

*Short-term versus Long-term challenges in Multi-Actor Water Management: a complexity analysis of two cases*

*Nanny Bressers and Ytsen Deelstra*

*NIG Conference, November 25-26. 2010*

---

**Abstract**

This paper will discuss the tension between short-term results and long-term objectives within the Dutch water sector within two cases: the knowledge and innovation program Living with Water and the policy program Delta Program. The Dutch water sector is a relatively open sector, which engages in participatory processes to solve the complex problems it faces. However, even within a relatively open sector tensions exist between short term and long term. This paper uses a complexity theory perspective to analyze how agents cope with these tensions. Two concepts are central in this analysis: self-organization and complexity leadership. Different types of self-organization have different effects on the coping with or causing of short term/ long term tensions. In these processes of self organization different types of leaders play a role in managing tensions between an organization and its environment, and their short-term/long-term orientations. This paper explores the effect of self-organization and leadership in the two selected cases on managing short-term/long-term tensions in the Dutch water sector.

**Keywords:** Short term versus long term; complexity; self-organization; leadership

---

**1 - The Dutch water sector: its developments and its challenges**

The Dutch water sector has a long history. A diverse set of challenges and opportunities has created a sector aware of the long-term challenges it faces. Severe floods have made safety priority number one in Dutch water management. Furthermore, the need for more land, caused by an increasing population with housing and agricultural needs, created the land reclamation technique ('polder areas'). The water sector therefore faces not only a combined water challenge (a combination of safety, quality and distribution) but also a combined challenge of water management with other sectors. Water is not an isolated sector: it is closely related to spatial planning, infrastructure and mobility, housing, and many more (Van Schie 2010: 43; Kuks 2004: 8). A long history of Dutch water

management (for more detailed description of this history see for example Van Buuren et al. 2010; Kuks 2004; Van Ast 2000) has resulted in a technocratic water sector at the end of the 19<sup>th</sup> century in which water is seen as controllable and land is reclaimed from the sea to serve as agricultural space. Nowadays this paradigm of control has become less influential as (social) complexity is perceived to be increasing. This perceived increased complexity is the result of interaction between the water sector and other sectors, such as spatial planning and economy. The required cooperation for dealing with this interaction has resulted in more openness towards multi-disciplinary and multi-actor working. This change in paradigms and cooperation types became especially prominent since the mid 1990's (Van Buuren et al. 2010: 44). Due to this change experts and stakeholders became more involved in the policy process. Policymaking thus developed from the domain of solely governmental actors towards a domain of increased multi-actor thinking and working (Edelenbos 2010: 13). This development further increased complexity (Klijn 1996: 25).

In this context actors engage in interactive processes of new roles, actions and knowledge (see for instance Etzkowitz 2003 for implications of these changes). In these processes actors need to cooperate with other actors, who might have different interests, ideas and perceptions about water management. Because roles start shifting, tensions may arise in leadership and decision-making (Termeer 2009: 300). Who decides what, and based on which knowledge, becomes a prominent question. Actors often diverge in their perspectives on short-term versus long-term decision-making and planning. For some actors it is important to realize visible changes on a short term, because they need to present their effectiveness to stakeholders, electorates, and so on. They might fear that inclusion of too many stakeholders will slow down their decision-process, or undermine earlier actions (Termeer 2009: 312). Other actors incorporate the complexity of the water sector as part of their decision-making process, to maximize the potential for finding solutions that strengthen each other, which makes them highly applicable for problems in a complex society (Edelenbos 2010: 17; Ashmos et al. 2000).

Complexity requires a dual strategy (Teisman 2005) in which complexity is accepted on one hand (for example for long-term developments) and in which order and structure is created at the other hand (for example for short-term realization of policy

goals). This paper will explore this situation, the tensions that arise from it and the role of leadership for two cases. Both cases rely on trust and interaction for the achievement of results (Edelenbos 2010: 17-18; Börzel 1998: 262), which means leadership and self-organization are of vital importance in structuring their objectives. The first case concerns the **Delta Program**, a still ongoing interactive policy initiative in which national government cooperates with lower tiers of government and stakeholders. Goal of the Delta Program is to make Dutch water management compatible with the requirements of future developments. The second case concerns knowledge development program **Living with Water**, a recently finalized knowledge program, partially subsidized by the Dutch government. This program worked on knowledge development and dissemination and network building for innovative water management. Both cases encountered tensions between participants on short-term versus long-term issues.

