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Climate-proof spatial planning for flood prone areas

Illustrated by the Zuidplaspolder and Westergouwe

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Contents

Summary	5
1 Introduction	7
2 Method	9
2.1 The Adaptive Capacity Wheel	9
2.1.1 Variety	9
2.1.2 Learning	10
2.1.3 Room for autonomous change	10
2.1.4 Leadership	10
2.1.5 Resources	11
2.1.6 Fair governance	11
2.2 Research protocol	11
2.2.1 Step 1: Preparing for the research	11
2.2.2 Step 2: Collecting the data	12
2.2.3 Step 3: Analysing the data	12
2.2.4 Step 4: Interpreting the data	12
2.2.5 Step 5: communicating and presenting the data	13
3 Climate-proofing the Zuidplaspolder	15
3.1 The planning process	15
3.1.1 The Zuidplaspolder project	15
3.1.2 Hotspot Zuidplaspolder	16
3.2 Assessing the Zuidplaspolder project	17
3.2.1 Variety	17
3.2.2 Learning	19
3.2.3 Room for autonomous change	20
3.2.4 Leadership	20
3.2.5 Resources	21
3.2.6 Fair governance	21
4 Water City Westergouwe	23
4.1 The planning process	23
4.1.1 Opposition and resistance	23
4.1.2 Changing tides	24
4.1.3 The innovative cascade model	25
4.2 Assessing the Westergouwe project	26
4.2.1 Variety	27
4.2.2 Learning	28
4.2.3 Room for autonomous change	30
4.2.4 Leadership	30
4.2.5 Resources	31
4.2.6 Fair governance	31
5 Analysis and discussion	33
5.1 Variety	33
5.2 Learning	33
5.3 Room for autonomous change	34
5.4 Leadership	34
5.5 Resources	35
5.6 Fair governance	35

6	Conclusion	37
	References	41
	Annex AFootnotes	43

Summary

This Working Document deals with the question to what extent Dutch spatial planning institutions have the capacity to promote climate-proof spatial planning for flood prone areas. To answer this question, we have studied current regional and local planning practices in the west of the Netherlands: the development and implementation of the Zuidplaspolder project at the regional level and the development and implementation of the Westergouwe project at the local level. The Adaptive Capacity Wheel provides the methodological framework. The results show that the spatial planning institutions involved do enable climate-proof spatial planning, but only to a limited extent. They face six important institutional weaknesses that may cause risks in particular on the long term. This Working Document concludes that to climate-proof spatial developments in flood prone areas, it is necessary to break through the strong path dependent development of spatial planning institutions, and to build in more flexibility in existing rules and procedures, by stimulating in particular the capacity of actors to improvise, by finding ways to generate resources to implement adaptation measures, and by creating room for entrepreneurial leadership.

1 Introduction

Spatial planning is increasingly acknowledged not only as a means of reducing emissions of greenhouse gases, but also as a necessity for combating the predicted impacts of climate change (Bulkeley, 2006; Campbell, 2006; Wilson, 2006; Biesbroek, Swart & van der Knaap, 2009). Many climate change adaptation measures have a spatial dimension – some examples are the construction of climate-proof dikes, the adjustment of agricultural practices, and the complete redesign of large infrastructure. Spatial planning can therefore fulfil an important role in addressing the impacts of climate change. In the Netherlands, situated in the delta of the Rhine, Scheldt and Meuse rivers and a country where 35 per cent of the land is below sea level, there is a great sense of urgency to develop a climate-proof spatial planning, in particular for the flood prone areas in the west of the Netherlands (de Vries, 2006; Hidding & van der Vlist, 2009).

For spatial planners, putting climate change adaptation into planning practice is a highly complex issue. There are many uncertainties about the magnitude and potential impacts of climate change, and about the effectiveness and feasibility of adaptation strategies. Moreover, in the context of climate change and sustainable development, rather than a mechanism ‘for action and change’ spatial planning generally is ‘a site of contestation between a dominant agenda of economic growth and a less powerful discourse of environmental concern; that is between different conceptions of the public good’ (Bulkeley, 2006; Campbell, 2006: 202; see also Owens & Cowell, 2002). In addition, a critical challenge within spatial planning is both the need to develop longer time horizons within which climate protection issues are being addressed, and the need to act quickly to put adaptation strategies in place (Bulkeley, 2006).

Another critical challenge involves the operationalisation of innovative – but still rather abstract – policy concepts and ideas in terms of pragmatic solutions, that is, the formulation of an answer to the question ‘what does it actually mean to take into account climate change issues?’ Due to the uniqueness of each region there is no unequivocal spatial planning approach and the concrete development and implementation of adaptation strategies has to take place at the local and regional level (Bulkeley, 2006; Biesbroek, Swart & van der Knaap, 2009).

Because of these uncertainties and ambiguities, climate change adaptation requires a high adaptive capacity (or adaptability) of society (Huiteima et al., 2009). As we do not know beforehand which course of action is the most effective, we need to be able to experiment with different strategies, to learn from experiences gained, and to adjust our policies and strategies to changing circumstances. In the Netherlands, within the field of spatial planning there is an increasing awareness of the need for a climate-proof spatial planning to reduce the impact of flooding (see also van den Brink, Termeer & Meijerink, 2010). In general, two central strategies are distinguished: vulnerability reduction and exposure reduction (see also Meijerink & Dicke, 2008). Vulnerability reduction refers to the preparation of urban areas for floods, for example by developing early warning systems and careful planning of evacuation routes, or by making adjustments to houses and infrastructure. Exposure reduction is aimed at keeping urban areas away from floods, for example by relocating properties or by inhibiting new developments in flood prone areas.

This Working Document deals with the question to what extent Dutch spatial planning institutions have the capacity to promote climate-proof spatial planning for flood prone areas. We thus take an institutional approach. Inspired by Scott (2008), we

define institutions as cognitive, normative and regulative structures that provide stability and meaning to social behaviour. Institutions enable and constrain the opportunities of actors to respond to changes in their environment. In what follows, we first present a method to assess the capacity of institutions to enable adaptation: the Adaptive Capacity Wheel (see also Gupta et al., 2008, 2010). Subsequently, with the help of this method we assess the capacity of Dutch spatial planning institutions to develop and implement the strategies of vulnerability reduction and exposure reduction. To demarcate our object of study, we focus on two recent and innovative practices of climate-proof spatial planning for flood prone areas in the west of the Netherlands: the development and implementation of the Zuidplaspolder project at the regional level and the Westergouwe project at the local level, respectively. Both projects are situated in the deepest polder of the Netherlands, the Zuidplaspolder. We conclude with a reflection and conclusions on the extent to which Dutch spatial planning institutions are prepared for climate change and promote climate-proof spatial planning for flood prone areas.

2 Method

2.1 The Adaptive Capacity Wheel

To assess the capacity of institutions to enable climate change adaptation, we have developed the Adaptive Capacity Wheel (see Figure 2.1). We have distinguished six qualities of institutions: three core qualities, namely variety, learning, and the room for autonomous change, and three supporting qualities, namely leadership, resources, and fair governance (see Gupta et al., 2008, 2010, for an extensive overview and theoretical underpinning of this Wheel). Subsequently, to assess these qualities, we have developed 22 criteria. Together, the six qualities and 22 criteria form the Adaptive Capacity Wheel.



Figure 2.1 The Adaptive Capacity Wheel.

2.1.1 Variety

The first core quality refers to the idea that the variety within a system must be at least as great as the environmental variety against which it is attempting to adjust itself (Conant & Ashby 1970). To deal with the manifold uncertainties and ambiguities of the climate issue, it is often argued that it is important to allow for and encourage variety

(e.g. Verweij & Thompson 2006; Pahl-Wostl et al. 2007; Weick & Sutcliffe 2001). Societies have to be preoccupied with keeping sufficient diversity inside, to be able to sense accurately the variety in ecological change outside. Not only variety in developed ideas and policy measures is required, thus variety on paper or in policy formulation, but also variety in realised adaptation strategies, thus variety in planning practice and policy implementation. The extent to which institutions allow for and encourage variety is indicated by the following criteria: the involvement of a variety of policy frames and solutions; the involvement of a variety of actors, sectors, and administrative levels during policy making and implementation; the room to promote a differentiation of adaptation strategies; and redundancy. Redundancy implies 'more of the same', for example the development of back up measures for a reduction of the flood probability.

2.1.2 Learning

The second core quality is learning. The climate issue is not only characterised by uncertainties about the effects of climate change, but also by uncertainties about how we should anticipate these effects. In each specific case, the parties involved face the challenge of discovering together the 'best' adaptation strategy. Moreover, the climate issue is a relatively new issue. It is therefore likely that it will conflict with dominant values, routines and problem frames and solutions. To deal with the uncertainties and the newness of the climate issue, it is often argued that an institutional setting is required that stimulates and supports learning (e.g. Pahl-Wostl et al. 2007; Dewulf et al. 2005). Ideally, actors exchange their problem frames and together make sense of the issues at stake, while at the same time discussing doubts (Weick & Sutcliffe 2001). Moreover, they are able and willing to scrutinise their underlying assumptions, and engage in single loop learning (i.e. improving routines) and double loop learning (i.e. challenging norms and basic assumptions) (Argyris & Schön 1978). The extent to which institutions allow for and encourage learning is thus indicated by the following criteria: trust, single and double loop learning, the possibility to discuss doubts and an institutional memory.

