# Cooperation in Landscape Conservation

*The influence of network structure on the adaptive capacity of collaborative arrangements in Dutch National Landscapes* 



Floor Koornneef – 3636135 June 25<sup>th</sup>, 2012

Supervisor: Dr. Frank van Laerhoven Second reader: Prof. dr. Peter Driessen

Sustainable Development Environmental Policy & Management Master thesis - 45 ECTs Utrecht University

### Acknowledgement

This research project gave me the opportunity to gain insight in the management of National Landscapes in the Netherlands, and the functioning of cooperation between different involved actors in this management. Without the participation of individual persons at these organizations, this research would not have been possible. If I want to thank them all personally, I should provide a long list of names, with the risk of forgetting one. Therefore I want to thank all, who have participated in one way or another, for their time and help they have devoted to completing surveys, participating in interviews or shorter phone calls, or for their help in finding the right persons.

Furthermore, I want to thank my supervisor dr. Frank van Laerhoven, for his enthusiasm and advise during my research. He kept me motivated and gave me confidence in my own research project, when I had a hard time starting it, which I deeply appreciated. His guidance provided me with new insights concerning my own research and the social sciences in more general.

I am really grateful for the trust my parents always have had in me during my studies. They were always there to show me my strengths when I did not saw them myself anymore. Thank you as well Pepijn, for your sometimes scientific, sometimes more personal advise and support. Thanks for the evenings you sacrificed reading my thesis. For this I also want to thank Gary Barnes, who made a final language check on my writings. Finally I want to thank Tessa Meulensteen for the drinks and discussions we had on our researches, they were very helpful.

#### **Summary**

We and our planet are subject to an ever changing environment. If systems want to survive they need the capacity to adapt to these changes. Adaptive capacity can therefore be seen as a precondition for the achievement of sustainable development. Empirical studies have shown that collaborative arrangements consisting of a divers set of actors, are more likely to establish adaptive processes. These arrangements can, however, have many different structures. The focus of this research was on investigating which structural factors in collaborative arrangements determine the adaptive capacity of these collaborative arrangements. Collaborative arrangements were approached as networks and the hypothesis was put forward, that high network closure and high network heterogeneity determine a high adaptive capacity. Through a social network analysis and a newly developed method for the measurement of adaptive capacity, this theory was tested on collaborative arrangements managing two National Landscapes in the Netherland.

It was found that both collaborative arrangements had the same level of adaptive capacity. One however had a higher network closer, whereas the other had a higher network heterogeneity. The relation between network closure and heterogeneity, and the adaptive capacity of a collaborative arrangement, appeared to be not that straightforward as hypothesized. Two different conclusions could be drawn. First, there might exist a range in the combination of network closure and heterogeneity, which determines the same level of adaptive capacity. Or secondly, the level of adaptive capacity of a collaborative arrangement is determined more by an other (unsystematic) variable. Further research should analyze the scale of the range, and the influence of other variables on the level of adaptive capacity of collaborative arrangements.

# Table of Contents

# Page number

Acknowledgement		
Summary	3	
1. Introduction	7	
Thesis outline	8	
2. Theoretical background and hypothesis formulation		
2.1 Adaptive management	10	
2.2 Co-management	11	
2.3 Relation network structure and network performance	12	
2.4 Network structure	13	
2.4.1 Network closure	14	
2.4.2. Network heterogeneity	15	
2.5 Research hypothesis	15	
3. Methodology		
3.1 Study areas	18	
3.2 Network mapping	18	
3.3 Measuring network closure and heterogeneity	21	
3.3.1 Network closure	21	
3.3.2 Network heterogeneity	23	
3.4 Measuring adaptive capacity	23	
4. National Landscapes in the Netherlands		
4.1 Definition and aim	27	
4.2 History and development	27	
4.3 Management practices	29	
4.4 Problems and criticism	30	
5. Case 1: Hoeksche Waard		
5.1 Background	32	
5.2 Network closure and heterogeneity	33	
5.3 Adaptive capacity of the co-management arrangement	34	
5.3.1 Past changes	35	
5.3.2 Future perspectives	36	
5.3.3 Determinants	38	

6. Case 2: Laag Holland		
6.1 Background	39	
6.2 Network closure and heterogeneity	41	
6.3 Adaptive capacity of the co-management arrangement	42	
6.3.1 Past changes	42	
6.3.2 Future perspectives	43	
6.3.3 Determinants	45	
7. Comparing cases		
7.1 Network structure	46	
7.2 Adaptive capacity	46	
8. Discussion and conclusions		
8.1 Data reliability and research validity	50	
8.1.1 Network data	50	
8.1.2 Adaptive capacity	51	
8.1.3 Comparability	52	
8.2 Research results discussed in a broader context	52	
8.3 Conclusion	54	
9. References	56	
Appendix I: Survey the Hoeksche Waard	60	
Appendix II: Survey Laag Holland	65	
Appendix III: Network organizations description		
Organisations in the Hoeksche Waard	70	
Organisations in Laag Holland	73	

# List of Figures

Figure 2.1 Relation network structure and qualities of the	
management system	
Figure 2.2 Hypothesis Sandström and Rova (2010a)	16
Figure 3 Different network structures	21
Figure 4 National Landscapes in the Netherlands	28
Figure 5.1 National Landscape the Hoeksche Waard	32
Figure 5.2 Cooperation network on the conservation of	34
National Landscape the Hoeksche Waard	
Figure 5.3 Theorem policy	36
Figure 5.4 Theorem financial resources	36
Figure 5.5 Theorem SOHW	37
Figure 5.6 Theorem Natuurmonumenten	37
Figure 5.7 Theorem ANCO De Rietgors	37

Figure 6.1 National Landscape Laag Holland	39
Figure 6.2 Cooperation network on the conservation of	41
National Landscape Laag Holland	
Figure 6.3 Theorem policy	43
Figure 6.4 Theorem financial resources	43
Figure 6.5 Theorem Programmabureau Laag Holland	44
Figure 6.6 Theorem Natuurmonumenten	44
Figure 6.7 Theorem ANCO Water, Land & Dijken	45
Figure 7.1 No effects if national government abandons	46
National Landscape policy	
Figure 7.2 Effects if 1/3 less financial resources are available	47
Figure 7.3 No effects if Programmabureau Laag Holland/SOHW stops	47
Figure 7.4 Effects if Natuurmonumenten stops cooperation	47
Figure 7.5 Effects if the Agricultural Nature Conservation	48
Organization stops cooperation	

# List of Tables

Table 3.1. Three ways of measuring adaptive capacity	23
Table 3.2. Proposed determinants of adaptive capacity	26
Table 5 The Hoeksche Waard network characteristics	33
Table 6 Laag Holland network characteristics	41
Table 7.1 Network characteristics compared	46
Table 7.2 Comparing level of adaptive capacity	48

# **1. Introduction**

National Landscapes are the youngest type of protected areas in the Netherlands. However, at the time of writing of this thesis they are threatened with abolition. National Landscapes are areas 'where the interaction of people and nature over time has produced an area of distinct character with significant ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values' (IUCN 2009).

The interaction between people and nature in National Landscapes, makes this protected area category a perfect example of a socio-ecological system. Berkes and Folke (1998) have introduced this term social-ecological system in order to stress the linkage between social and ecological systems. They believe that a delineation between social and ecological systems is arbitrary and artificial (Berkes & Folke 1998), since humanity depends for its survival on the services ecosystems provide. However, at the same time humanity has the capacity to transform ecosystems (Folke et al. 2002), by for example the cutting of trees or the emission of polluting gases. This influence of humanity on its environment is one important theme in environmental research. A central theme is currently the impact of different management systems and institutional arrangements on the state and sustainability of natural resources in socio-ecological systems (Sandström & Rova 2010b, Sandström 2011). This theme will be the central part of this thesis.

Social-ecological systems are subject to an ever changing environment. A changing climate and changing policy structures are only two examples. The capacity to cope with and adapt to these changes is therefore perceived as essential for the survival of these systems and critical for the achievement of sustainable development (Folke et al. 2002, Folke et al. 2005, Lebel et al. 2006, Clark & Clarke 2011). Empirical studies (Sabatier et al. 2005: 263) suggest that adaptive processes are more likely to be established by collaborative arrangements that involve many diverse actors from various sectors and user groups in the management, than other types of management systems (Plummer & Armitage 2010, Sandström & Rova 2010a, 2010b). Collaborative arrangements, however, have a large variety of different structures. The structure of a collaborative arrangement is 'assumed to affect the behavior of the individuals and the quality of their interactions, consequently affecting the institutional arrangements regulating resource use' (Sandström & Rova 2010a: 529-530). As a result, collaborative arrangements with different structures might have different outcomes and perform differently. Knowledge on the link between the structure of collaborative arrangements and the performance of these arrangements is, however, still limited (Sandström & Rova 2010a, 2010b).

Therefore, the objective of this research is to generate descriptive and explanatory knowledge on the structural factors in collaborative arrangements which determine the adaptive capacity of these collaborative arrangements, since this capacity is believed to be a precondition for sustainable development (Lebel et al. 2006, Clark & Clarke 2011). The collaborative arrangements that will be analyzed in this research are the arrangements managing National Landscapes in the Netherlands. The policy protecting these areas will be abolished most likely during the writing of this thesis. In order to safeguard these areas, a management system has to be in place that can adapt to any further changes that might occur in the future.

The analyses of the level of the cooperation between different parties involved in the management of National Landscapes; the structural characteristics of the collaborative management arrangement; and the adaptive capacity of these collaborative management arrangements will be used to obtain the objective of this research. The following research question was developed, in order to lead the research towards its research objective:

*'Which structural factors in collaborative arrangements in Dutch National Landscape management determine the adaptive capacity of these collaborative arrangements?'* 

To answer this main research question, three sub-research questions were developed:

- What are the underlying cooperation networks of stakeholders found within the study areas?
- What are the structural characteristics of the found networks?
- What is the level of adaptive capacity of the collaborative arrangements in the study areas?

During this research, two National Landscapes in the Netherlands, the Hoeksche Waard and Laag Holland, were analyzed and cross examined by comparing their similarities and differences concerning the structural characteristics and adaptive capacity of the collaborative management arrangements. The outcome of this research can help to improve natural resource management in general. When knowledge is available regarding which management structure generates the highest adaptive capacity, steering towards this management structure is possible.

#### Thesis outline

This thesis starts with a theoretical background of the research. Literature on adaptive management and co-management is reviewed in section 2.1 and 2.2. Afterwards theories on the relation between network structure and performance are put forward in section 2.3 and 2.4. Finally the hypothesis that is tested in this research is presented in section 2.5. Chapter 3 contains the methodological approach taken in this research and the rationale behind the operationalisation of the research questions.

Before the presentation of the collected data, chapter 4 put forward a contextual background on National Landscapes in the Netherlands. Their aim, history, management and problems are discussed. The data obtained confirming the methodological approach is then presented in chapter 5 for the Hoeksche Waard and in chapter 6 for Laag Holland. This data is further analyzed and compared in chapter 7. Chapter 8.1 lays down a discussion on the gathered data and analyses made. Furthermore in this chapter the results of the conducted research will be placed in a broader context and broader scientific literature. Finally the conclusions of this research will be discussed in section 8.3.

In appendix I and II, the surveys used in the research can be found. Furthermore, in appendix III the organizations involved in the management of the National Landscapes are described shortly.

### 2. Theoretical background and hypothesis formulation

#### 2.1 Adaptive management

Theories on adaptive management and it being a precondition for sustainable development have their roots in the ecological concept resilience. 'Resilience is a measure of the amount of change a system can undergo and still retain the same control on structure and function' (Lebel et al. 2006: 2). Resilient systems have the capacity 'to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity and feedbacks' (Walker et al. 2004: 2). This capacity of systems to adapt and to shape change is becoming more important due to a changing climate and the changing, uncertain world in transformation we face nowadays. It is expected that because of the changing climate, periods of abrupt change will increase in frequency, duration and magnitude (Folke et al. 2005). Resilient systems that can adapt to these changes without losing their function, structure, identity and feedbacks, are therefore believed to have a bigger chance of survival in the changing world we live in.

Management can destroy or increase the level of resilience of a system (Walker et al. 2004, Folke et al. 2002). From history it can be seen that because of humanity's attempts to control resources, by for example domestication and simplification of the landscape in order to increase production and reduce uncertainty, the capacity of ecosystems to adapt and cope with change has decreased (Folke et al. 2005). Since human action is at the moment dominant in social-ecological systems, the capacity to increase the resilience of these systems lies with individuals and groups acting to manage these systems. They influence resilience, either intentionally or unintentionally, with their actions. This capacity to influence resilience is referred to as adaptability by Walker et al. (2004). The level of adaptability or adaptive capacity of a management arrangement determines, whether this arrangement can successfully avoid the crossing of the system into an undesirable system regime, or succeed in crossing back into a desirable one (Walker et al. 2004).

In general, resilience derives from things that can only be restored slowly. Adaptive management therefore focuses on 'slowly-changing, fundamental variables that create memory, legacy, diversity and the capacity to innovate' (Folke et al. 2002: 438). Social capital (including trust and social networks) and social memory (including experience for dealing with change) are therefore essential social resources that enable adaptation (Folke et al. 2005). Adaptive management is flexible and open for learning. But at the same time it 'conserves and nurtures the diverse elements that are necessary to reorganize and adapt to novel, unexpected, and transformative circumstances' (Folke et al. 2002:438). The acceptation of the ecosystem complexity, uncertainty and the possibility of future change is very important in adaptive management (Folke et al. 2005, Lebel et al. 2006). Existing and developed knowledge about the socio-ecological environment is used in the constant reconsideration and adjustment of the management rules to this knowledge. Adaptive management is in fact a self-organized ongoing process of trial and error, in which

institutional arrangement and ecological knowledge are tested and revised (Sandström & Rova 2010b, Bodin & Prell 2011).

Adaptive capacity in this thesis is defined as the capacity to handle and adapt to abrupt changes without significant decline in crucial functions and the loss of structure and identity. The level of adaptive capacity of a socio-ecological system is believed to be determined by the amount of available resources (technical, financial, natural, social, institutional, political) and the social processes and structures through which these resources are mediated and employed (Lebel et al. 2006, Plummer & Armitage 2010). In this thesis the focus will be on the social processes and structures that determine adaptive capacity. The next section will continue on these processes.

#### 2.2 Co-management

Empirical studies (Sabatier et al. 2005) suggest that adaptive processes are more likely to be established by collaborative arrangements that involve many diverse actors from various sectors and user groups in the management, than other types of management systems (Plummer & Armitage 2010, Sandström & Rova 2010a, 2010b). Collaborative arrangements in the management of natural resources, however, have a large variety of names in the literature. Some scholars refer to them as co-management, which is often understood to mean the sharing of management responsibilities and authority between a state and local resources users (Borrini-Feyerabend et al. 2007). But co-management is also defined in much broader terms as a 'division of authority and management tasks among various stakeholders, public as well as private' (Sandström & Rova 2010b: 2). In this thesis co-management is used as an abbreviation of the term collaborative management. Both terms are understood as an collaborative arrangement, involving various actors, both private and public on different levels, who together contribute to and take responsibility for the management of a certain area.

These co-management arrangements can be seen as a type of governance arrangement. In the last decades, a shift can be noticed from government to governance. The term governance is used in many different ways and has a variety of meanings, but the essence of most definitions is that 'governance refers to the development of governing styles in which boundaries between and within public and private sectors have become blurred. The essence of governance is its focus on governing mechanisms which do not rest on recourse to the authority and sanctions of government' (Stoker 1998: 17). Governance rather emerges from the interactions between private and public parties or between private parties mutually (Lebel et al. 2006).

Co-management arrangements are believed to support the access to, and exchange of, both material and immaterial resources, like money, technology, scientific knowledge, local experiences and legitimacy. Besides this, co-management structures provide arenas for problem solving among involved stakeholders (Carlsson & Berkes 2005). Participation can

build trust and a shared understanding due to the exploring and sharing of different perspectives, explanations and interests (Lebel et al. 2006). Therefore, co-management is assumed to foster the rise of functional conflict resolution processes (Carlsson & Berkers 2005) and social learning (Lebel et al. 2006). This is necessary for actors to mobilize and self-organize and can create memory in the co-management arrangement, which enables a successful response to abrupt changes (Olsson et al. 2004, Lebel et al. 2006). Furthermore multilayered and polycentric co-management arrangements that include actors on different levels are believed to improve the fit between knowledge, action and local context. It enhances the diversity of response options and fosters memory building in the system (Folke et al. 2005, Lebel et al. 2006)

Co-management is, however, a broad term as already mentioned above, and it covers a wide variety of specific ways to organize and structure management (Sandström & Rova 2010a, 2010b). According to Sandström and Rova (2010) it therefore does not make sense to formulate statements in more than very general terms about the consequences of co-management, since different co-management structures might have different outcomes and perform differently. Their research therefore focuses on the relation between the structure of cooperation and the outcome of the cooperation. Knowledge about this relation between different co-management structures and the performances of these arrangements is however still limited (Sandström & Rova 2010a, 2010b). The aim of this research is to broaden this knowledge. The next section will continue on the relation between different co-management structures and their performances.