## **2 - Managing tensions: adaptive versus conservative self-organization**

Complexity theory is a broad field of science covering both natural sciences and social sciences and has applications as broad as ecology, (evolutionary) biology, economy, administrative and management sciences, sociology, and much more. From the late 1980's some scholars started to describe organizations and their environments as complex systems (see for example Senge 1990). Furthermore, theories were developed about the evolution of economic and ecological systems (Norgaard 1984). And from the late 1990's in the field of public administration evidence grew that decision-making processes could be described as complex systems (Kickert et al. 1997; Teisman 1995). Recent insights are that decision-making processes can be seen as process systems (Teisman et al. 2009). Process systems develop as a result of dynamics of views, perceptions, beliefs, and preferences of participants of the process, which are exchanged among them and with other process systems.

A central concept of complexity theory is **self-organization**. This concept refers to the ability of an agent to self-determine its behavior in a complex environment. Within complex networks of interacting actors, the type of self-organization of each actor can be an explanatory factor for the results of cooperation between those actors. This also impacts actors' abilities to cooperate in order to achieve long-term goals on the one hand

to make short-term decisions on the other hand as well. Leaders have considerable impact on the actions their organizations undertake through the formal decisions they make. Hence, leadership is an intervening factor for the type of self-organization that actors demonstrate in networks. Recent literature on **complexity leadership** (Uhl-Bien et al. 2007) discussed various types of leadership, which each have considerable impact on the formal decisions made by formal leaders. In the next subsections we will first explore the concept of self-organization, secondly we will look into complexity leadership more deeply, and in conclusion we will make these concepts operational for analyzing the cases of this paper.

### ***2.1. Self-organization***

The phenomenon of self-organization can be defined as the capacity of single agents or groups of agents to adapt to or resist changes in their environment by means of decisions made by those agents (see for instance Teisman et al. 2009 and Gerrits 2008 for a more elaborate discussion of self-organization). Two forms of self-organization are discerned by complexity theory: adaptive and conservative self-organization. **Adaptive self-organization** refers to agents that change their (organizational) form to cope with environmental changes. **Conservative self-organization** refers to agents that maintain their existing form and resist pressure from the environment. Both forms of self-organization are ideal types, which can be used for analytical purposes. For the application of self-organization to the short-term/ long-term tension we developed the following (working) axiom, which applies to a situation in which a network of actors has defined a shared long-term goal. *When conservative self-organization occurs, an organization makes decisions that primarily fit their own short-term goals (these decisions can correspond with the shared long-term goals, but by accident only). When adaptive self-organization occurs, an organization adapts its short-term decisions to the long-term goals willingly and explicitly.*

To describe the effect of self-organization of actors on short-term/long-term tensions in complex networks we will use two related concept, which will function as intervening variables for self-organization. The first concept is ‘boundary judgment’, which we will use to describe the self-organization in the context of policy making and

hence applies to the ‘Delta Program’ case. Second concept is ‘receptivity’, which we will use in the context of knowledge dissemination and hence applies to the ‘Living with Water’ case. We will elaborate on both concepts below.

**Boundary judgments** can be seen as perceptions of agents that demarcate what parts of (complex) environment are relevant for the organization and which parts are not (Gerrits 2008: 15-16). Boundary judgments can be complexity embracing and adaptive (holistic as to say) at one hand, or can be order embracing and conserving (sticking to existing structures) at the other hand. Or in other words, in case of adaptive self-organization an agent holds holistic views on the systems it is part of. In case of conservative self-organization an agent holds strict views of its environment which match the responsibilities of the organization (Teisman et al. 2009: 234-235).

Another way to conceptualize (adaptive) self-organization is by means of **receptivity**<sup>1</sup>. Receptivity is defined as the disposition as well as the ability of actors to absorb, accept and utilize innovation options (Bressers 2010, based on Jeffrey & Seaton 2004: 281-282). We define adaptive self-organization in terms of receptivity as follows. When receptivity is high, adaptive self-organization is likely to occur; when receptivity is low conservative self-organization is expected. Crucial for receptivity is recognition of an actor that application of new knowledge is beneficial for this actor. Both boundary judgments as well as receptivity determine the degree and type of self-organization in an organization, because of their influence on the frames of reference used by stakeholders in their decision about accepting changes or not.

## ***2.2. Complexity leadership: entangled leadership and self-organization***

Recent literature on leadership (Uhl-Bien et al. 2007) shifts traditional attention from the behavior of individual leaders (what leaders do and do not do) towards the role of leaders in terms of complex adaptive systems. These scholars argue that leaders are dependant of the system they are part of to be effective. They state that the interactions in a wider network are explanatory for the success of an organization. Based on these insights three types of leadership are defined: **administrative or formal leadership, adaptive**

---

<sup>1</sup> Do note that receptivity here is discussed a bit more narrowly than in for instance Bressers 2010 or Bressers forthcoming. In these publications receptivity includes leadership, whereas here we discuss it as something that exists next to and in relation to leadership.