2.1.3 Room for autonomous change

The third core quality of adaptive institutions is the room for autonomous change. Due to the unpredictable nature of many climate change effects, this is an important quality. It is about the capability of actors to improvise during crises at all levels of society, and to act as accommodating to and experimenting with the everyday contingencies, breakdowns, exceptions, opportunities and unintended consequences (Orlikowski 1996). The degree to which institutions allow for and encourage the room for autonomous change is indicated by the following criteria: the access to information about potential climate change impacts, the capacity of actors to improvise, and their ability to act according to plan.

2.1.4 Leadership

The fourth quality of institutions, leadership, supports the first three core qualities. Crucial are people in the public domain that promote change actively, and who face challenges by seeing opportunities, arranging connections and by reinterpreting their own routines. In this context, the following three types of leadership are particularly important. First, visionary leadership is important to link different time scales and to convince others to anticipate potential future threats (Young 1991). Second, entrepreneurial leadership is necessary to gain access to the necessary resources for

realising adaptation projects (Andersson & Mol 2002; Termeer 2009). And third and finally, collaborative leadership is necessary to bridge gaps, span boundaries, and build coalitions (Huxham & Vangen 2005).

2.1.5 Resources

The availability of resources also supports the three core qualities of institutions. For adaptation efforts to succeed, it is crucial that actors are able to generate sufficient resources (Biermann 2007). First, financial resources are required to experiment with and implement adaptation strategies. Next, human resources – such as knowledge and expertise – are required to develop these adaptation strategies. Finally, authority is required to take and implement the necessary decisions.

2.1.6 Fair governance

The sixth and final quality also supports the three core qualities of institutions. It is crucial that institutions meet fair governance criteria and can deal with social justice dilemmas (Paavola & Adger 2006). As we emphasise redundancy over cost-effectiveness, we prefer the phrase 'fair governance' rather than the dominant phrase of 'good governance' (e.g. Botchway 2001). Institutions should allow for and encourage responsive and accountable policy making and implementation. In addition, they should protect basic rights and equity and promote legitimate policy processes.

2.2 Research protocol

In this case study, we have used the research protocol for applying the Adaptive Capacity Wheel as developed by Gupta et al. (2010).

2.2.1 Step 1: Preparing for the research

This step involves the selection of the case study to assess the extent to which Dutch spatial planning institutions have the capacity to promote climate-proof spatial planning for flood prone areas. In line with the fact that the concrete development and implementation of adaptation strategies mainly takes place at the local and regional level (e.g. Bulkeley, 2006; Biesbroek, Swart & van der Knaap, 2009), we decided to adopt also these two geographical levels of analysis. The following two projects were selected for our assessment: the Zuidplaspolder project at the regional level and the Westergouwe project at the local level. The main aim of the Zuidplaspolder project is a large-scale transformation and integrated area-based development of the Zuidplaspolder, in particular involving the realisation of more space for urban development, more space for greenhouses, and more green areas (see e.g. Ministerie van VROM, 2004; Stuurgroep driehoek RZG Zuidplas, 2004). The Westergouwe project is an urban extension project of Gouda Municipal Executive, and is aimed at the construction of 3,850 new homes west of Gouda (see e.g. Gemeente Gouda, 2005). Although Westergouwe is formally situated in the Zuidplaspolder, it is not part of the planning process for the large-scale transformation of this polder. As both projects are situated in the deepest polder of the Netherlands, climate-proof spatial planning was a prerequisite.

2.2.2 Step 2: Collecting the data

Subsequently, we decided to make use of the following two data sources for the assessment and scoring of the six central qualities and 22 criteria of the Adaptive Capacity Wheel: 1) various types of documents, such as newspaper articles, press releases and policy reports; and 2) several in-depth and semi-structured interviews. Circa 10 key stakeholders were interviewed, either involved in the development of the practice of climate-proof spatial planning at the national level, in the planning process for the Zuidplaspolder project, or in the planning process for the Westergouwe project (see also Jager, 2010; Reitsema, 2010; van der Wal, 2010). Some examples of the selected interviewees are a representative of the Westergouwe project organisation, a representative of Gouda Municipal Council, the project leader of the Zuidplaspolder project, and the project leader of the Zuidplaspolder hotspot. The main challenge in designing the interview guides was to avoid technical language, while at the same time collecting the relevant information for the assessment. The lion's part of the interviews was transcribed and analysed in detail. Together, these data sources provided sufficient material to assess the capacity of Dutch spatial planning institutions to deal with the climate issue.

2.2.3 Step 3: Analysing the data

The next step of our research protocol involved the qualitative analysis of the data that we had collected, that is, the 'scoring' of the six central qualities and 22 criteria of the Adaptive Capacity Wheel. For each level and project, an Adaptive Capacity Wheel was drawn, representing the adaptive capacity of the spatial planning institutions on that specific level. A colour scheme (from green to red – see Figure 2.2) was used to visualise the results of our analysis and to facilitate the comparison between the three planning practices. The numbers were used to aggregate the scores of the various criteria.

Effect of institutions on adaptive capacity	Score	Aggregated scores for the six qualities and the adaptive capacity as a whole
Positive effect	+2	+1.01 to +2.00
Slightly positive effect	+1	+0.01 to +1.00
Neutral or no effect	0	0.00
Slightly negative effect	-1	-0.01 to -1.00
Negative effect	-2	-1.01 to -2.00

Figure 2.2 The colour scheme that was used to score the qualities of the Adaptive Capacity Wheel.

2.2.4 Step 4: Interpreting the data

After the data analysis, the scores and colours were related and interpreted in a broader context. This fourth step thus involved the translation of the information collected into a story – a story about the strengths and weaknesses of the Dutch spatial planning sector in terms of adaptive capacity, in particular the institutional contexts of the Zuidplas and Westergouwe projects. This step also included the explanation of dependencies between the qualities and criteria, and the comparison of

the two cases. Finally, during this step of the research we reflected on what could be done to improve the adaptive capacity of the spatial planning institutions.

2.2.5 Step 5: communicating and presenting the data

The last and final step concerned the communication and presentation of the data. We decided to use colours rather than grey shades to communicate how well a criterion or quality scores (see Figure 2.2). Whereas a grey tone is non-judgemental and provides a more neutral evaluation, a traffic light system – where green symbolises a high score and red a low score – is more communicative. By presenting the institutional strengths and weaknesses that we discovered in this way, we also aimed to suggest where there might be room for reform.

3 Climate-proofing the Zuidplaspolder

3.1 The planning process

3.1.1 The Zuidplaspolder project

The discussion about the development of the Zuidplaspolder started in 2001. In the Fifth National Policy Document about Spatial Planning (Ministerie van VROM, 2001), and in the subsequent National Spatial Strategy (Ministerie van VROM, 2004), the triangle constituted by the cities of Rotterdam, Zoetermeer and Gouda (Driehoek RZG – the RZG triangle) was designated as a potential location for urban development (see Figure 3.1). At the same time, however, it was acknowledged that this triangle was not the most favourable location to build, because it was situated in the deepest polder of the Netherlands, the Zuidplaspolder, and because it was part of the Green Heart. Nevertheless, to anticipate the population growth it was considered necessary to create space for large-scale urban development in the Zuidplaspolder.

In reaction, the local and regional government authorities involved presented the ‘transformation task’ for the Zuidplaspolder, to be further developed and implemented by Zuid-Holland Provincial Executive in close cooperation with the other parties involved (see e.g. Ministerie van VROM, 2004; Stuurgroep driehoek RZG Zuidplas, 2004). Besides the construction of 15,000 to 18,000 new homes and 350 hectares of business estate, the aim was to create 200 hectares for greenhouses and a green-blue zone between the nature areas of the Rottewig and the Krimpenerwaard. The project organisation consisted of a steering group, an administrative working group, a project organisation and various task groups. Through interactive and area-based planning, public support for the transformation task was to be created, and the quality of the planning process and the resulting plans were to be improved. The Zuidplaspolder was designated an exemplary project for climate-proof and area-based planning by the Ministry of Housing, Spatial Planning and the Environment. In January 2002, the steering group decided to develop the Zuidplaspolder by means of two planning instruments: an inter-regional vision (Interregionale Structuurvisie – ISV) and an inter-municipal plan (Intergemeentelijk Structuur Plan – ISP).