#### 2.3 Relation network structure and network performance

Co-management and other governance arrangements in general, can be approached as social networks (Carlsson & Berkes 2005, Carlsson & Sandström 2008, Sandström & Rova 2010a, 2010b). A social network consists of a set of social actors and a set of relationships that apply to these actors. Furthermore, it can contain additional information about the actors and their relations (Bodin & Prell 2011). Structures that can be identified as network-based are often characterized by high levels of interdependence involving multiple organizations. Diverse actors join in order to focus on common problems and formal lines of authority become blurred (Schneider et al. 2003).

The concept of networks is often used as an analytical tool or a descriptive metaphor to illustrate a phenomenon in which a related set of actors engage in various activities. Sandström and Carlsson (2008), however, cross this delineation, and treat networks as independent variables in their research. Their research adopts the hypothesis, that the structure of networks, i.e. the constellation of actors and the patterns of their interaction, affects the performance of networks. This hypothesis was proposed earlier by Carlsson and Sandström (2008). Their basic idea is that 'certain network structures generate higher social capital, and hereby, result in an improved performance' (Carlsson & Sandström 2008: 35). Schneider et al. (2003) agree with this and stress that the advantage of networks not only depends on who

is involved, but also on the extent to which interactions produce trust and consensus among actors involved. Trust and consensus, which are fostered by repeated interactions, will promote collective action even though conflicting values and beliefs might exist. In other words 'network structure is assumed to affect the behavior of the individuals and the quality of their interactions' (Sandström & Rova 2010a: 529-530), which directly affects institutional arrangements and their performance. This link between network structure and the performance of governance systems is put forward by several scholars (Marsh & Smith 2000, Carlsson & Sandström 2008, Sandström & Carlsson 2008, Sandström & Rova 2010a, 2010b, Bodin & Prell 2011, Sandström 2011).

Why network structure can be assumed to influence performance of the network is explained in two ways by Carlsson and Sandström (2008). First, network activities are often perceived as bargaining games. Actors are involved in a network because they want to maintain or acquire resources. For this they are dependent on other actors in the network. As a result network actors have to negotiate and adapt to the strategies of the other actors in the network. The performance of the network is therefore highly dependent upon how such bargaining interactions precede, i.e. the structure of the interaction. The second explanation starts with the assumption that the structure of a network information about the underlying structure of more stable interactions provides. This structure of relations and the place of individuals in the network, have important behavioral, perceptual and attitudinal consequences. Not only for the individual actors in the system, but for the entire network as a whole. 'The pattern of relations either enhances or restricts the process of resource allocation and influences performance'(Carlsson & Sandström 2008: 39).

Sandström and Carlsson (2008) have, during the testing of the hypothesis of Carlsson and Sandström (2008), approached network performance as efficiency and innovativeness of a network. Sandström and Rova (2010a, 2010b), who also adopted the same hypothesis in their research, however defined network performance as the level of adaptive capacity of a comanagement arrangement. In this research too, network performance is approached as the level of adaptive capacity of the co-management arrangement, since this capacity is believed to be a precondition for sustainable development (Lebel et al. 2006, Clark & Clarke 2011) in the uncertain world in transformation we live in these days.

#### 2.4 Network structure

Carlsson and Sandström (2008) propose two structural network properties that might have an influence on the performance of a network, network closure and network heterogeneity. Network closure refers to the level of connectedness of the network which can be direct or indirect through a central actor. Network heterogeneity on the other hand refers to the diversity of actors involved in the network and the level of their cross-boundary exchange. The hypothesis is put forward that 'well-performing co-management system are comprised of networks characterized by a heterogeneous set of actors and that they at the same time, are centrally and densely integrated' (Carlsson and Sandström 2008: 46).

The study of Sandström and Carlsson (2008) shows that the two network characteristics have an influence on the efficiency and innovativeness of networks. Network closure and heterogeneity, however, do not affect both performance characteristics positively. A high network closure was found to lead to an improved efficiency of the network and on the other hand, high network heterogeneity led to an improved innovativeness of the network. Sandström and Carlsson (2008) also stressed that network closure and heterogeneity did not influenced the efficiency and innovativeness of the network directly but that it affected the central organizing process, which in turn affects the network efficiency and innovativeness.

Sandström and Rova (2010a, 2010b) assumed that a combination of high network closure and high network heterogeneity would have a positive effect on the adaptive capacity of a comanagement arrangement. High network closure would promote and smoothen the decisionmaking process and high network heterogeneity would be important for the existence of ecological knowledge and the spread of it among the actors in the network (figure 2.1). These are both aspects of adaptive management which is perceived by Sandström and Rova (2010a, 2010b) as an active rule-forming process based upon prevailing ecological knowledge.

Low

High	In this type of network, access to various resources (e.g. knowledge) is improved. However, high transaction costs and difficulties in making priorities and managing conflicts between different interests hamper the policy process.	High levels of heterogeneity promote access to diversified knowledge. At the same time, high levels of closure improves the internal decision-making process by lowering transaction costs and fostering effective conflict resolution mechanisms.	
Heterogeneity	This kind of network structure hampers the governance process by obstructing the prospect of dealing with collective action problems in an efficient manner. It is also less likely to access knowledge and new ideas promoting innovative solutions to the problems faced.	The ability to make decisions and solve conflicts at low transaction costs is possible within this network. However, the process of knowledge mobilisation is likely insufficient, which affects the ability to find innovative solutions.	

**Network Closure** 

Hiah

Figure 2.1 Relation network structure and qualities of the management system (Sandström & Rova 2010a: 531)

#### 2.4.1 Network closure

Network closure refers to the level of connectedness of the network. The connections in a network can be either direct or indirect through a central actor. Network closure is therefore measured by two measures, density and centrality. A high density means high levels of activity. This is believed to secure the flow of communication which allows bargaining and

joint action. Centrality on the other hand explains to what extent these interactions are centralized (Carlsson & Sandström 2008) or in other words, how 'unequally well connected' the actors in the network are. High levels of centrality imply hierarchy in the network and communication and collaboration can also be channeled through a central coordinator (Sandström & Carlsson 2008). Thus the higher the levels of density and centrality are, the higher the level of network closure is (Carlsson & Sandström 2008).

It is believed that a network with many and strong connections between actors in the network, is rich in social capital (Carlsson & Sandström 2008). A close network structure is assumed to have a positive effect on the capacity to establish and maintain rules concerning the management of the resource, and the capacity to solve and handle conflict and divergences among stakeholders (Sandström & Rova 2010a, 2010b). However, very dense networks on the other hand might risk reducing the diversity of knowledge which is incorporated in the management process (Sandström & Rova 2010a). Furthermore, too dense networks are less innovative and more vulnerable to external stress (Carlsson & Sandström 2008).

#### 2.4.2. Network heterogeneity

Network heterogeneity refers to the diversity of actors involved in the network and the level of their cross-boundary exchange. The idea that network heterogeneity has a positive effect on the performance of the network comes from the concept of structural holes. A structural hole is an absence of a connection in the network. Individual actors that can bridge these holes can gain access to more or new resources and information and thus have an advantage. Networks that contain a lot of these bridging individuals are considered to be rich in social capital and are therefore better performing. Network heterogeneity has turned out to be a successful measure and proxy for bridges over structural holes. 'The more heterogeneous set of actors, the more the network is assumed to span, or bridge, global structural holes' (Carlsson & Sandström 2008: 42).

A heterogeneous network is assumed to profit from an increased specialization which will allow the requirement of relevant knowledge, proper labor division and risk sharing. A network containing actors with many different expertises is expected to generate new knowledge and is perceived more innovative then a homogenous network. However, in diversified networks effective collaboration might be difficult to achieve due to the different backgrounds of the involved actors (Sandström & Rova 2010a). If networks are too heterogeneous it might be hard to prioritize and make joint decisions (Carlsson & Sandström 2008).

#### 2.5 Research hypothesis

High levels of closure and high levels of heterogeneity on their own can have a negative influence on the performance or adaptive capacity of a collaborative arrangement, i.e. a decrease of innovativeness and the inability to establish consensus. Therefore Sandström and Rova (2010a, 2010b) suggest that the combination of high network closure and high

heterogeneity will result in positive outcomes of collaborative arrangements (see figure 2.1), in which 'heterogeneity facilitates access to a diversified set of resources, while network closure improves the ability to set rules as well as to maintain and monitor these rules' (Sandström & Rova 2010a:530-531).

The hypothesis of Sandström and Rova (figure 2.2) proved to be a well working one when tested during a single case study on fish management area (Sandström & Rova 2010a). After this study they conducted a second study in which they tested their hypothesis during a comparative case study using again fish management areas (Sandström & Rova 2010b). The data in this second study did not fully support the initial hypothesis. Sandström and Rova (2010b), however, stressed that the idea of closure and heterogeneity as decisive variables relating to adaptability should not be rejected. Concluding, there is still uncertainty about the validity of the hypothesis and the relation between network closure and heterogeneity, and the adaptive capacity of a collaborative arrangement. Furthermore, as will be discussed in the next chapter, the method of measuring adaptability used by Sandström and Rova (2010a, 2010b), should be questioned. Therefore this research applied their theory on a larger and more complex system (National Landscape management) using a comparative case study approach and a different method for the measuring of adaptive capacity. The aim of this research was therefore to test the proposed hypothesis of Sandström and Rova (2010a, 2010b) (figure 2.2) and to see whether network closure and heterogeneity are indeed the structural factors in collaborative arrangements that determine the adaptive capacity of the collaborative arrangement.



Figure 2.2 Hypothesis Sandström and Rova (2010a)

In order to test this hypothesis and answer the main research question, 'Which structural factors in collaborative arrangements in Dutch National Landscape management determine the adaptive capacity of these collaborative arrangements?', three sub-research questions were developed:

- What are the underlying cooperation networks of stakeholders found within the study areas?
- What are the structural characteristics of the found networks?
- What is the level of adaptive capacity of the collaborative arrangements in the study areas?

The next chapter will discus the methodological approach taken in order to answer these questions.

# **<u>3. Methodology</u>**

#### 3.1 Study areas

The management of National Landscapes is a good example of a governance arrangement. Many different parties, private as well as public on different levels, are involved in the conservation of these areas. The co-management arrangements in National Landscapes offer the opportunity of being mapped in a network representing the different involved organizations and their cooperation ties. Therefore, collaborative arrangements managing National Landscapes are chosen as cases in this research. Two National Landscapes in the Netherlands were analyzed and cross examined by comparing their similarities and differences concerning the structural characteristics and adaptive capacity of the comanagement arrangements.

The selected National Landscapes are the Hoeksche Waard and Laag Holland. Both landscapes are characterized as a 'very open landscape' and are subject to water because of their location. One of the oldest polders of the Netherlands is located in Laag Holland, and the Hoeksche Waard has been sea in the past as well. Both areas are shaped by agricultural practices. In the Hoeksche Waard this is mainly for crop production due to the clay soils. Agriculture in Laag Holland is, however, dominated by cattle breeding due to the presence of peat lands. Hereby it is assumed that some environmental characteristics of the National Landscapes are constant especially when they are compared to other National Landscapes which are dominated by forests. Besides this, both National Landscapes are located in only one province. Finally, these National Landscapes were selected because the networks of organizations involved in the conservation of the National Landscapes were expected to have more or less the same size, which is important for a proper comparison as will be explained bellow.

#### 3.2 Network mapping

In this research a social network analysis was conducted. A social network analysis is believed to be a powerful tool for the generation of knowledge on governance structures governing complex social-ecological systems and the management of natural resources (Marín & Berkes 2010, Sandström & Rova 2010b). This method provides 'the means to map and quantify social relations, as well as visualize and analyze network structures mathematically' (Sandström & Carlsson 2008:499).

In order to answer the first sub-research question, *What are the underlying cooperation networks of stakeholders found within the study areas?*, the cooperation networks of involved actors in the conservation of National Landscapes were mapped. When mapping a network one can speak of nodes and links. A node is an actor found within the network. In this research, nodes are the organizations or authorities involved in the conservation and management of National Landscapes. Nodes can be connected with each other through links. In this research a link means cooperation in the from of information exchange, consultation

and/or project implementation on the subject of National Landscape conservation, between the nodes.

One important aspect of network analysis is who to include and where to draw the boundaries of the network under study (Wasserman & Faust 1994). Two approaches that can be taken in the specification of network boundaries are a nominalist and a realist approach. In a nominalist approach, the boundaries are based on the theoretical concerns of the researcher. A realist approach has the focus on how network actors themselves perceive the network boundaries and membership (Wasserman & Faust 1994). In this research, a realist approach was taken, since it would allow also for the identification of informal relationships or connections and unofficial actors. These real-life actors and relations might be missed when only formal relations are taken into account (Carlsson & Berkes 2005).

Sandström and Rova (2010a, 2010b) have used the snowball method to identify the network in their research. In a snowball approach, a small number of people who are relevant to the research topic are asked to identify other relevant respondents, who in turn are asked to identify other people (Bryman 2008). This will allow respondents to nominate each other as being part of the network (Sandström & Carlsson 2008), which is very useful in the construction of a cooperation network. In this research, respondents were asked in a survey or interview with whom they cooperate (in the form of information exchange, consultation and/or project implementation) when it comes to the conservation of the National Landscape (see appendix I and II for the surveys). The snowballing started with the central organization of both National Landscapes, in Laag Holland the 'Programmabureau Laag Holland' and in de Hoeksche Waard 'Samenwerkingsorgaan Hoeksche Waard (SOHW)'. These organizations provided a list of other organizations with whom they cooperated. The organizations on the list were asked if they also cooperated with any other organization that was not on the list. This ended, when no new organizations or authorities were mentioned (Sandström & Rova 2010a). In practice it became clear that in both landscapes the involved organizations differed somewhat. One reason for this is that the 'conservation of the National Landscape' was understood differently in both of the National Landscapes and among the different organizations, due to the vague description and aim of National Landscape conservation provided by the national government (Janssen 2009). Due to this vague description of the national government, it was decided to not provide respondents with a more precise definition of 'conservation of the National Landscape' and leave this subject to their own interpretation. The other reason for the diversity of involved actors is that the management and conservation of both National Landscapes is organized completely different.

In this research, the choice for providing the respondents with a list of possible cooperation partners (recognition method) was preferred above letting respondents create the list themselves (recall method). The recall method often elicits only the strongest ties whereas the recognition method elicits both strong and weak ties (Crona & Bodin 2011). The choice of the recognition method was motivated by the belief that it was easier for the respondents to pick

from a provided list instead of thinking about their cooperation relations more deeply. By making it easy for respondents, it was hoped they would be more willing to cooperate with the research. Providing a long list, however, might prevent respondents from thinking more deeply about their relation with other organizations that are not on the list. This risk was tried to be minimized by asking respondent to add organizations to the list if they were not on it. This option was however not used by many respondents.

When mapping a network, the strength of the links between the nodes should also be taken into account since this indicates the quality of a relationship (Monge & Contractor 2003). Especially since the recognition method provides information about both strong and weak links. Not taking into account differences in tie strengths can give a misleading picture of the network closure and heterogeneity. It should be questioned whether a one time contact has the same effect as a weekly contact, on for example the handling of conflict and divergences among stakeholders. Sandström and Carlsson (2008) for example, have only included the links that were identified as more frequent contacts in their network analysis. This is also preferred for reasons of data validity. When respondents are asked about the frequency of interactions, they have to recall from their memory. Information on stronger ties appears to be less sensitive to information deficits. Besides, these relatively stable patterns of interaction are more representative for the 'true' network structure (Wassermann & Faust 1994).

The strength of the link can be indicated by the frequency of the contact, the duration of the relation, and the amount of different relations between two nodes (Monge & Contractor 2003). During the interviews it became clear that it is hard for respondents to make a clear distinction between different cooperation ties they have with one organization. Therefore it was hard to recall when the cooperation on National Landscape conservation started and how frequent this cooperation was. Furthermore, respondents were reluctant to answer many difficult questions. Due to the fact that network analyses are extremely vulnerable to missing data (Wasserman & Faust 1994, Sandström 2011) it was decided to only ask with which organization they cooperated in the conservation of the National Landscape, how frequent this cooperation on a scale from one to five (see appendix I and II for the surveys). In order to identify the tie strength between different organizations, the frequency of the cooperation was combined with the perceived cooperation tie strength. Only the strongest links (three-monthly cooperation or more, and a tie strength of three and higher) were included in the analysis.

Finally, not all respondents completed the survey completely. A few only identified the existence of a cooperation tie and did not mention the strength. Five organizations did not responded at all or where not approached to participate in the research. In these cases the answers other organizations gave on the strength of the cooperation tie was used and the effects of missing data were attempted to be minimized in this way.