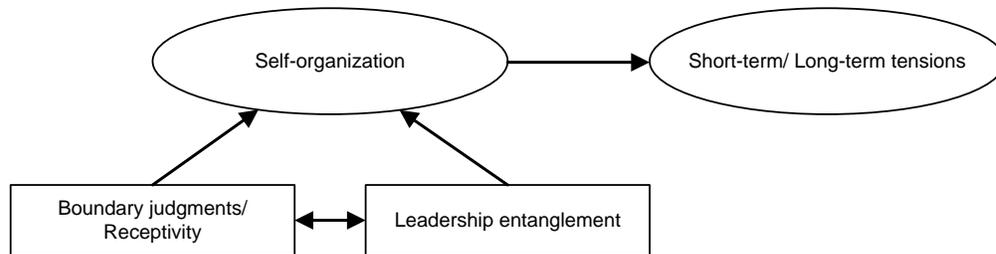
**leadership**, and **enabling leadership**. Administrative leadership is about who is entitled to make formal decisions, for example about allocating means. Adaptive leadership is the kind of behavior that stimulates process systems to ensue explorative actions in order to develop new adaptive strategies. Adaptive leaders are mostly informal leaders. Enabling leaders provide space for adaptive leaders and their networks to do their work on the one hand, and at the other hand ensure that the adaptive network does not wander of too much from existing formal strategies and goals. At the same time enabling leaders also prepare formal leaders for implementation of adaptive strategies by stretching the formal strategies in advance towards new adaptive strategies. This model assumes that adaptive leaders are aiming at dissipative or adaptive self-organization, and that administrative leaders are predominantly aiming at conservative self-organization (the pursuit of self-interest in order to survive as subsystem). Enabling leaders in conclusion are constantly trying to manage the tension between the preferred direction and pace of change of the subsystems.

According to the complexity leadership model **entangled forms of leadership**, in which formal and adaptive leaders mutually influence each other, are necessary for organizations to develop successful development strategies. When entanglement is high enabling leadership is almost non-existent as formal and adaptive leaders interact frequently and freely. In lower levels of entanglement, enabling leaders come into play to manage the tensions that can exist between adaptive leaders and formal leaders. In this paper we will address the interactions between leader types and other actors and how these interactions explain the way short term/ long-term tensions are managed.

### ***2.3. Analytical model***

This paper uses an ideal typical model to describe the patterns of self-organizations and the role of leadership within our cases. *Within this model we consider conservative boundary judgments to equal situations of low receptivity and adaptive boundary judgments to equal situation of high receptivity.* We combine these boundary judgments and receptivity with ideas about complexity leadership to develop an ideal type model for analyzing short-term/long-term tensions. We reason that boundary judgments/ receptivity and entanglement of leadership are two intervening factors for the self-organization in a

network. These two intervening factors influence each other as well. It is through this interaction that self-organization is shaped. Figure 1 demonstrates these relations between factors and processes.



**Figure 1 – Relations between discussed and applied concepts**

The effect of boundary judgments and receptivity on self-organization is as follows. When formal leaders make strict boundary judgments (of the policy question and the preferable contribution of the organization to the solution), which follows the responsibilities and short term goals of the organization, conservative self-organization occurs. This is for example the case when policy silos are not willing to see a problem wider than its own policy responsibility. Hence as formal leaders make wider boundary judgments, adaptive self-organization can occur. Comparable processes occur when we focus on receptivity. When formal leaders acknowledge that new knowledge is needed for their organization to develop into new roles and products and recognize the potential benefit of applying new knowledge, their adaptivity is higher than when they do not recognize these potentials.

The effect of leadership entanglement on self-organization is as follows. When entanglement is high, informal leaders can influence formal leaders to change their boundary judgments or receptivity to new knowledge. When entanglement is low, possibilities to influence formal leaders are also low. As informal leaders are less bound to the formal policies and strategies of their organizations than formal leaders they can make wider boundary judgments that fit long-term goals.