With the help of the layers approach, as introduced in the National Spatial Strategy (Ministerie van VROM, 2004), the possibilities for developing the Zuidplaspolder were studied (where to build, what to build et cetera). The layers approach distinguishes between three different layers: the underground layer, the network layer and the occupation layer. The *underground* layer forms the basis and consists of low dynamic functions such as geomorphology, soil typology, and the water system. Also natural, cultural, and landscape values play an important role. The *network layer* involves the infrastructure (roads, railways and waterways) and for example green-blue networks of ecological zones. Networks are more dynamic than the functions of the underground layer and set the boundaries for the urban functions of the *occupation layer*. This third layer involves the actual use of the land: urban developments and the social and culture structure.



Figure 3.1 Plan area for the development of the Zuidplaspolder project (source: Driehoek RZG Zuidplas).

3.1.2 Hotspot Zuidplaspolder

The reason for the introduction of the Zuidplaspolder hotspot was the social and political criticism of the planned urban development of the Zuidplaspolder. These criticisms regarded the location and the depth of the polder particularly (e.g. Schreuder, 2005; Meerhof, 2007). To make the spatial development of the Zuidplaspolder climate-proof, the Xplorelab department of Zuid-Holland Provincial Council therefore took the initiative to carry out the hotspot Zuidplaspolder. The hotspot concept has been introduced by the national research programme Climate changes Spatial Planning. Hotspots are practical projects, usually initiated by government authorities, and situated within a specific sector, place or region where spatial planning and climate are closely intertwined and where this close relationship may cause tensions. The objective of Xplorelab was innovation in process and content: 'doing things differently' and 'setting aside routines', as the project leader of the Zuidplaspolder hotspot explained. Developing integrated solutions and setting on the political agenda new topics such as climate change adaptation are some examples.

In first instance, the Zuidplaspolder hotspot met with resistance, as a potential outcome could be a negative advice regarding the planned urban developments. Furthermore, as the hotspot project leader explained, the Zuidplaspolder project organisation was convinced it had already taken into account water management issues: 'The hotspot was considered unnecessary'.¹ However, the hotspot project leader continued, 'taking into account water management issues is not the same as taking into climate change issues'.² The aim of the hotspot project therefore was first and foremost to put climate change on the political agenda of the formal Zuidplaspolder project. The hotspot project began in March 2007, focusing mainly on 'the possibilities rather than the impossibilities'³, as a result of which the public resistance against this research project gradually decreased. Rather than discussing and criticising the current plans for the Zuidplaspolder, the aim of the hotspot was to assess the extent to which the plans contributed to climate-proofing this polder. The informal hotspot and the more formal Zuidplaspolder project were carried out at the same time – they were parallel trajectories.

During the hotspot trajectory, the long term effects of climate change were studied, and its consequences for the Zuidplaspolder. In addition, various solutions were developed to climate-proof the urban development plans, on the basis of the 'multi-layered safety' concept primarily introduced by the Ministry of Transport, Public Works and Water Management (Rijksoverheid, 2008). The concept of multi-layered safety distinguishes between three different safety layers. The first and most important layer is flood prevention: the reduction of the flood probability and the implementation of the safety standards by taking technical and spatial measures. The second layer involves sustainable and climate-proof spatial planning on the basis of for example 'flood risk maps' and the 'water assessment'. The third and final safety layer involves disaster management. Despite flood prevention and sustainable spatial planning, a flood disaster always forms a threat that has to be anticipated. To reduce the number of casualties and the economic damage, it is necessary to develop strategies of disaster management.

By means of five exemplary projects, the hotspot elaborated several measures and strategies that could serve as a source of inspiration for the Zuidplaspolder project (Xplorelab, 2008). 'We actually applied seduction tactics', the hotspot project leader explained. 'Despite the fact that from a formal point of view it was considered unnecessary, we just said: well, let's just do it. And by making nice booklets it turned out to be possible to seduce these people to integrate new ideas into their plans.'⁴

3.2 Assessing the Zuidplaspolder project

In this section, with the help of the Adaptive Capacity Wheel, we show the results of our assessment of the capacity of the spatial planning institutions involved in the development and implementation of the Zuidplaspolder project, in relation to the parallel trajectory of the hotspot Zuidplaspolder, to enable climate change adaptation (see Figure 3.2). For an explanation of the colours, see Figure 2.2.

3.2.1 Variety

The first core quality of adaptive institutions is variety. To begin with, the spatial planning institutions involved allowed for and encouraged a large variety of problem frames and solutions. In developing concrete adaptation strategies, the layers approach of the National Spatial Strategy as well as the concept of multi-layered safety was applied. For instance, within the five exemplary projects of the Zuidplaspolder

hotspot various measures and adaptation strategies were developed to reduce the vulnerability of the Zuidplaspolder (the second layer of the concept of multi-layered safety; climate-proof spatial planning). These measures and strategies have been partly integrated in the existing formal plans for this polder. Much attention was also paid to the development of evacuation plans (the third layer of the concept of multi-layered safety). Furthermore, on the basis of the layers approach of the National Spatial Strategy, the underground of the Zuidplaspolder was studied and decisions were made about which parts of the Zuidplaspolder would be best suited for urban development. Hence, there was no dominant problem frame in the planning and decision making process for the Zuidplaspolder. The central idea was that the Zuidplaspolder could only be made climate-proof when different measures would be developed and implemented.



Figure 3.2 The Adaptive Capacity Wheel applied to the Zuidplaspolder project.

Two critical notes have to be made. First, the choice to build in the Zuidplaspolder (exposure reduction) was never part of a public debate. With the designation of the RZG triangle as an urban development location in the National Spatial Strategy, it just had become national policy to build in the deepest polder of the Netherlands. Second, although the spatial planning institutions involved allowed for a large variety of problem frames and solutions, it remains to be seen to what extent the developed

measures and strategies will actually be implemented. Due to the current economic crisis, at the moment only 2 of the 5 exemplary projects will probably be implemented.

The spatial planning institutions also encouraged the involvement of a variety of actors, sectors and administrative levels. From the government authorities involved to NGOs and the residents of the Zuidplaspolder – everyone was invited by Zuid-Holland Provincial Council to participate in the planning process for the Zuidplaspolder. ‘Perhaps the only thing they did not do enough was involving the critics. But apart from that, everyone has been involved’, the hotspot project leader stated. However, as a result, the project leader continued, ‘the national public opinion about this project is still divided, although the hotspot contributed to creating a more positive image.’⁵ Due to the approach taken, interactive area-based planning, there was a great diversity in adaptation strategies and measures, and much room for the development and implementation of tailor-made solutions. In particular the five exemplary projects generated many innovative strategies and measures. Nevertheless, due to the economic crisis cost-effectiveness became a very important value and requirement, influencing the choice of strategies and measures that would be implemented. At the moment, only two of the five exemplary projects will probably be implemented. Moreover, as a result, there is less redundancy – less back up measures are being developed.

3.2.2 Learning

The second core quality of adaptive institutions is learning. The spatial planning institutions involved in the Zuidplaspolder project promoted learning in various ways. To begin with, all parties involved seemed to trust and respect each other and they seemed to enjoy working together. In addition, doubts were discussed in several special brainstorm sessions, organised by Xplorelab, about the climate problems in the Zuidplaspolder. An important aim of these sessions was to name potential problems and uncertainties, and to discuss different solutions and courses of action. Xplorelab also contributed greatly to the institutional memory. Innumerable reports, policy documents and booklets were made to preserve and pass on knowledge to other, comparable, projects. As a consequence, the Zuidplaspolder project has a large institutional memory.

With regard to the criteria of single and double loop learning, our assessment shows a more nuanced picture. To a certain extent the parties involved were engaged in single loop learning and were able to improve their routines. To begin with, the establishment of Xplorelab in itself can be interpreted as an expression of single loop learning, as its main aim was to put the climate issue on the agenda of existing political planning processes. In addition, Xplorelab brought together important parties, organised various workshops and brainstorm sessions, and in this way succeeded in stimulating and encouraging continuous learning during the more formal planning trajectory of the Zuidplaspolder project. As the hotspot project leader explained: ‘You need such an innovative group to be adaptive, and to be able to make connections.’⁶ Hence, together the parties were engaged in a collective learning process, stimulated by the establishment and activities organised by in particular Xplorelab. However, at the same time, working together was not always easy and sometimes hindered by a sectoral way of working and thinking of some parties (e.g. Xplorelab, 2008: 52-54). It follows that the spatial planning institutions only to a rather limited extent allowed for double loop learning: the reinterpretation of routines and doing things differently. It can be expected that the current economic crisis will have a negative impact on this.

3.2.3 Room for autonomous change

The third core quality of adaptive institutions is the room for autonomous change – to what extent did the spatial planning institutions involved allow for and encourage the capability of actors to improvise during crises at all levels of society, and to act as accommodating to and experimenting with the everyday contingencies, breakdowns, exceptions, opportunities and unintended consequences? To begin with, for the residents of the Zuidplaspolder as well as for the project organisation of the Zuidplaspolder project and Zuidplaspolder hotspot, the access to information was high. These two project organisations closely worked together with employees of for example the KNMI, the water board involved and of various national ministries. In addition, to increase the self organisation of residents, evacuation plans were made and information was provided about how to act during crises. Under the supervision of Zuid-Holland Provincial Executive in particular, the Zuidplaspolder project organisation also seems to be able to act according to plan.