The data on the cooperation ties and its strength was entered in Pajek, a network analysis program which can map networks and calculate network characteristics, in order to get a clear picture of het network. This map is provided in chapter 5.2 for the Hoeksche Waard and chapter 6.2 for Laag Holland.

#### 3.3 Measuring network closure and heterogeneity

When the cooperation networks of both National Landscapes were mapped, the second subresearch question, *What are the structural characteristics of the found networks?*, could be answered. The literature proposed network closure and heterogeneity as being important network characteristics that determine the adaptive capacity of the co-management arrangement. Therefore these two network characteristics were measured.

#### 3.3.1 Network closure

As described in the previous chapter, network closure is measured by two measures, network density and network centrality. The higher the levels of density and centrality are, the higher the level of network closure is (Carlsson & Sandström 2008).

Network density can be calculated by dividing the actual number of links in the network with the maximum number of links possible (Monge & Contractor 2003). This is represented in the following formula (Sandström & Rova 2010a: 534)<sup>1</sup>:

$$\frac{l}{n(n-1)/2}$$

where: l = the number of links n = the number of actors

The value of network density can vary from 0 to maximum 1. A network in which all nodes are connected with each other, has a density of 1 (figure 3.A).



Figure 3 Different network structures (Sandström & Rova 2010b:5)

<sup>&</sup>lt;sup>1</sup> The network analysis program Pajek can calculate network density as well. In this research the density measure 'no-loops allowed' was used calculated by Pajek.

When using density as an indicator for interconnectedness, the size of the network should, however, be taken into account. In small networks a larger value of network density is needed in order to achieve the same levels of structural cohesion as in large networks (Sandström & Carlsson 2008, Sandström 2011). Therefore network size, i.e. the number of actors in the networks, was also measured.

Network centrality is an umbrella concept. It examines the variation in individual's centralities within a network. This can be measured in three different ways, using the degree, betweenness or closeness of the individual network actors (Monge & Contractor 2003). Degree reflects the number of direct links an actor has, which can show how central the actor is in the network. Betweenness is understood as the extent to which an actor in the network mediates, or in other words, how often the actor is situated between two other actors. Finally closeness refers to the extent an actor is close to or can easily reach other actors in the network (Monge & Contractor 2003). When the advantage of a central network is understood in the way that central actors can channel communication and collaboration, it makes most sense to measure network centrality using degree centrality and betweenness centrality. In previous studies (Sandström & Carlsson 2008, Sandström & Rova 2010b, Sandström 2011) degree centrality was used as the main measure for the level of network centrality. Sandström and Rova (2010a) also used betweenness centrality. They however stated that this measure was very sensitive to the existence of long rows of indirect links between network actors. This measure therefore reveals foremost 'differences in the potential of withholding or distorting the flow of information' (Freeman 1978/79 in Sandström & Rova 2010a: 536). Betweenness centrality might thus not measure network centrality exactly as it is understood in this research. Therefore it was decided only to use degree centrality as a measure of network centrality.

The degree centrality of the network is calculated by first counting the amount of direct links every individual actors has, i.e. the degree of every individual actor. The actor with most links is perceived as the most central actor. The second step is summarizing the differences between the degree of the most central actor and the degree of all other individual actors. Finally this sum is divided by the maximum possible sum of the differences (Sandström & Carlsson 2008, Sandström & Rova 2010a, 2010b). This calculation is represented in the following formula (Sandström & Rova 2010a: 535)<sup>2</sup>:

$$C = \frac{\sum_{i=1}^{g} [C(n^*) - C(n_i)]}{\max \sum_{i=1}^{g} [C(n^*) - C(n_i)]}$$

Where:  $C(n^*)$  = the centrality of the most well-connected individual, C(ni) = the centrality of the *i*<sup>th</sup> individual, and maximum is taken over all possible graphs with *g* actors.

<sup>&</sup>lt;sup>2</sup> For this measure too, network analysis program Pajek was used to calculate degree centrality.

The value of degree centrality can vary from 0 to maximum 1. A network with a structure as presented in figure 3.B has a degree centrality of 1.

### 3.3.2 Network heterogeneity

Network heterogeneity was measured by the diversity of the actors involved in the network and the level of their cross-boundary exchange (figure 3.C). Different actors are perceived to hold different resources and knowledge, and are perceived as having different perspectives. Organizations in this research were classified as different, when they belong to a different sector or field of interest like, environment, agricultural, tourism, enterprise or government. But also in governmental agencies a differentiation was made between, national, regional en local government, since it appeared that national, regional and local governments have different interests when it comes to National Landscapes (Janssen 2009, Renes 2011).

The heterogeneity of a network was measured first by the amount of different types of organizations in the network. Secondly it was measured by the level of cross-boundary exchange in the network, which is calculated by dividing the number of links that connect organizations with different backgrounds by the total number of links in the network (Sandström & Carlsson 2008, Sandström & Rova 2010a, 2010b)

### 3.4 Measuring adaptive capacity

In order to answer the last sub-research question, *What is the level of adaptive capacity of the collaborative arrangements in the study areas?*, a method was developed for the measurement of the adaptive capacity of the co-management system. The concepts of adaptive capacity and adaptive governance in broader terms, are however 'difficult to grasp and measure in real empirical settings' (Sandström 2011: 302). A co-management system that has a high level of adaptive capacity is able to react and adapt to disturbance in the external environment without significant decline in it crucial functions and the loss of its structure (Folke et al. 2005, Carlssonn & Sandström 2008). In this research, adaptive capacity is therefore understood as the capacity to handle and adapt to abrupt changes without significant decline in crucial functions and the loss of structure and identity. Since the measurement of adaptive capacity is difficult, it is measured in three different ways in this research, which all have their advantages and drawbacks which will be explained below (see table 3.1 for a summary).

Table 3.1 Three ways of measuring adaptive capacity			
Measure	Advantage	Drawback	
Past events	Actual adaptive capacity is	Adaptive capacity of a past network is	
	measured	measured	
Perceptions	Actual adaptive capacity of	The reliability of a perception about a	
future	present network is measured	future imaginary event is questionable	
Adaptive	Adaptive capacity of present	Indirect measure so uncertainty about	
capacity	network is measured	actual adaptive capacity. Overlap with the	
determinants		independent variable of this research.	

Adaptive capacity 'can only be observed when it is realized through some form of concrete adaptation' (Lemos et al. 2007 in Bohensky et al. 2010: 25). Therefore, the best way to measure the adaptive capacity directly is to analyze past events in which the co-management systems faced an abrupt change in the external environment, like for example changes in climate, disease outbreaks, changes in global market demands, subsidy changes, or changes in governmental policies (Folke et al 2005). A system with a high adaptive capacity is capable to adapt to these changes without significant decline in it crucial functions and the loss of its structure (Folke et al. 2005, Carlsson & Sandström 2008).

When measuring the adaptive capacity in this way, two things should be taken into account. First of all, some shocks or abrupt changes might not be noticed by the organizations because the co-management system was able to adapt to them without any significant consequences (Yohe & Tol 2002). Secondly, the fact that the co-management network might have changed in the past, should be taken into account. The network might have been different at the time of the abrupt change, compared to the network that is measured now. As a result, a possibility exists that the adaptive capacity of a past network is measured, instead of the adaptive capacity of the present network which is analyzed.

The analysis of abrupt changes in the past and the reaction of the collaborative arrangements on these changes, is based on the survey (forty-three completed) among involved organizations and twelve semi-structured and unstructured interviews with respondents that are more active in the management and conservation of the National Landscape. They were asked what abrupt changes have occurred in the past and if these changes have resulted in a crisis within the co-management system. Furthermore, they were asked how the comanagement system had responded to these crises, and if things had changed in the comanagement system after the event. The survey was intended to make an inventory of changes in the past, which were used in the interviews. Furthermore, the survey gave an idea how serious the changes and their impacts were.

In order to get a better picture of the adaptive capacity of the present network, a second direct measure was introduced. The perception of organizations within the co-management network, on the adaptive capacity of their co-management system (Bohensky et al. 2010), was measured. Respondents were asked in the survey to respond to five theorems (see appendix I and II for the surveys) and mark to what extent they agreed or disagreed with the theorem. The theorems provided were whether the respondent believed there would or would not be negative effects on the conservation of the landscape, when the national government would abandon their National Landscape policy this year; when there would be disbanded this year; when Natuurmonumenten would retreat in the cooperation this year. These five theorems only give a limited picture of the perception of adaptive capacity on a selection of some possible future events. However, it was believed to be the best method, which did not

took too much of the respondents' time, making their response rate higher. Furthermore, in semi-structured interviews some key respondents were asked what they thought about the adaptive capacity of the co-management arrangement in the future. The reliability of this measure concerning the measurement of adaptive capacity can be questioned, since it is based on perceptions about an imaginary event in the future which is often hard to judge. Furthermore, it is possible that respondents do not have the right knowledge to judge the theorems. Therefore a third measure is introduced.

The third measure gauges the adaptive capacity indirectly, using determinants of adaptive capacity. When scores on determinants are high, the adaptive capacity is expected to be high as well. This method is used by many scholars (Yohe & Tol 2002, Adger et al. 2004, Nelson et al. 2007, McClanahan et al. 2008, Brown et al. 2010, Sandström & Rova 2010a, 2010b), who, however, all use different determinants. In this study, this method should be used carefully because in this research the structural factors in collaborative arrangements that determine the adaptive capacity of these collaborative arrangements are under investigation. Measuring adaptive capacity using its determinants can therefore result in an overlap between the independent and dependent variable of this research, during measurements.

Sandström and Rova (2010a, 2010b) measured the adaptability of co-management systems. They captured this empirically 'by verifying the existence of a framework of rules, recognition of ecological complexity, and the integration of such ecological knowledge into the rule-making process' (Sandström & Rova 2010b: 1). When looking at these aspects, one can only make predictions on how adaptive a system will be when it faces disturbances, shocks or abrupt changes. In the study of Sandstrom and Rova (2010a, 2010b) this is in line with their definition of adaptability, which is defined as the potential to respond adaptively. In this research adaptive capacity is however defined differently. Furthermore this method is not suitable for this research since the rule-forming process and the importance of rules in National Landscape management differs a lot from the management area researched by Sandström and Rova.

Other studies (table 3.2) have proposed more vague determinants of adaptive capacity. The determinants are somewhat overlapping or defined differently in the studies. None of the studies however, analyzed the adaptive capacity of a co-management system. Yohe and Tol (2002) analyzed the contribution of various adaptation options to the coping capacities of a system. Nelson et al. (2007) and Brown et al. (2010) developed a method to measure adaptive capacity of local natural resource managers. McClanahan et al. (2008) analyzed the adaptive capacity of communities and societies located at the western side of the Indian Ocean. Finally, the IPCC (2001) analyzed the adaptive capacity of countries and regions.

Table 3.2 Proposed determinants of adaptive capacity				
Scholars	Yohe & Tol (2002: 26)	Nelson et al.	McClanahan et al.	IPCC (2001: 895)
		(2007: vii) &	(2008: 22)	
		Brown et al.		
		(2010)		
Used	- Available technical options	- Human	- Recognition	- Economic
determinants	- Available resources and	capital	causality and human	resources
	their distribution	- Social	agency in natural	- Technology
	- Structure of critical	capital	resources	- Information and
	institutions and allocation of	- Natural	- Capacity to	skills
	decision-making authority	capital	anticipate to change	- (Social)
	and employed decision	- Physical	and develop response	infrastructure
	criteria	capital	strategies	- Institutions
	- Stock of human capital	- Financial	- Occupational	- Equity
	- Stock of social capital	capital	mobility	
	- Access to risk spreading		- Wealth	
	processes		- Occupational	
	- Information availability and		multiplicity	
	treating by decision-makers		- Social capital	
	- Public's perceived		- Technology	
	attribution and exposure to		- Infrastructure	
	stress			

When analyzing these different determinants it can be said that the adaptive capacity of a comanagement system is determined by the availability of resources (technical, financial, social and institutional) and the processes through which they are mediated and employed (Lebel et al. 2006, Plummer & Armintage 2010). Since the independent variable of this research is the network structure which can be understood as the process through which the resources are mediated, the choice was made to only look at the availability of resources. Otherwise the overlap between the independent variable and the measure used for the dependent variable would be too great, which would result in an automatic correlation between the independent and dependent variable.

It was decided to only look at financial and technical resources, whereas social and institutional resources appeared to be hard to measure in practice. In order to identify the level of financial resources, it was analyzed to what extent the financial demand in order to conserve the national landscape met the financial supply. The level of technical resources was identified by analyzing to what extent external parties were hired to provide information or implement projects. Therefore one key respondent in each National Landscape was asked whether the network had enough technical recourses and knowledge to conserve the National Landscape.

# 4. National Landscapes in the Netherlands

#### 4.1 Definition and aim

National Landscapes are identified as protected area Category V by the International Union of Conservation of Nature (IUCN) and are defined as areas 'where the interaction of people and nature over time has produced an area of distinct character with significant ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values' (IUCN 2009). The aim of National Landscapes is to maintain a balanced interaction between culture and nature, through the protection of the landscape and its associated traditional management approaches, societies, cultures and spiritual values, and species that are associated with the landscape and agro-biodiversity. Furthermore, National Landscapes aim to provide natural products and environmental services; opportunities for recreation and tourism; and a framework which allows active involvement of the community in the management of the landscape. Finally, National Landscapes should act as models of sustainability, which can provide knowledge for further application (IUCN 2009). They connect the three pillars of sustainable development, environment, society and economy with each other, since their aim is to protect the environment but at the same time social and economic development should be stimulated. This makes National Landscapes potential pioneers in the search for sustainable development (Janssen 2009).

There are several reasons to value landscapes. They are 'more and more recognized as essential components of people's surroundings' (Janssen 2009:38). The European Landscape Convention argues that 'landscapes should be valued for reasons of health, education and rural development' (Janssen 2009: 38). National Landscapes are areas for recreation in which inhabitants of cities can spend their leisure time away from work and daily duties. Landscapes are often a result of many centuries of interaction between humans and nature. They visualize past events and can be used to explore history. They are therefore an expression of people's diversity of shared cultural and natural heritage (Janssen 2009). Heritage is an important social binding factor which contributes to the creation of identity and is often perceived as worthwhile conserving.

Finally, landscapes provide an area for rural development and food production. This is often accompanied with high levels of biodiversity and nature. Besides that, nature is an important aspect for recreation, the conservation of biodiversity is essential for the sustaining of our planet for future generations.

#### 4.2 History and development

National Landscapes cover about 20% of the Dutch terrestrial area and are estimated to be inhabited by 2.5 million people (Rijksoverheid 2012, ANWB Media 2009). They are a new phenomena in the Netherlands since 2006. The Dutch national government has given this protected area status to twenty cultural landscapes that are worthwhile conserving because of

their international rare or unique character (figure 4). Furthermore, these landscapes show the development of the Netherlands and are characteristic for the interplay between nature and cultural history in the Netherlands (ANWB Media 2009).



Figure 4 National Landscapes in the Netherlands

When looking at a European scale, the Netherlands has been lagging in their attempt to conserve landscapes. Germany, France and the United Kingdom had already established Landscape parks in the 1950s and 1960s (Janssen 2009). Although the idea of landscape protection in the Netherlands started already in the interwar period, the first policy attempts were made in the 1970s. The purpose of National Landscape Parks at that time was to conserve the landscape and preserve the regional identity of the area. The Provinces would

take a lead in the management of these areas, in cooperation with municipalities, water boards and nature conservation organizations. The initial name National Landscape Parks, however came up against a lot of resistance. Farmers viewed parks as closed, with no opportunity for agricultural modernisation and from 1980 onwards policy makers spoke about National Landscapes. In 1983, the ministry of Culture, Recreation and Social Work was abolished and the ministry of Agriculture was given the responsibility for the implementation of the National Landscapes. This ministry however, was not interested in landscape protection and was not inclined to devolve responsibilities to the Provinces. As a result the National Landscape proposal was never implemented (Janssen 2009).

At the end of the 1990s the idea of National Landscapes was re-introduced. This time it was motivated by the growing pressure of urbanizations on rural areas, especially in the Randstad. The focus was on the conservation of green and open spaces, instead of the preservation of regional identity which was the aim in the 1970s National Landscape proposal. Also in contrast to the 1970s proposal, the central government would take the lead in the management of National Landscapes. Only a marginal space was left for local governments. The Provinces would instead be given their own landscapes to manage, Provincial Landscapes. This distinction was however rejected by parliament and a new proposal was made for thirteen National Landscapes. They were however never appointed and with the collapse of the government in 2002 the National Landscape plans were deferred again (Janssen 2009).

#### 4.3 Management practices

Finally in 2006, the National Spatial Strategy (Nota Ruimte) identified twenty National Landscapes. For each National Landscape, core qualities on which the conservation of the landscape should be based were defined by the national government (Rijksoverheid 2012). The responsibility for the management of the National Landscapes was again decentralized in contrast to the 1990s plans. The exact borders of these areas where defined by the Provinces in which the landscapes where located, except for the Groene Hart. The core qualities defined by the national government had to be described more precisely by the Provinces (Janssen 2009). The Provinces also had to take care of the exact measures that should be taken in order to conserve or improve the core qualities of the landscapes. Furthermore, they had to translate the conditions for the landscapes in the Nota Ruimte to their own policies (Rijksoverheid 2012).