In terms of our model this means there are four possible ideal types. (1) When formal leaders make strict boundary judgments and there is little entanglement, **conservative self-organization** will occur. (2) When formal leaders make strict boundary judgments,

but entanglement is high, ad hoc adaptive decisions can be made as informal leaders can influence the boundary judgments of the formal leaders: **informal adaptive self-organization**. (3) when formal leaders make wider boundary judgments themselves, in a situation of little entanglement, adaptive self-organization occurs, however not to its full potential: **formal adaptive self-organization**. As informal learning capacity is not utilized, partly adaptive strategies emerge. And (4) when formal leaders make wide boundary judgments themselves and entanglement is high, **fully adaptive self-organization** occurs in which also the learning potential of (informal) adaptive networks is utilized.

When we employ this model to analyze tensions between short-term and long-term strategies we derive at the following analytical scheme:

	Low-entangled leadership	High-entangled leadership
Conservative boundary judgments / low receptivity	Conservative self-organization causing high tensions	Informal adaptive self-organization causing ad hoc solutions to tensions
Adaptive boundary judgments / high receptivity	Formal adaptive self-organization causing some relief to tensions	Fully adaptive self-organization causing almost no tensions

**Table 1 – Analytical ideal type model for short-term/long-term tensions**

### **3 - Case Study 1: Policy program Delta Program**

*Case description in this section is based on participatory research of Ytsen Deelstra executed during his work as a management consultant during the preparations of the Delta Program.*

#### **3.1. The emergence of the Delta Program**

The Delta Program emerged as a result of the advice of the second Delta Committee in September 2008. The second Delta Committee was chaired by professor Veerman and looked into the safeguard on the long term against flooding and of the fresh water reserve

of The Netherlands. The committee was installed by the state secretary of the Ministry of Public Works, Transportation and Water Management<sup>2</sup>. The state secretary is responsible for flood protection and water management and installed the committee on request of the Director-General of Rijkswaterstaat<sup>3</sup> (RWS) which resides under the responsibility of the state secretary. The committee concluded that due to increased value of investment behind the dikes in combination with a rising sea level (as a result of climate change) The Netherlands are confronted with urgent however not acute problems of water management. Current safety norms are not sufficient anymore and in the long term even higher levels of river discharge and higher sea levels are to be reckoned with than thus far supposed. The committee recommended installing a Delta Program consisting of nine subprograms that handle specific geographical areas and themes<sup>4</sup>. Furthermore the Program should be organized in such a way that integral planning is possible. Hence realization of program goals will be integrated with local and regional long term developments and with adjacent policy themes.

National government decided to adopt all recommendations of this committee. As a result preparations started to install a Delta Program which aims at safety against flooding and the safeguard of fresh water supplies towards the year 2100. Hence the Delta Program has a (very) long term perspective. Existing (policy and management) programs are still executed according to earlier plans. In some cases pace of execution of these programs should be increased according the Delta Committee. From October 2008 until February 2010 an interdepartmental group of civil servants at the national level worked on three issues to prepare the Delta Program.

First issue is the legal anchoring of the Delta Program in a Delta Act. This has lead to a Delta Enactment that will be subject to decision-making by the newly elected government in 2011. This Delta Enactment includes several items. First item is the national procedures of decision-making which includes a new actor, with a new role: the Delta Commissioner (who is responsible for integral planning by drafting the yearly Delta Program Plan), and a new decision-making platform: the steering committee Delta

---

<sup>2</sup> In Dutch: 'Ministerie van Verkeer en Waterstaat'. Henceforth: V&W

<sup>3</sup> A governmental agency responsible for the execution of water management en flood protection policies

<sup>4</sup> The geographical programs are: Waddensea, North Sea coast, IJsselmeer area, Rivers Meuse, Rhine and IJssel, Rivermouth of the Rhine, South Western Delta. The policy themes are: Flood protection norms, Building in hazardous areas) floodplains, and Freshwater strategy.

Program consisting of the ministers of several relevant ministries and chaired by the MP. Within the Delta Program the competences of different ministers stay in place, hence afore mentioned platform is needed to enable integral planning by formal decision-making at the national level. Second item is the legal status of the Delta Program, which is – because of the long term character of the program – preferably an Act of Law. And third item is a separate budgeting scheme for the sole purpose of the program. This scheme is set apart from other issues that are funded through the normal budgeting schemes of the departments of national government and is also anchored in the Delta Act.

Second issue is the setting up of the organization of the Delta Program. This also includes several items. First item was the installment of nine subprograms (in line with the advice of the second Delta Committee) and the formulation of policy assignments by the principals of each subprogram. Each involved department had claimed to be the principal of one or more subprograms. Second item was the development of organizational principles for stakeholder participation of the subprograms. These principles described roles of national and regional government within a subprogram and the role of non-governmental stakeholders who want to participate. Third issue involved the appointment of program directors for each subprogram. Each program director is responsible for the execution of the policy assignment set by the principals. First product these program directors had to deliver, were project plans for the first 4 years. These plans were due June 2010.

