat Directive, Bird Directive, Water Framework Directive, etc.), in particular, are sometimes difficult to combine with other, national policy objectives such as nature development, rural development and agriculture. Integrated area-based policies can also form an excuse for the national government to disregard the potential inconsistencies between policies and transfer those problems to the provincial and regional level.

6.3 Identified coherence problems and win-win areas with other policies

We conclude this section with an overview of potential coherence problems and win-win areas with other policies. The overview (see Table 6.4) is more or less based on our document analysis. This also means that it is not a complete overview of coherence and win-win areas of water policy with other policies.

Remarkably, the Water Vision presents mostly win-win opportunities for combining water management with other policy goals. As this document primarily deals with the effects of climate change on water management, this means that adaptation to climate change is also seen as a possibility for innovation. On the positive side, we can assess this vision as an encouragement to find really integrated and sustainable solutions in the near future. On the negative side, however, the vision tends to conceal the difficult political choices that have to be made and the potential conflicts that do exist. Mainly on the basis of empirical studies, we have identified some potential conflicts between water policy and other policies as well. Our overall conclusion is that win-win or conflict is just another perspective from which to look at these issues. Theoretically, every potential conflict can turn into an innovation or a win-win solution. It is evident that we need to study the practical implications of water management on other policies to avoid a mere discursive battle.

Table 6.4 Overview of win-win and conflict situations arising between water policy and other policies

Water policy	
Coherence and win-win areas between water policy and other policy areas	Potential conflicts between water policy and other policy areas
Water policy can be very coherent with nature policy, especially in areas where water storage can be combined with the development of new nature areas (e.g. in the summer beds of the rivers and in deep polders).	Water policy can conflict with nature policy, especially in areas where water storage is a potential threat to existing nature areas. This occurs mainly if water quality is too poor (and/or nature areas are very vulnerable).
Temporary water storage can be combined with agriculture, when new financial instruments can be designed to compensate farmers for the loss of income (blue services, i.e. relating to water).	Water policy can be very much in conflict with agricultural development, when agricultural lands need to serve as (permanent) water storage areas.
Housing and other urban developments can be combined with water storage in integrative spatial designs.	Water policy can conflict with housing and other urban developments in areas where both functions claim space.
Inclusion of water aspects in spatial plans stimulates innovative designs (such as floating houses). These innovations can be capitalised upon by exporting them to other countries.	Water policy can raise the costs of spatial development projects with negative consequences for house prices and economic development.
Water policy can be an incentive to regional economic development (of rural areas) as it can transform agricultural lands into water and nature areas with lots of incentives for tourism and other economic development.	Water policy can threaten the typical Dutch landscapes (with cows and green meadows), because agricultural areas have to be transformed into new lakes or swamp areas.

6.4 Conclusions

What can we conclude on climate policy integration in the Dutch national water policy? First of all, the national water policy is mainly concerned with adaptation issues. Mitigation is hardly an issue within the water policy.

Climate adaptation is omnipresent in the national water policy and is a central issue within the recent policy documents. Actually, the inclusion of adaptation within the water policy started as far back as the mid nineteen nineties. At that time, the consequences of climate change for the Dutch water systems were already acknowledged (more rain, more water in the large rivers, rising sea levels) after two serious near floodings of the major rivers. As a consequence, Dutch water policy shifted from a rather technological approach (higher dykes and indigenous water projects) to an approach that would supply more space for water (on land). This also implied an approach with more inclusion of ecological aspects in water policy and had spatial consequences. However, adaptation to climate change was not explicitly mentioned as such. This only happened after 2005 and the publication of the Dutch adaptation strategy (ARK, 2007). The consequences of the new climate scenarios for the contemporary water policy have not yet been specified in national policy plans. However, the influential Delta Committee has advised upon a far-reaching set of measures to secure the desired level of water safety over the next 100 to 200 years. Their advice has emphasised climate adaptation and prepares for the worst climate scenarios on temperature rise and sea-level rise.

The Water Test is a policy instrument that stimulates the inclusion of water issues (and thus climate adaptation issues) at the level of spatial plans or spatial projects. It obligates the initiator to include water issues in his/her plan. Policy evaluations have shown that this Water Test is rather effective in relation to inclusion. This instrument also stimulates local decision makers to include the knowledge of water experts in their spatial plans at an early stage.

The consistency of water policy with climate adaptation is high, because climate adaptation is the central objective within the water policy. Most inconsistencies arise in relation to other policy objectives, mainly as a result of the spatial claims of this new water policy. This spatial claim has to compete with other spatial claims for agriculture, housing and other development projects, and the preservation of the typical Dutch landscapes. Although most policy documents emphasise the possibility of combining these functions within integrated area-based projects and innovative designs, this cannot conceal the fact that most of these land claims are in fact inconsistent. This does not have to be addressed in national policy documents however, because these plans contain only rough guidelines for the elaboration of these plans at the provincial and the regional level.

The third criterion refers to the weighting of climate adaptation aspects as against other aspects. Because of the strong overlap between water policy and climate adaptation, we focused on the weighting of adaptation-related water aspects (such as water retention) in relation to other policies. Our analysis shows that the national government tries to promote the weighting of these water-adaptation issues by means of a number of policy instruments. Most of these instruments lack the obligation to prioritise these issues and focus on obligatory inclusion (Water Test and Environmental Impact Assessment) and on voluntary agreements with the lower levels of government (provinces, water boards and municipalities). This is consistent with the policy philosophy that integration of different policy objectives should take place at the regional or local levels. There is a possibility that this weighting aspect of the current water policy will be revised in the next national water policy document (due in 2010). This would not, however, be very consistent with the decentralisation and deregulation trends within spatial policy and rural policy.

This lack of obligatory weighting increases dependency on the actual policy output and outcomes at the regional and local level. Policy evaluations of the 'old' water policy (2000-2006) show that water-adaptation issues are not prioritised within decision making on locations for development project (housing, industry, etc). The priority of climate change issues increases only after the choice of location has been made. In the actual designs of these development areas, water adaptation issues (e.g. retention) are indeed taken seriously. These mixed outcomes show that water adaptation issues are weighted within the actual design, but, when it comes to location choice, economic and financial issues have priority. Furthermore, most decision makers seem to believe that most of these climate adaptation issues can be mitigated in the actual design.

Reporting refers to the importance of feedback for policy implementation. Our information on this aspect is limited. We have shown that monitoring and *ex-post* evaluation have been given attention in the relevant policy documents on water policy. In addition, we can state that policy evaluations have indeed been executed after five or six years of policy implementation. It is not very clear, however, how these evaluations have been used to improve policy implementation. On the other hand, we have seen that scientific-scenario studies on climate change have been included in policy making. The new scenarios on climate change even form the starting point for the next national water policy document in 2010.

Policy integration requires both financial resources and knowledge. Most water policy documents contain an indication of the required resources for implementation. However, these indications are seldom accompanied by a clearly defined budget. Generally, a specific budget is made available, but the remaining resources required have to be made available within the current national budgets and by contributions from other governments (EU, provinces, water boards, municipalities). As regards the know-how aspects, the Water Test is an interesting policy instrument because of its stimulus to include water experts in spatial plans and projects.

7 Climate policy integration in South-Holland and Rotterdam

7.1 Introduction

In this chapter we zoom in on the provincial and municipal level of government. At this level, we have selected one Dutch province (South-Holland) and one municipality (Rotterdam). The Province of South-Holland is one of the twelve Dutch provinces and is located in the west of the country. It is the most heavily populated and industrialised province in the Netherlands with almost 3.5 million inhabitants in an area of just 2,800 km². The most important towns are Rotterdam and The Hague. The province is strategically located with the North Sea to the west and the river delta of the Rhine and the Meuse to the south. It also has valuable nature and landscape areas. In particular, the Green Heart (located in the area between Amsterdam, Utrecht, Rotterdam and The Hague) is designated as a national landscape, with its characteristic grasslands, windmills, polders and canals. Because of its location, population size and economic activities, the Province of South-Holland faces many challenges relating to climate change. The municipality of Rotterdam is one of the largest Dutch cities with almost 600,000 inhabitants and has one of the largest harbours in the world with a lot of petrochemical industry. We selected this municipality because of its recent initiatives on climate policy. It is therefore not representative of all Dutch municipalities. It is more an extreme case that shows what large cities can do to adapt to, and mitigate, climate change.

7.2 Regional and municipal programmes and strategies

The new governing coalition of the Province of South-Holland published its coalition agreement in 2007 (Province of South-Holland, 2007a). This strategic programme includes the issue of climate change and policy ambitions on both climate mitigation and climate adaptation. Climate mitigation will focus on the reduction of energy use and CO₂ emissions of 20% by 2020 (as compared to 1990). Remarkably, this diverges from the national policy objective of 30% reduced CO₂ emissions over the same period. Arguments for this difference have not been mentioned. Additionally, the province wants to reach 20% sustainable energy by 2020. This will be worked out in an energy policy document. Climate adaptation will focus on water policy in particular. This means that water policy will also play a more important role in spatial planning and spatial development projects. Within this context, climate adaptation is embedded in the provincial water policy. Most of these plans to adapt to climate change will have to be concretised in specific project plans, for example the Zuidplaspolder (see Chapter 8) and the Green Heart national landscape. An important issue is the provincial decision to change the way they decide on the water levels in the polders and the peat-meadow areas. The traditional weighting rule that water levels are adjusted to suit current functions (like agriculture) will be replaced by the rule that these functions will have to adapt to the higher water levels that are now needed. Such decisions may have radical implications for the

relevant farmers as in many cases farming cannot be combined with high water levels. The actual decisions on water levels have to be made by the water boards. The province can influence their decision making however, because water board plans have to comply with the strategic provincial water plan.

The coherence of climate policy with other goals is only implicitly addressed. Most spatial inconsistencies have to be resolved within integrated spatial plans and projects. Remarkably, the possible inconsistencies of climate policy with the two other provincial priorities, transport policy and economic development, are hardly addressed. With regard to transport policies, the province wants to impose sustainability requirements in addition to their general requirements on prices and services when they put their bus routes out to tender to private bus companies. Sustainability in economic development is only mentioned in relation to cultivation under glass. New greenhouse complexes should be totally sustainable.

Table 7.1 summarises the horizontal climate policy integration in the provincial strategic programme with reference to the criteria used to assess such integration (see section 2.1)

Table 7.1 Horizontal climate policy integration in the provincial strategic programme (2007-2011)

Criterion	Provincial strategic programme (2007-2011)
Inclusion	Climate change is explicitly mentioned in the section on environmental issues (section 1). However it is not explicitly mentioned in the chapters on transport policies and economic development.
Consistency	Not addressed.
Weighting	Not addressed.
Reporting	Not addressed.
Resources	15 million euro is budgeted for the issue of climate and energy policies (2007-2011) out of a total (additional) budget of 287 million euro.

In the municipality of Rotterdam, a new municipal executive (mayor and aldermen) was installed in 2006. This executive published a coalition programme for the period 2006-2010. This programme pays little or no attention to climate change issues. The word climate change is not mentioned even once. Its main focus is on social and economic issues. Only general environmental issues (such as air quality) and the need to reserve more space for water retention have been briefly addressed. The more extensive municipal budget plan for 2008 (**Gemeente Rotterdam, 2007**) does mention climate change. In the environmental section, climate change mitigation is even the primary subject. This is remarkable, because in the 2007 budget plan climate change was not even mentioned in the environmental section. The mitigation ambitions originate from the Rotterdam Climate Initiative (RCI). We discuss this initiative in more detail in section 7.3. The budget plan indicates as its main objective a 50% reduction in CO₂ emissions by 2025 (compared to 1990). This ambitious objective has to be combined with an ongoing development of the Rotterdam harbour and industry. By 2010, the CO₂ emission level has to be cut back to the 2005 level. Rotterdam has the ambition of being a pilot city for CO₂ reduction in the Netherlands and other large cities in the world. This means that every municipal decision will have to include information on its effects on energy emissions. The

budget plan also states that these energy aspects should carry a lot of weight in all decision making until 2025. Adaptation is not explicitly mentioned in this budget plan. However, the impacts of climate change on urban water management have been addressed. Climate change is an important argument for an active water policy in Rotterdam. This has been elaborated in the second water plan (see section 7.3). The budget plan states that water storage should be treated as an opportunity to improve the city's living conditions. However, it also indicates that the extra cost for water storage will exceed these financial benefits.

Table 7.2 summarises the horizontal climate policy integration in the Rotterdam coalition programme and the municipal budget plan with reference to the criteria used to assess such integration (see section 2.1).

Table 7.2 Horizontal climate policy integration in the municipality of Rotterdam

Criterion	Rotterdam coalition agreement 2006-2010	Municipal budget plan 2008
Inclusion	Climate change is not mentioned.	Climate change mitigation is mentioned in the environmental section. Adaptation is not mentioned but integrated in water policy.
Consistency	Not addressed.	Not really addressed. The document states that reduction of CO ₂ emissions should go hand in hand with economic development. How this should be done is not elaborated.
Weighting	Not addressed.	Energy emissions should be given weight in every decision.
Reporting	Not addressed.	Not addressed.
Resources	Not specified.	Not specified for these climate objectives.