However, the extent to which the spatial planning institutions involved promoted the capacity of actors to improvise is rather limited. In general, the climate issue was perceived by the Provincial and Municipal Executives involved as a long term issue, as something which is very difficult to anticipate on and adapt to. At a certain moment, choices just have to be made, and a particular policy course has to be followed. Another important reason why not all measures and innovative ideas developed by the hotspot were incorporated in the planning process of the Zuidplaspolder project was that rules and requirements of existing formal procedures, for example zoning plans, often represented the policy course followed now, and as a result restricted (or even worse: not allowed) the incorporation of new and innovative plans.

3.2.4 Leadership

The first supporting quality of adaptive institutions is leadership. For climate-proof spatial planning, the following three types of leadership are important: visionary leadership, entrepreneurial leadership and collaborative leadership. On the basis of our assessment we can conclude that the involved spatial planning institutions allowed for and promoted in particular visionary leadership, enacted by Zuid-Holland Provincial Executive. The establishment of Xplorelab is a good example of the way in which this Provincial Executive aimed to create the room to experiment, study the impacts of climate change and develop a long term vision. By contrast, the spatial planning institutions did not promote entrepreneurial leadership. For instance, in the beginning the hotspot met with much resistance of the parties involved, and later on only a few parties took the initiative to actually develop and implement the climate adaptation measures and strategies suggested by the hotspot (van der Wal, 2010). The Ministry of Housing, Spatial Planning and the Environment provided a grant as a result of which two of the five exemplary projects can be further developed, but this still does not guarantee their actual implementation. The current economic crisis clearly also has a negative impact on the extent to which the parties involved are able to demonstrate entrepreneurial leadership.

Finally, only to a limited extent the spatial planning institutions promoted collaborative leadership. Whereas the hotspot project organisation did manage to bring together many different parties, and stimulate the formation of coalitions and alliances, the formal Zuidplaspolder project and more informal Zuidplaspolder hotspot are still separated and carried out in parallel trajectories, which are supervised and coordinated by different project leaders. The hotspot project is not part of the formal planning process for the transformation of the Zuidplaspolder.

3.2.5 Resources

An important second supporting quality is the availability of resources. For climate change efforts to succeed it is crucial that actors are able to generate sufficient financial and human resources. In addition, authority is required to take and implement the necessary decisions. To begin with, the spatial planning institutions promoted the availability of human resources. In particular during the hotspot project many people and parties were involved; much time, budget, and energy was available to develop measures and strategies to climate-proof the Zuidplaspolder. However, after the presentation of the final report by Xplorelab, the availability of human resources decreased considerably, which demonstrates a gap between policy formation and policy implementation (see also van der Wal, 2010). Due to the current economic crisis the availability of financial resources is a problem. The government authorities involved are reluctant to invest in climate adaptation measures, which are around 20 to 30 percent more expensive to develop and implement. Finally, also against the background of the current economic crisis, whether Zuid-Holland Provincial Executive has the required authority to take and implement climate adaptation measures remains to be seen.

3.2.6 Fair governance

The final supporting quality of adaptive institutions is fair governance. The spatial planning institutions involved seem to promote accountable policy making and implementation. In addition, they seem to allow for and enable legitimate policy processes, and protect basic rights and equity. Only the extent to which the institutions allow for responsive policy making and implementation can be questioned. Although many different parties are involved, in particular some of the smaller Municipal Executives involved stated that their input was not always taken into account by the Zuidplaspolder project organisation (see also van der Wal, 2010).

4 Water City Westergouwe

4.1 The planning process

Westergouwe is an urban extension project of the municipality of Gouda, aimed at the construction of 3,850 new homes west of Gouda. Although Westergouwe is situated in and is formally part of the Zuidplaspolder, it is not part of the planning process for the large scale transformation of this polder. Already in the 1970s, Gouda Municipal Executive purchased the lands west of Gouda, at the time situated at the territory of the municipality of Moordrecht. Following the directions of the national government, initially these lands were reserved for the construction of a prison. However, as the plans for this prison were soon withdrawn, and as Gouda was searching for potential locations for urban extension, the lands west of Gouda were reserved instead for the construction of a new residential area: Westergouwe.

4.1.1 Opposition and resistance

For several reasons, it would take until the beginning of the 21st century for the concrete planning phase to start. The first important problem was the poor condition of the lands; weak peaty soils situated 6.7 metres below sea level. In general, the lands west of Gouda were considered one of the worst locations for an urban extension and therefore the plans of Gouda Municipal Executive met with severe criticism, in particular from the water board Schieland and Krimpenerwaard. Second, there was a conflict with Moordrecht Municipal Executive, on which territory the lands were situated. Wishing to continue its rural countryside image, Moordrecht Municipal Executive opposed the plans for the development of Westergouwe. Only in the mid 1990s the conflict was solved with a correction of the border between Gouda and Moordrecht, through which the lands became situated at the territory of Gouda. In return, Gouda Municipal Executive promised to realise a nature area between Westergouwe and Moordrecht. Around the same time, Zuid-Holland Provincial Executive incorporated the construction of Westergouwe in its regional plan.

A third reason why the concrete planning of Westergouwe would only start in the early years of the 21st century was Gouda's 'section 12-status' (*artikel 12-status*). Because of its structurally negative financial situation, caused in particular by the management and maintenance of the weak peaty soils, the national government had put Gouda Municipal Executive under legal and financial restraint. In return for strict financial supervision – for large spending expenditures Gouda was obligated to ask permission – it received extra resources to improve its financial situation. Hence, for the construction of Westergouwe, Gouda Municipal Executive required the approval of the national government. However, the national government refused to approve of the urban extension plans of Gouda, because it believed that Gouda's financial problems would only become worse with the construction of Westergouwe. Moreover, it feared that Gouda would not be able to compensate for the damage in case of a flood disaster – and it did not want to be held responsible for (and be forced to solve) the problems of Gouda. A fourth and final reason why there was strong resistance against the plans for the construction of Westergouwe was the national restrictive spatial policy for the Green Heart of the Randstad, prohibiting new urban developments in the Zuidplaspolder. This was thus another important reason why the national government, the Ministry of Housing, Spatial Planning and the Environment in particular, for a long time opposed the urban extension plans of Gouda Municipal Executive.

4.1.2 Changing tides

As a result, Gouda Municipal Executive first focused on the realisation of other planned residential areas, such as Bloemendaal (northwest of Gouda, constructed in the 1970s–1980s) and Goverwelle (east of Gouda, constructed in the 1980s–1990s). Around the turn of the century, the national debate on the spatial policy for the Green Heart and in particular the Zuidplaspolder was reopened, turning the tide for Westergouwe. As the representative of Gouda Municipal Council stated:

At a certain moment, the Zuidplaspolder came on the screen as a potential location for urban development, and was going to be incorporated in the Fifth National Policy Document on Spatial Planning. Well, because of that the issue got a different feeling. Westergouwe threatened to be excluded from the Green Heart. This was favourable for us, as the national government could not keep on stating: Westergouwe is situated in the Green Heart and therefore its construction is not possible. Consequently, it really had to start thinking collaboratively with us in the planning of Westergouwe.⁷

Although the restrictive policy for the Green Heart was formally being loosened, the Minister of Housing, Spatial Planning and the Environment formulated strict conditions for the development of Westergouwe, regarding in particular the financial feasibility, the water management system, and the infrastructural opening up of the new residential area. Together with the three main government authorities involved – Zuid-Holland Provincial Executive, water board Schieland and Krimpenerwaard, and the Ministry of Housing, Spatial Planning and the Environment – at the end of 2003 Gouda Municipal Executive started up an integrated planning process for the development of Westergouwe. In November 2003, these parties signed a declaration of collaboration.