By February 2010 the Delta Commissioner was appointed, however as a result of a political crisis (about another issue) in the Cabinet of Ministers, the cabinet had resigned and decision-making about the Delta Enactment (among many other issues) was put on hold by Parliament. Preparations however continued and by June 2010 the project plans for all subprograms were ready. Most subprograms installed a regional steering committee in accordance with the organizational principles for the subprograms. The Delta Commissioner formed a small staff to be able to fulfill his tasks, and he installed a weekly meeting of all Program Directors to exchange experiences due course. In September 2010 the first Delta Program Plan was presented based on the project plans and policy research executed by RWS. This plan was presented at ‘Prinsjesdag’ which is the formal moment during which national budget is presented to Parliament. This first

Delta Program provides for five strategic decisions that should be taken coherently and will be prepared the next 3 to 4 years. These five decisions are called delta decisions and are deemed necessary to cope with the connections between subprograms that occur as a result of the coherence of the (physical) water system.

Apart from the formal structures of the Delta Program also some informal networks emerged in which images and perceptions about for example organizational principles and the coherence of the Delta Program (connections between subprograms in terms of policy content) could be exchanged. Most important network in this phase was the 'Eerbeek Group' started by the Director-General Water in person to exchanges views about the first National Water Plan and the recommendations of the second Delta Committee. This Eerbeek Group, named after the venue of the first meeting, consisted of some regional administrators (some members of Provincial Executive, and some chairmen of water boards, in addition to Directors-General of some of the most involved Departments at the national level). This Eerbeek Group had no formal status at all. However, it was used to quickly receive feedback about the set up of the Delta Program. At the same time the subprograms started to form their own more regionally oriented networks to exchange views. For example the subprogram of the IJsselmeer region invited experts and stakeholders to participate in the preparation of the project plan from December 2009 to March 2010, and the subprogram of the Rijnmond Region did the same from March to September 2010.

At this point our recent history stops. Most subprograms are starting up their work according to their project plans. All subprograms are aiming at developing a long-term vision reaching as far as the year 2100. These visions will be translated into long-term strategies that will be used to define both the long-term questions as well as the short-term questions. At the end of 2011 the first results of the long-term visions and long-term strategies are expected. During this process participating governments and non-governmental stakeholders are allowed to add regional, spatial and economical issues to the water management oriented issues that result from the central goals of the Delta Program. However, in the end national government determines the scope of the questions it wants to address within the Delta Program (of course this is related to a decision what issues are budgeted by the Delta Fund).

### *3.2. Short-term – long-term tensions*

During the participative research three short-term/ long-term tensions were discovered within the Delta Program thus far (until September 2010). These tensions are:

1. Different perceptions of national and regional actors about the aims of subprograms, matching organizational scheme and pace of investments;
2. Different perceptions about the content and status of the delta decisions, which seem to be changing during 2010;
3. Delay of some existing short-term programs at the project level in some cases.

We will elaborate on these tensions below.

The first tension between short-term and long-term goals became clear even before policy content of the Delta Program became the central issue for involved actors. During the preparation phase from the end of 2008 until the beginning of 2010, regional actors were making a plea to incorporate their knowledge (and influence) from the very beginning of the program. Most regional actors held in mind the image of intergovernmental cooperation in the project 'Ruimte voor de Rivier' (a flood protection project for the main rivers). However, Ruimte voor de Rivier was already almost in execution phase; preparing concrete measures for fixed and agreed upon goals. Most regional actors expected that the Delta Program would lead to new measures for each subprogram that could be implemented when existing programs are finished. This was expected to be in 2015. However, funding from the Delta Fund was agreed to be from 2020 and onwards.

Another issue was the perception of the aim of the subprograms. As became clear during the formulation of the project plans the first aim was to investigate what kinds of problems and policy questions occurred at what moment. Or in other words, the aim was to identify the strategic issues for the subprograms. In December 2009 these aims were not clear yet and regional actors expected that the Subprograms would have aims that would be much more concrete and at a much lower level of abstraction. It took several discussions within the Eerbeek Group and in formal platforms to make clear that the Delta Program is currently in a whole other phase than 'Ruimte voor de Rivier'. And that

the aim was to define long-term policy questions exploring possible connections between national goals and regional developments. National government made clear that national policy goals were central for each subprogram.