7.3 Regional and municipal climate change strategies

7.3.1 Provincial strategy on mitigation

The provincial ambitions on climate mitigation have been elaborated in a provincial policy document on energy. A separate strategy on mitigation has not been issued. This policy document named *Energy in a New Perspective 2008-2011* (Province of South-Holland, 2008) is still being discussed in the provincial parliament. We have treated this draft plan as an approved policy document. It elaborates the climate mitigation ambitions of the current provincial coalition and the mitigation objectives from the national mitigation programme. The latter is also important in order to anticipate the upcoming covenant on climate and energy ambitions that the national government wants to enter into with all the provinces. The province can influence CO₂ emissions and new sustainable sources of energy by using: (1) the provincial position in spatial planning and spatial development projects, (2) the provincial position in granting environmental permits in industry, and (3) its opportunities to stimulate sustainable energy sources and innovation.

Climate change is obviously included in this provincial document. It states that 25% of Dutch CO₂ emissions emanate from this province. The province focuses on using the existing possibilities and techniques for wind energy and heating. Besides this, it aims to stimulate the creation and application of new energy sources (innovation).

Table 7.3 summarises the horizontal integration of climate policy in Energy in a New Perspective with reference to the criteria used to assess such integration (see section 2.1).

Table 7.3 Horizontal climate policy integration in relation to Energy in a New Perspective

Criterion	Energy in a New Perspective 2008-2011
Inclusion	Climate change is the motive for this policy document. It also elaborates on the national mitigation strategy.
Consistency	One inconsistency has been mentioned between placing new windmills and protecting the landscape. The solution will be sought by creating more large-scale wind parks in suitable areas such as off-shore, on sea-dykes and on industrial sites.
Weighting	Not addressed..
Reporting	A monitoring programme on CO ₂ emissions, alternative energy sources and energy reduction will start in 2008. Every two years the results will be published in a (broader) monitoring report (Province of South-Holland, 2007b).
Resources	Budgets are specified for the subjects Warmth (6.5 million), Wind energy (1 million) and Innovation (2.5 million).

7.3.2 Provincial strategy on adaptation

A specific provincial strategy on climate adaptation does not exist. Climate adaptation has nevertheless gained a lot of attention in the province. This attention focuses mainly on its spatial consequences and on water policy. The relevant new policy documents are still under preparation at this time. At the end of 2008, a new provincial water plan and a new spatial vision will be issued. Climate adaptation will be included in these new plans. However, at this point, an assessment of the policy integration and coherence of these plans is not yet possible.

However, we have studied a draft provincial document on the climate adaptation issues to be addressed in these plans. This document provides us with the current provincial view on some possible inconsistencies and win-win possibilities between climate adaptation (and thus the new water policy) and other policy fields. These are summarised in Table 7.4.

Table 7.4 Coherence, win-win and conflicts under proposed climate and other plans

Klimaatwijzer PSV and Waterplan (draft August 2008)	
Coherence and win-win areas between climate adaptation and other policy areas	Potential conflicts between climate adaptation and other policy areas
The temperature rise could have positive effects on recreation and tourism in the coastal zone.	Adapting to higher sea levels and more river water could lead to the necessity to strengthen the dykes. This will conflict with plans to develop these areas into residential areas.
	Climate change could lead to periods of severe drought. This will cause water to become more salty. This could lead to problems with the supply of drinking water, nature protection and with agriculture.
	Water storage will be a problem in the urban areas. There may be conflicts with the ambition to intensify the land use (for living and working) in these areas.
	Adaptation to climate change forces governments to reconsider development of deep polders (with new houses). Building of houses in deep polders should be prevented.
	Higher temperatures could lead to an increase in 'heat stress' in the cities and a health risk for at-risk groups such as the elderly.

7.3.3 Municipal strategy on mitigation

Rotterdam's strategy on mitigation has been embedded in the Rotterdam Climate Initiative (see also: www.rotterdamclimateinitiative.nl and Gupta et al., 2007). This initiative is the joint climate programme of the municipality of Rotterdam, the Port of Rotterdam, Deltalinqs⁵ and DCMR Environmental Protection Agency Rijnmond. It contains an ambitious programme to reduce the CO₂ emissions in Rotterdam by 50% by 2025. Besides these ambitious objectives, it is also a public-private partnership with its own board, (advisory) council and project bureau. The initiators participate on the decision-making board under the presidency of the Mayor of Rotterdam. The advisory council under the presidency of former prime minister, Ruud Lubbers, offers opportunities for a broader participation of governments (province, ministries and the EU), environmental groups and other private actors.

The initiative focuses on the following three objectives in the project period 2007-2025:

- Energy savings: energy efficiency through the exchange of energy streams, clustering, co-siting in the port; new factories replacing old ones; surplus-heat utilisation from port to the city and within the port; development of energy-efficient real estate in the city; energy-efficient households (including affordability); energy-efficient public lighting; public transportation network with

⁵ This organisation represents the private companies in the Rotterdam harbour and other industrial companies.

park and ride locations, energy savings in schools, restructuring areas, vegetation roofs, etc.

- Sustainable energy: use of biomass in power stations, expansion of wind turbines, use of bio fuels in traffic, implementation of green electricity, sustainable energy in households (solar energy, heat sources, etc.).
- CO₂ capture, utilisation and storage: the port offers opportunities for a cost-efficient infrastructure for the transport and storage of CO₂ captured from power stations, refineries and chemical sources. A small portion of this can be utilised in the greenhouse industry and other industries, a large portion can be stored in aquifers as well as in empty gas and oil fields, some onshore, most offshore, possibly in combination with enhanced oil and gas recovery.

The initiative puts a lot of emphasis on innovation and new techniques. In addition, Rotterdam also uses this initiative to emphasise its green and innovative image at the international level as a member of the Clinton Climate Initiative and in the cooperation with other harbours around the world. Special attention is paid to monitoring. Every year, a progress monitor is published presenting developments with respect to the target (CO₂ reduction) and progress in terms of measures. A first monitoring report with key facts and figures has already been issued. The idea is that this monitoring will lead to annual amendments of the programme to enhance its effective implementation. Resources for the RCI are specified in the Action Programme (2007-2011). However, only the contribution of the municipality has been specified (50 million euro). Contributions from the private parties, the national government and the EU have not yet been specified.

Table 7.5 summarises horizontal climate integration in the Rotterdam Climate Initiative with reference to the criteria used for such assessment (see section 2.1).

Table 7.5 Horizontal climate policy integration in the Rotterdam Climate Initiative

Criterion	Rotterdam Climate Initiative Action Programme (2007-2010)
Inclusion	Climate change mitigation is explicitly mentioned and is the main objective of this programme and most of its projects.
Consistency	The action programme is internally consistent. However, inconsistencies with other policy objectives will arise in the implementation stage of the specific projects.
Weighting	Within this programme, climate change is obviously considered to be the most important challenge. The initiative has gained considerable attention in politics and the media. Its actual weighting will depend on the success of the initialised projects.
Reporting	An annual monitoring on CO ₂ emissions and the effectiveness of the measures is scheduled and will be used to learn from and improve the programme.
Resources	Municipality resources have been allocated for the first four years (50 million euro). The contribution from private partners and other governments has not been specified in this programme.

7.3.4 Municipal strategy on adaptation

Rotterdam's strategy on climate adaptation has been integrated in its water policy for the most part. The Second Rotterdam Water Plan was issued in 2007 by the municipality of Rotterdam and three water boards (Gemeente Rotterdam, 2007).

This cooperation is another example of multi-government cooperation and an indication of the growing interdependency of spatial planning (municipal responsibility) and water management (water board responsibility) at the urban level. This cooperation has been institutionalised into a cooperative structure for joint implementation. Water boards and the different municipal departments work together to develop new projects and implement the water plan. This practical and strategic cooperation exceeds the obliged cooperation as demanded by the Water Test (section 6.2.1).

Climate change is an important motive for the actualisation of the water plan. In order to make the city climate proof, a new approach to water storage, water quality and protection from water is needed. Adaptation to climate change is also the reason for the long-term scope of this water plan, up to 2030. The plan acknowledges that 600,000 m³ of extra water storage is needed before 2015 (and 800,000 m³ before 2050) due to the effects of climate change (more rainfall). Furthermore, new and higher embankments may be necessary to protect the city against floods from the rivers and the sea. The main inconsistency is that all these measures will claim more land, but land is scarce and expensive in Rotterdam. On top of all this, the municipality has decided, in its spatial strategy, that it wants to concentrate on building new houses within the city borders. This strategy is designed to enhance the working and the living conditions in the city centre. In addition, the municipality wants to protect the open landscapes around Rotterdam from house building and reserve those areas for recreation and nature. The water plan acknowledges the inconsistency between this spatial strategy and their water adaptation strategy. Innovative solutions are needed to find the required space for water storage. The plan also mentions some of the possible solutions. Water storage on roofs is one of them. The municipality could stimulate 'green' roofs by subsidy schemes. Another possible solution is the concept of 'water squares'. These public squares could be designed to store water in times of heavy rainfall. At the same time, water storage could be used to enhance the working and living conditions in the city. Open water raises the prices of real estate in the city, and new real estate development could thus finance water projects as well.

The water plan also proposes a monitoring strategy on the main objectives (water storage, water quality and water safety). An annual report will be issued with information on the effects and effectiveness of the water plan projects. The required resources for this plan are estimated at between 400 and 500 million euro. It is not clear yet how this budget will be financed and by whom. Besides the contributions of the municipality and the water boards, it requires additional investments by the national government and the EU. Private funding is also possible. One of the ideas is to create a water fund. This fund could be financed by private developers who are obliged to compensate for concreting over additional surface areas by providing extra water storage. They could be given the possibility to pay off this obligation by depositing a certain amount of money in this fund. The government could use this fund to finance new water storage projects.

Table 7.6 summarises horizontal climate policy integration in the Second Rotterdam Water Plan with reference to the criteria used to assess such integration (see section 2.1).

Table 7.6 Horizontal climate policy integration in the Second Rotterdam Water Plan

Criterion	Water Plan Rotterdam (2007-2030)
Inclusion	Adaptation to climate change is the most important motive for this water plan. It includes adaptation to climate change through its effects on water.
Consistency	Reserving more space for water storage is considered to be consistent with the objective of creating an attractive place to live and work. The inconsistency, that the space for this is not available (or too expensive) in the city centre and the old areas, is also addressed. Innovations are needed to solve this problem. This inconsistency is being increased by the strategic spatial decision to build mainly within the city borders in order to spare the remaining green areas outside the city.
Weighting	Within this programme, climate change is obviously considered to be the most important challenge. It emphasises that water storage should be internalised in every spatial project in the city by mitigation, actual compensation or financial compensation (water fund).
Reporting	An annual policy performance monitoring report is proposed.
Resources	400-500 million euro are needed for the implementation of this plan. The actual contribution of the municipality and the three water boards has not been specified. External financing is required.

7.4 Conclusions

In this chapter we have studied the adaptation and mitigation strategies of the Province of South-Holland and the municipality of Rotterdam. These two case studies are examples of the possibilities that exist for the Dutch provinces and large cities to contribute to climate adaptation and mitigation. Our analysis has been limited to an analysis of policy documents.

From this analysis, we can formulate the following conclusions:

- Climate adaptation and mitigation have been prominently included in the general provincial policy strategy for the next four years, but no attention is paid to it in the corresponding strategy for Rotterdam.
- The Province of South-Holland and the city of Rotterdam have both issued strategies on mitigation and adaptation in recent years. In both cases, adaptation has mainly been integrated within their water policy documents. Both water policy documents have included adaptation issues extensively and also cover land-use issues. Meanwhile, it appears that adaptation issues that are not directly related to water and land-use issues have received very limited attention until now. Mitigation has been integrated in the provincial and municipal environmental (or energy reduction) plans. Climate change is included within these plans and is an important motive for additional ambitions on CO₂ reduction and sustainable energy production.
- The actual weighting of climate change issues with respect to other issues is difficult to determine based on these policy documents. Although climate change is an important issue in these policy documents, the actual prioritising takes place at the level of projects and decision making on building permits, etc. This level of

policy outputs and outcomes was not included in our analysis. Besides, most policy documents have been issued very recently and policy outcomes and outputs cannot be expected at this point.

- Some inconsistencies have been addressed. With regard to adaptation/water issues, most inconsistencies occur with competing land-use claims. The province deals with rural areas in particular and thus with competing land-use claims from agriculture, nature development and new urban development. Furthermore, the land claims for permanent water storage also compete with the policy strategy to conserve the existing, mainly agricultural, landscape. The municipality of Rotterdam is responsible for water management in its urban areas. The main inconsistency here is that more space is needed for water storage, while at the same time Rotterdam wants to stimulate building within its city borders. Innovations are needed to solve this inconsistency.
- In our two cases, only one inconsistency was actually addressed. This is the inconsistency between placing new windmills and the protection of the landscape. The implementation of mitigation measures also reveals other inconsistencies. For example, CO₂ storage in underground mines has raised worries about safety issues among the inhabitants above ground. Other practical inconsistencies are likely to appear at the time that other mitigation measures are being implemented.
- The provincial and municipal policy documents studied here pay explicit attention to reporting on policy implementation and the effects of these measures. Most of these monitoring and evaluations have yet to be implemented, so we cannot say anything on the effects on policy implementation or new policy.
- The studied plans require significant financial resources. This is usually specified as well. However, these resources are not completely available and require external financing by the state, EU, private companies, etc.

8 Case study: the Zuidplaspolder

8.1 The Zuidplaspolder: a typical case

The Zuidplaspolder, an area of reclaimed land lying in the triangle formed by the cities of Rotterdam, The Hague and Gouda, was the last peat bog to be drained by windmill-driven pumps in the nineteenth century. The polder is one of the deepest in Europe, about six metres below sea level. Because of its vicinity to the cities of Rotterdam and The Hague, the polder is considered as very suitable for the development of houses, greenhouses and industrial areas.