For each National Landscape, an implementation plan was developed by the responsible Province, often in cooperation with municipalities, partnerships, interest groups, civil society organizations and businesses like for example farmers (Provincie Zuid Holland 2011). In practice too, many different parties are involved in the conservation of National Landscapes. Inhabitants and farmers maintain and develop the landscape in their daily practices. Bigger landowners and managers, like Staatsbosbeheer, Natuurmonumenten, the Provincial Landscapes, Dienst Landelijk Gebied and the Water Boards, besides this, take account for specific parts of the management and development (Nationale landschappen 2011). As already mentioned in the previous chapter, since the conservation of National Landscapes involves a diversity of actors, public as well as private on different levels, National Landscape management can be identified as co-management.

#### 4.4 Problems and criticism

The policy strategy and the management of Dutch National Landscapes has been criticized (Janssen 2009, Renes 2011). According to Janssen (2009) there is an absence of clear criteria for development planning. This may lead to confusion and fragmentation in the identity of the designated areas. Activities of Provinces vary widely as a result of this in combination with a lack of visionary ideas (Renes 2011). Furthermore, the National Landscapes are not governed by a park authority with significant planning powers and semi-independent status. As a result, there is no instrument to resolve occasions when there remains a conflict. This is however very likely to occur since for example national and local/regional interests often differ. The interest of the national government lies with landscape conservation, but local parties are often more interested in economic growth and the social well-being of local communities (Janssen 2009). Conflicts concerning the borders of National Landscape have already occurred, when active local politicians and farmers wanted to stay out of the landscape (Renes 2011).

There is also criticism on the Provinces. They are reluctant in forcing restrictions on local authorities. Municipalities are for example eager to build new houses. In National Landscapes this is, however, only allowed for the natural growth of the local population. In practice permissions are given for a larger amount of new houses than is necessary for the local population (Janssen 2009, Renes 2011).

Financial resources for the conservation of the National Landscapes are also limited. Calculations showed that the necessary amount of money was twenty times higher that the sum that was available (Renes 2011). At the time of writing of this thesis, the national government was making serious plans to abolish their National Landscape policy. The protection of National Landscapes will be left to any party who wants to take responsibility. Sometimes this will be the Province, but in some National Landscapes, conservation practices lie idle due to this change of policy (personal communication netwerkdag Nationale Landscape 2012). As a result of this change, even less money will be available for the National Landscape conservation and building restrictions are in risk of being weakened (personal communication 2012).

It is said that cooperation between municipalities is limited and that Provinces put more emphasis on the planning process and on consensus between different governmental layers than on the landscapes aim. Finally, it is stressed that, the possibility of creating official bodies for the planning and management of National Landscape, consisting of representatives of municipalities, farmers, conservationists and the local population are even further away (Renes 2011). This research found, however, that there is cooperation within National Landscapes. In Laag Holland there is an official body consisting of representatives of most involved parties and, also in the Hoeksche Waard, civil society organizations are involved in an intensive cooperation in order to achieve a better cooperation with the municipalities. Furthermore, a network platform for National Landscapes has been launched in 2011, where involved actors can exchange knowledge and experience. However, the abolition of the national National Landscape policy might seriously threaten the National Landscapes and their conservation. Their future is uncertain and therefore it is important that proper management arrangements are in place that can adapt to any further changes in the future.

# 5. Case 1: Hoeksche Waard

#### 5.1 Background

The Hoeksche Waard (figure 5.1) is a young sea clay island, located in the province Zuid-Holland, south of Rotterdam. The island, which is now connected by several bridges to the main land, reaches an area of about 26.790 hectares and is inhabited by about 85.700 residents. The landscape is dominated by agricultural land mainly for crop production and dikes that define the polders which were created in the past centuries (Provincie Zuid-Holland 2007).

The core qualities of the Hoeksche Waard that were identified by the national government are (Provincie Zuid-Holland 2007):

- the great openness of the landscape;
- the polder pattern; and

- the pattern of creeks ridges and dikes (kreekruggen & dijken).

These official core qualities are supplemented by the region itself, with other qualities like sustainable agriculture and the large amount of cultural-historical objects in the area (Nationaal Landschap Hoeksche Waard n.d.).

The first time the Hoeksche Waard was mentioned as a National Landscape was in 1989 in the national government plans of the 'Vierde Nota' and later in 2000 and 2002 in the 'Vijfde Nota' (Janssen et al. 2007). These plans were never implemented and the Hoeksche Waard was not present in the initial plans of the 'Nota Ruimte' in 2004. This absence was motivated by the potential expansion of the Mainport of Rotterdam in the Hoeksche Waard. Expansion in the Hoeksche Waard could improve the economic competiveness of the Netherlands and was preferred above the conservation of the landscape



Figure 5.1 National Landscape the Hoeksche Waard (Nationale Landschappen 2011)

(Nota Ruimte 2004). This decision was met with great resistance from inside the area. A strong lobby of civil society organizations in the Hoeksche Waard resulted in change of plans. The Hoeksche Waard was placed on the final National Landscape list of the 'Nota Ruimte' in

2006, instead of the area of Westergo in the province of Friesland, where local parties were not happy with the designation of National Landscape (Renes 2011).

In the Hoeksche Waard, cooperation between civil society organizations and later the municipalities started already in 1999. At this time eight teams were given the task to research possible ways of landscaping the Hoeksche Waard in the future. The conclusion of all teams was that due to its unique character the Hoeksche Waard should best stay open and green. Several civil society organizations in the Hoeksche Waard joint hands in the 'Hoeksche Waards Initiatief' (HWI) in order to keep the Hoeksche Waard' was established in which all five municipalities took part in order to keep the Hoeksche Waard an open and vital area. The 'Commissie Hoeksche Waard' developed together with civil society organizations<sup>3</sup> a structural vision on the area and in its extension an implementation program on the core qualities of the area as a National Landscape (Personal communication 2012).

At the time of writing of this thesis, new cooperation processes in order to conserve the area are developing. A new landscape management plan is developed in the Hoeksche Waard in a cooperation between Samenwerkingsorgaan Hoeksche Waard (SOHW), Groenbeheer Hoeksche Waard, Hoekschewaards Landschap, Agricultural Nature Conservation Organisations (ANCO) De Rietgors, LTO-Noord, H-Wodka, Erfgoedkoepel Hoeksche Waard, water board Hollandse Delta en Landschapsbeheer Zuid-Holland (SOHW 2012). Furthermore, seven civil society organizations<sup>4</sup> joined hands and developed the 'Platform Hoeksche Waards Middenveld (HWM)' in order to establish a better cooperation between civil society organizations and the local governments.

#### 5.2 Network closure and heterogeneity

During interviews and the survey in which respondents were asked with which organizations their organization cooperated in order to conserve the National Landscape, data was collected on the existence and the strength of cooperation ties. Using this data a cooperation network (figure 5.2) was constructed. The thickness and darkness of the lines represents the strength of the cooperation tie between two organizations. A

Table 5 The Hoeksche Waard networkcharacteristics		
Size (No.)	27	
Density	0,39	
Degree Centrality	0,45	
Actors diversity (No.)	12	
Cross-boundary exchange (%)	(111/27	
	2) 41 %	

<sup>&</sup>lt;sup>3</sup> Hoekschewaards Landschap, Erfgoedkoepel Hoeksche Waard, Entrepreneurs association Hoeksche Waard, Housing Cooperation HWwonen, LTO Noord, Staatsbosbeheer, Natuurmonumenten, Kamer van Koophandel, ANCO De Rietgors, Streekcommissie Hoeksche Waard and Hoeksche Waard Duurzaam (Personal communication 2012)

<sup>&</sup>lt;sup>4</sup> Hoeksche Waard Duurzaam, Erfgoedkoepel Hoeksche Waard, Hoekschewaards Landschap, LTO-Noord, section Hoeksche Waard, Entrepreneurs Association Hoeksche Waard, Streekcommissie Hoeksche Waard and VVV Zuid Holland Zuid, section Hoeksche Waard.

thick black line means a very strong cooperation and a thin white line means a weaker cooperation tie. The different colors of the actors in the network represent their classification as a specific type of organization. This classification is based on the sector or field of interest of the organization, or the government level, and is used for the analysis of the heterogeneity of the network. The network characteristics that were calculated as described in the methodology chapter are presented in table 5.



Figure 5.2 Cooperation network on the conservation of National Landscape the Hoeksche Waard

Of the twenty-seven organizations present in the network, the ministries have not been consulted on their cooperation with other parties. This choice was made because in these organizations many different employees are involved on many different subjects of National Landscape conservation. Consulting only one employee might lead to a misrepresentation of the cooperation link. The Erfgoedkoepel Hoeksche Waard and Archeologie Hoeksche Waard unfortunately did not respond to the survey. As a result the cooperation with these four organizations is only based on the answers other organizations provided.

#### 5.3 Adaptive capacity of the co-management arrangement

The adaptive capacity of the co-management arrangement in the Hoeksche Waard is analyzed using the three measures described in the chapter 3. The level of adaptive capacity can only be estimated in a comparison with the adaptive capacity of the co-management arrangement in Laag Holland. This will be done in chapter 7. This section will present the findings in the Hoeksche Waard. The data used is collected from interviews, the survey and during the attendance of the presentation of the pamphlet 'Hoeksche Lente'.

#### 5.3.1 Past changes

Two changes that were mentioned often by respondents are analyzed in the Hoeksche Waard. One internal change within the network and one external change from outside.

First, in 2010 a structural change occurred in the working procedures of the municipalities and SOHW. Before civil society organizations were very often consulted and involved in decision-making procedures concerning the landscape in the Hoeksche Waard, but in 2010 the municipalities decided this involvement should become less pronounced. The civil society organizations were not happy with this change. Until today, some civil society organizations are still not satisfied with their cooperation with the municipalities. Therefore they started a close cooperation in Platform Hoeksche Waards Middenveld in spring 2012 and presented a pamphlet 'De Hoeksche Lente' with their demands and offerings, to the municipalities in the hope to establish a better and more frequent cooperation on the subjects of spatial planning, landscape, economy and sustainable development (Platform Hoeksche Waards Middenveld 2012). It should be said that not all civil society organizations were dissatisfied with the cooperation with the municipalities. They however did join the others in the pamphlet in order to create a stronger civil society platform (personal communication 2012).

This internal change had an effect on the structure of the collaborative arrangement. This change was not perceived positively by all involved parties. It caused tensions between municipalities and some civil society organizations. Furthermore, the knowledge on the National Landscape that civil society organization possessed was not used by the municipalities. Instead the municipality hired expensive professionals (personal communication speech HWM 2012). Whether this change had a real negative effect on the conservation of the National Landscape is not clear. However, after two years now it appears that the change will have a positive effect as well, since the civil society organizations have become more close due to this change.

The second change that is mentioned, is the change in National Landscape policy of the national government. This is expected to, and already results in less financial support for the conservation of the landscape. The decrease of financial support in general is by most respondents indicated as a crisis. They stress that less is possible, but on the other hand that new ways are investigated to generate money. The change in national government policy was also a motivation for the civil society organizations to join hands and demand a stronger cooperation with the municipalities. This change on the one hand has negative effects on the conservation of the National Landscape, because less money is available for conservation practices. On the other, this change is expected to lead to innovations. New and more sustainable financial resources are investigated and civil society organizations intensified cooperation.

#### 5.3.2 Future perspectives

Respondents were asked whether they agreed with theorems about fictitious events that might occur in the future and their effects. The diagrams presented below are the result of twenty-one completed surveys. The results showed that there is a difference in the expected impact of the abolition of National Landscape policy by the national government (figure 5.3). More respondents disagreed with the theorem and believed that the abolishment of this policy would have negative effects on the conservation of the national landscape. However some respondents agreed with the theorem and believed that this abolishment would have no effects on the conservation of the National Landscape.



Figure 5.3 Theorem policy

Most respondents agreed with the theorem that a decrease in financial resources would have negative effects on the conservation of the National Landscape (figure 5.4). Some respondents did mention that a decrease in financial resources lead to a search for new ways to raise money for the conservation on the National Landscape.



Figure 5.4 Theorem financial resources

Many respondents disagreed completely with the theorem that there would be no effects on the conservation of the National Landscape when SOHW ceased to exist (figure 5.5). SOHW seems to be an important party in the conservation of National Landscape.


Figure 5.5 Theorem SOHW

Whether there will be effects on the conservation of the National Landscape when Natuurmonumenten stops the cooperation with other parties and only focuses on the management of their own areas, seems to be unclear (figure 5.6). Many respondents say they do not have the knowledge to say something about this. Many disagree and expect that a retreat of Natuurmonumenten will have no effect on the conservation of the National Landscape and only a few agree that there will be effects.



Figure 5.6 Theorem Natuurmonumenten

Finally, it also appears to be unclear whether there will be effects on the conservation of the National Landscape if the agricultural nature conservation organization De Rietgors, would break off contacts with other organizations (figure 5.7). Many respondents do not know. More respondents disagree and think there will be no effects on the conservation, but there is not much difference between the number of respondents that agree with the theorem.



Figure 5.7 Theorem ANCO De Rietgors

Concluding, it can be said that only a decrease in financial resources and the abolition of SOHW is believed to have effects on the conservation of the National Landscape by most respondents. A small majority of the respondents expects the abolishment of the National Landscape policy to have effect on the conservation of the Hoeksche Waard. Except for the retreat of Natuurmonumenten and De Rietgors, most respondents believe that these changes, should they occur in the future, will have an effect on the conservation of the National Landscape.

# 5.3.3 Determinants

According to the civil society organizations, expensive professionals are hired erroneously. HWM states they have a large amount of knowledge that is not used now because of a lack of cooperation (personal communication speech HWM 2012). SOHW states that the hiring of professionals is a common practice of government organizations and that this also happens in the Hoeksche Waard (personal communication 2012). The implementation program 2010-2014 also speaks of the possibility of the deployment of the Dienst Landelijk Gebied (SOHW 2010). Concluding, it can be stated that some external parties are indeed hired on the subject of National Landscape conservation and that not all knowledge is available in the area, or that it is at least not used intensively.

The implementation program 2007-2013 of National Landscape the Hoeksche Waard stated that in order to implement to program properly  $\pounds$ 6,25 million would be necessary. However, only  $\pounds$ 2,8 million was available which means a shortag e of  $\pounds$ 3,5 million (Provincie Zuid-Holland 2007). Only 45% of the necessary financial resources was available at that time. The new implementation program 2010-2014 needs about  $\pounds$ 9,46 million spread over four years (SOHW 2010). It is expected that this amount of money will be largely available. For 2014, there is some uncertainty since it is expected that funding opportunities will decrease and therefore alternative ways of financing will have to be found (personal communication 2012). In the past no calculations have been made that estimate the cost for an optimal conservation of National Landscape Hoeksche Waard. The proposed projects in the implementation plan 2010-2014 are a result of the structural vision Hoeksche Waard 2030 and the availability of financial resources (Personal communication 2012). Assuming that in 2014 only half of the necessary financial resources is available, 84% of the financial resources are available for the implementation of the proposed projects. These projects however do not represent all efforts that are necessary for an optimal conservation National Landscape Hoeksche Waard.

# 6. Case 2: Laag Holland

#### 6.1 Background

National Landscape Laag Holland (figure 6.1) is the area between the cities of Alkmaar. Hoorn, Amsterdam and The area which Zaanstad. reaches about 51,400 hectares has almost twice the size of the Hoeksche Waard and is inhabited by 110.000 residents. This landscape too is dominated by agricultural land, however a big part of the area (except for the reclaimed lands) has a peat soil on which cattle grazes. Due to the presence of peat lands in Laag Holland, this landscape faces a serious problem which is not in the Hoeksche present Waard. The peat lands slowly



Figure 6.1 National Landscape Laag Holland (Nationale Landschappen 2011)

combust due to low water levels which are necessary for cattle grazing. The peat lands can only be preserved when the water levels are raised, which makes intensive cattle crazing impossible. The co-management arrangement of Laag Holland faces a difficult dilemma, whether to support large scale agriculture in the area or to preserve the peat lands. Both the peat lands and the cattle grazing are important characteristics of the landscape, but in the future a choice between cattle grazing and nature preservation will have to be made.

The core qualities of the National Landscape on which its official conservation program is based are (Provincie Noord-Holland 2006):

- the high level of openness of the landscape;

- the presence of many meadow and marsh birds;
- the old geometric design patterns of the reclaimed lands (droogmakerijen);
- the peat;
- the medieval strip allotments and the historic waterways;
- the large number of archeological sites; and
- the typical dike and ribbon villages (dijk- en lintdorpen).

Of these qualities only the openness, the geometric patterns of the reclaimed lands and the strip allotments were identified by the national government as core qualities.