Hence, most policy assignments for the subprograms provide for a scoping phase in which connections between policy goals and regional developments are studied. After this scoping phase national government decides about the scope of the subprogram (in other words determine for which parts of the policy question national government will bear the costs). If regional governments want to realize other goals, they can cooperate with national government by taking joint measures that together fit regional and national needs. In this stage it also became clear that additional expenditures for short-term measures were not budgeted by national government, and that budgets of the Delta Program were set aside for execution of measures after 2020.

The second tension became clear somewhat later than the first tension. In June 2010 it became clear to the precursor of the Delta Commissioner (responsible for preparations of the program at that time) that from the perspective of the national water system (large rivers, in land lakes and estuaries) strong relations exist between different Subprograms. Decisions about the IJsselmeer would effect decisions about the river mouth of the Rhine. Decisions about flood protection norms would affect all geographical areas of the Delta Program. Decisions about fresh water strategy would affect IJsselmeer, the river mouth of the Rhine and the Southwestern Delta area (south of the river mouth of the Rhine). National government desired an organizational principle that would help to cope with these interrelations and decided to define the earlier mentioned Delta Decisions. Perceptions about these Delta Decisions vary from actor to actor and seem to be changing. At the moment of introduction of these decisions, most actors believed that Delta Decisions will be directional for the long term and can be laid down in policy, by anchoring those decisions in the next National Water Plan (a six yearly policy memorandum of national government). Most actors believed that it is possible to choose one single strategy for the future. However during 2010 civil servants within the subprogram's started to believe that it will not be possible to choose single strategies for several subprogram's. They believe it is more realistic to expect that several

options will be decided to implement that will not give definitive answers to the long term objectives.

From the beginning of 2010 another tension became visible. The long-term policy process of the subprograms of the Delta Program was holding back existing programs that aimed at the execution of measures until 2015 - 2020. For example Ruimte voor de Rivier and parts of the Hoogwater Beschermingsprogramma (HWBP: national flood protection program aiming at dike reinforcements). In the IJsselmeer area civil servants worked on reinforcing some dikes, including the Afsluitdijk (the closure dam that created the IJsselmeer), as part of the HWBP. They started to question the basic assumptions of their work as they presumed a link with the IJsselmeer subprogram. Later on a formal decision was taken not to link these short-term measures to the long-term policy that was developed by this Subprogram. Nevertheless, according to some consultants involved with the detailing of the measures, a delay of a half year to a year has resulted from these 'uncertainties'.

During 2010 tensions in the subprogram of the Rotterdam Rijnmond area also became visible. The municipality of Rotterdam has large ambitions to revitalize some harbor areas close to the city. Part of the plans is building outside the dikes. Civil servants presume a link with the subprogram, since one of the possible long-term measures is to close-off the Rijnmond water from the sea with a closure dam. In this case water levels can be controlled very easily which simplifies possibilities to build outside dikes considerably. However, it also became clear that first policy decisions are not expected to be taken before 2015. Furthermore, these policy decisions would concern the situation beyond 2050. Such timescales, however, are deemed unfavorable for decisions about redeveloping the aforementioned harbor areas, which the municipality wants to realize at least before 2030. To summarize, the Delta Program case demonstrates several short-term/long-term tensions, which require leadership and action to manage them.

### ***3.3. Dealing with tensions***

In terms of adapting the formal structures of decision-making the Delta Program shows some strong patterns of conservative self-organizations since many existing structures and competences were maintained. Regarding the competences of national government the formal competences of different ministers stay the same. However, the procedures

that lead to decision-making have been adapted by the introduction of the Delta Commissioner. Another issue was the setting of the boundaries of the Delta Fund. In this case also strong patterns of conservative self-organization were visible. By setting the central goals of the Delta Program, boundaries for funding were created. The Ministry of Public Works, Transportation and Water Management perceived the Delta Program to be one of its central tasks. For reasons of accountability the Steering Committee Delta Program decided that the Delta Fund should only bear the costs of measures that help realize the goals of the Delta Program. Integral funding by the Delta Fund, which makes it possible to realize other policy goals than solely the goals of the Program, was ruled out. However, by the creation of the Steering Committee as a platform the possibility was created to combine national funding when combination of goals is beneficial. Due to high levels of entanglement we characterize this situation as *informal adaptive self-organization*. The entanglement of formal and informal leadership is partly created by the introduction of the new (hybrid) role of the Delta Commissioner. Another factor was the creation of a strong informal network that exchanged views of the preparation of the Delta Program.