Initially, the Ministry of Transport, Public Works and Water Management was not involved in the integrated planning process for Westergouwe. This however changed soon, due to the increasing impact of two important water policy documents, namely the advice of the advisory committee on ‘Water Management in the 21st century’ (Commissie WB21, 2000) and the formal standpoint of the Dutch cabinet in response to this advice, ‘Dealing Differently with Water’ (Ministerie van Verkeer en Waterstaat, 2000). The introduction of a more spatial orientation to Dutch water management, expressed in the new policy concept of ‘Room for Water’, and the growing public debate about the potential impacts of climate change, put Westergouwe in the political spotlight. Whereas the reopened national debate on the spatial policy for the Green Heart had turned the tide for Westergouwe in a positive way, the ‘transition’ in Dutch water management (van der Brugge et al., 2005), turned the tide in a more negative way. As the representative of Westergouwe project organisation explained:

It was a new time, Water Management in the 21st century, water as a guiding principle for spatial planning. The discussion was brought up about where should we build, and about Westergouwe as the ‘deepest drain of the Netherlands’, as Westergouwe is always finely being referred to.⁸

‘The development of Westergouwe was debated on the cutting edge’, the representative of Gouda Municipal Council added, ‘while the location was already decided on years ago’.⁹ This had advantages but also disadvantages. As the representative of the Westergouwe project organisation continued:

As a result of the discussion, this project was put on the map immediately, as it was perceived as some sort of litmus test for the entire West Netherlands. Well, the advantage for us was that we had the people at the table who were able to take decisions. On the other hand, Westergouwe was placed on a podium of what

we thought: we are only Gouda Municipal Executive, developing and constructing a new residential area. That national discussion about how to deal with water went too far for us, that is also not up to us. Gouda is not the obvious party to lead that discussion.¹⁰

Nevertheless, as a result the Ministry of Transport, Public Works and Water Management took a seat at the Westergouwe table. Subsequently, at the end of 2003 on the initiative of Gouda Municipal Executive, the Working group Water task Westergouwe (*Werkgroep Wateropgave Westergouwe – 3W*) was established, chaired by Frans Tielrooy, who had also chaired the advisory committee on ‘Water Management in the 21st century’. The aim of the 3W working group was to study the possibility of constructing a sustainable and ‘water-proof’ residential area west of Gouda. The 3W working group thus only focused on the water management aspects of the development of Westergouwe, according to the principles of the advice on ‘Water Management in the 21st century’.

4.1.3 The innovative cascade model

To develop its advice, the 3W working group established three think tanks (on water quantity, water quality and safety) and invited many experts in the field of sustainable water management and urban development, local and regional parties, national government authorities, research institutes and private companies to help to analyse the issue and to search for solutions. In September 2004, the 3W working group presented its advice (*Werkgroep Wateropgave Westergouwe, 2004*). It concluded that ‘given the choice for the location, from a water management perspective it is both possible and safe to develop a residential area on the location as laid down in the regional plan’ (*ibid.*, p. 29).¹¹ In reaction, on 30 September 2004, under strict conditions, the Minister of Housing, Spatial Planning and the Environment approved the development and construction of Westergouwe.

Key to the advice of the 3W working group was the solution of the cascade model: variable water levels that compensate the seepage pressure. By creating different water level sections (*peilvakken*), together forming a ‘water stairs’ (*watertrap*), the water level was to be brought down in a multi-stage way (*op een getrapte manier*) – whereby the ground level follows the water levels. Furthermore, to reduce the potential impacts of flooding in case of a dike breach, the floor levels are constructed at the inundation level or flood level. In the masterplan for Westergouwe, entitled ‘Water City Westergouwe’, the cascade model was elaborated further (*Gemeente Gouda, 2005*). Inspired by the different water levels, six different living environments were developed, each integrating the water in a different way: Canals, Gardens, Bulwark, Rural Living, Water Living, and Centre. As a result, in Westergouwe it will be possible to live at the water, near the water or on the water. For instance, the Water Living Environment consists of water villas on the water, the Canals Living Environment consists of canal houses along canals, and the Bulwark Living Environment consists of three islands where houses are surrounded by the water. ‘Constructive adjustments’ (*constructieve aanpassingen*), such as underground parking spaces, will be implemented to create sufficient space for water storage.



Figure 4.1 Integrated masterplan for Westergouwe (source: Westergouwe project organisation). The colours (orange, yellow, green et cetera) represent the different living environments.

In Westergouwe a central weakness was thus turned into an opportunity. Rather than fighting the water with higher dikes and other innovative flood defences, the water was embraced and made the central characteristic of the identity of the new residential area. In June 2009, the integrated masterplan for Water City Westergouwe was formally approved. It is expected that the implementation will start in 2011, and will last until 2020. The Westergouwe project organisation, a consortium of Gouda Municipal Executive and two private construction companies, Heijmans and Volker Wessels, is responsible for the further elaboration and implementation of the masterplan.

4.2 Assessing the Westergouwe project

In this section, with the help of the Adaptive Capacity Wheel, we show the results of our assessment of the capacity of the spatial planning institutions involved in the development and implementation of the Westergouwe project to enable climate change adaptation (see Figure 4.1). For an explanation of the colours, see Figure 2.2.



Figure 4.2 The Adaptive Capacity Wheel applied to the Westergouwe project.

4.2.1 Variety

As the representative of the Westergouwe project organisation explained, the integrated masterplan for Westergouwe was based on two central choices: ‘floor level is flood level and we only focus on the potential impacts of flooding’.¹² Rather than developing and implementing measures to reduce the flood probability, the parties involved adopted the flood risk approach and focused on the development and implementation of measures and strategies to reduce the potential impacts of flooding. However, whereas both vulnerability reduction and exposure reduction are essential parts of this water safety strategy, the focus was solely on vulnerability reduction – such as making adjustments to houses, parking spaces and infrastructure, and the introduction of varying water levels. The location choice to develop a new residential area west of Gouda was already made a long time ago and was not part of the discussion. As the representative of Gouda Municipal Council stated: ‘We did not have another choice. This was our last opportunity.’¹³ As a result, the variety in problem frames and solutions decreased considerably. The dominant problem frame was vulnerability reduction. Measures to reduce the flood probability as well as solutions to solve the housing shortage of Gouda in a different way, for example by choosing for a different location, were not part of the planning process.

Although the degree to which the spatial planning institutions allowed for and encouraged the involvement of a large variety of problem frames and solutions was rather limited, they did promote the involvement of a wide variety of actors, sectors, and administrative levels during policy making and implementation. 'Pretty much everybody working with water has been involved', according to the representative of the Westergouwe project organisation.¹⁴ An important reason was that Westergouwe was a politically sensitive project, and the focus of a national public debate on how to anticipate the potential impacts of climate change in the west of the Netherlands. Initially, mainly public parties were involved. With the establishment of the 3W working group, however, and the positive decision by the Ministry of Housing, Spatial Planning and the Environment, many more parties became involved, such as experts in the field of sustainable water management and urban development, local and regional parties, citizens, interest organisations, research institutes and even private construction companies.

Through the introduction of the cascade model, and the accompanying diversity in living environments, a differentiation of adaptation strategies and tailor-made solutions was promoted. Although no back-up measures were developed for a reduction of the vulnerability of Westergouwe, that is, a redundancy of measures was not promoted, the project organisation did try to construct a 'robust water system' and a 'robust residential area', the representative of the Westergouwe project organisation explained, by incorporating flexibility. 'We have built in a surplus – there is extra room for water within the system.'¹⁵

4.2.2 Learning

Within the Netherlands, the focus on a reduction of the potential impacts of flooding is rather innovative – the dominant problem frame is often probability reduction (see also van den Brink, Termeer & Meijerink, 2010). Although the strategy of impact reduction was interpreted in a rather limited way, as exposure reduction was not part of the planning process, it nevertheless illustrated the innovative working style and learning capacity of the Westergouwe project organisation. Despite the severe opposition and resistance, in particular from the water board Schieland and Krimpenerwaard and the Ministry of Housing, Spatial Planning and the Environment, it was decided to develop and construct Westergouwe.

The spatial planning institutions promoted learning in several ways. With regard to the development and construction of the new residential area, the parties involved were engaged in single loop learning and were able to improve their routines. They also seemed to trust each other. Although the process architecture developed only gradually, due to the initial resistance and opposition of some of the government authorities involved, it proved to be rather successful in the end (in particular the establishment of the 3W working group). The project organisation succeeded in involving many different public and private parties, working together collaboratively and creatively. As the representative of Gouda Municipal Council stated: 'All the parties were bursting with positive energy. Because everyone realised that what we were doing was something special. Therefore, in a relatively short period of time, a lot could be done'.¹⁶ The representative of the Westergouwe project organisation added: 'From a technical perspective, everything is possible. In my opinion, the greatest innovation of Westergouwe is the process. That the parties have found each other in a good way'.¹⁷

More important in the context of our assessment of the adaptive capacity of the Westergouwe project is the extent to which the parties involved were also engaged in double loop learning. The answer to this question is twofold. On the one hand, already

in the 1970s Gouda Municipal Executive purchased the lands west of Gouda and decided to construct at that location the new residential area of Westergouwe. From then on, the debate about the location for the construction of this new residential area was never opened up. Consequently, it can be argued that the institutions did not promote the parties involved to challenge norms and basic assumptions – and thus consider other potential locations for urban extension. As the representative of the Westergouwe project organisation explained:

If you look at the agreement of 30 September 2004, signed by the Minister [of Housing, Spatial Planning and the Environment], the following was actually stated: well, all our questions have been answered, and our conditions have been met, but if would have to take the decision again we probably would say 'no' to Westergouwe. But since the project is running for such a long time now, we have decided to continue it.¹⁸

As the representative of the Westergouwe project organisation continued: 'If Westergouwe is put in a broader perspective, if we would consider this location from the perspective of the Zuidplaspolder or rather even from the perspective of the entire west of the Netherlands, Westergouwe would not be one of the most favourable locations'.¹⁹ 'I think that if we would start up this process now, Westergouwe would not be developed', also the representative of Gouda Municipal Council stated.²⁰

However, on the other hand, a more positive perspective can be taken. Because despite the opposition and resistance against the development of Westergouwe, the project organisation succeeded in doing things differently. It introduced and elaborated the innovative water safety strategy of vulnerability reduction, and succeeded in developing a 'water-proof' residential area that now serves as an example for urban extension projects of other municipalities in the west of the Netherlands. Moreover, to be able to develop a 'water-proof' residential area, the Westergouwe project organisation introduced several new instruments and mechanisms. An important problem of the vulnerability reduction strategy turned out to be the search for water safety norms regarding the protection of Westergouwe against floods – How safe is safe enough? To what extent do the potential impacts of flooding have to be reduced? – as there are no national water safety norms for local and regional dikes and water defences. There are only water safety norms for the main water defences, laid down in the national Embankment Act. Subsequently, another important question that the parties involved struggled with was how to 'formalise' or institutionalise these norms so that they would also actually be implemented – the spatial planning institutions did not provide for an instrument.