A part of Laag Holland, Waterland, was already put forward as National Landscape in the 1970s. All other policy documents on National Landscapes that followed incorporated Laag Holland as a National Landscape in their plans (Renes 2011). In 1994 Waterland got the title Valuable Culture landscape (Waardevol Cultuurlandschap). In 2000 this area was called de Groene Long which already had an office that took care of subsidy provision in the area. This Programmabureau de Groene Long started operating in 2002 with the purpose of conserving the area. It was a cooperation between the cities of Amsterdam and Zaandstad, the Intergemeenschappelijk Samenwerkingsorgaan Waterland (ISW), the water board Hollands Noorderkwartier and the Province Noord-Holland. They were advised by an area council consisting of the agricultural nature conservation organization, Milieufederatie, Kamer van Koophandel and representatives of local projects (personal communication 2012).

In 2002, a Taskforce Veenweiden Noord-Hollands Midden was initiated to address the problems concerning the peat lands. This Taskforce was a cooperation between the WLTO (now LTO-Noord), water board Hollands Noorderkwartier, Staatsbosbeheer, Natuurmonumenten, Landschap Noord-Holland, the ministry of agriculture and the Province of Noord-Holland. In 2003 the municipality of Graft de Rijp and Zaanstad joint as observers (Meeuwissen et al. 2004).

When the Nota Ruimte indicated Laag Holland as a national Landscape in 2006, the Programmabureau de Groene Long was abolished. A new Programmaburea Laag Holland was initiated combining the involved parties of the Groene Long and the Taskforce. A new cooperation started between the municipalities, the Province, the water board, Landschap Noord-Holland, Natuurmonumenten, Staatbosbeheer, LTO-Noord and the two agricultural nature conservation organizations that existed at that time (PS-commissie NLWM 2005). In cooperation they developed the implementation program 2007-2013 on the conservation of the core qualities of the National Landscape.

In 2008/2009 the Province Noord-Holland wanted to be more responsible and involved in the management of Laag Holland. It replaced the Programmabureau from Purmerend to the Province house in Haarlem. Now decisions on the policy concerning the conservation of Laag Holland are taken by the Stuurgroep<sup>5</sup> which meets three times a year and consists of several board members of involved parties. The Stuurgroep is supported by the Kernteam<sup>6</sup>, which functions as a advisory council. The Kernteam meets six times a year and consists of officials

<sup>&</sup>lt;sup>5</sup> Stuurgroep consists of a representative of: The Province Noord-Holland, the municipalities of Amsterdam, Amsterdam city area Noord, Zaanstad, Purmerend, Waterland and Schermer, Nationaal Groenfonds,

Agricultural nature conservation organization Water Land & Dijken, Landschap Noord-Holland, Waterboard Hollands Noorderkwartier, Milieufederatie Noord-Holland, LTO-Noord and prof. Dr ir. G Meester of Leiden University.

<sup>&</sup>lt;sup>6</sup> Kernteam consists of a representative of: The Province Noord-Holland, the municipalities of Amsterdam , Amsterdam city area Noord, Zaanstad and Schermer, ISW, Agricultural nature conservation organization Water Land & Dijken, Landschap Noord-Holland, Staatsbosbeheer, Waterboard Hollands Noorderkwartier, Milieufederatie Noord-Holland, LTO-Noord

of the involved local parties. The Programmabureau Laag Holland supports the Stuurgroep and Kernteam and is responsible for the implementation of decisions taken by the Stuurgroep and the adopted policy. Furthermore the Programmabureau is initiator and contact point for local parties in the region (Laag Holland n.d., personal communication 2012).

# 6.2 Network closure and heterogeneity

During interviews and the survey in which respondents were asked with which organizations their organization cooperated in order to conserve the National Landscape, data was collected on the existence and the strength of cooperation ties. Using this data, a cooperation network

(figure 6.2) was constructed. The thickness and darkness of the lines represents the strength of the cooperation tie between two organizations. A thick black line means very strong cooperation and a thin white line means a weaker cooperation tie. The different colors of the actors in the network represent their classification as a specific type of organization. This classification is based on the sector or

Table 6 Laag Holland network					
characteristics					
Size (No.)	30				
Density	0,49				
Degree Centrality	0,44				
Actors diversity (No.)	7				
Cross-boundary exchange (%)	(151/426)				
	35 %				

field of interest of the organization and is used for the analysis of the heterogeneity of the network. The network characteristics that were calculated as described in the methodology chapter are presented in table 6.



Figure 6.2 Cooperation network on the conservation of National Landscape Laag Holland

Of the thirty organizations present in the network, the ministries and the Province have not been consulted on their cooperation with other parties. This choice was made because in these organizations many different employees are involved on many different subjects of National Landscape conservation. Consulting only one employee might lead to a misrepresentation of the cooperation link. The cooperation with these organizations is therefore only based on the answers other organizations provided.

### 6.3 Adaptive capacity of the co-management arrangement

The adaptive capacity of the co-management arrangement in Laag Holland is analyzed using the three measures described in the chapter 3. As already mentioned in the previous chapter the level of adaptive capacity can only be estimated in a comparison with the adaptive capacity of the co-management arrangement in the Hoeksche Waard. This will be done in chapter 7. This section presents the findings in Laag Holland. The data used is collected in interviews, the survey and during the attendance of a meeting of the Kernteam.

# 6.3.1 Past changes

In Laag Holland too, two changes in the past that were often mentioned by respondents are analyzed. Here too, one change is an internal change within the network and one is an external change from outside.

First, the Programmabureau Laag Holland was located in the region and had the main focus on local small scale projects. In 2008 the Province Noord-Holland wanted to get more involved in the management of Laag Holland, because they lacked control and detected a lack of vision in the management of Laag Holland (personal communication 2012). The independent chairman of the Programmabureau was replaced by the representative of the Province Noord-Holland and the conservation of the National Landscape became more policy oriented. Not all involved parties were happy with this change. According to them, the Programmabureau in Purmerend functioned fine and it was easily accessible. The involved parties did not understand why the Province undertook these steps. After the change, dissatisfaction was expressed by local organizations about their decreased influence on the projects to be implemented. It took about two years, but slowly all parties became satisfied with the working procedures. Meanwhile there is active cooperation between the involved parties (personal communication 2012).

As a logical effect of this internal change, the structure of the cooperation changed somewhat. Although the first response of the local parties on this change was negative, no decline in crucial functions of the management arrangement was identified. After the change discussions took place in which every party could express themselves, in order to solve the dissatisfaction. In the long run, it can be said the result of this change was positive, all parties are satisfied now with the working procedures and this change has had no effect on the conservation of the national landscape. In Laag Holland, as a second change, an expected and already experienced decrease of financial resources due to cuts is often mentioned. Some respondents mention that due to these cuts, involved organizations close themselves somewhat and look only at their own interests. Other respondents mention that work and cooperation will continue with less money and that these cuts have no effect on the cooperation. Notwithstanding these cuts, the involved parties have agreed on an extension of their cooperation for at least three years (personal communication 2012). This change has not yet resulted in a decline in functions or loss of structure of the collaborative arrangement. There is, however, some diversity among involved actors on what the effects will be in the future.

# 6.3.2 Future perspectives

Respondents were asked whether they agreed with theorems about fictitious events that might occur in the future and their effects. The diagrams below are the result of twenty-two completed surveys. The results showed that there is quite a difference in the expected impact of the abolishment of National Landscape policy by the national government (figure 6.3). More respondents disagreed with the theorem and believed that the abolishment of this policy would have negative effects on the conservation of the National Landscape. However quite some respondent agreed with the theorem and believed that this abolishment would have no effects on the conservation of the National Landscape.



#### Figure 6.3 Theorem policy

Almost all respondents agreed with the theorem that a decrease in financial resources would have negative effects on the conservation of the National Landscape (figure 6.4). Some respondents did mention that a decrease in financial resources would lead to the development of innovative ways to raise money for the conservation on the National Landscape.



Figure 6.4 Theorem financial resources

Almost all respondents disagreed completely with the theorem that there would be no effects on the conservation of the National Landscape when the Programmabureau Laag Holland ceased to exist (figure 6.5). The Programmabureau is believed to be an important central party that facilitates the cooperation between the other parties.



Figure 6.5 Theorem Programmabureau Laag Holland

If there will be effects on the conservation of the National Landscape when Natuurmonumenten stops the cooperation with other parties and only focuses on the management of their own areas, seems to be unclear (figure 6.6). Many respondent say they do not have the knowledge to say something about this. Others stress that Natuurmonumenten is only a small party in Laag Holland and that it more important that the nature management sector in general is represented in meetings. But some of the respondents agreed with the theorem and stressed that everyone involved should cooperate. In total most respondent agreed and believe the withdrawal of Natuurmonumenten will have an effect on the conservation of the National Landscape.



Figure 6.6 Theorem Natuurmonumenten

Finally, almost all respondents agreed with the theorem that there would be effects on the conservation of the National Landscape if the agricultural nature conservation organization Water, Land & Dijken, would break the contacts with other organizations (figure 6.7). This organization is perceived as an important party in the management of the National Landscape and their retreat is expected to have effects. Some respondents however mentioned that this organization would never do this. So this future scenario is very unlikely.



Figure 6.7 Theorem ANCO Water, Land & Dijken

Concluding, it can be said most respondents believe that these changes, should they occur in the future, will have an effect on the conservation of the National Landscape. For the retreat of Natuurmonumenten and the abolishment of the National Landscape policy the difference between the number of respondents that agreed and disagreed is almost equal.

#### 6.3.3 Determinants

In Laag Holland an external party was recently hired to conduct a social cost-benefit analysis on different possible management practices. But besides this, all knowledge and technical expertise that are necessary to conserve National Landscape Laag Holland is believed to be available within the collaborative arrangement. For area development processes, Dienst Landelijk Gebied (personal communication 2012) is hired as in the Hoeksche Waard. Concluding, most knowledge and technical expertise is available in the area.

Several studies showed that there is a shortage of  $\in 10$  million to  $\in 15$  million on a yearly basis for the conservation of National Landscape Laag Holland. In 2011 the government invested  $\in 25$  million every year in the area, so in total the conservation on Laag Holland is believed to cost between  $\in 35$  million and  $\in 40$  million (Provincie Noord -Holland 2011). Concluding, between 60% and 70% of the necessary financial resources is available for the conservation of the National Landscape.

# 7. Comparing cases

# 7.1 Network structure

Looking at the network characteristics of both co-management networks (table 7.1) it can be said that the network in Laag Holland is slightly larger. Furthermore, this network is more dense then the network in the Hoeksche Waard. The degree centrality of both networks only differs a little, and it can therefore be said that they are equality central. Concluding, the co-management network of Laag Holland has a higher closure, based on the network density.

Table 7.1 Network characteristics compared							
	Hoeksche Waard	Laag Holland					
Size (No.)	27	30					
Density	0,39	0,49					
Degree Centrality	0,45	0,44					
Actors diversity (No.)	12	7					
Cross-boundary exchange (%)	(111/272) 41 %	(151/426) 35 %					
Conclusion		·					
Network closure	Lower	Higher					
Network heterogeneity	Higher	Lower					

The co-management network in the Hoeksche Waard consists of a more diverse set of actors compared to the network in Laag Holland. This is much likely to affect the level of cross-boundary exchange, which is also higher in the Hoeksche Waard. Concluding, the co-management network of the Hoeksche Waard has a higher level of network heterogeneity.

# 7.2 Adaptive capacity

Placing the results of the five theorems in the Hoeksche Waard and Laag Holland next to each other, results in the following diagrams (figure 7.1-7.5). In this research it is assumed that when the number of respondents that expect negative effects is low, the level of adaptive capacity of the co-management arrangement is high. The higher the adaptive capacity of a collaborative arrangement is, the better it can adapt to changes, the less negative effects a change will have.



Figure 7.1 No effects if national government abandons National Landscape policy

In Laag Holland respondents are more diversified in their opinion on the effects of the abandoning of the national National Landscape policy on the conservation of the National Landscape (figure 7.1). In the Hoeksche Waard 71% of the respondents expect negative effects if the National Landscape policy is abandoned, in Laag Holland only 55% of the respondents expect effects on the conservation of the National Landscape.



Figure 7.2 Effects if 1/3 less financial resources are available

In the Hoeksche Waard 67% of the respondents expect negative effects on the conservation of the National Landscape, if coming year 1/3 less financial resources are available, in Laag Holland 86% of the respondents (figure 7.2).



Figure 7.3 No effects if Programmabureau Laag Holland/SOHW stops

In the Hoeksche Waard 76% of the respondents expect negative effects on the conservation of the National Landscape if coming year SOHW creases to exist. In Laag Holland this differs not that much, 72% of the respondents expect negative effects if Programmabureau Laag Holland ceases to exist (figure 7.3).



Figure 7.4 Effects if Natuurmonumenten stops cooperation

In the Hoeksche Waard 24% of the respondents expect negative effects on the conservation of the National Landscape if Natuurmonumenten retreats in the cooperation with other organisations. In Laag Holland 36% of the respondents expect effects (figure 7.4).



Figure 7.5 Effects if the Agricultural Nature Conservation Organization stops cooperation

In the Hoeksche Waard 29% of the respondents expect negative effects on the conservation of the National Landscape if the agricultural nature conservation organisation De Rietgors retreats in the cooperation with other organisations. In Laag Holland 77% of the respondents expects effects if Water Land & Dijken retreats (figure 7.5). This theorem, however, should not be used in the analysis, due to the fact that both agricultural nature conservation organisations have a very different position and influence in the Hoeksche Waard and in Laag Holland. Using this theorem would give a misrepresenting picture of the adaptive capacity of the entire co-management network.

In table 7.2 a summary of all data on the adaptive capacity measures in the Hoeksche Waard and Laag Holland is compared. In the column 'AC' (Adaptive Capacity), the co-management arrangement that scores best on the specific adaptive capacity measure is marked. As can be seen, both co-management arrangements score on the same amount of adaptive capacity measures. It can therefore be concluded that both co-management arrangements in the National Landscapes have the same level of adaptive capacity. Laag Holland, however, has a more dense network, whereas The Hoeksche Waard has a more heterogeneous network. The degree centrality of both networks is, nevertheless, equal. Concluding, the relation between network closure and heterogeneity, and the level of adaptive capacity of the collaborative arrangements appears to be not that straightforward as hypothesized. Next chapter will discuss this result in more dept and will draw the final conclusion. However, before drawing a final conclusion, next chapter will first discuss the reliability and validity of the collected data.

Table 7.2 Comparing level of adaptive capacity							
	Hoeksche Waard	AC	Laag Holland	AC			
Past changes:	Effect/result		Effect/result				
Internal change	Tensions between some civil society organisations and the municipalities.		Tensions between local organizations and the Province, but	X			

		1		
	Structural change, but no		meanwhile everyone is	
	clear functional change.		satisfied about working	
	Change has resulted in a		procedures.	
	closer cooperation between		Structural change of	
	civil society organisations.		but no functional	
			change.	
Decrease financial	Less is possible. Change	Х	Involved parties focus	
resources (external	will lead to search for		more on own agenda.	
change)	innovate ways of		Cooperation is	
	financing.		extended three more	
	Change has resulted in a		years. No decline in	
	closer cooperation between		structure and function	
	civil society organisations.		but future is uncertain.	
Theorems:				
National Landscape	71% expects effects		55% expects effects	X
policy				
1/3 less financial	67 % expects effects	X	86 % expects effects	
resources				
Central	76 % expects effects		72 % expects effects	X
organizations stops				
Natuurmonumenten	24 % expects effects x	X	36 % expects effects	
stops cooperation				
Agricultural Nature	29 % expects effects (this	-	77 % expects effects	-
Conservation	theorem is not used in the		(this theorem is not	
Organisation stops	analysis)		used in the analysis)	
cooperation				
Determinants:				
Financial resources	Expected that 84% is	X	60-70% is available	
	available for proposed			
	projects. Total costs of			
	National Landscape			
	conservation are not			
	known.			
Technical resources	Many knowledge is present		Most knowledge and	X
	at the civil society		technical expertise is	
	organisations, but due to a		present in the network.	
	lack of cooperation this is		-	
	not used. Instead			
	professionals are hired.			
Total adaptive	1	4x		4x
capacity				
J		1		1

# 8. Discussion and conclusions

#### 8.1 Data reliability and research validity

In order to draw conclusions based on the collected data, this data and its shortcomings should be discussed. Only when the reliability of the data is known, a valid conclusion can be drawn.