The new role of the Delta Commissioner is not entirely a formal role in the sense that formal decision-making powers remain with existing ministers and their departments. This new role is neither entirely informal in the sense that the Delta Commissioner is responsible for the preparation of decision-making by formulating the yearly Delta Program Plan based on the contributions of the program organizations. As a result of this position the Delta Commissioner can manage tensions between departments and between national government and the lower tiers very quickly, by addressing these directly at the responsible minister and/or responsible local administrators. The program directors of the subprograms also have a hybrid role. Formally they are appointed to prepare national policy decisions. However they develop these policies in close interaction with regional and local stakeholders. Informally they take up an intermediary role 'between' national government and other stakeholders. Hence they can quickly address tensions between national and regional level including short-term/ long-term tensions.

The Eerbeek group is another example of creating adaptive self-organization through informal leadership. In this case the Director-General Water made use of this informal construct to be able to exchange views about the National Water Plan and the reception of the recommendations of the second Delta Committee. This construct is completely informal, whereas the Delta Commissioner and the program directors also have some 'formal' features. The Eerbeek group proved to be very useful before the Delta Program came into being, in a phase where new roles had not been set yet. However when the Delta Program became more organized, attention of regional and local administrators shifted towards the governance platforms of the subprograms. These platforms are expected to deal with short-term/ long-term (and other) tensions that arise when the scoping phase of the subprograms will be concluded.

In conclusion we summarize this case as follows. In terms of our model the Delta Program is an informal adaptive process. Conservative self-organization occurs as involved actors were not prepared to change responsibilities and competences. At the same time high levels of entanglement were induced by both introducing the hybrid roles of the Delta Commissioner and the Program Directors as well as by creating a strong informal network that managed expectations about the introduction of the Delta Program.

#### **4 - Case Study 2: Learning program Living with Water**

*Case description in this section is based on the work Nanny Bressers carried out from early 2007 until the end of 2009 at Living with Water, as transition monitor and program evaluator.*

##### ***4.1. The Living with Water network***

Living with Water was a subsidized program, which ran from 2004 till early 2010. The national government subsidized the program with money from the natural gas revenues, under the BSIK (or: ICES/KIS 3) arrangement. This arrangement intended to strengthen the Dutch knowledge infrastructure, by investing money in a variety of programs, working on a diverse set of topics. These topics could include matters such as nanotechnology and biomedical innovations, but also topics such as innovative water management. This latter topic was covered by Living with Water. The program worked

on innovative knowledge development to realize a new place for water and facilitate and stimulate cooperation in the water sector.

This cooperation was enhanced by the participation of a broad selection of actors in the program. The BSIK arrangement required the programs to realize demand-supply actor cooperation within the program network, in order to make sure the developed knowledge would have societal relevance and be applicable in practice. In Living with Water this requirement was carried out by setting up a tripartite participation structure. Governmental actors, knowledge actors and business actors were to participate and cooperate in the program. Furthermore, each participating actor was to invest in the project of the program it participated in, thereby creating some sense of commitment and dedication of the participating actors. Living with Water harbored approximately 100 projects; each working on a subtopic of innovative water management.

As mentioned above the purpose of the program was to realize more space for water and facilitate and stimulate cooperation between water actors. This objective was formulated in three core messages, which differed over time. The final version of the three messages (or: three results) was: giving water its new place and space; connecting science and practice (and within that beta and gamma); and creating vital alliances<sup>5</sup>. These objectives were not unique for Living with Water in the water sector, and were rather widely supported. However, this does not mean they were already realized or were easy to accomplish. The next section will discuss (potential) tensions within the program.

#### ***4.2. Short term and long term tensions in and around Living with Water***

In Living with Water tensions between short term and long term were especially visible within projects. An important risk of tensions and dichotomies between short term and long term lies in the associations participants have with this tensions. These associations were demonstrated for a similar program as Living with Water in Bressers et al. (2010). In this paper the authors found tens of associations participants of a project on a sustainable Port of Rotterdam had with short term versus long term. The project in which this occurred shared many characteristics with Living with Water and its projects: multi-actor, rather abstract and long-term objectives, in an area with a degree of differing

---

<sup>5</sup> Website Living with Water

interests, perceptions and beliefs of actors. Actors would associate short term with technology, doing something, fast, objective, and working on solutions, whereas they perceived the long term to be similar to organization, thinking about things, slow, subjective and working on ideas.

These associations hampered the functioning of the project. Similar associations can be retrieved in the Living with Water case. Participants of projects often associated the short term with doing something practical and visible, with beta sciences, with concrete and tangible action, whereas they associated long term with philosophizing about futures and ideas, with gamma sciences, and with little action and much thinking and talking. Not all actors shared these associations, but one could often see in discussions related to short term/ long term that actors considered working on long-term objectives as vague and scientific, whereas working on short-term actions was considered more useful.