In the end, it was first decided to incorporate the floor levels (one of the main starting points of the cascade model and solution for the water safety issue – thus the norm that was developed) in the water management section of the local plan of Gouda Municipal Executive. In addition, Gouda Municipal Executive and two private construction companies (Heijmans and Volker Wessels) developed a public-private partnership in which various structural or building requirements were laid down. In the actual construction of Westergouwe, these requirements now have to be realised. As the representative of the Westergouwe project organisation explained:

Setting floor levels in the water management section already goes quite far, normally you don't go that far. But for the protection against flooding in case of a dike breach we do not have an instrument. So one of the central questions was: how are we going to realise water safety? Because we do not have a public instrument to realise that – such an instrument would always go further than the building regulations, as it is focused on more strict building requirements. Well,

in Westergouwe we were able to solve that struggle. Together with two construction companies, Heijmans and Volker Wessels, Gouda Municipal Executive has made an agreement about how the new residential area is to be dealt with. Hence, in the end we did not solve the issue in a public way, but in a private way. In a private agreement, the parties, Gouda Municipal Executive and Heijmans and Volker Wessels have agreed to implement these extra building requirements.²¹

4.2.3 Room for autonomous change

The third core quality of adaptive institutions is the room for autonomous change – to what extent did the spatial planning institutions involved allow for and encourage the capability of actors to improvise during crises at all levels of society, and to act as accommodating to and experimenting with the everyday contingencies, breakdowns, exceptions, opportunities and unintended consequences? As many parties were involved in the Westergouwe project, and as it was often referred to and considered an exemplary project for climate-proof spatial planning, the access to information was high. For the project team members, it was not a problem to obtain new information. On the contrary, it was often overloaded with policy documents, climate scenarios et cetera. The Westergouwe project organisation was also capable to act according to plan: despite the opposition and resistance of important parties such as the water board Schieland and Krimpenerwaard and the Ministry of Housing, Spatial Planning and the Environment, it succeeded in developing a masterplan for Westergouwe. Moreover, in June 2009, the plan was approved by the local and regional government authorities involved and incorporated in the existing local and regional plans, and from 2012 to 2020 the masterplan will be implemented in five subsequent phases.

However, the extent to which the spatial planning institutions involved promote the capacity of actors to improvise is rather limited. For instance, the Westergouwe project organisation decided to take the KNMI climate scenarios, which were presented in 2006, as central starting point and steering framework for the development of the masterplan. It thus decided not to take into account and to leave out future climate scenarios – it will not adjust the masterplan when new climate models are being published. As the representative of the Westergouwe project organisation explained:

At one point, we just had to know: is it going to be left or right? Where do we stand? (...) And that applies to any plan. You take into account current policies, whereas future policies are difficult to anticipate. We did not make an agreement about a sliding scale, and that we would continually estimate and calculate the effects of a new climate scenario. We did try to build in extra space and construct a robust water system, a robust residential area.²²

On the other hand, the capacity of the future residents of Westergouwe will be relatively high, due to the innovative measures taken to cope with flooding.

4.2.4 Leadership

The first supporting quality of adaptive institutions is leadership. For climate-proof spatial planning, the following three types of leadership are important: visionary leadership, entrepreneurial leadership and collaborative leadership. To begin with, in the Westergouwe project, the spatial planning institutions involved allowed for and encouraged visionary leadership. In particular Zuid-Holland Provincial Council, i.e. Xplorelab, demonstrated visionary leadership by putting the climate issue on the agenda of the Westergouwe project and by helping the project organisation to think of

innovative ways to construct a water-proof or climate-proof residential area. As the representative of the Westergouwe project organisation explained:

Zuid-Holland Provincial Council introduced the adaptation issue, and the water board Schieland and Krimpenerwaard contributed the climate scenarios. Also the attention for the protection against floods was introduced by Zuid-Holland Provincial Council.²³

However, the leadership to develop an alternative solution and location for the urban extension to Gouda lacked. As the initiator of the project, Gouda Municipal Executive demonstrated both entrepreneurial and collaborative leadership. It clearly took the lead, gained the necessary resources and succeeded in organising a process architecture that inspired the parties involved to develop and implement the innovative masterplan 'Water City Westergouwe'. The establishment of the 3W working group, chaired by Frans Tielrooy is a good example of the collaborative leadership of Gouda. 'Gouda always took the lead, as we were the initiator. We continually carried the load', the representative of the project organisation stated.²⁴ However, if Gouda would have been able to make the decision about Westergouwe all by itself, he continued, 'then Westergouwe would have never come'.²⁵ Perhaps one of the strengths of the planning process for Westergouwe therefore is that 'the problem is felt at different places at the same time; that the leadership is distributed over the parties involved'.²⁶

4.2.5 Resources

An important second supporting quality is the availability of resources. For climate change adaptation efforts to succeed it is crucial that actors are able to generate sufficient financial and human resources. In addition, authority is required to take and implement the necessary decisions. To begin with, 'pretty everyone has been invited, involved in the planning process', the representative of the Westergouwe project organisation stated.²⁷ Whereas the availability of human resources was not a problem, due to the current economic crisis the availability of financial resources – in particular the selling of the new homes through which the construction of Westergouwe should be financially feasible – could become a problem. In addition, due to its problematic financial situation, in case of a flood disaster it remains to be seen whether Gouda Municipal Executive will be able to carry the responsibility to compensate for the damage. The Westergouwe project organisation does not think the actual construction of the residential area will be a financial problem: 'the system that we have developed is that robust that if necessary the construction of Westergouwe can be carried out in a traditional way', according to its representative.²⁸ With regard to the final criterion, Gouda Municipal Executive seems to have the required authority to take and implement the decisions necessary to construct Water City Westergouwe.

4.2.6 Fair governance

The final supporting quality of adaptive institutions concerns fair governance. The spatial planning institutions involved seem to promote responsive and accountable policy making and implementation. In addition, they seem to allow for and enable legitimate policy processes. However, the extent to which they will protect basic rights and equity is still uncertain. As a result of the water safety strategy chosen (vulnerability reduction), the way in which the future residents of Westergouwe will be protected against floods is different from the residents living in other parts of Gouda. The future residents of Westergouwe will have to live with regular floods, and they do not have the guarantee that the national government will take care of them in case of a flood disaster – Gouda Municipal Executive carries that responsibility.

5 Analysis and discussion

5.1 Variety

During the planning process for the Zuidplaspolder project, a wide variety of actors, sectors and administrative levels were involved, and many different potential adaptation strategies were developed, for a large part on the initiative of Xplorelab. Inspired by the layers approach and the concept of multi-layered safety, adaptation strategies were developed addressing all layers – there was no dominant problem frame. By contrast, in Westergouwe, instigated by the strict national conditions, the focus was predominantly on the development of measures to reduce the vulnerability of the new residential area. Moreover, exposure reduction, which is also an important strategy in the context of climate-proof spatial planning for flood prone areas, in both projects only played a role at the level of the designated plan area (where to build in the Zuidplaspolder, the introduction of different living environments to deal with the seepage pressure in Westergouwe). The choice for both locations was considered as given, determined by either changing national policies or by the purchase of the land in the past. Interestingly, both projects did not want to take part in the national debate about building in the Zuidplaspolder. For instance, the hotspot project excluded its critics and the project organisations together decided to deliberately exclude the Westergouwe project from the planning process for the Zuidplaspolder. To summarise: there was hardly any variety in where to build (the strategy of exposure reduction was only introduced at the level of the plan area), but there was much variety in how to build (strategies for vulnerability reduction). However, despite the relatively large variety in potential adaptation measures and strategies, the actual implementation of these measures and strategies is problematic, partly due to the current economic crisis and the lack of sufficient financial resources.