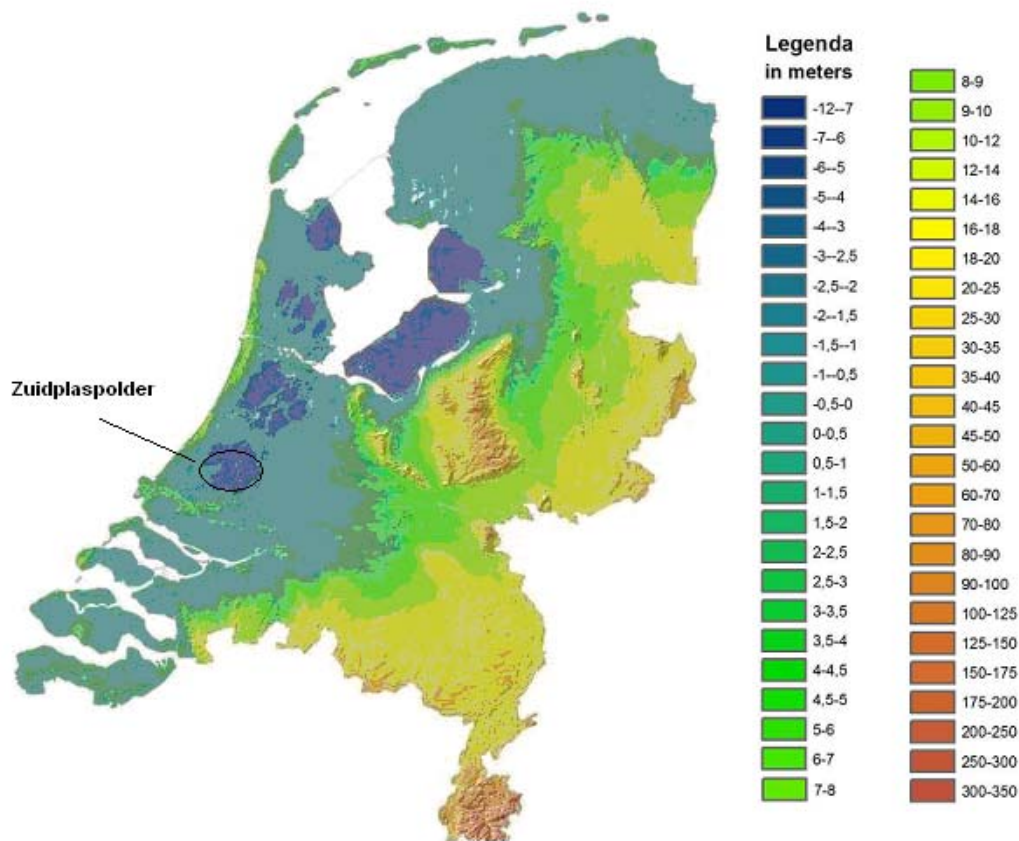


Figure 8.1 Elevation map of the Netherlands (AHN, 2008): the Zuidplaspolder represents the lowest area in the Netherlands.

The area's low elevation (see Figure 8.1) and the anticipated increased future risk of floods, combined with development pressures from Rotterdam and Gouda, have turned this area into one of the country's biggest adaptation challenges. But it is hardly alone: some 60% of the Netherlands, accounting for 70% of its gross domestic product, lies below sea level. As the climate warms and sea levels rise, the country aims to meet these challenges with a variety of approaches, ranging from complex engineering to 'natural'. The Zuidplaspolder is a case in point. As the lowest

real estate in one of the Netherlands' most vulnerable provinces, the Zuidplaspolder has become a test bed for factoring water and climate change into zoning and development plans.

8.2 History

In the sixteenth century, the Zuidplaspolder was still a swampy area with forests. Because of the high groundwater table, the area had developed a deep peat layer. When fuel was needed for various industrial activities in Gouda, the peat was harvested and dried to become fuel. First the peat layer above the water level was harvested but soon the peat layer below the water level was harvested too, leading to the development of a landscape of large lakes, divided by narrow dykes on which villages developed (see Figure 8.2).

In the seventeenth century, there were already private initiatives to turn the Zuidplas Lake into a polder, but the financial stakes were still too high. In 1816, King William I of the Netherlands commissioned a new plan. Since the King provided the money, the Zuidplaspolder can be deemed the first state polder.

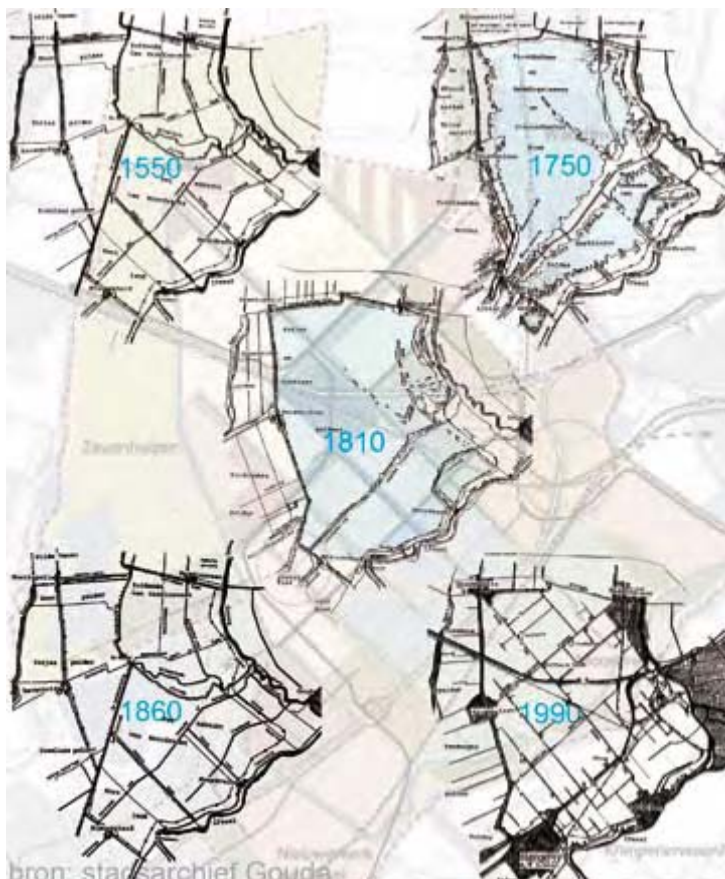


Figure 8.2 Development of the Zuidplaspolder (Xplorelab, 2007).

By means of windmills, water was pumped from the polder by a scoop or by a jack (propeller of Archimedes). Land below the water level was thus drained. The height at which a single windmill can pump the water is limited. By combining mills, each mill pumps water into a higher reservoir, with the last pumping it out to the river or lake (see Figure 8.3).

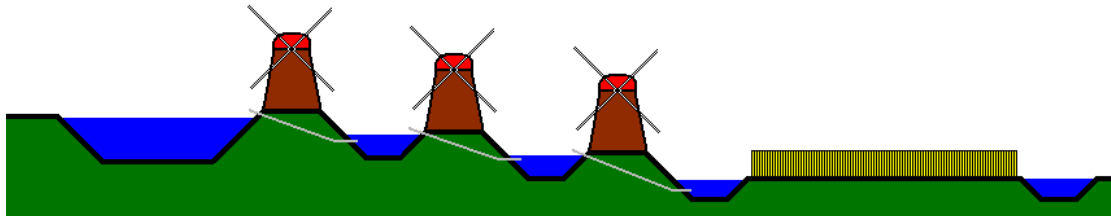


Figure 8.3 Creating a polder by means of windmills.

In addition to windmills, steam power, which was more reliable than windmill power, was used for the very first time. This gave the engineers the opportunity to ‘practise’ with the use of steam power which would later be used to pump the Haarlemmermeer polder dry. This technical innovation had barely any impact on the spatial design of the polder, as the ranks of mills and drainage pools were still essential. The drainage channels, together with the polder roadways, form an orthogonal main structure. In 1840, the lake was dry and the polder was formed.

Table 8.1 Land use in the Zuidplaspolder

Land use	%		Surface (ha)	%
Rural	82.5	Water	77	1.7
		Grassland	1702	38.3
		Arable agriculture	1392	31.4
		Orchards	33	0.0
		Greenhouse horticulture	394	8.9
		Forest and nature	83	1.9
Urban	9.4	Industrial area	134	3.0
		Residential area	283	6.4
Infrastructure	7.5	Roads and railways	334	7.5
Total			4432	99.4

Source: CBS statistiek 1997 Arc-view in Scheerder and Mispelaar 2001.

For a long time, the polder was primarily an agricultural area but, from the 1960s onwards, the landscape has increasingly accommodated other functions (see Table 8.1). In the northern section, more and more cultivation under glass has developed, and the main structure of the polder is criss-crossed by motorways and business parks. The polder is now characterised by intensive land use for arable farming and for cultivation under glass, alternating with church-centred villages. During recent decades, five of the six surrounding municipalities have extended their built-up areas into the polder. Businesses, glass nursery houses, dwellings, farms, nature and water are all jostling for space, the result being that the polder is developing as a fragmented landscape.

8.3 Physical characteristics

8.3.1 Soil

The soil of the Zuidplaspolder represents a transition from peat to clay (see Figure 8.4).

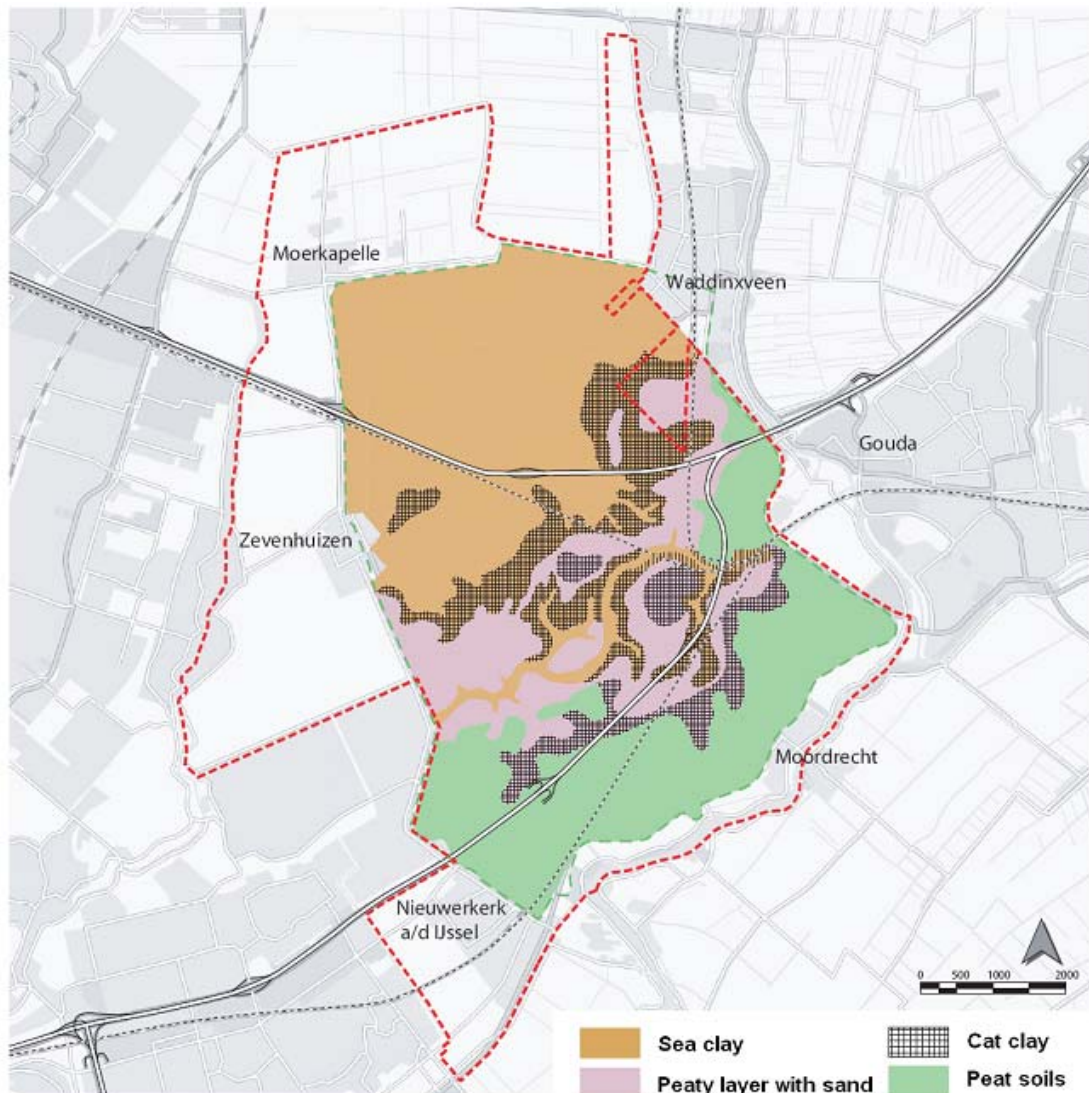


Figure 8.4 Soil map of the Zuidplaspolder (Province of South-Holland, 2006).