### 8.1.1 Network data

In order to gather the data on the existence and strength of cooperation ties on the conservation of the National Landscapes, one person at each organization was asked to complete a survey or participate in an interview. It was sometimes hard to find the right person who had the knowledge on the cooperation ties concerning the conservation of the National Landscape. It became clear that in some organizations, for example the municipalities, more persons are responsible for the conservation or for different parts of the conservation. Some respondents made this remark themselves and stressed that they could only respond for that perspective. The chairman of agricultural nature conservation organization Water, Land & Dijken, for example remarked that she made an estimation, since she had no exact insights in the contacts of all the employees. Furthermore, for instance at the LTO-Noord and Landschap Noord-Holland employees also cooperated at different levels with other organizations. Concluding, it became clear that the answer of one person was not always fully representative for the entire organization. Due to time limitations, however, it was not possible to consult every person that had something to do with the conservation of the National Landscape at every organization. This shortcoming was offset by combining the answers of two organizations on the same link. In this way the answers one person gave could be checked. When comparing the answers, it was found that in some cases the answers two persons gave on the existence and the strength of a cooperation tie differed a lot. An explanation for this is that organizations might perceive the strength of the cooperation tie differently or that the consulted persons did not have the right knowledge on the cooperation tie. Therefore it was decided to use the average of the given answers.

Furthermore, it should be stressed that the answers the respondents gave are based on their interpretation of the asked questions. The term 'National Landscape conservation' has been defined only vaguely by the national government when it initiated National Landscapes. It is not unthinkable that respondents interpreted this and therefore the question differently. This can also be an explanation for the cases in which the answers on the cooperation tie strength mismatched.

It should be stressed as well, that the data used in this research, is the researchers interpretation of the perceptions of the respondents. In the analyses the researcher perception also played a role. For example, the classification of the different organizations in different groups can be done differently. In this research the organizations that are involved in nature conservation are grouped as one. However, Natuurmonumenten and the National Groenfonds for instance, contribute in a very different way to nature conservation using different methods.

In fact all organizations are different, but some are more similar to each other than others. The characteristics on which classifications can be made are various. However, if they are taken too specific, every organization would be a group on its own and comparing heterogeneity would make no sense.

Finally, the concept of networks is originally an analytical tool or a descriptive metaphor to illustrate a phenomenon in which a related set of actors engage in various activities. It is devolved to understand and simplify a complex reality. Whether relations between actors are really catchable in networks and whether network characteristics really represent cooperation structures, should always be questioned. The network characteristics density and degree centrality, for example, do not take into account the strength of a tie. In reality it was found that the tie strengths in the networks differed a lot, which will have an effect on the distribution of knowledge through the network. Network characteristics that take these differences into account and represent this complexity fully, were however not available.

For this research network analysis was nevertheless believed to be the best method available to investigate cooperation structures and their effects on the adaptive capacity of collaborative arrangements.

# 8.1.2 Adaptive capacity

As already mentioned in the methodology chapter, the concept of adaptive capacity is 'difficult to grasp and measure in real empirical settings' (Sandström 2011: 302). It can only be observed when a form of concrete adaptation is realized as reaction to a change. Three ways of measuring adaptive capacity are therefore combined in this research. These methods however, all have their shortcomings concerning validity which were already discussed in the methodology chapter. Analyzing past events and the adaptation to occurred changes will result in the measuring of the adaptive capacity of a previous network which might have been different from the present network. If determinants of adaptive capacity are measured, one should realize that it can never be said with certainty that they indeed cause a high level of adaptive capacity. It was assumed that a combination of the methods would provide a more valid method to measure the level of adaptive capacity than the already existing methods.

In practice, it turned out to be very difficult for respondents to identify changes in the past and to determine their effects on the structure, function and identity of the co-management arrangement. For respondents it appeared also very hard to make predictions about the future. The co-management arrangements on the moment face a lot of uncertainty due to the abolition of the National Landscape policy. From the interviews it became clear that respondents did not had a clue what the results of this change would be. Finally, the comparison of the adaptive capacity determinants should also be handled with care. As already mentioned in chapter 5, in the Hoeksche Waard, a calculation for the total conservation costs was never made. Comparing the availability of financial resources for the conservation of the two National Landscapes is therefore not completely fair. The availability

of technical resources should ideally be judged by an expert who is intensely knowledgeable about both landscapes. This expert was however not available.

The analysis has shown that the adaptive capacity of both co-management arrangements in the National Landscapes is equal. This conclusion is, however, based on the interpretation of the researcher. Combining this with the fact that adaptive capacity is very hard to measure and the critiques just discussed, it should be concluded that the analysis and the conclusions should be handled with care.

# 8.1.3 Comparability

In the methodology chapter it was already mentioned that density is very sensitive to network size. Laag Holland has almost twice the size of the Hoeksche Waard, and in practice it was found that in Laag Holland many more organizations are involved in the conservation of the National Landscape. These smaller organizations were initially not on the provided organization list. When they were put on, other organizations still did not identify them often as strong cooperation partners. When an explanation was requested, it was said by a respondent that these smaller organizations did not participate in the decision-making procedure (personal communication 2012). In the Hoeksche Waard, also small local organizations are involved in the decision-making process, which is not as formal as in Laag Holland. In the Hoeksche Waard this is also possible in practice since there are not that many organizations involved. Finally, the size of both networks was not equal but since it did not differ substantially, the two cases were perceived as comparable.

The remark should be made that the organization and the management structures in both National Landscapes are completely different. In Laag Holland the Province takes a leading role in the management, and the different involved organizations signed a formal cooperation contract with specific focus on the conservation of the National Landscape. Furthermore a special Programmabureau was imitated and cooperation is structured in a Stuurgroep and a Kernteam. In the Hoeksche Waard the Province is, in contrast to Laag Holland, a minor player. Here the initiative is taken by the civil society organizations and the municipalities who cooperate, but without a formal contact. The focus of this research was, however, on the network structure and therefore this difference in management structure was not taken into account in the judgment of the comparability of both cases.

# 8.2 Research results discussed in a broader context

This study has been conducted in the light of the social relationship approach, which 'investigates how patterned relationships among actors within a system enable and constrain human action' (Bodin & Prell 2011: 10). This approach assumes that human behavior and action is highly influenced by the structure of social relations in which actors are embedded. Social network analysis, as conducted in this research, is one of the best-developed methods to study social relations and their effects. The method has already been used by different scholars with the objective to link specific network structures with governance outcomes

(Carlsson & Sandström 2008, Sandström & Carlsson 2008, Sandström & Rova 2010a, 2010b, Bodin & Prell 2011, Sandström 2011). Of these scholars, Sanström and Rova (2010a, 2010b) hypothesized a relation between network closure and heterogeneity, and the adaptive capacity of a collaborative arrangement. The conducted research tested this hypothesis.

The second study of Sandström and Rova (2010b) concluded that the relation between network closure and heterogeneity, and the adaptive capacity of a co-management arrangement was not that straightforward. They concluded, however, that their hypothesis should not be rejected completely. This study too does not allow for a rejection of their theory since no comparison was made between a network with a high closure and heterogeneity, and a network with a low closure and heterogeneity. However, the conducted research also does not allow for a full acceptance of the hypothesis. Several different conclusions can be drawn from the conducted research.

The first conclusion does not reject the hypothesis completely. It implies the possibility of a range in the combination of closure and heterogeneity, which provides the same levels of adaptive capacity. A somewhat lower network closure combined with a somewhat higher network heterogeneity might result in a same level of adaptive capacity as a somewhat higher network closure combined with a somewhat lower network heterogeneity. This would explain why the collaborative arrangement in Laag Holland, with a higher network density has the same level of adaptive capacity as the Hoeksche Waard, which has a higher network heterogeneity.

The other conclusion that can be drawn, is that another variable is more important in the determination of the level of adaptive capacity of a collaborative arrangement. This variable can be network centrality which was equal in both co-management networks. This would mean that the presence of a central organization in a network will enlarge the likeliness of adaptation to abrupt changes in the future. If a central organization can be seen as a leader in the network, this can give evidence for the idea of Folke et al. (2005: 451) who say 'leadership is essential in shaping change and reorganization by providing innovation in order to achieve the flexibility needed to deal with ecosystems dynamics'. A central leading organization in the network than a high level of density and heterogeneity.

However, it might also be possible that another variable that is not measured in this research is more important in the determination of the level of adaptive capacity, for example the availability of resources. It is also possible that unsystematic variables (King et al. 1994) influenced the adaptive capacity in the analyzed co-management networks. The capacity to adapt successfully to certain changes in the past might for example have been possible due to appropriate wetter conditions at the time of the shock or other factors that were coincidentally present at the right moment. As a result, the proposed relation between network structure and governance outcomes, particularly adaptive capacity, should be nuanced. Network structure is most likely not the only important variable determining the level of adaptive capacity.

Furthermore, Sandström and Rova (2010b) concluded that high network closure and heterogeneity promoted a common process in which a common view is developed on present conditions and necessary actions. Having a joint view is believed to be one of the prerequisites for adaptability (Sandström 2011). Without a joint view it is hard to make decisions on necessary actions. The research found some evidence for the relation between network closure and heterogeneity and the formulation of a joint view and the eradication of conflict. In the Hoeksche Waard it appeared that there were tensions between the municipalities and some civil society organizations. The last also demanded an increase of cooperation with the municipalities. In Laag Holland no evidence was found and no mention was made of serious tensions within the co-management network. The network in the Hoeksche Waard was found to have a lower density and a higher heterogeneity. The lower density would explain the tension, as would the high heterogeneity. Networks that are very diverse are assumed to have difficulty to reach agreement and make joint decisions due to the different perspective of the involved actors (Carlsson & Sandström 2008, Sandström & Rova 2010a). The causal relation between high density and a joint view should, however, be questioned, since having a joint view can also be a reason for close cooperation.

Finally, this research investigated several different methods for the measurement of adaptive capacity levels. It was found that all methods had their limitations and were not suited for the research. Therefore a new method for the identification of the level of adaptive capacity was developed. Whereas previous studies (Yohe & Tol 2002, Adger et al. 2004, Nelson et al. 2007, McClanahan et al. 2008, Bohensky et al. 2010, Brown et al. 2010, Sandström & Rova 2010a, 2010b) used only a single method to measure the level of adaptive capacity, this study combined three different ones. Since all methods have their shortcomings, a combination of all three was assumed to provide a more valid level of adaptive capacity. This new method can be used in other studies on different topics as well. The determinants to measure can be expanded from only looking to resources, to researching the social processes through which they are mediated and employed. This can, however, only be done if the research does not investigate the relation between social processes and adaptive capacity, as was the case in this research.

# 8.3 Conclusion

The objective of this research was to generate descriptive and explanatory knowledge on the structural factors in collaborative arrangements which determine the adaptive capacity of these collaborative arrangements, since this capacity was believed to be a precondition for sustainable development. The research started with the question: *Which structural factors in collaborative arrangements in Dutch National Landscape management determine the adaptive capacity of these collaborative arrangements?* '. Literature proposed two structural factors to have an influence on the adaptive capacity of collaborative arrangements, network

closure and network heterogeneity. It was hypothesized that a combination of high network closure and high heterogeneity would result in a collaborative arrangement with a high level of adaptive capacity.

This research compared two collaborative arrangements managing a National Landscape in the Netherlands. One collaborative arrangement network appeared to have a higher network density, the other had a higher network heterogeneity. It was found, however, that both collaborative arrangements had the same level of adaptive capacity. Two different conclusions can be drawn from the conducted research, they should however be handled with care due to the limitations as discussed in section 8.1.

First, there might exist a range in which the combination of network closure and heterogeneity determines a same level of adaptive capacity. A network with a somewhat higher closure and a somewhat lower heterogeneity can therefore have the same level of adaptive capacity as a network with a somewhat lower closure and a somewhat higher heterogeneity. This conclusion would not lead to a rejection of the research hypothesis. Further research on the scale of this range is however necessary, in order to use this knowledge in practice for the establishment of adaptive co-management arrangements.

The other conclusion that can be drawn is that another variable is more important in the determination of adaptive capacity than network closure and network heterogeneity. It is possible that the presence of a central leading organization which can channel knowledge and take the initiative to organize action is more important to the capacity to adapt to change. This conclusion is based on the fact that the network centrality in both networks was equal like the level of adaptive capacity. Nevertheless, it can not be excluded that other (unsystematic) variables which were not taken into account in this research, determine the level of adaptive capacity. The investigation of these variables is, however, beyond the scope of this study and their influence should be analyzed in further research.

Concluding, the conducted research showed that the relation between network closure and heterogeneity, and the level of adaptive capacity of a collaborative arrangement is not that straightforward as suggested. In line with the conclusion of Sandström and Rova (2010b) the direct relation between network structure and the ability to adapt, should be nuanced. Network structure is most likely not the only factor that determines adaptive capacity of a collaborative arrangement. Further research investigating which variables determine the adaptive capacity of collaborative arrangements should therefore also focus on other (unsystematic) variables.

### 9. References

- Adger, W.N., Brooks, N., Kelly, M., Bentham, G., Agnew, M. & Erkisen, S. 2004, *Technical Report 7: New indicators of vulnerability and adaptive capacity*, Tyndall Centre for Climate Change Research.
- ANWB Media 2009, Nationale landschappen en parken: Nederland op z'n mooist, ANWB Media.
- Berkes, F. & Folke, C. 1998, *Linking social and ecological systems*. *Management practices and social mechanisms for building resilience*, Cambridge Univ Press.
- Bodin, Ö. & Prell, C. 2011, *Social Networks and Natural Resource Management*, Cambridge Univ Press.
- Bohensky, E., Stone-Jovicich, S., Larson, S. & Marshall, N. 2010, "Adaptive capacity in theory and reality: Implications for governance in the Great Barrier Reef region", in Armintage, D. & Plummer, R. (eds.) Adaptive capacity and environmental governance, Springer, pp. 23-42.
- Borrini-Feyerabend, G., Pimbert, M., Farvar, M.T., Kothari, A. & Renard, Y. 2007, *Sharing power: A global guide to collaborative management of natural resources*, Cambridge Univ Press.
- Brown, P.R., Nelson, R., Jacobs, B., Kokic, P., Tracey, J., Ahmed, M. & DeVoil, P. 2010, "Enabling natural resource managers to self-assess their adaptive capacity", *Agricultural Systems*, vol. 103, no. 8, pp. 562-568.
- Bryman, A. 2008, Social Research Methods, Oxford Univ Press.
- Carlsson, L.G. & Berkes, F. 2005, "Co-management: Concepts and methodological implications", *Journal of environmental management*, vol. 75, no. 1, pp. 65-76
- Carlsson, L.G. & Sandström, A.C. 2008, "Network governance of the commons", *International Journal of the Commons*, vol. 2, no. 1, pp. 33-54.
- Clark, J.R.A. & Clarke, R. 2011, "Local sustainability initiatives in English National Parks: What role for adaptive governance?", *Land Use Policy*, vol. 28, no. 1, pp. 314-324.
- Crona, B. & Bodin, Ö. 2011, "Bonding and bridging ties in natural resource governance", in Bodin, Ö. & Prell, C. (eds.) Social Networks and Natural Resource Management, Cambridge Univ Press, pp. 206-233.
- Folke, C., Carpenter, S., Elmqvist, T., Gunderson, L., Holling, C.S. & Walker, B. 2002, "Resilience and sustainable development: Building adaptive capacity in a world of transformations", *Ambio*, vol. 31, no. 5, pp. 437-440.
- Folke, C., Hahn, T., Olsson, P. & Norberg, J. 2005, "Adaptive governance of socialecological systems", *Annual Review of Environment and Resources*, vol. 30, pp. 441-473.