5.2 Learning

In the Netherlands, climate-proof spatial planning is considered an innovative planning practice, as the dominant problem frame is the technocratic paradigm of flood prevention or probability reduction (van den Brink, Termeer & Meijerink, 2010). Not surprisingly, the development and implementation of vulnerability and exposure reduction strategies is a complex task, hindered by the belief that technical engineering solutions are still the best way to protect flood prone areas against floods and that climate-proof spatial planning is only stimulated *next to*, rather than *instead of*, measures for probability reduction. From this perspective, the efforts of the local and regional authorities to climate-proof the new spatial developments in the Zuidplaspolder are remarkable. In general, despite the national focus on flood prevention, and within the boundaries of the designated plan areas, the local and regional parties involved were engaged in a collective learning process, stimulated by the establishment of and activities organised by in particular Xplorelab. They seemed to trust and respect each other, and they seemed to enjoy working together. Doubts and uncertainties were discussed during several brainstorm sessions and the publication of innumerable reports, policy documents and booklets contributed to the institutional memory of both projects.

To a certain extent the parties involved were thus engaged in single loop learning and were able to improve their routines. However, only to a limited extent did the spatial planning institutions allow for and encourage double loop learning – the

reinterpretation of routines and doing things differently. They demonstrated a strong path dependent development, in particular in Westergouwe where the location choice for this new residential area was already made in the 1970s. Nevertheless, despite the opposition and resistance, the Westergouwe project organisation succeeded in doing things differently. For instance, it developed innovative ways to institutionalise the new floor levels of Westergouwe in the water management section of the local plan of Gouda Municipal Executive. And together with two private construction companies it developed a public-private partnership in which various building requirements were laid down.

5.3 Room for autonomous change

Both in the Zuidplaspolder and in Westergouwe, the access to information was high. The spatial planning institutions also promoted the capacity to act according to plan. However, in both projects, the extent to which the institutions promoted the capacity of actors to improvise was rather limited. The climate issue was generally perceived as a long term issue, as something which is very difficult to anticipate on and adapt to. As both Zuid-Holland Provincial Executive and Gouda Municipal Executive pointed out, at a certain moment choices just have to be made (such as on which climate scenario the plans will be based), and a particular policy course has to be followed. Rules and requirements of existing formal planning procedures, often represented the current policy course, and as a result to some extent restricted the incorporation of new and innovative plans, or made that more difficult. The successful involvement of private construction companies in the Westergouwe project can be interpreted as a positive sign for the room for autonomous adaptation at the local level.

5.4 Leadership

On the basis of our assessment we can conclude that the spatial planning institutions that we studied allowed for and promoted in particular visionary leadership, enacted by Zuid-Holland Provincial Executive, i.e. Xplorelab. Both during the planning process for the Zuidplaspolder project and during the planning process for the Westergouwe project, this provincial department created the room to experiment, to study the impacts of climate change and to develop a long term vision. With regard to the other two types of leadership, entrepreneurial leadership and collaborative leadership, our assessment shows a more nuanced picture. In the Zuidplaspolder, the initiator of the project, Zuid-Holland Provincial Executive, lacked entrepreneurial leadership – as a result, the actual implementation of climate change adaptation strategies is still uncertain. And only to a limited extent did this Provincial Executive promote collaborative leadership. Although in particular the hotspot project organisation managed to bring together many different parties, the hotspot project and the more formal Zuidplaspolder project are still separated and carried out in parallel trajectories. By contrast, mainly due to the strong sense of urgency, Gouda Municipal Executive demonstrated strong entrepreneurial and collaborative leadership. It clearly took the lead and despite all the initial opposition and resistance against the urban extension in Westergouwe it succeeded in organising a process architecture that inspired the parties involved to develop and implement the innovative masterplan ‘Water City Westergouwe’.

5.5 Resources

The availability of resources is highly dependent on the political and public climate. In the Netherlands, the idea of climate-proof spatial planning is still marginally developed and implemented. There is hardly any (national) financial budget available to stimulate climate-proof spatial planning for flood prone areas, which is also in line with the decentralisation trend within Dutch spatial planning and the idea that climate-proof spatial planning is situation-specific and primarily has to take place at the local and regional level. There is only some budget available for the development of innovative ideas and adaptation strategies, of which the introduction of the Zuidplaspolder hotspot project is a good example. The Zuidplaspolder project also benefits from its designation as exemplary project with international status – the Ministry of Housing, Spatial Planning and the Environment provided a grant as a result of which two of the five projects of the Zuidplaspolder hotspot can be developed further. Unlike water managers, spatial planners have only few possibilities to generate the necessary resources for implementing paper plans. The construction of new and climate-proof residential areas such as Westergouwe should become financially feasible mainly through the selling of the new homes. However, due the current economic crisis, this could be a problem. When it comes down to implementing paper plans, there is much uncertainty about the availability of resources.

5.6 Fair governance

The nature of governance within society determines the room for social actors to participate creatively in the problem solving process and thereby establish and change institutions. The Dutch institutions involved in climate-proof spatial planning for flood prone areas seem to allow for and encourage legitimate, responsive and accountable policy making and implementation. For instance, during the planning process of the Zuidplaspolder project as well as the Westergouwe project local and regional parties were actively involved in the development and implementation of adaptation strategies. However, the extent to which the spatial planning institutions protect basic rights and equity is uncertain and remains to be seen. An important problem of the vulnerability reduction strategy is the lack of formal water safety norms for local and regional dikes and water defences. As a result, for planning projects such as Westergouwe a normative answer has to be formulated to the question: how safe do we think is safe enough (– to what extent do the potential impacts of flooding have to be reduced and which water safety norms shall we apply)? This is a difficult question, hindering the planning process and generating uncertainty regarding the water safety and protection level of new residential areas. Moreover, the way in which for example the future residents of Westergouwe will be protected against floods is different from the residents living in other parts of Gouda.

6 Conclusion

The central question of this Working Document was to what extent Dutch spatial planning institutions have the capacity to promote climate-proof spatial planning for flood prone areas. We have focused our assessment on the Zuidplaspolder project and the Westergouwe project, both situated in the deepest polder in the west of the Netherlands. Based on our assessment, the applications and use of the Adaptive Capacity Wheel, we can conclude that Dutch spatial institutions do enable climate change adaptation, but to a limited extent. They provide five important institutional strengths that are required to cope with the new challenges and develop and implement adaptation strategies, but at the same time face six important institutional weaknesses (see Table 6.1).

Table 6.1 Institutional strengths and weaknesses of Dutch spatial planning institutions.

Institutional strengths	1.	Variety in potential adaptation strategies to climate-proof spatial developments
	2.	Inclusion of a wide variety of actors, sectors and administrative levels
	3.	Room for experimenting and learning
	4.	Involvement of private construction companies
	5.	Visionary leadership
Institutional weaknesses	1.	Dominant focus on vulnerability reduction
	2.	Strong path dependent development of institutions
	3.	Lack of improvising capacity of society
	4.	Lack of entrepreneurial leadership
	5.	Adaptation strategies lack financial resources
	6.	Lack of water safety norms for local and regional dikes and water defences

The following five institutional strengths could be identified. First, inspired by the layers approach and the concept of multi-layered safety, Dutch spatial planning institutions allow for and encourage the development of many different potential adaptation strategies to climate-proof spatial developments. This can be considered an innovative practice, as in the Netherlands the dominant problem frame regarding water safety is flood prevention. A second institutional strength is that the spatial planning institutions promote the involvement of a wide variety of actors, sectors and administrative levels during policy making and implementation. Third, they generate room for experimenting and learning, and promote a positive atmosphere. The local and regional parties involved were engaged in a collective learning process, stimulated by the establishment of and activities organised by in particular Xplorelab. Fourth, the spatial planning institutions promote the involvement of private construction companies, helping to redefine flood protection as a public and a private responsibility rather than as a public responsibility alone. Finally, the spatial planning institutions that we studied promote visionary leadership, enacted by Zuid-Holland Provincial Executive, i.e. Xplorelab. Both during the planning process for the Zuidplaspolder project and during the planning process for the Westergouwe project, Xplorelab created the room to study the impacts of climate change and to develop a long term vision.

However, the same institutions face the following six institutional weaknesses. The first institutional weakness that we have identified concerns the dominant focus on vulnerability reduction. In the two projects that we studied, exposure reduction only played a role at the level of the designated plan area. A second institutional weakness is the strong path dependent development of the spatial planning institutions. Decisions once taken, such as the decision to develop a new residential area west of Gouda are almost impossible to turn back, in favour of another decision or location choice. The third weakness concerns the improvising capacity of society. Both Zuid-Holland Provincial Executive and Gouda Municipal Executive at one point decided to follow a specific policy course rather than adapting continuously to changing circumstances. In addition, existing rules and procedures often restricted the incorporation and implementation of innovative plans and strategies. The lack of entrepreneurial leadership, and in particular the gap between policy making and policy implementation, is the fourth institutional weakness that we have identified. Related to this weakness is the fifth institutional weakness of spatial planning institutions to climate-proof spatial developments: the lack of financial budget and the few possibilities that spatial planners have to generate resources. The lack of water safety norms for local and regional dikes and water defences is the sixth and final institutional weakness that we have identified. As a result, the protection of basic rights and equity in new residential areas such as Westergouwe is uncertain.