The soil map of the Zuidplaspolder portrays an image of the situation that formed the polder approximately 5,000 years ago. A layer of sea clay, six to eight metres thick, was deposited in that period. When this area was closed by a sea wall, a freshwater environment developed gradually. Consequently, water plants created moor and landmass. The Zuidplas took shape through excavation and dredging in the Middle Ages, but the 5,000 year old soil became visible after the lake was reclaimed in 1840. This forms the basis of the current soil use. The influence of the sea was strongest in the northwest part of the Zuidplas, as evidenced in the

uninterrupted sea clay layer up to the ground level. In contrast, the irregular influence of the sea in the southeast caused different layers of clay and moor. In the most south-easterly part of the Zuidplaspolder, there is no sea clay, only moor. In the middle of the polder, some creek ridges, consisting of sand, were left behind in the bedding of the creek about 5,000 years ago. Creek ridges lie a little higher than their surrounding area. This is because clay and peat settled further than sand during dehydration and reclamation. The creek ridges stand out on the soil map, but because of their height they are also visible in the field (Xplorelab, 2007).

8.3.2 Water management

Parts of the polder are subject to land subsidence. First of all, some of the observed land subsidence is due to time-lag effects from the last ice age (isostatic movement). Whereas Scandinavia is still moving upwards due to the melting of ice, large parts of the northern and western areas of the Netherlands are experiencing a land subsidence of several centimetres per century.

Second of all, the land in many places in the low-lying parts of the Netherlands is subsiding due to a settling of the clay and peat layers, and oxidation of peat (MNP, 2005). For agricultural land use, the water table has to be kept relatively low. As a result, in areas where the soil consists of peat, the peat oxidises and contributes to subsidence. Due to this subsidence, the ground level is lowering each year by seven to ten millimetres. Before the draining, the bottom of the lake was 5.9 metres below the main sea level. Nowadays, the surface level lies at 6.76 metres below sea level. Ground water is connected to the sea by subsoil water layers. Draining the polder results in those brackish layers coming to the surface and mixing with the fresh ground water. Seepage and several blows are the result. A boil (or blow) is a flow of soil, usually in the form of fine sand or silt. The flow is forced in by groundwater or water and air under pressure, called seepage. Boils arise in places where the soil is not 'heavy' enough, for example in ditches. The soil bursts up and groundwater comes into the surface water. The water, brackish and full of nutrients and iron, has a detrimental effect on the water quality. The sand has to be moved out each year to let the water in the ditches flow through. The water that comes out of the boil contains less oxygen and only becomes indistinguishable when the iron oxidises in the air. Raising the water level can create pressure against the seepage (Xplorelab, 2007).

Another important characteristic of the Zuidplaspolder in relation to water management is the fact that the polder is situated next to the Hollandse IJssel River, which is connected to the major rivers – the Meuse and the Rhine – in the delta and via them to the sea. A breach in the dyke would therefore have serious consequences.

8.3.3 Climate change

Because of the changing climate, the weather conditions will become more extreme: more rainfall in winter and extreme rain in summer. When wind directions change

because of the climate change, there will also be longer dry periods and the annual amount of precipitation will be less. Because of climate change, the issues to be dealt with include:

- Flooding due to heavy rainfall
- Drought and water seepage (partly brackish)
- Increase in sea level and flooding of rivers
- Land subsidence because of peat oxidation.

Because of the increasing developments in this part of the Netherlands and the more space needed to prevent water problems, a combination of land use is needed.

8.4 Policy integration and coherence in the Zuidplaspolder

8.4.1 Selection of the Zuidplaspolder as a location for urbanisation

Because of its low location and huge economic pressure, the Zuidplaspolder is extremely vulnerable to climate change. To make things worse, the polder is under tremendous pressure to urbanise. In 1998, the polder was designated a development area to meet the need for urban expansion (including greenhouse horticulture) in the southern part of the Randstad, where there was a great need for space for development. The Randstad, or rim city, is composed of a number of towns and cities – an urban network in the western Netherlands long before the term became fashionable. Calculations had shown that the need for housing would grow by approximately 14,000 houses per year till 2020, after which it would drop to 10,000 per year until 2030. The need for housing was so acute that it could not be accommodated within the boundaries of the Randstad area itself. That is why an appeal was made to develop areas on the borders of the Randstad area, such as the Zuidplaspolder. In the Kabinet Kok I (1994-1998), the Minister of Spatial Planning was requested to explore the space for development for the period 2010-2030. This study was, among others, undertaken in preparation of the Fifth National Spatial Planning Strategy (*Vijfde Nota Ruimtelijke Ordening*). Four areas were nominated as potential urbanisation sites:

1. the Zuidplaspolder,
2. the Hoeksche Waard,
3. the Green Heart (*Groene Hart*),
4. sites along the coast.

Out of these four areas, the Zuidplaspolder was selected as a location for urbanisation. The arguments for selecting the Zuidplaspolder related to landscape and risk. The Hoeksche Waard was rejected as a location for urbanisation because of its unique landscape value, having just been given the status of a National Landscape. The main objective for National Landscapes is the preservation and enforcement of the key landscape qualities such as historic elements, geomorphology, natural character and openness (Province of South-Holland, 2006).

The Green Heart was also rejected as a location for urbanisation. The Green Heart comprises the open area surrounding the Randstad. It is a relatively thinly populated area characterised by its rural nature, in contrast to the urban areas around it. In the 1950s, the Dutch government had already decided that the area between the cities of the Randstad Holland should, as far as possible, remain open. The Green Heart is special, because – in spite of its close proximity to the Randstad - in many respects it is an average Dutch region. Rural land use predominates. Density of population is 470 persons per km², as against 1,680 in the surrounding city regions. The Green Heart is, furthermore, one of the oldest man-made landscapes in the Netherlands. Originally, it was marshy and almost inaccessible. In the Middle Ages, the cities developed on the dry rim. Only later was the marshland reclaimed, mainly for agricultural purposes. Finally, the Green Heart is a habitat for flora and fauna enjoying international protection, such as meadow and water birds. The common spatial policy of the national and provincial governments for the Green Heart consists of two elements: restrictive policy and stimulation policy. The goal of the restrictive policy is to restrain the spatial expansion of housing and industry. The goal of the stimulation policy is to sustain and improve the green qualities of the area: nature, landscape, recreation and dairy farming (Faludi et al., 1996).

The area along the coast was considered less appropriate than the Zuidplaspolder because of the expected increasing sea level. The cost of building along the coast would be substantially higher than building in the Zuidplaspolder (Province of South-Holland, 2006).

Table 8.2 summarises the extent to which climate issues influenced the selection of the Zuidplaspolder as a site for urbanisation, as measured by the criteria used to assess the integration of climate policy (see section 2.1).

Table 8.2 Policy integration of climate change aims during the selection of the Zuidplaspolder as a location for urbanisation

Criterion	<i>Decision to develop Zuidplaspolder</i>
Inclusion	Climate change was not included as such; no specific studies were carried out.
Consistency	Climate change was considered less important than the landscape value of the Hoeksche Waard and the Green Heart. In relation to climate change, the risk of building in the Zuidplaspolder was considered less than building along the coast.
Weighting	Weighting was undertaken by the policymakers. There were no policy instruments for making this decision.
Reporting	The decision was communicated in the Fifth National Spatial Planning Strategy in 2001. It was re-evaluated several times later during discussions of the parliament. The Xplorelab study can also be seen as an evaluation.
Resources	<u>Finance</u> : not discussed. <u>Knowledge</u> : climate change experts were asked to give their expert opinion. No special studies were carried out.

Before selecting the Zuidplaspolder, experts on climate change were consulted with regard to the potential risks. This consultation did not include specific studies: interviewees were just asked for their expert opinion. The representative of the water board, interviewed on 5 August 2008 in Rotterdam, remembered:

Arguments relating to climate change only played a minor role in the selection of the Zuidplaspolder. Arguments relating to water safety also played only a minor role. Other areas such as the Hoeksche Waard and the Green Heart had more landscape value. The Zuidplaspolder is a rather fragmented landscape. That is why the Zuidplaspolder was selected.

The water board was aware of the nomination procedure. They did not object to the nomination because, according to them from a water management point of view, the Zuidplaspolder is perfectly safe. The decision about the different locations was not influenced by the depth of the polder because basically all locations are below sea level. In 2001, the Fifth National Spatial Planning Strategy nominated the Zuidplaspolder as one of the areas for urbanisation.

8.4.2 The master plans

After the publication of the Fifth National Spatial Planning Strategy, the provincial council took the initiative in setting up a multi-actor platform in 2002. This multi-actor platform, called the Steering Committee Triangle Rotterdam-Zoetermeer-Gouda (RZG), was responsible for coordinating the developments in the Zuidplaspolder. The Steering Committee Triangle RZG had to function with a framework determined by the national government, which stated that a balance had to be maintained between housing and economic development, and an optimal coordination was required between urbanisation, water management, soil management, green space and greenhouse horticulture (see Van Pelt & Hoekstra, 2003). The most important points of departure were:

1. Polders such as the Zuidplaspolder are more suitable for urbanisation than peat grassland areas
2. The triangle RZG does not need new regional centres so urbanisation should serve existing centres
3. The Zuidplaspolder needs more 'green infrastructure' (space for nature)
4. The triangle, being part of the provincial axis of greenhouse horticulture, has to offer space to greenhouse horticulture
5. Plans for the Eendragtspolder (part of the Zuidplaspolder) should prioritise water retention and recreation
6. Plans for the Tweemanspolder and the Wilde Veenen (also part of the Zuidplaspolder) should prioritise agriculture
7. Accessibility of the Zuidplaspolder requires a concentration of infrastructure but also additional connections. This applies to roads as well as to public transport
8. Accessibility of the Zuidplaspolder requires investments in roads for which a separation of local/regional traffic and other traffic is most cost effective
9. Accessibility of the Zuidplaspolder requires investment in public transport.

The multi-actor platform consisted of 23 actors: various local governments, planners, water managers, transport companies, transportation managers, farming pressure groups and nature conservationists. The involvement of interest groups and the commercial sectors was based on the belief that the government acting alone would

not be able to address all public interests. Rather, there was a clear role for the public and the commercial parties who would actually use the space developed.

The Steering Committee Triangle RZG had to draw up a master plan for the area in which economic activities (among others greenhouse horticulture and urbanisation) could go hand in hand with societal demands (Province of South-Holland, 2007c). This caused tensions between different, uncoordinated policy fields such as water, nature conservation, recreation, housing and transport (infrastructure). Though space was needed for water storage (necessary in the face of climate change), space was also required for the construction of roads and railways, for nature, new housing, and so on. Another complicating factor was that agriculture, which – since time immemorial - had largely determined the appearance of the Dutch countryside, was now under pressure. Subsidies were being wound down, and agriculture was increasingly regarded as an economic activity which had to pay its own way on the open market. The challenge was to find a development strategy for the Zuidplaspolder which would address the changing circumstances and requirements, while respecting those qualities which the Dutch as a society wished to retain. The stakeholders in the Zuidplaspolder were struggling with:

- How to combine the prevention of further land subsidence with the increased demand for housing in the peat areas
- How to combine water treatment (locally) with measures to prevent and combat desiccation (in an affordable way and within the framework of the EU Water Framework Directive)
- How to combine water retention (for example water retention in 15% of the most low-lying areas) with urbanisation.

To prevent conflicts, the steering committee decided to take a so-called layer approach. This layer approach is a new instrument in Dutch planning. It assumes that land use in the Netherlands may be regarded as consisting of three layers:

- The first layer is formed by the land surface and consists of water, soil, and the flora and fauna of the areas
- The second layer is formed by networks, namely, the physical network of railways, roads and waterways
- The third layer is formed by a pattern of land use such as agriculture, housing, nature, etc.

One cannot regard these three layers as completely independent, because they all interact with each other. The idea is that involving all three layers in spatial planning can prevent conflicts between different users of the same land, as well as create greater coherence in the measures to be taken. In Dutch planning, urbanisation, intensive agriculture and other forms of occupation are often regarded as separate, unrelated elements, without sufficient consideration for the demands created by the other layers. In the Zuidplaspolder – perhaps because of its low elevation - there was a strong awareness among the actors that water could also set intrusive constraints on long-term, sustainable location policies. They knew that they had to take into account slowly developing trends such as rising sea levels, higher levels of water discharge and more precipitation. They therefore decided to give consideration to the

properties and functions of the surface layer and the network layer, as well as the structural significance of both layers. The environmental circumstances formed the point of departure to plan human land use.

Although it is not true, common sense suggests that the low elevation of the Zuidplaspolder implies higher risks of flooding. This turned out to be an advantage in relation to climate proofing the vision. That is probably why the interests of water management were taken seriously right from the start. (Representative of the water board, interviewed on 5 August 2008 in Rotterdam)

During the formulation of the master plan, the steering committee explicitly took climate change into account. They used the climate change scenarios of the Royal Netherlands Meteorological Institute (KNMI) to formulate their vision. The climate change scenarios that they had used had been prepared in the context of Water Management in the 21st Century (WB21) (Können, 2001; Beersma & Buishand, 2002). The steering committee decided to make the formulation of their plans climate proof in relation to the scenario called ‘central’ (see Table 8.3).

Table 8.3 Collection of variables according to the WB21 scenarios and later variants

Variable	low	central	high	change of Atlantic circulation	high dry
Annual mean temperature in 2050 (°C)	+0.5	+1	+2	-2	+2
Annual mean precipitation (%)	+1.5	+3	+6	-6	-10
Summer precipitation (%)	+0.5	+1	+2	-2	-10
Winter precipitation (%)	+3	+6	+12	-12	-10
10day precipitation sum (%)	+5	+10	+20	-20	-10
Return period of 1/100 yr daily precipitation sum (yr)	90	78	62	-	200
Annual evaporation (%)	+2	+4	+8	-8	+8
Sea level rise (cm)	+10	+25	+45	-	+45
Intensity of high wind speed and gales (%)	±5	±5	±5	-	0 - -10

Source: Können 2001; Beersma & Buishand 2002.