- IPCC 2001, *Climate Change 2001: Impacts, Adaptation, and Vulnerability* Cambridge Univ Press.
- IUCN 2009, "Category V Protected Landscape/seascape". Retrieved June 18, 2012, from <a href="http://www.iucn.org/about/work/programmes/pa/pa\_products/wcpa\_categories/pa
- Janssen, J., Pieterse, N., Van den Broek, L. & Breedijk, M. 2007, *Historie Nationale Landschappen* NAI Uitgevers & Ruimtelijk Planbureau.
- Janssen, J. 2009, "Sustainable development and protected landscapes: The case of the Netherlands", *International Journal of Sustainable Development and World Ecology*, vol. 16, no. 1, pp. 37-47.
- King, G., Keohane, R.O. & Verba, S. 1994, *Designing social inquiry: scientific inference in qualitative research*, Princeton Univ Press.
- Laag Holland n.d., "Organisatie". Retrieved June 18, 2012, from http://www.laagholland.nl/organisatie
- Lebel, L., Anderies, J.M., Campbell, B., Folke, C., Hatfield-Dodds, S., Hughes, T.P. & Wilson, J. 2006, "Governance and the capacity to manage resilience in regional social-ecological systems", *Ecology and Society*, vol. 11, no. 1.
- Marsh, D. & Smith, M. 2000, "Understanding policy networks: towards a dialectical approach", *Political studies*, vol. 48, no. 1, pp. 4-21.
- Marín, A. & Berkes, F. 2010, "Network approach for understanding small-scale fisheries governance: The case of the Chilean coastal co-management system", *Marine Policy*, vol. 34, no. 5, pp. 851-858.
- McClanahan, T., Cinner, J., Maina, J., Graham, N., Daw, T., Stead, S., Wamukota, A., Brown, K., Ateweberhan, M. & Venus, V. 2008, "Conservation action in a changing climate", *Conservation Letters*, vol. 1, no. 2, pp. 53-59.
- Meeuwissen, G. & Van der Eerden, D 2004, "Concept plan van aanpak: Van Taskforce rapport naar Nationaal Landschap Noord-Hollands Midden". Retrieved June 18, 2012, from <u>http://www.noord-</u> <u>holland.nl/zoeken/get\_url.asp?page=/provstukken/OPENBAAR/PSCIE/NOTA/Nlwm/20</u> <u>04/NLWM220303.04.pdf</u>
- Monge, P.R. & Contractor, N.S. 2003, *Theories of communication networks*, Oxford Univ Press.
- Nationaal Landschap Hoeksche Waard n.d., "Nationaal Landschap". Retrieved June 18, 2012, <u>http://www.nationaallandschap.nl/nationaal-landschap/</u>
- Nationale Landschappen 2011, "Beleid en uitvoering". Retrieved November 16, 2011, from <a href="http://www.nationalelandschappen.nl/page.php?id=21">http://www.nationalelandschappen.nl/page.php?id=21</a> (website is not available anymore since February 2012)

- Nelson, R. Brown, P. R. Darbas, T. Kokic, P. & Cody, K. 2007, *The potential to map the adaptive capacity of Australian land managers for NRM policy using ABS data*, CSIRO, Australian Bureau of Agricultural and Resource Economics, prepared for the National Land & Water Resources Audit.
- Nota Ruimte 2004, "Ruimte voor ontwikkeling". Retrieved June 18, 2012, from http://www.fnp.nl/downloads/NotaRomteCompleet.pdf
- Olsson, P., Folke, C. & Berkes, F. 2004, "Adaptive Comanagement for building resilience in social-ecological systems", *Environmental Management*, vol. 34, no. 1, pp. 75-90.
- Platform Hoeksche Waards Middenveld 2012, "De Hoeksche Lente 2012 (pamphlet)". Retrieved June 18, 2012, from <u>http://www.dehoekschewaard.ltonoord.nl/nieuws/pamflet-de-hoeksche-waard-lente-2012-platform-hoekschewaards-middenveld</u>
- Plummer, R. & Armitage, D. 2010, "Integrating perspectives on adaptive capacity and environmental governance", in Armintage, D. & Plummer, R. (eds.) *Adaptive capacity and environmental governance*, Springer, pp. 1-22.
- Provincie Noord-Holland 2006, "Uitvoeringsprogramma Nationaal Landschap Laag Holland 2007-2013". Retrieved June 18, 2012, from <u>http://www.noord-holland.nl/bestanden/programmabegroting2011/5.2.2.1\_UVP\_nationaal\_landschap\_Laag</u> <u>-Holland\_2007-2013.pdf</u>
- Provincie Noord-Holland 2011, *Discussienota: Toekomstscenario's Laag Holland* Provincie Noord-Holland.
- Provincie Zuid-Holland 2007, "Uitvoeringsprogramma Nationaal Landschap Hoeksche Waard 2007-2013". Retrieved June 18, 2012, from <u>http://www.commissiehw.nl/quirkycms100/uploadedfiles/PZH-Hoeksewaard-def.pdf</u>
- Provincie Zuid-Holland 2011, "Nationale landschappen". Retrieved December 12, 2011, from <a href="http://www.zuid-holland.nl/overzicht\_alle\_themas/thema\_groen/c\_nationale\_landschappen.htm">http://www.zuid-holland.nl/overzicht\_alle\_themas/thema\_groen/c\_nationale\_landschappen.htm</a>
- PS-commissie NLWM 2005, "Agendapunt 4: Voortgang Nationaal Landschap Laag Holland". Retrieved June 18, 2012, from <u>http://www.noord-</u> <u>holland.nl/zoeken/get\_url.asp?page=/pdfstukken/PSCIE/NOTA/Nlwm/2005/NLWM191</u> 004.05%20agenda-statencommissielaagholland.doc.pdf
- Renes, H. 2011, "The Dutch National Landscapes 1975-2010: Policies, Aims And Results", *Tijdschrift voor Economische en Sociale Geografie*, vol. 102, no. 2, pp. 236-244.
- Rijksoverheid 2012, "Nationale Landschappen". Retrieved January 4, 2012, from http://www.rijksoverheid.nl/onderwerpen/landschap/nationale-landschappen
- Sabatier, P.A. 2005, *Swimming upstream: Collaborative approaches to watershed management*, The MIT Press.

- Sandström, A.C. & Carlsson, L.G. 2008, "The performance of policy networks: the relation between network structure and network performance", *Policy Studies Journal*, vol. 36, no. 4, pp. 497-524.
- Sandström, A.C. & Rova, C.V. 2010a, "The network structure of adaptive governance-A single case study of a fish management area", *International Journal of the Commons*, vol. 4, no. 1, pp. 528-551.
- Sandström, A.C. & Rova, C.V. 2010b, "Adaptive co-management networks: A comparative analysis of two fishery conservation areas in Sweden", *Ecology and Society*, vol. 15, no. 3.
- Sandström, A.C. 2011, "Social networks, joint image building, and adaptability", in Bodin, Ö. & Prell, C. (eds.) Social Networks and Natural Resource Management, Cambridge Univ Press, pp. 288-321.
- Schneider, M., Scholz, J., Lubell, M., Mindruta, D. & Edwardsen, M. 2003, "Building consensual institutions: Networks and the National Estuary Program", *American Journal of Political Science*, vol. 47, no. 1, pp. 143-158.
- SOHW 2010, "Structuurvisie Hoeksche Waard: Uitvoeringsprogramm 2010-2013". Retrieved June 18, 2012, from <u>http://www.sohw.org/photo/files/Uitvoeringsprogramma%20ontwerp%2029%20septemb</u> <u>er%202010\_laatste%20versie.pdf</u>
- SOHW 2012, "Concept landschapsbeheerplan Hoeksche Waard". Retrieved June 18, 2012, from http://www.sohw.org/photo/files/Landschapsbeheersplan\_conceptversie\_18012012.pdf
- Stoker, G. 1998, "Governance as theory: five propositions", *International social science journal*, vol. 50, no. 155, pp. 17-28.
- Walker, B., Holling, C.S., Carpenter, S.R. & Kinzig, A. 2004, "Resilience, adaptability and transformability in social-ecological systems", *Ecology and Society*, vol. 9, no. 2.
- Wasserman, S. & Faust, K. 1994, *Social network analysis: Methods and applications,* Cambridge Univ Press.
- Yohe, G. & Tol, R.S.J. 2002, "Indicators for social and economic coping capacity Moving toward a working definition of adaptive capacity", *Global Environmental Change*, vol. 12, no. 1, pp. 25-40.

# Appendix I: Survey the Hoeksche Waard

Naam:
Naam organisatie/instantie:
Functie binnen organisatie/instantie:
Werkzaam bij organisatie/instantie sinds:

<u>Deel 1</u> (antwoord invulkaart vindt u onder vraag)

**1. Met welke organisaties of instanties werkt uw organisatie/instantie direct samen (overleg, informatie uitwisseling en/of projectuitvoering) als het gaat om het behoud van het Nationaal Landschap de Hoeksche Waard?** Vink de betreffende organisaties aan in kolom 1. Staat de organisatie/instantie waarmee u samenwerkt met betrekking tot het behoud van het Nationaal Landschap de Hoeksche Waard niet in de lijst, voeg deze dan a.u.b. onderaan toe.

2. Wat was gemiddeld de frequentie van deze samenwerking in het afgelopen jaar? Wekelijks, maandelijks, driemaandelijks, halfjaarlijks, jaarlijks of eenmalig? Vul één van deze aanduiding in, in kolom 2. Mocht de samenwerkingsfrequentie niet te vangen zijn in een van de bovenstaande aanduiding specificeer dan alstublieft met regelmatig, af en toe, een enkele keer.

3. Hoe sterkt vindt u de samenwerkingsband betreft het behoud van Nationaal Landschap de Hoeksche Waard, met deze organisatie/instantie op de schaal van 1 tot 5? Vul in kolom 3, 1,2,3,4 of 5 in, waarbij 1 zeer zwak en 5 zeer sterk is.

Organisaties/instanties 1.samenwerking 2. frequentie		3. sterkte samenwerkingband					4. opmerking (hier kunt u desgewenst					
			zeer zwak zeer ster		zeer zwak		zeer zwak			zeer sterk 4 5		een opmerking maken over de
			1	2	3	samenwerking met deze organisatie)						
Samenwerkingsorgaan												
Hoeksche Waard (SOHW)												
Vereniging Hoekschewaards												
Landschap (HWL)												
Erfgoedkoepel Hoeksche												
Waard												

Stichting Archeologie			
Hoeksche Waard			
Agrarische natuurvereniging			
de Rietgors			
LTO Noord			
Stichting Hoeksche Waard op			
de Kaart (H-Wodka)			
Staatsbosbeheer			
Natuurmonumenten			
Groen beheer Hoeksche			
Waard			
Streekcommissie Hoeksche			
Waard			
Hoeksche Waard Duurzaam			
Bedrijvenpark Hoeksche			
Waard			
Ondernemersvereniging			
Hoeksche Waard			
Woningcorporatie Hoeksche			
Waard (HW Wonen)			
Kamer van Koophandel			
VVV Hoeksche Waard			
Waterschap Hollandse Delta			
Gemeente Binnenmaas			
Gemeente Cromstrijen			
Gemeente Korendijk			
Gemeente Oud-Beijerland			
Gemeente Strijen			
	1		

Drechtsteden (bureau)		
Regio zuid-holland-zuid		
Regio Alblasserwaard-		
Vijfheerenlanden		
Dienst Landelijk Gebied (DLG)		
Provincie Zuid-Holland		
Ministerie van I&M		
(Infrastructuur & Mileu)		
Ministerie van EL&I		
(Economische zaken,		
Landbouw & Innovatie)		
Ministerie van OC&W		
(Onderwijs, Cultuur &		
Wetenschap		
Landschapsbeheer Zuid-		
Holland		
Omgevingsdienst Zuid-		
Holland- Zuid		
Servicenet Nationale		
Landschappen		
Andere organisaties/instanties:		

#### <u>Deel 2 (antwoord invulkaart vindt u op de volgende pagina)</u>

4. Heeft er in het verleden een abrupte verandering plaatsgevonden in het ecologisch systeem (plagen, weersomstandigheden ect.), samenwerking, management, financiële steuning of overheidsbeleid, met betrekking tot het behoud van het Nationaal Landschap de Hoeksche Waard? Zo ja, welke? Er mogen meerdere veranderingen worden genoemd op dezelfde onderwerpen, vul ja of nee in in kolom 1. Indien er een abrupte verandering heeft plaats gevonden, ligt deze kort toe in kolom 2.

5. Heeft deze abrupte verandering geleid tot een crisis? Vul ja of nee in in kolom 3, ligt dit kort toe in kolom 4.

6. Hoe is er omgegaan met deze crisis door het samenwerkingsverband van verschillende organisaties en instanties die betrokken zijn bij het behoud van Nationaal Landschap de Hoeksche Waard? *Ligt dit toe in kolom 5.* 

7. Hebben er naar aanleiding van deze crisis veranderingen plaatsgevonden in de structuur van het samenwerkingsverband van verschillende organisaties en instanties die betrokken zijn bij het behoud van Nationaal Landschap de Hoeksche Waard? *Vul ja of nee in, in kolom 6.* 

8. Is de functie van het samenwerkingsverband van verschillende organisaties en instanties die betrokken zijn bij het behoud van Nationaal Landschap de Hoeksche Waard veranderd, naar aanleiding van deze crisis? *Vul ja of nee in, in kolom 7.* 

9. Is de identiteit van het samenwerkingsverband van verschillende organisaties en instanties die betrokken zijn bij het behoud van Nationaal Landschap de Hoeksche Waard, veranderd naar aanleiding van deze crisis? *Vul ja of nee in, in kolom 8.* 

	1. Verandering	2. Specificatie	3. Crisis	4. Specificatie	5. Reactie	6. Structuur	7. Functie	8. Identiteit
Ecologisch								
systeem								
Samenwerking								
Management								
Financiële steuning								
Overheidsbeleid								

Anders:				

**10. Bent u het eens of oneens met de volgende stellingen?** Kruis de kolom aan die voor u van toepassing is.

Stelling	Geheel	Gedeeltelijk	Dit weet ik niet,	Gedeeltelijk	Geheel
	mee	mee oneens	ik kan hier niks	mee eens	mee eens
	oneens		over zeggen		
- Ik heb er vertrouwen in dat er geen gevolgen zullen zijn voor het behoud					
van het Nationaal Landschap de Hoeksche Waard, als de Nationale					
overheid dit jaar haar beleid omtrent National Landschappen schrapt.					
- Ik verwacht dat er negatieve effecten zullen zijn op het behoud van					
Nationaal Landschap de Hoeksche Waard, als er dit jaar een derde					
minder financiering beschikbaar is.					
- Ik heb er vertrouwen in dat er geen gevolgen zullen zijn voor het behoud					
van Nationaal Landschap de Hoeksche Waard, als het					
Samenwerkingsorgaan Hoeksche Waard (SOHW) dit jaar, om welke					
reden dan ook, ophoudt te bestaan.					
- Ik verwacht dat er gevolgen zullen zijn voor het behoud van het					
Nationaal Landschap de Hoeksche Waard, als Vereniging					
Natuurmonumenten dit jaar besluit het contact met andere organisaties in					
de Hoeksche Waard te verbreken en zich alleen bezig te houden met het					
beheer van haar eigen gebieden.					
- Ik verwacht dat er gevolgen zullen zijn voor het behoud van het					
Nationaal Landschap de Hoeksche Waard, als Agrarische					
natuurvereniging de Rietgors dit jaar besluit het contact met andere					
organisaties in de Hoeksche Waard te verbreken.					

Ik wil u heel hartelijk danken voor uw tijd en de moeite die u heeft genomen om te helpen bij mijn onderzoek, dank u wel.

# **Appendix II: Survey Laag Holland**

Naam:
Naam organisatie/instantie:
Functie binnen organisatie/instantie:
Werkzaam bij organisatie/instantie sinds:

<u>Deel 1</u> (antwoord invulkaart vindt u onder vraag 3)

1. Met welke organisaties of instanties werkt uw organisatie/instantie direct samen (overleg, informatie uitwisseling en/of projectuitvoering) als het gaat om het behoud van het Nationaal Landschap Laag Holland? Vink de betreffende organisaties aan in kolom 1.

Staat de organisatie/instantie waarmee u samenwerkt met betrekking tot het behoud van het Nationaal Landschap Laag Holland niet in de lijst, voeg deze dan a.u.b. onderaan toe.

2. Wat was gemiddeld de frequentie van deze samenwerking in het afgelopen jaar? Wekelijks, maandelijks, driemaandelijks, halfjaarlijks, jaarlijks of eenmalig? Vul één van deze aanduiding in, in kolom 2. Mocht de samenwerkingsfrequentie niet te vangen zijn in een van de bovenstaande aanduiding specificeer dan alstublieft met regelmatig, af en toe, een enkele keer.

**3.** Hoe sterkt vindt u de samenwerkingsband betreft het behoud van Nationaal Landschap Laag Holland, met deze organisatie/instantie op de schaal van 1 tot 5? Vul in kolom 3, 1,2,3,4 of 5 in waarbij 1 zeer zwak en 5 zeer sterk is.

Organisaties/instanties	1.samenwerking	2. frequentie	3. sterkte samenwerkingsband					4. opmerking (hier kunt u desgewenst		
			zeer zwak			zee	er sterk	een opmerking maken over de		
			1	2	3	4	5	samenwerking met deze organisatie)		
Programmabureau Laag										
Holland										
Stichting Landschap Noord-										
Holland										
Agrarische natuurvereniging										
Water, Land & Dijken										
Milieufederatie Noord-Holland										

Hoogheemraadschap Hollands		
Noorderkwartier		
LTO Noord		
Staatsbosbeheer		
Vereniging		
Natuurmonumenten		
Nationaal Groenfonds		
Servicenet Nationale		
Landschappen		
Intergemeentelijk		
Samenwerkingsverband		
Waterland		
Gemeentelijk		
samenwerkingsverband Land		
van Leeghwater		
Gemeente Amsterdam		
Stadsdeel Amsterdam-Noord		
Gemeente Zaanstad		
Gemeente Castricum		
Gemeente Purmerend		
Gemeente Waterland		
Gemeente Schermer		
Gemeente Graft de Rijp		
Gemeente Beemster		
Gemeente Landsmeer		
Gemeente Oostzaan		
Gemeente Wormerland		
Gemeente Zeevang		
Gemeente Edam-Volendam		

Dienst Landelijk Gebied (DLG)		
Provincie Noord-Holland,		
anders dan programmabureau		
Laag Holland		
Ministerie van I&M		
(Infrastructuur & Mileu)		
Ministerie van EL&I		
(Economische zaken,		
Landbouw & Innovatie)		
Ministerie van OC&W		
(Onderwijs, Cultuur &		
Wetenschap)		
WZNH (Welstandszorg NH)		
De Boerderijenstichting NH		
Bureau Toerisme Laag Holland		
Recreatie Noord- Holland		
Recreatieschap Waterland		
Recreatieschap Het Twiske		
Recreatieschap Alkmaarder-		
en Uitgeestermeer		
Ontwikkelingsbedrijf NHN		
Andere organisaties/instanties,		
waarmee wordt samengewerkt		
m.b.t. Laag Holland:		

#### Deel 2 (antwoord invulkaart vindt u onder vraag 9)

4. Heeft er in het verleden een abrupte verandering plaatsgevonden in het ecologisch systeem (plagen, weersomstandigheden ect.), samenwerking, management, financiële steuning en/of overheidsbeleid, met betrekking tot het behoud van het Nationaal Landschap Laag Holland? Zo ja, welke? Er mogen meerdere veranderingen worden genoemd op dezelfde onderwerpen, vul ja of nee in in kolom 1. Indien er een abrupte verandering heeft plaats gevonden, licht deze toe in kolom 2.