To conclude, the Adaptive Capacity Wheel offers a detailed analytic framework that is able to capture different aspects of discussions on adaptation in the spatial planning sector at different administrative levels. Moreover, it helps to structure these debates, and study the implications for the adaptive capacity of spatial planning institutions. To climate-proof spatial developments in flood prone areas, it is necessary to break through the strong path dependent development of spatial planning institutions, and to build in more flexibility in existing rules and procedures, by stimulating in particular the capacity of actors to improvise, by finding ways to generate resources to implement adaptation measures, and by creating room for entrepreneurial leadership.

Challenges for the further development of the Adaptive Capacity Wheel concern the issue of the weight of the different qualities (do we want to differentiate between the qualities? – some qualities are perhaps more important for adaptive capacity than others), the operationalisation and assessment of some of the criteria (such as in particular trust, authority, discuss doubts, and diversity), and the ‘scoring’ of the qualities and the criteria (which remains a highly subjective enterprise).

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Annex A Footnotes

- ¹ In Dutch: 'Men vond de hotspot niet nodig.'
- ² In Dutch: 'Rekening houden met water is niet hetzelfde als rekening houden met klimaat.'
- ³ In Dutch: Het project heeft zich vooral gericht 'op de mogelijkheden in plaats van de onmogelijkheden'.
- ⁴ In Dutch: 'Wij hebben eigenlijk de verleidingstactiek toegepast. Dus ondanks dat het formeel allemaal niet nodig was, hebben wij gewoon gezegd van nou, we doen het gewoon. En door leuke boekjes te maken kan je die mensen uiteindelijk verleiden van nou, neem die nieuwe ideeën maar mee in je plannen.'
- ⁵ In Dutch: 'Het enige wat ze misschien te weinig hebben gedaan is het meenemen van de criticasters. Verder is eigenlijk iedereen en alles betrokken. (...) Maar het betekent wel dat de publieke opinie nog altijd verdeeld is ten aanzien van dit project, ondanks dat de hotspot daar wel in positieve zin aan heeft bijgedragen.'
- ⁶ In Dutch: 'Zo'n innovatief clubje heb je nodig om adaptief te kunnen zijn, om de verbindingen te kunnen leggen.'
- ⁷ In Dutch: 'Op een gegeven moment kwam de Zuidplaspolder in beeld als verstedelijkingslocatie en zou een plek gaan krijgen in de 5e Nota Ruimtelijke Ordening. Dat gaf natuurlijk wel een ander gevoel aan de kwestie. Westergouwe dreigde buiten het Groene Hart te komen. Voor ons gunstig, omdat het Rijk niet meer keihard kon blijven zeggen: Westergouwe ligt in het Groene Hart en dus kan het niet. Dat betekende dat het Rijk dus ook echt mee moest gaan denken in dit verhaal.'
- ⁸ In Dutch: 'Het was een nieuw tijdsgewricht, Waterbeheer 21^e eeuw, water als sturend principe voor de ruimtelijke ordening. De discussie ontstond waar moeten we gaan bouwen, en over Westergouwe als diepste putje van Nederland, zoals Westergouwe altijd zo fraai wordt aangeduid.'
- ⁹ In Dutch: 'De discussie over de ontwikkeling van Westergouwe werd op het scherpst van de snede gevoerd, terwijl de locatie al jaren in beeld was.'
- ¹⁰ In Dutch: 'Dat maakte ook wel dat dit project direct op de kaart kwam, want dit was dan ongeveer wel een soort lakmoesproef voor heel West-Nederland. Nou, daar hebben wij voordeel bij gehad, want dat maakt dat we wel de mensen aan tafel hadden die besluiten konden nemen. Anderzijds bracht het Westergouwe op een podium waarvan wij zoiets hadden van: we zijn hier alleen maar als gemeente Gouda een woonwijk aan het ontwikkelen en aan het bouwen. Die landelijke discussie over hoe om te gaan met water dat ging ons toch echt effe wat te ver en dat is ook helemaal niet aan ons. Gouda is niet de aangewezen partij om die discussie te trekken.'
- ¹¹ In Dutch: 'Gegeven de keuze voor de locatie is het vanuit waterhuishoudkundig perspectief mogelijk en verantwoord op de locatie zoals vastgelegd in het streekplan een woonwijk te ontwikkelen.'
- ¹² In Dutch: 'Vloerpeil is overstromingspeil en we kijken alleen naar de gevolgenkant.'
- ¹³ In Dutch: 'We hadden geen andere keuze. Dit was onze laatste mogelijkheid.'
- ¹⁴ In Dutch: 'Iedereen is er zo'n beetje bijgehaald die iets met water te maken had.'
- ¹⁵ In Dutch: 'We hebben wel een overmaat ingebakken - er zit wel al extra ruimte voor water in het systeem.'

- ¹⁶ In Dutch: 'De energie was bij alle partijen wel een hele goeie. Want iedereen besepte zich wel van hé we zijn hier iets speciaals aan het doen. Daardoor kon in een relatief korte tijd toch een heleboel werk verzet worden.'
- ¹⁷ In Dutch: 'Technisch gezien is alles mogelijk. De grootste innovatie bij Westergouwe zie ik nog steeds in het proces. Dat de partijen elkaar gevonden hebben op een goede manier.'
- ¹⁸ In Dutch: 'Als je kijkt naar het akkoord van 30 september 2004, ondertekend door de minister, dan werd daar toch min of meer gezegd van: nou, onze vragen zijn goed beantwoord, en onze eisen zijn gerealiseerd, maar als we nu alles weer opnieuw zouden bekijken, zouden we waarschijnlijk 'nee' zeggen tegen Westergouwe. Maar omdat het al zo lang loopt hebben we besloten er toch maar mee verder te gaan.'
- ¹⁹ In Dutch: 'Als je Westergouwe in een breder perspectief plaatst, dus als we de hele Zuidplaspolder of heel West-Nederland zouden beschouwen, dan zou Westergouwe daar nou niet als één van de meest gunstige locaties naar voren komen.'
- ²⁰ In Dutch: JvB: 'Ik denk dat als we dit proces nu zouden opstarten, dat Westergouwe er dan niet zou komen.'
- ²¹ In Dutch: 'Het voorschrijven van vloerpeilen in de waterparagraaf gaat al redelijk ver, normaal ga je niet zo ver. Maar voor het opvangen van de optredende krachten bij een dijkdoorbraak daar hebben we geen instrument voor. Dus één van de centrale vragen was: hoe gaan we die waterveiligheid nu borgen? Want we hebben geen publiek instrument om dat te borgen. Want zo 'n instrument zou altijd verder gaan dan het bouwbesluit, want het gaat om strengere eisen. Nou ja, die worsteling hebben we uiteindelijk hier in Westergouwe in elk geval redelijk makkelijk kunnen oplossen. De gemeente Gouda heeft samen met Heijmans en Volker Wessels, twee bouwbedrijven, een samenwerkingsovereenkomst gesloten over hoe met de hele wijk om te gaan. Wij hebben het dus uiteindelijk niet publiekrechtelijk vastgelegd maar privaatrechtelijk waarbij dus de partijen, Heijmans en Volker Wessels en de gemeente, zich in een privaatrechtelijke overeenkomst akkoord hebben verklaard met het meenemen van die extra constructieve eisen.'
- ²² In Dutch: 'Op een gegeven moment was het van ja, we moeten het nu wel weten: wordt het links of rechts? Waar zijn we aan toe? (...) En dat geldt in elk plan. Staand beleid neem je mee, en ja, toekomstig beleid is zo lastig op te anticiperen. Er is geen afspraak gemaakt dat we een glijdende schaal hebben dat we steeds doorrekenen wat een nieuw klimaatscenario betekent. We hebben wel een overmaat ingebakken, geprobeerd een robuust watersysteem, een robuuste wijk te bouwen.'
- ²³ In Dutch: 'Het inbrengen van adaptatie kwam dus in dit geval van de provincie [Zuid-Holland], en de klimaatscenario's kwamen van het hoogheemraadschap [Schieland en Krimpenerwaard]. Ook de veiligheid tegen overstromingen kwam vooral van de provincie.'
- ²⁴ In Dutch: 'Gouda heeft altijd het voortouw genomen, want wij waren initiatiefnemer. Wij hebben steeds aan de kar geduwd of getrokken.'
- ²⁵ In Dutch: 'Dan was Westergouwe er niet gekomen.'
- ²⁶ In Dutch: 'Misschien is het juist daarom sterk dat het probleem op hetzelfde moment op verschillende plekken gevoeld wordt, dat het leiderschap verdeeld is over de partijen'.
- ²⁷ In Dutch: 'Iedereen is er zo'n beetje bijgehaald, betrokken bij het planproces'.
- ²⁸ In Dutch: 'Het systeem dat we hebben ontwikkeld is zo robuust dat het verdere bouwen desnoods traditioneel kan'.