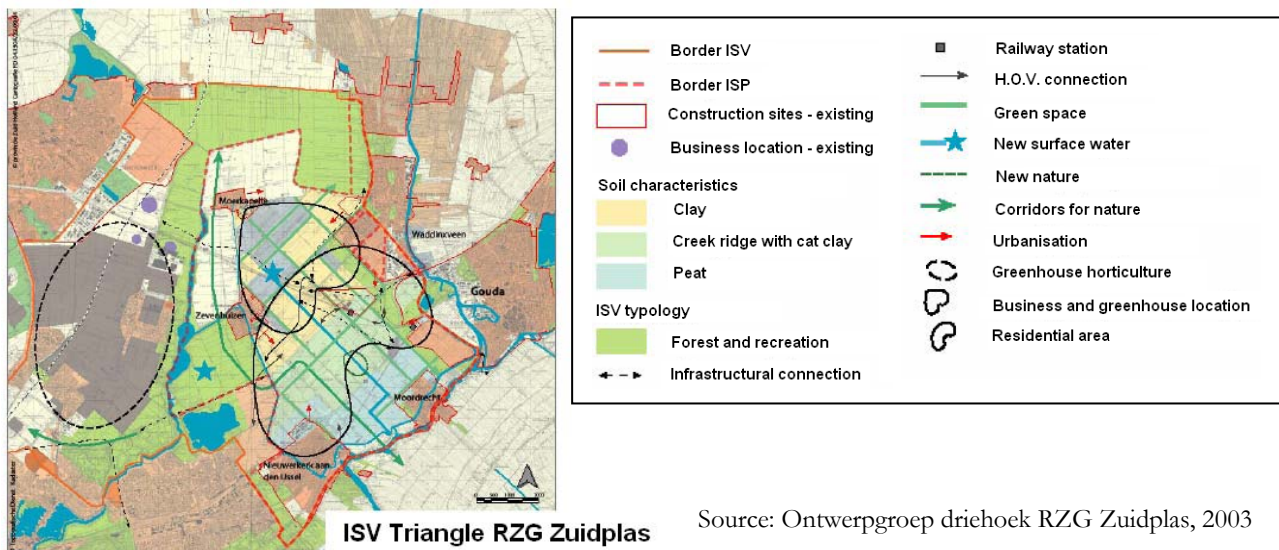
The layer approach led to a distinction between three different environmental landscapes in the Zuidplaspolder:

1. In the northern part, the soil of the Zuidplaspolder consists of clay. In this part, space is allocated to urban functions such as greenhouse horticulture, housing and industrial areas.
2. In the middle part, the soil of the Zuidplaspolder consists in the higher areas of partly oxidised estuarine sediments or cat clay (*katteklei*) and in the lower areas, of former creeks. In the higher parts, space is allocated to housing. In the lower parts, space is allocated to nature and water.
3. In the southern part, the soil of the Zuidplaspolder consists of patches of peat (*restveen*). These will be used for water retention, nature and recreation. On the higher areas, housing is possible (Province of South-Holland, 2006).

8.4.2.1 The interregional organisational vision

In 2004, the multi-actor platform developed a master plan for the Zuidplaspolder area called the Interregional Organisational Vision (*Interregionale Structuurvisie* or ISV) (see Figure 8.5). The ISV features agreements on:

- the number of houses to be built, the number and size of business locations, and the number and size of greenhouses;
- the way in which the area should develop its infrastructure (railways, roads and waterways);
- space for nature conservation and development;
- the projects that are needed to guide development in the area.



Source: Ontwerpgroep driehoek RZG Zuidplas, 2003

Figure 8.5 The ISV map of the Zuidplaspolder.

For the period 2010-2020, the plan contains proposals to build 15,000-30,000 houses, 125 hectares of business area, 280 hectares of greenhouse area, 500 hectares of ecological development, space for water storage and improvement of the infrastructure. The unity of the polder is guaranteed by a main plan structure, in which spatial structured elements such as the avenues, lane, canals and the circular canal.

The ISV is accompanied by a financial plan. This means that part of the money that is earned by real estate development (building of houses and business locations) is spent on buying land from farmers for nature development and water storage. (Project leader of Xplorelab, interviewed on 27 July 2008 in Wageningen)

In the project, a fund (regional development authority) is established which makes it possible to divide the costs over the different parties equally (Xplorelab, 2007).

8.4.2.2 The intermunicipal organisational plan and the spatial plan

On the basis of the ISV master plan, two new plans were formulated:

- The Intermunicipal Organisational Plan (*Intergemeentelijke Structuurplan*) or ISP signed by the five municipalities in the Zuidplaspolder in January 2006
- A revision of the Spatial Plan for South-Holland East, approved of by the provincial government in May 2006.

These two plans frame the boundaries within which development in the Zuidplaspolder has to take place. To formulate the Intermunicipal Organisational Plan and to revise the Spatial Plan for South-Holland East, the number of actors on the multi-actor platform had to be reduced from 23 to 8. The ISP Steering Committee consisted of representatives from:

- The five municipalities in the Zuidplaspolder
- The Province of South-Holland
- The municipality of Rotterdam (stakeholder with regard to spatial planning of urbanisation areas in the Randstad region)
- The water board (regional authority responsible for water management both water quantity and water quality).

The eight actors that remained were first and foremost government/policy actors. Because the policy actors wanted to keep their internal conflicts from the other private actors, they decided to formulate the Intermunicipal Organisational Plan and to revise the Spatial Plan for South-Holland East on their own. There was a fear that the commercial parties might try to influence the planning process. They feared that, if the private actors were involved, wrong expectations could be created that could subsequently not be met. They feared that, in such a situation, the private actors might even start lawsuits, thereby delaying the process. Therefore, they only wanted to start public-private cooperation after the public negotiations had been settled. The reason given for this decision was that the Intermunicipal Organisational Plan and the revision of the spatial plan were administrative issues which involved administrative negotiations, but especially the real estate developers, who had become powerful actors in the Zuidplaspolder, were not amused at being formally excluded.

During the process of formulating the ISP, the original 23-actor platform was renamed the Forum. They kept meeting regularly to monitor the progress of the ISP platform and to make sure that the agreements in the ISV were indeed formalised in the ISP. In addition, the ISP project organisation organised large public meetings (at least once or twice a year) to report their progress and to give other actors the opportunity to respond to their ideas. Last but not least, private actors were invited to participate in project teams to develop the ideas for specific parts of the area. That is how the environmental movement came to play an important role in the development of the green space in the Zuidplaspolder, and how the ISP project team tried to involve private actors in the process and keep them on board.

The ISP can be seen as an agreement among municipalities to mainstream their municipal spatial policy. The ISP does not have legal status. Each municipality has to formulate its own zoning plan on the basis of which the ISP can have legal consequences. As the ISP was being developed, the Spatial Plan for South-Holland East was revised by the Province of South-Holland in order to accommodate the new development in the Zuidplaspolder. In contrast to the ISP, the Spatial Plan does have legal status. It forms the basis for the development of the municipal zoning plans.

The ISV had set the several quantitative goals for the ISP and the revision of the Spatial Plan for South-Holland East (see Table 8.4).

Table 8.4 Quantitative goals set by the ISV for the ISP and the revision of the spatial plan

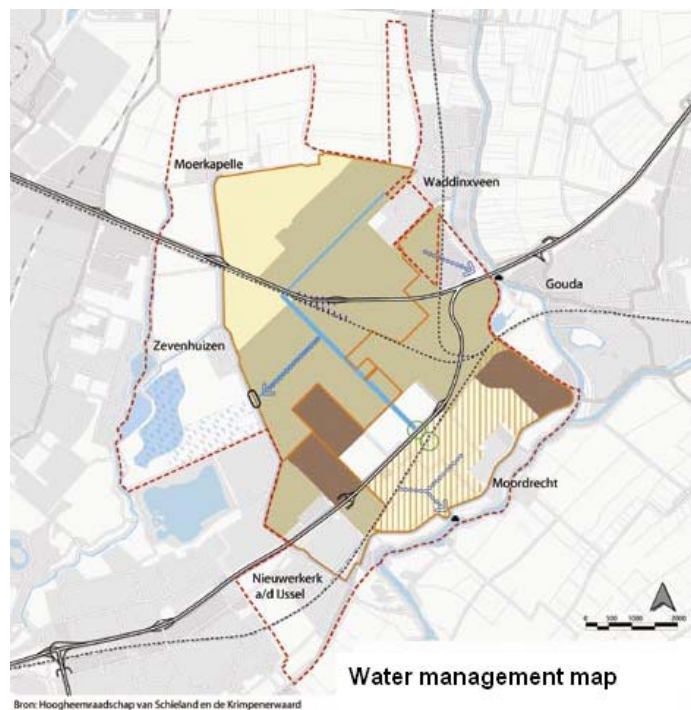
Quantitative goals for the ISP and the revision of the spatial plan	
Housing	Space for the development of 15,000 to 30,000 houses. Until the year 2020, the plan is to build 15,000 houses, of which 5,000 to 10,000 are located in the region of Rotterdam. Some of the other housing locations are planned in the Zuidplaspolder.
Business locations	150-300 ha are reserved for the development of business locations for the period 2010-2020, 125 ha of which have to be realised by 2020.
Greenhouse horticulture	280 ha are reserved for greenhouse horticulture. 80 ha are reserved for relocation of greenhouse horticulture.
Nature	Development of 325 ha of nature in the peat-land area and the middle part
Infrastructure	Space for 50 ha of infrastructure.
Recreation	In the Eendrachtspolder, 150 ha are reserved for the development of recreational facilities.
Water retention	150 ha in the Eendrachtspolder are reserved for water retention.

During the formulation of the ISV, there were conflicts of interest especially between the smaller municipalities in the Zuidplaspolder and the large city of Rotterdam. Rotterdam was confronted with migration of inhabitants from the city centre to other places, thereby leading to degradation of the city centre. It therefore wanted less development of new housing in the Zuidplaspolder in order to prevent migration of its population from the city centre to the new residential areas. The smaller municipalities in the Zuidplaspolder were in favour of the development of the new residential areas. Negotiations started with regard to where and how many new residential areas should be developed. This resulted in a compromise: the multi-actor platform decided to start a phased development. This phased development of real estate in the Zuidplaspolder is planned to start in 2010. From 2010 onwards, the polder will transform from an agricultural area into a residential area with recreational possibilities. In the first phase (2010-2020), the first of the urban residential areas will be built. Also, the first part of the greenhouse horticultural locations and the first part of the business locations will be developed. In the second phase (2020-2030), the development of the Zuidplaspolder will be completed. The exact form of the developments in this second phase remains to be decided on the basis of future developments.

At first, the plans included the development of 30,000 new houses. Now this number has been reduced. They want to start with 7,000 and then they want to re-evaluate the situation. But if you build fewer houses, there will also be less revenue to, for example, buy agricultural land or develop nature. So even the environmental organisations are not pleased with the change in plan. The ISP has high ambitions but it remains to be seen if they can realise these. (Project leader of Xporelab, interviewed on 24 July 2008 in Wageningen)

Although the quantity of planned houses in the first phase has been reduced, at the same time the quality of the houses has been increased. The new plan for 7,000 houses still has a high potential to finance the planned infrastructure (roads, cycle paths, public transport, waterways and green space). (Project leader Zuidplaspolder, email on 23 October 2008)

This shows that, although there is some worry among stakeholders with regard to the financial viability of the plan, the flexibility of the ISP compensates for this. Because of this flexibility, the discussions with Rotterdam could be accommodated in the plan.



Indication of surface of open water (%) to be created for each ha. developed as residential area, business location or greenhouse location

5 - 10%
app. 10%
app. 15%

→ Advised direction of water drainage

Source: Province of South-Holland, 2006

Figure 8.6 Water management map.

The residential areas will be designed by the developers, but under the conditions set by the water board. During the formulation of the ISP, research carried out with regard to the effects of a breach of the Gouwe and/or the Hollandse IJssel dykes showed that only the southern part of the polder would suffer from flooding. This supported the decision to plan new residential and business areas not in the south but in the middle or the north. In addition, the water board calculated how much space for water retention was needed to compensate for the new paved area. This space was calculated on the basis of land use and soil characteristics. It turned out that, depending on current land use, between 5% and 15% of open water had to be created for each hectare developed, in order to prevent flooding in the event of heavy rain (see Figure 8.6). In terms of water management, flooding caused by heavy rain does not present a major obstacle to the water board. A bigger challenge is provided by desiccation. During dry summers, the water board will have to pump water into the Zuidplaspolder in order to prevent the soil becoming too dry. In the southern part (the peat area) in particular, this could have major consequences especially in the peat patches. Since peat has a relatively low specific weight, it runs a high risk of being pushed aside by water pressure. This threat becomes more real when water tables drop in dry periods – peat contains a large amount of water and organic material. The chances of the peat then being pushed aside because of the water pressure is very high. To prevent these problems, water from outside the area (from the Hollandse IJssel) will have to be pumped in. However, during dry spells, the water in the Hollandse IJssel is much saltier than usual. When the water table of the Hollandse IJssel is low, the salt water from the sea goes further into the river than usual. So, if this water is used, the Zuidplaspolder too will experience brackish water. This will have consequences for nature and agriculture; or as the representative of the water board, interviewed on 5 August 2008 in Rotterdam, stated:

In relation to climate change, desiccation presents a greater challenge to us in terms of water management than flooding.