5. Heeft deze abrupte verandering geleid tot een crisis? Vul ja of nee in in kolom 3, licht dit toe in kolom 4.

6. Hoe is er omgegaan met deze crisis door het samenwerkingsverband van verschillende organisaties en instanties die betrokken zijn bij het behoud van Nationaal Landschap Laag Holland? Licht dit toe in kolom 5.

7. Hebben er naar aanleiding van deze crisis veranderingen plaatsgevonden in de structuur van het samenwerkingsverband van verschillende organisaties en instanties die betrokken zijn bij het behoud van Nationaal Landschap Laag Holland? Vul ja of nee in, in kolom 6.

8. Is de functie van het samenwerkingsverband van verschillende organisaties en instanties die betrokken zijn bij het behoud van Nationaal Landschap Laag Holland veranderd, naar aanleiding van deze crisis? *Vul ja of nee in, in kolom 7.* 

9. Is de identiteit van het samenwerkingsverband van verschillende organisaties en instanties die betrokken zijn bij het behoud van Nationaal Landschap Laag Holland, veranderd naar aanleiding van deze crisis? *Vul ja of nee in, in kolom 8.* 

	1. Verandering	2. Specificatie	3. Crisis	4. Specificatie	5. Reactie	6. Structuur	7. Functie	8. Identiteit
Ecologisch								
systeem								
Samenwerking								
Management								
Financiële steuning								
Overheidsbeleid								

Anders:				

**10. Bent u het eens of oneens met de volgende stellingen?** Kruis de kolom aan die voor u van toepassing is

Stelling	Geheel	Gedeeltelijk	Dit weet ik niet,	Gedeeltelijk	Geheel
	mee	mee oneens	ik kan hier niks	mee eens	mee eens
	oneens		over zeggen		
- Ik heb er vertrouwen in dat er geen gevolgen zullen zijn voor het behoud					
van het Nationaal Landschap Laag Holland, als de Nationale overheid dit					
jaar haar beleid omtrent National Landschappen schrapt.					
- Ik verwacht dat er negatieve effecten zullen zijn op het behoud van					
Nationaal Landschap Laag Holland, als er dit jaar een derde minder					
financiering beschikbaar is.					
- Ik heb er vertrouwen in dat er geen gevolgen zullen zijn voor het behoud					
van Nationaal Landschap Laag Holland, als het programma bureau Laag					
Holland dit jaar, om welke reden dan ook, ophoudt te bestaan.					
- Ik verwacht dat er gevolgen zullen zijn voor het behoud van het					
Nationaal Landschap Laag Holland, als Vereniging Natuurmonumenten					
dit jaar besluit het contact met andere organisaties in Laag Holland te					
verbreken en zich alleen bezig te houden met het beheer van haar eigen					
gebieden.					
- Ik verwacht dat er gevolgen zullen zijn voor het behoud van het					
Nationaal Landschap Laag Holland, als Agrarische natuurvereniging					
Water, Land & Dijken dit jaar besluit het contact met andere organisaties					
in Laag Holland te verbreken.					

Ik wil u heel hartelijk danken voor uw tijd en de moeite die u heeft genomen om te helpen bij mijn onderzoek, dank u wel.

# **Appendix III: Network organizations description**

# Organisations in the Hoeksche Waard

# Samenwerkingsorgaan Hoeksche Waard (SOHW) (<u>www.sohw.org</u>)

SOHW in the formal cooperation body between the municipalities of Binnenmaas, Cromstrijen, Korendijk, Oud-Beierland and Strijen. The aim of SOHW is to look after the mutual interests of the municipalities on the subjects of spatial planning, landscape, economy, society and safety.

# Hoekschewaards Landschap (HWL) (<u>www.hwl.nl</u>)

This associations was founded in 1973. HWL has about 1750 members and 400 active volunteers. The aim of HWL is to conserve nature, landscape and historical beauty in the Hoeksche Waard. HWL has five working groups: biological research, nature conservation/management, education and information, policy influence and the exploitation of the visitors centers. HWL is owner of eighty locations in the Hoeksche Waard who reach in total 140 hectares. Furthermore, HWL owns two visitors centers in the area and it founder of the knowledge centre Hoeksche Waard.

# Erfgoedkoepel Hoeksche Waard

This is a umbrella organizations of the following associations:

- Bomenstichting Fraxinus Excelsior
- Erfgoedhuis Zuid-Holland
- Historische Vereniging 's-Gravendeel
- Historische Vereniging Oud-Beijerland
- Oudheidkundige Vereniging en Museum Het Land van Strijen
- Stichting Archeologie Hoeksche Waard
- Stichting Landelijk Erfgoed Hoeksche Waard
- Stichting Molen Landzigt 1857
- Stichting Molencomplex Godschalxoort
- Stichting Streekmuseum Hoeksche Waard
- Stichting tot behoud van molens in de gemeente Binnenmaas
- Stichting Vriendenkring van het Streekmuseum Hoeksche Waard

The aim of Erfgoedkoepel Hoeksche Waard is to conserve cultural historical and archeological objects in the area.

# Agricultural nature conservation organization De Rietgors (<u>www.rietgorsinfo.nl</u>)

This foundation focuses on the conservation of agricultural and landscape qualities of the Hoeksche Waard. In this foundation several societal organizations are represented (LTO-Noord section Hoeksche Waard and work group arable farming, HWL, Game management section Hoeksche Waard, association of rural women 'Vrouwen van nu' and SOHW).

# LTO-Noord (<u>www.ltonoord.nl</u>)

LTO-Noord is the national entrepreneur association for farmers and gardeners in the agricultural sector in the nine Provinces above the Meuse, with about 21.000 members. LTO-Noord tries to strengthen the economic and societal position of its members.

# Hoeksche Waard op de Kaart (H-Wodka)(<u>www.hwodka.nl</u>)

H-Wodka was founded in 2005. This foundation focuses on the promotion and development of precision agriculture. Using GPS and GIS technology the land can be used optimally with only a minimum of fertilizers and pesticides, leaving space for nature to develop.

#### Staatsbosbeheer (www.staatsbosbeheer.nl)

Staatbosbeheer was founded in 1899 and manages by order of the Dutch national government, about 26.000 hectors nature throughout the Netherlands. Initially the aim of this organization was to enlarge forests for wood production, but meanwhile it also conserves other type of areas.

# Natuurmonumenten (<u>www.natuurmonumenten.nl</u>)

Natuurmonumenten is a national association with more than 730.000 members. The aim of this association is to conserve nature in the Netherlands by acquiring nature reserves. The first area was bought in 1906 and by now they manage 355 area, in total 100.000 hectares.

### Groenbeheer Hoeksche Waard (/www.wshd.nl/groenbeheerhw/)

This is a cooperation between water board Hollandse Delta and the municipalities in the Hoeksche Waard. The aim of Groenbeheer Hoeksche Waard is to conserve and develop landscape qualities.

#### Streekcommissie Hoeksche Waard

This civil society organization was founded in 1974 as a deliberative body between inhabitants and the Province on the development of structural plans by the Province. They communicate mainly on subjects of spatial planning and housing.

#### Hoeksche Waard Duurzaam (www.hoekschewaardduurzaam.nl)

Hoeksche Waard Duurzaam is a cooperative and founded in 2010. The aim is to stimulate sustainable development in the Hoeksche Waard. They have several working groups on the subjects of energy, technology and climate; natural resources and biodiversity; construction and environment; involvement and education; and marketing and communication.

#### Entrepreneur association Hoeksche Waard (<u>www.o-hw.nl</u>)

This associations represent the interests of more then 300 entrepreneurs in the Hoeksche Waard.

#### Housing cooperation HWwonen (www.hwwonen.nl)

HWwonen rents houses in the Hoeksche Waard. The housing cooperation was founded in 2010 after a merging of three smaller cooperation. HWwonen advertises with living in a National Landscapes and tries to contribute to the conservation of the Hoeksche Waard.

# Kamer van Koophandel (<u>www.kvk.nl</u>)

Kamer van Koophandel is the national organisation which helps entrepreneurs with their enterprise, with more the 35.000 members. Being an entrepreneur it is obligatory to register at the Kamer van Koophandel.

#### Water board Hollandse Delta (<u>www.wshd.nl</u>)

Waterboard Hollandse Delta is responsible for the management of waterways and also roads in an area which reaches 101.809 hectares (including the Hoeksche Waard). Furthermore it takes care of waste water treatment and flood protection measures.

#### Municipality of Binnemaas (www.binnenmaas.nl)

Binnenmaas has about 28.889 inhabitants and the municipalities researched about 75,60 km<sup>2</sup>.

#### Municipality of Cromstrijen (<u>www.cromstrijen.nl</u>)

Cromstrijen has about 12.760 inhabitants and the municipalities researched about 70,31 km<sup>2</sup>.

#### Municipality of Korendijk (www.korendijk.nl)

Korendijk has about 10.774 inhabitants and the municipalities researched about 100,48 km<sup>2</sup>.

# Municipality of Oud-Beijerland (<u>www.oud-beijerland.nl</u>)

Oud-Beijerland has about 23.400 inhabitants and the municipalities researched about 19,61  $km^2$ .

#### Municipality of Strijen (www.strijen)

Strijen has about 8.851 inhabitants and the municipalities researched about 57,72 km<sup>2</sup>.

#### Landschapsbeheer Zuid-Holland (<u>www.landschapsbeheerzuidholland.nl</u>)

Landschapsbeheer Zuid-Holland helps conserving the landscape of Zuid-Holland by advising, knowledge sharing through courses and the giving of financial support for private parties like farmers. They coordinate the work of many volunteers and carry out work for different government agencies on the subjects of nature, landscape and cultural history.

#### Omgevingsdienst Zuid-Holland-Zuid (www.ozhz.nl)

Omgevingdienst is part of the Province Zuid-Holland. They advices and support nineteen municipalities on environmental subjects including the municipalities in the Hoeksche Waard.
## **Organisations in Laag Holland**

## Programmabureau Laag Holland

The Programmabureau is located at the Province Noord-Holland. Three a four officials work here on the implementation of the policies adopted by the Stuurgroep Laag Holland.

## Landschap Noord-Holland (<u>www.landschapnoordholland.nl</u>)

This foundation was founded in 1936 in order to conserve nature and the landscape of Noord-Holland. It is one of the twelve provincial landscape organizations in the Netherlands. Landschap Noord-Holland manages 86 areas, in total 4.448 hectares. Furthermore they manage areas of other parties and give advice on ecology, landscape and nature. 6000 volunteers help this organization which has about 41.000 members and 150 employees.

# Agricultural nature conservation organization Water, Land & Dijken (<u>www.waterlandendijken.nl</u>)

Water, Land & Dijken is active in the enlargement of biodiversity, accessibility of the area, education and participation of civilians. They focus on profitable agriculture as supporter of the cultural landscape. 500 farmer and 150 civilians are member of Water, Land & Dijken who are active in an area which reaches 50.000 hectare.

# Milieufederatie Noord-Holland (<u>www.mnh.nl</u>)

Milieufederatie Noord-Holland is one of the twelve provincial environmental federations. Many smaller organisations in the province Noord-Holland are connected and are represented by the Milieufederatie. Through lobby, dialog, education, advice, public pressure and sometimes legal actions they try to reach their goal, nature conservation.

## Water board Hollands Noorderkwartier (www.hhnk.nl)

Water board Hollands Noorderkwartier was founded in 2003 by the merging of several smaller water boards. The water board is responsible for the management of waterways and roads in an area which reaches 196.400 hectares (including Laag Holland). Furthermore it takes care of waste water treatment and flood protection measures.

*LTO-Noord* See Hoeksche Waard

*Staatbosbeheer* See Hoeksche Waard

*Natuurmonumenten* See Hoeksche Waard

## Nationaal Groenfonds( <u>www.nationaalgroenfonds.nl</u>)

Nationaal Groenfonds was founded in 1994 by the Provinces and the Ministry of Economy, Agriculture and Innovation. It provides financial support for activities for nature, forest and landscape, for public as well as private parties and individuals.

# Intergemeentelijk Samenwerkingsverband Waterland (ISW) (<u>www.isw.nl</u>)

ISW is the cooperation body of seven municipalities, Beemster, Edam-Volendam, Landsmeer, Purmerend, Waterland, Wormerland and Zeevang. Cooperation takes place on the topics of: spatial planning, housing, landscape conservation, tourism and recreation, traffic and transport, and economy.

# Gemeentelijk samenwerkingsverband Land van Leeghwater (<u>www.landvanleeghwater.nl</u>)

This is a cooperation between the municipalities of Beemster, Schermer and Graft de Rijp manly on tourism and recreation.

# Municipality of Amsterdam (<u>www.amsterdam.nl</u>)

The capital of the Netherlands has 790.044 inhabitants. Amsterdam adjacent to Laag Holland which is a large recreational area for its inhabitants.

## City district Amsterdam-Noord (<u>www.noord.amsterdam.nl</u>)

The city district is somewhat independent of the central municipality and is located in Laag Holland. 86.675 residence inhabit Amsterdam-Noord, which reaches an area of 49,01 km<sup>2</sup>.

## Municipality of Zaanstad (<u>www.zaanstad.nl</u>)

Zaanstad has about 148.399 inhabitants and the municipalities researched about 83,04 km<sup>2</sup>.

# Municipality of Castricum (<u>www.castricum.nl</u>)

Castricum has about 34.446 inhabitants and the municipalities researched about 59,92 km<sup>2</sup>.

# Municipality of Purmerend (<u>www.purmerend.nl</u>)

Purmerend has about 79.209 inhabitants and the municipalities researched about 24,56 km<sup>2</sup>. Purmerend is officially not located within the boarders of Laag Holland.

## Municipality of Waterland (<u>www.waterland.nl</u>)

Waterland has about 16.998 inhabitants and the municipalities researched about 115,64 km<sup>2</sup>.

## Municipality of Schermer (<u>www.schermer.nl</u>)

Schermer has about 5.465 inhabitants and the municipalities researched about 64,44 km<sup>2</sup>.

## Municipality of Graft de Rijp (www.graftderijp.nl)

Graft de Rijp has about 6.444 inhabitants and the municipalities researched about 21,75 km<sup>2</sup>.

#### Municipality of Beemster (<u>www.beemster.net</u>)

Beemster has about 8.733 inhabitants and the municipalities researched about 72,08 km<sup>2</sup>.

## Municipality of Landsmeer (<u>www.landsmeer.nl</u>)

Landsmeer has about 10.317 inhabitants and the municipalities researched about 26,49 km<sup>2</sup>.

## Municipality of Oostzaan (<u>www.over-gemeenten.nl</u>)

Oostzaan has about 9.094 inhabitants and the municipalities researched about 16,13 km<sup>2</sup>. Oostzaan and Wormerland have merged their administration in Over-gemeenten.

## Municipality of Wormerland (<u>www.over-gemeenten.nl</u>)

Wormerland has about 15.791 inhabitants and the municipalities researched about 45,14 km<sup>2</sup>. Oostzaan and Wormerland have merged their administration in Over-gemeenten

## Municipality of Zeevang (<u>www.zeevang.nl</u>)

Zeevang has about 6.334 inhabitants and the municipalities researched about 55,23 km<sup>2</sup>.

## Municipality of Edam-Volendam (<u>www.edam-volendam.nl</u>)

Edam-Volendam has about 28.685 inhabitants and the municipalities researched about 24,78 km<sup>2</sup>.

## Bureau Toerisme Laag Holland

Bureau Toerisme Laag Holland is a cooperation of the municipalities of Waterland, Purmerend, Zeevang and Beemster. The focus on the promotion of tourism in Laag Holland and work in close cooperation with entrepreneurs in the area.

## Recreatie Noord-Holland (www.recreatienoordholland.nl)

Recreatie Noord-Holland develops and managers recreational activities and areas in the province Noord-Holland. Three areas (recreatieschappen) are located in Laag Holland: Landschap Waterland, Het Twiske and Alkmaarder- en Uitgeestermeer.