Table 8.5 provides an overview of the integration of climate change aims in these regional plans with reference to the criteria specified to assess policy integration (see section 2.1).

After the formulation of the Intermunicipal Organisational Plan and the revision of the Spatial Plan for South-Holland East, the province took a step back. The central idea was that area development in the urban setting was a matter for local governments, who were well equipped to do so with their powers in respect of land management and their specialised land departments. Almost all municipalities in the Netherlands have a land management department and many are used to buying and selling land for development. The province is only responsible for broad policy, for regional issues such as nature conservation and infrastructure. It has passed the responsibility for local planning on to the municipalities, which are now working very hard on the formulation of regional spatial plans. It is at this point that the real estate developers joined the process again. During the negotiations from which they had been excluded, they organised themselves and, as soon as they could, they jumped in to design plans for building in a climate-proof way.

Table 8.5 Policy integration of climate change aims in the ISV, ISP and the revised Spatial Plan for South-Holland East

Criterion	Regional plans: the ISV, the ISP and the revision of the Spatial Plan of South-Holland East
Inclusion	Climate change was included by climate proofing the plans according to the KNMI WB21 central scenario (see Table 8.3). This means climate change adaptation goals were taken into account.
Consistency	The layer approach implies that other goals such as infrastructure or housing can only be met if environmental goals – including climate adaptation in terms of water management - are met.
Weighting	The designs took a so-called layer approach. The Interregional Organisational Vision is based on a design that starts from the opportunities and constraints offered by the environmental conditions (soil, geomorphology, water system, landscape, nature). It then proceeds to design the infrastructural network and the areas for living and working on the basis of these environmental conditions.
Reporting	The ISV was evaluated by means of an Environmental Impact Assessment.
Resources	<u>Financing</u> : The financing of the plans is made possible by selling land to real estate developers. Now that the demand for housing is decreasing and fewer houses will be built in the coming few years, this may jeopardise the other plans for the area. <u>Knowledge</u> : Experts on water management were given an important voice in the process.

8.4.2.3 The strategic environmental assessment

The ISP master plan and the revision of the Spatial Plan for South-Holland East were evaluated by means of a Strategic Environmental Assessment (SEA) in 2006. The SEA evaluated the role that the environment (green space, water, infrastructure and housing) had played in the formulation of the ISP and the revision of the Spatial Plan for South-Holland East as well as the potential environmental effect of the plans. Two kinds of issues were important for the SEA: first of all, issues relating to ‘green’ space (nature and landscape), ‘blue’ space (water) and ‘red’ space (infrastructure, greenhouse horticulture, housing, industrial areas); second of all, issues relating to the planning of these functions.

The SEA firstly assessed the ISP master plan and the revision of the Spatial Plan for South-Holland East in terms of their spatial quality. It evaluated whether the plans had used the ecological potential, whether water and infrastructure contributed to the design of the area and whether the plans had optimally integrated the various functions in multifunctional land use. Secondly, the SEA assessed the plans in terms of their physical and chemical qualities. It evaluated whether the ISP master plan and the revision of the Spatial Plan for South-Holland East did enough to prevent or to minimise environmental damage. Thirdly, the SEA assessed the ISP master plan and the revision of the Spatial Plan for South-Holland East in terms of their social and economic quality. It evaluated whether the plans used or even strengthened the cultural identity of the Zuidplaspolder and whether they took social and economic interests sufficiently into account (Province of South-Holland, 2006).

The SEA concluded that the plans had used the environmental potential of the Zuidplaspolder. Everything seemed to be fine, but this did not last not for long.

8.5 The Zuidplaspolder as a hotspot

In 2007, a new political discussion started. The climate change hype had caught on in the Netherlands. Al Gore had published his book and his movie was showing in all cinemas. In addition, a new ruling coalition had just hammered out the policies that would be pursued for the next four years (see Chapter 5). This new coalition was substantially greener than the previous one.

In this context, several actors that had been excluded from the formulation of the ISV and the ISP took the opportunity to oppose the plans. These were first and foremost people who opposed the Zuidplaspolder becoming a location for urbanisation, because they feared that this would destroy the traditional polder landscape. They would have preferred the Zuidplaspolder to remain part of the Green Heart. However, they used arguments relating to climate change to argue that the Zuidplaspolder was not a safe area in which to live. They posed questions in the media such as: How climate proof are these plans? Is it really wise to develop a new urban area in the lowest polder in the Netherlands? Wouldn't the risk of flooding be too high in the event of a dyke breach? What about the risk of flooding in relation to increased precipitation? Wouldn't the polder turn into a big bathtub? How much would it cost to keep the polder dry in order to develop a residential area in this polder? So the actors with an interest in landscape values used climate change as a means to reach their goals.

As a result of the discussions in the media, members of the Labour Party (PvdA) also started questioning the plans in the Zuidplaspolder. The discussion became political. In response, the Province of South-Holland decided to ask an independent research organisation (Xplorelab) for a second opinion as to whether the plans were climate proof. Xplorelab was charged with performing a climate appraisal using the latest climate scenarios, in particular for the longer term (to 2100). Xplorelab contacted the research programme Climate for Space and Zuidplaspolder became one of the hotspots⁶ of the Climate for Space programme. This means that most of the work in this project was carried out by practitioners working in the field. The Zuidplaspolder hotspot project was implemented by a consortium and ran for one year. Schieland en de Krimpernerwaard regional water board and ConSept worked alongside Zuid-Holland provincial council on sub-studies within the project. Wageningen, Delft and Amsterdam (VU) universities provided the academic input.

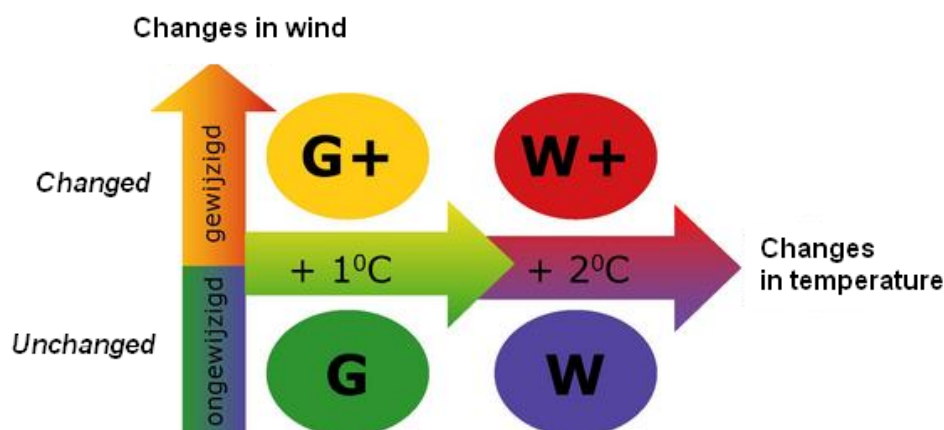
Xplorelab used the latest climate scenarios of the Royal Dutch Meteorological Institute (KNMI) to evaluate how climate proof the plans were. These scenarios

⁶ Hotspots are practice-based projects within the Knowledge for Climate research programme (KforC, 2008) in which spatial planning and climate change play an important role, and conflicts of interest are found between climate change goals and other goals. Efforts are made to find spatial adaptation possibilities within potential hotspots and learn from these experiences.

distinguished between rise in temperature and changes in the wind (see Figure 8.7). The Royal Dutch Meteorological Institute published these scenarios in 2006 and indicated that these had equal probability.

Xplorelab (in a report as yet unpublished) concluded that the existing plans had done well by taking the risk of flooding into account through the use of the 'layer' or 'strata' planning methodology and thereby climate proofing the plans. In relation to risk of flooding, Xplorelab concluded that there is no direct relationship between Zuidplaspolder being one of the lowest areas in the Netherlands and an increased risk of flooding. The risk of flooding relates to 1) the distance to the river or sea, 2) the risk of a dyke breach and 3) the inundation level of water in the polder in the event of flooding. With regard to the distance to the river or sea, indeed the Zuidplaspolder is located alongside the Hollandse IJssel River, which is connected to the major rivers (Meuse and Rhine) in the delta and via them to the sea, but the Hollandse IJssel does not actively transport water from the Rhine anymore. It is a so-called sleeping river. A movable storm surge barrier has been built where the Hollandse IJssel meets the sea. The double storm surge barrier consists of two steel screens 80 metres wide. These screens hang between two lift towers. In the event of unusual circumstances, these screens are let down into the water. In addition, the Zuidplaspolder is surrounded by a dyke. Statistically, the risk of a dyke breach is very low: on average only once every 10,000 years is a dyke breach expected to occur. Some other polders are much more dangerous to live in: some of their dykes have a statistical probability of breaching once every 2,000 years. Their probability of flooding is five times higher than that of the Zuidplaspolder. In relation to the height of the water level, in the event of a failure of the sea surge barrier and a dyke breach, the water level in the Zuidplaspolder is expected to rise to 1.3 metres. As most houses are built on mounds that are 1.5 metres high, flooding will cause damage but will not be life threatening. The polder will not fill like a bathtub up to a water level of eight metres. So, from a climate change perspective, the water board felt that it would be perfectly safe to build houses in the Zuidplaspolder.

Xplorelab concluded that the plans for the Zuidplaspolder were indeed climate proof with regard to flooding for three of the KNMI scenarios. Only in the event of the most extreme scenario (the W+ scenario) would additional measures have to be taken. Xplorelab also concluded that the phased development of residential areas in the Zuidplaspolder would offer enough adaptation space to adapt to the most extreme scenario if needed. So the phased development was desirable from a climate adaptation point of view. With regard to climate change adaptation in relation to nature conservation (corridors), water quality (higher temperatures and therefore higher risk of toxic blue-green algae) and siltation, Xplorelab made some recommendations to improve adaptation to climate change.



Code	Name	Description
G	Moderate	1°C temperature rise no change in wind direction
G+	Moderate +	1°C temperature rise + winters are more moderate and wetter due to western winds + summers are hotter and dryer due to eastern winds
W	Warm	2°C temperature increase no change in wind direction
W+	Warm +	2°C temperature increase + winters are more moderate and wetter due to western winds + summers are hotter and dryer due to eastern winds

Figure 8.7 KNMI climate scenarios 2006.

Table 8.6 summarises climate policy integration in the Xplorlab re-evaluation with reference to the criteria used to assess such integration (see section 2.1).

Table 8.6 Policy integration of climate change aims in the Xplorlab re-evaluation

Criterion	Xplorlab re-evaluation
Inclusion	Climate change was explicitly included. In fact evaluating whether the ISV and ISP were climate proof was an explicit aim of the re-evaluation.
Consistency	Consistency of climate change goals was not relevant. This had already been dealt with in the ISV and ISP.
Weighting	Weighting of climate change goals was not relevant. This had already been dealt with in the ISV and ISP.
Reporting	The Xplorlab re-evaluation can be seen as an evaluation of the ISV and ISP.
Resources	<u>Financing</u> : not mentioned. <u>Knowledge</u> : the re-evaluation used scientific knowledge as a resource by linking up to the Space for Climate programme. The Zuidplaspolder was nominated as a hotspot.

That is the point we are at now. In less than five years, the actors in the Zuidplaspolder have managed to turn a complex dilemma into an interesting opportunity. It is the first regional project in the Netherlands to use soil characteristics to determine where residential areas and greenhouses could best be planned, and which part of the area could best be used for water retention and nature. This is a direct consequence of the way in which the Zuidplaspolder is adapting to climate change. Meanwhile, local actors are looking for new solutions to

the problem of climate change. This is resulting in innovative experiments. One of these projects is the 'greenhouse village'. In this project, greenhouse horticulture is linked to residential areas and thereby all circles (nutrients, heating, etc.) are closed (see Box 8.1)

8.6 Conclusion

The degree to which climate change adaptation or mitigation are included in the decision-making process depends on the stage of the process. In the initial decision to develop the Zuidplaspolder, climate change was not really an issue at that time. The decision was made on the basis of landscape arguments and economic arguments. Although some experts were briefly consulted, no studies were carried out and neither was the decision evaluated in terms of whether it was climate proof. When the political discussion about climate change gained momentum in 2007, the research by Xplorelab – in a way - evaluated this decision: if the Xplorelab's study had shown that the plans for the Zuidplaspolder were not climate proof, then the whole project could have been cancelled.

When the plans for the Zuidplaspolder – the ISV and the ISP - were developed, a so-called layer approach was used. This layer approach took the surface land area – which involves water, soil, and the flora and fauna - as its point of departure. On this basis, the next layer, namely that of infrastructure and housing, was planned. It was assumed that the abiotic conditions set the conditions for the planning of infrastructure and housing. The layer approach does not include specific climate change adaptation measures. The ISV and the ISP were evaluated by means of an Environmental Impact Assessment which did not specifically include climate change adaptation or mitigation indicators either. After that, specific local plans were developed for the residential areas. The plans are subject to the Water Test. This test evaluates, among other things, whether the plans meet the requirement of good water management. For example, each hectare of residential area must have at least 10% of open water. This open water is meant to function as a buffer in the event of heavy rains. So climate change adaptation and mitigation measures are taken into account in these plans to the extent that it is legally required. However, on a local level, there are also interesting experiments such as the Greenhouse Village, or experiments with new building techniques.

In 2007, the ISV and the ISP were re-evaluated in the as-yet-unpublished Xplorelab study in order to determine whether the plans were sufficiently climate proof. Xplorelab concluded that the plans were climate proof in relation to the latest KNMI climate change scenarios, even though climate change had never been an explicit part of the plans. This shows that climate change adaptation may be a new discourse but it is not a new practice. It supports our earlier findings that water management practices and climate change adaptation measures are two sides of the same coin.

This case study has allowed us to gain a heightened understanding of the manifestations of policy integration and coherence in practice. It shows how decisions are taken in practice and how different policy goals are weighted.

Box 8.1 The Greenhouse Village

The Dutch greenhouse business is well known for its large stake in world supply of cultivated flowers, plants and vegetables. In the Netherlands, greenhouse cultivation largely depends on natural gas: Dutch greenhouses account for almost 10% of national natural gas consumption. With increasing environmental awareness and rising fuel prices, new methods are being developed to reduce dependence on natural gas. The Dutch greenhouse business is at the cutting edge in the use of innovative technologies for energy, water and climate control. New greenhouse designs appear in which fossil fuel dependency is largely reduced. Instead, these greenhouses are transformed into sources of sustainable energy (InnovationNetwork, 2007).

One of these experiments is the 'solar mound'. The solar mound consists of a few dozen to hundreds of houses connected to a glasshouse. As well as providing food, the glasshouse supplies the neighbourhood with energy and serves to process waste and purify the water. The design is based on an innovative greenhouse that captures the excess heat from solar radiation during summer. The heat is stored in underground natural water reservoirs (aquifers) and used for heating the greenhouse at night or during the winter. Energy balances show that there is sufficient energy left to heat a large number of houses (a 2 ha greenhouse can heat up to 200 houses). In addition, the greenhouse supplies tap water, treats wastewater and produces electricity. The whole complex is self-sufficient in energy and water and recycles nutrients and carbon. Studies were carried out (in Huissen, Westland, Nieuwveen and Dantumadeel) on the feasibility of the solar mound in 2006. A document on a sustainable public utilities structure for the Zuidplaspolder was also published. In 2006, the rose growers' glasshouse in Nieuwveen was adapted. In 2007 and 2008 heat was supplied to 83 dwellings belonging to the Vestia housing association. In Huissen, the local council has decided that future extensions of residential housing and glasshouses must conform to the solar mound concept. In Waddinxveen, the horticultural businesses are collaborating on a tender to supply heat to approximately 2,750 dwellings in the future (InnovationNetwork, 2007).

Greenhouse Village does not require external energy supply, either for heating, cooling or electricity. Moreover, all of the energy used comes from renewable energy sources (solar and biomass). Only low volumes of external water are needed (for which rain water can be used), and wastewater and green wastes are locally treated and reused. Both the carbon and the nutrient cycles are closed. As a consequence, the environmental benefits are significant (InnovationNetwork, 2007).

The project management have to involve the various stakeholders (project developer, future house owners, greenhouse companies, local authorities, etc.) from the start of the project. This intense form of integration is challenging, because house owners and greenhouse owners are different parties in most practical situations. The project management have to look for the mutual and conflicting interests and have to make arrangements and rules to ensure the functioning of the complex as a whole. In this situation the economic and/or organisational optimum does not necessarily comply with the ecological optimum (InnovationNetwork, 2007)

The first energy-producing greenhouses were established in 2007. They received a lot of media coverage and attracted the attention of members of the Dutch parliament. The results are above expectations: the energy-producing greenhouses increased their vegetable harvests by 20% and reduced their use of fossil fuels by 100% (InnovationNetwork, 2007).

9 Conclusions and reflection

9.1 Introduction

The conclusions re-visit the three objectives of the project:

1. Assess the degree of policy integration in different policy sectors and determine key coherence problems between climate policies and other policies;
2. Suggest means to enhance climate policy integration and improve policy coherence;
3. Develop concepts and methods by which policy integration, coherence and governance can be studied.

In our introduction we stated that this research aimed to increase understanding of the features and preconditions for better integrated and more coherent policies and governance processes. In addition, the goal was also prescriptive, i.e. which methods, approaches and institutions, at different levels, could contribute to fostering understanding of climate policy integration and to increasing coherence.

In this chapter, we start with our main conclusions on the integration of climate change in Dutch government policy (section 9.2). Next, we address policy coherence and the means that have been used to stimulate coherence (section 9.3). Finally, we reflect on our conclusions and formulate some recommendations (section 9.4) .

9.2 Policy integration

We start by assessing the degree of policy integration in different policy sectors with reference to the criteria introduced in Chapter 2: inclusion, consistency, weighing, reporting and resources.

9.2.1 Inclusion

In recent years, climate change has been included in national and regional governments' programmes and in different policy sectors (energy, traffic, water, spatial planning and education). This implies that both adaptation and mitigation have been recognised as important national, regional and local policy issues in the Netherlands. Mitigating climate change is about preventing climate change and has a long history in Dutch national policy. Adaptation to climate change is about adapting to the consequences of climate change and has only recently become an explicit policy issue. Until 2004-2006, there was a taboo on climate adaptation among climate policy makers and activists because they felt that an adaptation strategy would imply that climate change would be accepted. This taboo has vanished in the last three to four years, and adaptation, and meanwhile also mitigation, have gained considerable political and societal attention in these years. This growing attention on these climate

issues does not mean that climate policy did not exist previously, it was just framed differently. The main difference is perhaps that the old climate policy was framed as environmental policy, energy policy and emissions policy (mitigation) and water policy (adaptation). This early integration of climate change into water policy also means that adaptation policy existed even before it was actually framed as such.

The recent national mitigation strategy has mainly strengthened the focus on climate change and CO₂ reduction within the existing environmental, energy and emissions policies. The focus has not been on the integration of climate change in other policy fields. The national government has set its ambitions on greenhouse gas reduction (in particular CO₂) of 30% by 2030. To reach this ambitious goal, multiple taxation instruments have been introduced to stimulate CO₂ reduction by consumers and companies. Green labels for cars and houses have been introduced to inform the public on the environmental consequences of their actions, and subsidy schemes have been set up for energy saving and alternative sources of energy (wind, solar). In addition, the national government aims to sign contracts on energy saving with different economic sectors and with regional and local governments. We have, however, also seen examples of sectors and regional and local governments that include climate change objectives in their strategies and policies on a voluntary basis. Some even precede and exceed the national ambitions, like Rotterdam, for example, that is targeting a 50% reduction in CO₂ emissions by 2025.

The adaptation strategy focuses solely on policy integration in other policy sectors. The national government does not want to introduce a new adaptation policy sector. The integration of climate change into the national water policy is a central theme for the obvious geographical reasons (major parts of the Netherlands are below sea level and the country has many rivers) as well as cultural reasons (the preoccupation of the Dutch with their fight against the water). As a consequence, water policy and climate adaptation are almost inseparable in the Netherlands. Climate adaptation was already integrated into water policy before the term 'adaptation' was even used, spurred on by the river floods of 1993 and 1995. This focus on climate change within the Dutch water policy went hand in hand with an increased focus on spatial planning and land use (in the water policy). This has strengthened the integration between water policy (and thus adaptation) and spatial planning. By highlighting climate change adaptation as a water management issue or even as a spatial planning issue, other aspects of climate change adaptation are excluded or receive much less attention. When discussing spatial adaptations to climate change, policymakers prefer quick and technical solutions such as building higher and stronger dykes and not building in low-lying polders. These solutions, however, solve only part of the problem. Building higher and stronger dykes may solve the problem of higher water levels, but it does not solve the problems of other sectors such as agriculture, nature or tourism. The integration of adaptation in these other policy areas has been limited so far. Climate change has received attention in policy development within these policy areas (i.e. in scientific studies), but this is not yet visible in the formal policy documents.

Inclusion is not, however, always a good indicator of policy integration. One possible side-effect of the recent climate change hype is that it leads to symbolic policy

integration. This means that climate adaptation or mitigation is merely used as an additional argument to plead for other policy objectives or societal interests such as nature development, recreational development or even house building. Or it is only used to be able to profit from the resources that have been made available for these climate issues.

9.2.2 Consistency

The second evaluation criterion is consistency. Both climate change mitigation policy and climate change adaptation policy in the Netherlands pay explicit attention to coherence problems in terms of win-win areas. These are discussed for several sectors such as the traffic and transport sector, nature, agriculture, water, energy, health, housing, recreation and industry. Closer investigation, however, reveals that, although there are definitely win-win situations, there are also contradictions between climate policy and some other policy sectors. In the densely populated Netherlands, many of these contradictions have to do with land use. Production of bio fuels (especially second generation bio fuels) may, for example, entail a trade-off for nature conservation and food production. It may well be that bio fuels compete for space with nature conservation and food production. However, most conflicts between climate policy and other policy goals seem to relate to economic development and/or the availability of new technologies.

Overall, we have identified a tendency to disguise inconsistencies between climate change aspects and other aspects and label these as innovations; or, in more neutral terms, the policy expectations for innovations to solve existing contradictions are very high. For example, the inconsistency between building within the city borders and more space for water storage is solved by an appeal to find innovative methods to store water. This could be an effective way to stimulate innovations, but it also tends to cloak and avoid existing inconsistencies. What will happen if those innovations cannot be brought to fruition?

Another characteristic of Dutch national policy is the tendency to transfer responsibility for dealing with inconsistencies to lower levels of government. This tendency emerges in spatial planning and thus often in adaptation issues in particular. The idea is that these inconsistencies, and thus policy integration, are more effectively dealt with at these lower levels. This idea challenges the concept that policy integration should be achieved at the national policy level. This also means that inconsistencies at the national level do not have to be problematic, because they can be efficiently resolved at the regional or local level.

Another argument for paying attention to different levels is the fact that there is not always a clear relation between (in)consistency at the national level and at regional or local levels. Consistency at the national level could very well produce inconsistencies at the local level, and inconsistencies at the national level could prove to be not so inconsistent at a local level. The Zuidplaspolder case showed us that the national inconsistency between climate adaptation and building houses in low polders is not

really problematic within this specific local case. National policy integration (or weighting) would have meant that building in these areas would have been banned, whereas building within this specific polder was completely climate proof (according to the experts). Also, it may seem consistent to build houses on mounds or to design floating houses in the lowest polder, but in practice this would lead to increased seepage and flooding.

9.2.3 Weighting

Weighting climate issues is another aspect of policy integration. This aspect is less developed in the Dutch national policy. As inconsistencies are hardly addressed in the current climate policy, neither does current policy discuss how the conflicts between climate policy and other policy sectors should be addressed. This is partly due to the fact that most climate policy has been formulated only recently. Therefore the weighting of climate change goals in relation to other goals is currently being discussed. An example is the formulation of the National Adaptation to Climate Change Agenda, a negotiation process in which the relative priority of climate change adaptation impacts is weighted in comparison to other policy aims.

At the moment, national policy does not force other regional and local governments to prioritise climate issues over other policy aims. We have only identified instruments to include climate issues in policy making (Environmental Impact Assessment [EIA], Water Test). This approach is strongly linked with the Dutch cooperative policy culture of negotiations and soft policy instruments, and with the philosophy that policy integration should be solved at the local or regional levels. An advantage of such an approach is the flexibility to find local and regional solutions for the problems at hand and the opportunities that it offers for including societal actors in decision making. A major disadvantage is the fact that economic interests tend to be prioritised over climate issues. One example is the fact that, in location choice (in spatial development), climate issues are mostly out-weighted by economic interests. Climate (adaptation) issues are mostly mitigated in the actual design after the location has been picked. This issue should be addressed by the national government because it could lead to major spatial decisions that are not climate proof.

9.2.4 Reporting

Reporting is another criterion and reflects the importance of feedback for policy implementation. Most policy documents pay attention to the monitoring of policy outputs and policy outcomes. In most of the policy documents, a monitoring or evaluation programme is proposed. Because of the fact that most of these policies have been published only very recently, we cannot judge the effects of these reports on policy implementation. Nevertheless, we did observe a difference between climate change mitigation and climate change adaptation. In relation to climate change mitigation, we have seen that there is a long history of monitoring greenhouse gas

emissions. In relation to climate change adaptation, we have identified the fact that the KNMI's (Dutch weather institute) climate scenarios and other scientific reports have been used *ex ante* in these policy document. *Ex post* monitoring and evaluation instruments have only recently been developed in climate change adaptation.

There is, however, one specific problem with reporting in the Dutch policy context. This problem is that policy aims are not always made concrete at the national level. General policy aims, such as a 30% reduction in CO₂ emissions by 2030, are concrete. These general policy objectives are seldom specified for specific sectors or areas. The responsibility to specify how these objectives are to be achieved has mostly been commissioned to the regional or local government. This flexible and diffuse approach to policy implementation makes national reporting and monitoring difficult and requires other (or additional) evaluation methods (e.g. process evaluations or responsive evaluations). In other words: the classical evaluation methods based on quantified and clear policy objectives fit well with the centralised approach to policy implementation, but these evaluation methods do not fit well with the Dutch decentralised or diffused approach to policy implementation.

9.2.5 Resources

This brings us to the last criterion: resources. In relation to resources, we have distinguished budgets and knowledge. With regard to budgets, it is not easy to deduce general conclusions from our analysis. It is clear that budgets have been made available for climate mitigation and adaptation at the different levels of government. In most policy documents there is, however, a considerable gap between the available budgets and the budget that is actually needed to implement the policy plan. This gap should be closed by contributions from other governmental and societal actors and by using existing policy budgets. In most cases, it is not specified how this could be realised in practice. Some actors also question this focus on budgets as a criterion for climate policy integration. The size of the budget is not necessarily related to the effectiveness or efficiency of the policy measures involved. Some measures could in fact be very cheap for the government (e.g. an obligation for CO₂ capture by industry), whereas other measures are very expensive and not very efficient, such as subsidy schemes for small-scale projects for solar energy produced by windmills. Saying all this, we must also say that we did not find any indication that budget is a limiting factor for climate policy at the moment. We did not observe any climate-change projects that could not be implemented due to lack of funds. This is supported by another observation, namely, that many other sectors seemingly want to link up to climate policy. This could indicate that climate policy potentially has a budget that is relatively large as compared to the budgets of some other sectors.

With regard to knowledge resources, we can conclude that specific knowledge about climate change, climate policy and the impacts of climate change adaptation and mitigation instruments is fragmented and often not available. This means that, at the time of writing, there is also insufficient information available on policy inconsistencies and how to deal with them. At the same time, a number of initiatives

have been undertaken to fill this knowledge gap. In 2007, for example, the new Knowledge for Climate programme started (KforC, 2008). It builds on the BSIK programmes (such as Climate *changes* Spatial Planning, Living with Water and Habiforum) and international research programmes. Knowledge for Climate is a scientific research programme that supports the National Programme for Spatial Adaptation to Climate Change (ARK). Knowledge for Climate has a budget of 50 million euro awarded from the Economic Structure Enhancing Fund (FES) with the intention, through participation and co-financing, of establishing the content and scope of the research programme so that it forms the basis for a local, regional, national and international climate adaptation strategy. Knowledge for Climate is not only a scientific research programme but also aims to learn from the experiments of local people in practice. With regard to the latter, in the first phase, the research programme will focus on eight areas, called hotspots. In these eight selected pilot areas (e.g. the Zuidplaspolder), climate scientists will cooperate with governments and societal actors to find new ways of combining climate adaptation, mitigation and economic development. One of its ambitions is to make adaptation knowledge accessible to policymakers. The experiment with the hotspots is a very direct way to do this. The philosophy is that area-specific policy making and *ex-ante* evaluation go hand in hand and form a joint learning process for both scientists and the actors involved. This approach fits with the idea that the most effective and efficient solutions to these problems can only be found in an interactive and area-specific approach and not with the implementation of a detailed plan by the central government.

9.3 Policy coherence

In this section we address the coherence problems between climate policies and other policies. There has been a debate in the literature about the most appropriate approach to promote coherence and coordination. There has, in particular, been a discussion around the use of more centralised or diffuse approaches (Russel & Jordan, 2007). According to Russel and Jordan, centralised approaches are mainly based around minimising the amount of discretion that departmental policy makers have when dealing with cross-cutting issues. With regard to policy coherence, we have focused on the way in which policy coherence can be achieved. In other words we have analysed what kind of approach is being used in the Netherlands to achieve policy coherence.

In the Netherlands, the initiative to pay attention to climate policy coherence is taken mostly by government actors. In relation to climate change mitigation, for example, the targets have been defined in the government's coalition agreement, both for the reduction of greenhouse gases and for efficiency and renewable sources. In relation to climate change adaptation, for example, the initiative to climate proof spatial planning in the Netherlands was taken by the State. This is probably because policy coherence and integration often require difficult decisions with regard to who wins and who loses. This requires a helicopter view of the policy field: policy aims with regard to water, nature, agriculture, urbanisation, transport, etc. should be coherent.

Not everything is possible and financial means are limited, so choices will have to be made. The national policy does not yet make explicit choices. At the time of writing, negotiations are being held in which the relative priority of climate change impacts compared to other policy aims is being decided by government actors. In relation to climate change adaptation, ministries, provinces, municipalities and the water board are negotiating policy coherence as part of the formulation of the National Adaptation to Climate Change Agenda. In relation to climate change mitigation, the government has chosen a different approach to address policy coherence, namely, by presenting potential policy coherence problems as opportunities and challenges. From a national perspective, climate policies are initiated and decided upon by government actors; this would then seem to reflect a predominantly centralised approach to promote policy coherence and coordination.

At the same time, we also observed that this centralised approach does leave room for regional solutions and voluntary actions (self-organisation). With regard to the regional solutions, the case study of the Zuidplaspolder shows how regional governments together with other regional actors dealt with the problem of policy coherence at a regional level. In spatial planning and land-use issues in particular, this is often the level at which many decisions are taken. The strategic special plans in the Zuidplaspolder were also the outcome of regional negotiations among different government and private actors with different interests. During these negotiations, the regional actors had to deal with issues of policy coherence. They did so by using a so-called layer approach. Although this layer approach did not include specific climate change adaptation measures, it did check whether the plans were climate proof according to the climate change scenarios that were known at that time.

With regard to self-organisation, the Rotterdam Climate Initiative shows how the centralised approach still leaves room for local actors to take voluntary measures. As we have seen, the Rotterdam Climate Initiative is the joint climate programme of the municipality of Rotterdam, the Port of Rotterdam, Deltalinqs⁷ and DCMR Environmental Protection Agency Rijnmond. It contains an ambitious programme to reduce CO₂ emissions in Rotterdam by 50% by 2025; this is a higher target than that proposed in national programmes. Rotterdam also uses this initiative, among other things, to emphasise its green and innovative image at the international level as a member of the Clinton Climate Initiative and in the cooperation with other harbours around the world.

So we can conclude that in the Netherlands a centralised approach is used to promote policy coherence but that this centralised approach leaves room for regional solutions and voluntary actions (self-organisation). Power is not in the sole hands of national government actors: it is increasingly dispersed among government and non-government actors from different administrative levels (e.g. Hooghe & Marks, 2001). This fits in with the current trend towards decentralisation in spatial and environmental policies, whereby responsibilities are delegated from the national, to

⁷ This organisation represents the private companies in the Rotterdam harbour and other industrial companies.

lower levels of government. So, when we focus on different levels, we can characterise the Dutch approach as a kind of multi-level co-governance: the higher levels supervise lower ones, but at the same time the lower levels have a certain degree of autonomy. When we focus on a single level, we can characterise the Dutch approach as a kind of multi-actor co-governance: in policy making, not only does the national government consult decentralised governments, but interest groups are also incorporated informally into the policy-making process. Responsibilities and power are spread over many organisations, overlapping and cross-cutting each other. This multi-actor and multi-level co-governance typically reinforces policy integration at the regional and local level. At the higher levels of organisation, governments avoid making clear-cut 'yes' or 'no' decisions. These decisions are often left to the regional and local level.

9.4 Reflection and recommendations

The second goal of our study is to suggest means to enhance climate policy integration and improve policy coherence. We do so by reflecting on our findings and discussing them. This will feed in to the third goal, namely, to develop concepts and methods by which policy integration, coherence and governance can be studied.

9.4.1 Reflection on the top-down approach and recommendations

When reflecting on our findings, we feel that the theoretical framework is very appropriate for analysing policy integration and policy coherence from a top-down perspective. From this top-down perspective, the framework also takes into account lower levels of organisation. This allowed us to see that, from a top-down perspective in the Netherlands, the initiative to pay attention to climate policy coherence is mostly taken by government actors. Government agents believe that technological analyses and solutions are sufficient to adequately manage climate change hazards and serve the public. As a result, government agents frame climate change in technical terms and argue that it can be managed safely, trusting that the right selection of technology will bring risks within manageable levels (see also Hanke et al., 2002).

Because climate change has been conventionally understood as a technical issue, practices, including policy prescriptions and governance mechanisms which reflect these understandings, have been enacted. Problems are often addressed through instrumental interventions, typically through engineering works or the measurement of biophysical or ecological indicators in isolation from their social context (such as monitoring CO₂ emissions). To the extent that climate change adaptation or mitigation requires changes in citizens' behaviour, use is made of strategic reasoning, such as providing information or education. Examples of policy instruments that provide information to decision makers include the EIA and the Water Test.

On the basis of this top-down perspective, our first recommendation would be an obligatory inclusion of climate change issues with climate-inclusive EIA and the Water Test. These instruments force lower levels of government or other sectoral parts of the national government to include information and expertise on climate change issues in their decision-making process. This inclusion does not assure the actual weighting of these issues. However, it is an interesting instrument to include these issues at an earlier stage of decision making than before. Our second recommendation would then be to pay more attention to monitoring and accountability. When public policies are being implemented, it is necessary to have a feedback loop to the political system, providing information about whether the implemented policies are working as intended. This is required both for accountability and for learning so that policies and practices can be further developed.

9.4.2 The bottom-up approach and recommendations

However, for policy integration that assumes a more bottom-up approach to policy making and implementation, our policy integration approach is somewhat problematic. It assumes that policy implementation is most effective through national policy sectors; integration of climate aims in these policy sectors is thus an effective way to reach these climate aims. However, our case study shows that the manifestation of policy coherence and integration can be understood as an outcome of interaction among actors in specific areas or sectors. In these interactions, actors together decide on the definition of the problem that they are experiencing as well as on a solution to these problems. In order to understand the manifestation of policy coherence and integration, we must understand the interaction and the negotiation process among actors. This requires a more diffuse perspective. Such a perspective has several practical consequences (it leads to different but not necessarily contradictory recommendations) as well as some theoretical/methodological ones.

First of all, such a diffuse perspective requires attention to different forms of cooperative governance, involving all the examples of inter-governmental and public-private partnerships that have been created to integrate and implement policy. Some of these partnerships are characterised by multi-level governance (national, regional and/or local actors). These partnerships also often aim to integrate and implement the different policy aims within a specific geographical area. These cooperations thus tend to include policy making and policy implementation. These partnerships may be overlooked or disregarded under a more top-down approach to policy integration and coherence. At the same time however, they are an interesting instrument for climate policy integration because of the complex character of these climate issues, the regional differentiation and the complexity of integration at the national level.

Second of all, such a diffuse perspective has consequences for the shape and role of science in the policy process. Our research has drawn attention to a rather new instrument within the new Dutch climate (adaptation) policy: the hotspots approach. In specially assigned areas, experiments are being conducted to combine specific

scientific studies on the consequences of climate change with the area-specific policy processes that aim to find solutions for these problems. These processes usually include government and non-government actors. These hotspots might be an interesting instrument for designing a science-policy interaction more in line with a more diffuse approach to policy making and integration.

Third of all, such a diffuse perspective has consequences for the methodology that we use to study policy integration and coherence. Studying the manifestation of policy coherence and integration requires a bottom-up perspective in addition to a more top-down perspective. This type of mixed approach was applied in our study. Such a bottom-up perspective can be provided by case studies. A case study provides a systematic way of looking at events, collecting data, analysing information and reporting results. This allows us to gain a heightened understanding of why certain instances happened as they did (see Yin, 1984). The advantage of the case study is that it can home in on real-life situations: by placing ourselves within the context being studied, we learn to understand the viewpoints and the practices of the actors being studied. For researchers, the closeness of the case study to real-life situations and its multiple wealth of details is important for the development of a nuanced view of reality, including the view that human behaviour cannot be meaningfully understood as simply rule-governed acts. Concrete experiences can be achieved via continued proximity to the studied reality and via feedback from those under study (Flyvbjerg, 2006). This makes the case study a perfect bottom-up design to contribute to debate, scientific or otherwise, e.g. with regard to climate change. Such a case study gives insight not only into the extent to which climate change is included in decisions, the extent to which different policy goals are weighted, the extent to which this weighting is reported and the extent to which resources are allocated to different policy goals, but most importantly into the 'how' question. We feel a case study methodology can greatly contribute to an understanding of policy integration and coherence and the implementation of climate policies. This is needed in particular with regard to the unstructured problems involved in climate change issues (see Hisschemöller & Hoppe, 2001).

9.4.3 A balanced approach

Reflection on both the top-down approach and the bottom-up approach reveals that both have their advantages and their disadvantages. Therefore, in this report, we argue for a balanced approach that recognises the value of the various different models for governance, policy integration of climate change and methods to analyse and evaluate both.

On the one hand, a top-down approach assumes that policy implementation is most effective through national policy sectors. Integration of climate objectives in these policy sectors is thus an effective way to reach these objectives. This can lead to a very inflexible style of policy making and implementation that fails to pay attention to local and regional circumstances. Therefore a top-down approach should leave room for regional solutions and voluntary actions (self-organisation), particularly in

sectors and situations where these regional and local actors are inclined to include climate change objectives in their own policies and behaviour.

On the other hand, it is an illusion that a bottom-up approach can solve all the problems of the top-down approach without bringing in its own. In relation to climate change, it is an illusion that citizens and businesses can always make the right decisions on their own. As we have seen, economic interests then tend to be prioritised over climate issues. Therefore, a bottom-up approach should not imply that the top-down approach is simply dismissed. In some cases, governments are expected to decide themselves, even though there is opposition.

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Appendix 1 Interviews

Jelmer Biesma, Schieland en de Krimpenerwaard District Water Board (interviewed 12.08.08)

Pieter Bloemen, climate change adaptation expert, Ministry of Housing, Spatial Planning and the Environment (interview 14.07.08)

Geert Draaiers, climate change expert, Dutch Commission on Environmental Assessments (interview 27.08.08)

Hasse Goosen, programme coordinator Xplorelab (interview 24.07.08)

Jip Lenstra, climate change mitigation expert, Ministry of Housing, Spatial Planning and the Environment (interview 12.08.08)

Frank van Pelt, project leader Zuidplaspolder (interview 03.09.08)

Rob Swart, senior researcher, Alterra (interview 10.07.08)