The effects of these associations and the tensions between short term and long resulting from this were different for each project. Some projects encountered severe problems due to differences in perspectives. This problem was often framed in terms of 'speaking different languages' and 'having trouble understanding each other'. The project *Spaarkaat*, which acknowledges in their official evaluation report that the project did not work out as planned (despite important lessons learned), describes how 'the crew (public and private parties) did not understand each other well'. An important problem they encountered concerned the commitment of participants, who each had their own agendas and own rationales for participating (Arcadis 2009: 12). The project described the importance of discussing these different interests, to make sure they are not conflicting with each other. Continuity and progress, even when obstacles occur, is mentioned by the project as an important success factor for overcoming these problems.

Different agendas and interests can thus become a problem in terms of tensions between short term and long term. Because of the nature of multi-actor projects differences between actors are bound to arise. This played a role in virtually all Living with Water projects. However, it did not always play a negative role. Another example is the project Waalweelde, which harbored a variety of smaller subprojects. Each of these smaller initiatives was organized by another actor: sometimes a scientist, sometimes a

policymaker, sometimes a market party. These smaller initiatives often had rather tangible and concrete objectives, in which results would become visible on the short term to mid term. The project as a whole, however, included long-term objectives, of which the smaller subprojects were concretizations. This created a tremendous amount of energy in the project, enough to convince stakeholders to advocate the project ideas to their networks.

The lessons behind these two examples is that differences between short-term and long-term objectives exist in each knowledge and innovation program or project, but that these differences do not automatically result in tensions and problems. These differences occurred on each level: from subproject, to project, to program. On program level, this especially impacted the participation of executive business. Executive business did not agree with the scope of Living with Water, both in terms of long-term abstract thinking and in terms of the inclusion of gamma sciences. Program management formulated this as follows in an interview: *“The contractors were less involved because they felt that what Living with Water did was too far away from their daily practice, especially with regard to the involvement of gamma-science. (...) Contractors have to run their material, it costs too much for them to work with implicit knowledge, or take part in communities of practice”*. In the case of executive business these tensions played a rather decisive role in their choice not to become (too) involved. In many other instances tensions remained low in Living with Water.

### ***4.3. Dealing with the short term versus long term tension***

The tensions between short term and long term were handled in Living with Water from the start. Many projects paid explicit attention to these tensions, and other tensions and matters related to it. An example is the project Eerst Zuiveren Dan Bergen, which put a lot of effort into an interactive process of learning each others ‘languages’ and perceptions. This helped to tackle tensions. Another example is the project WaterTekens, in which the project consortium cooperated so well that they continued their cooperation after the project had been ended.

But how did these, and other, projects manage to do this? What becomes quickly visible is the importance of a combination of formal and informal strategies. Successful

projects both had a project leader who steered explicitly on interaction and open discussion of perceptions and interests, and a group of actors who were in essence receptive to each other. This high receptivity could be noted in the presence of dynamic competencies, an open attitude towards learning, and a shared companionship. A good example of the latter aspect can be found in the project Zilte Landbouw Texel, in which the (scientific) project leader remarked about his (business) co-project leader: *“I became good friends with [name co-project leader] (...) Our objectives are so different, but it goes well. We need each other.”*

The informal ties thus mattered a great deal, but the involvement of a formal project leader advocating interaction and discussion equally mattered. Leadership within Living with Water was highly entangled. Project leaders generally demonstrated much respect and interest for and in their project participants, and viewed their cooperation as instrumental and essential in realizing the desired changes in the water system. Respect for both formal and adaptive strategies was a given in many projects. The awareness that knowledge and innovation projects required both formal and adaptive leaders in order to realize both change and implementation was high.

Receptivity of the involved actors was high (see also Bressers *forthcoming*), although this differed per project. In general, one can see that successful projects realized high degrees of receptivity, whereas less successful projects realized only a low degree of receptivity. This places the program Living with Water mostly in the category of ‘fully adaptive self-organization (causing almost no tensions)’. One should note, however, that this concerns short-term/long-term tensions within the program and projects. In the relation with outsiders (potential adopters of the developed knowledge and innovations) these tensions occurred more commonly. An important concern of these recipients was the long-term range of benefits of adopting this knowledge and innovation, whereas they would have to invest money in it much earlier on.

These tensions trickled into the program, due to the involvement of stakeholders and potential receivers in the projects. The combined effort of formal and informal strategies and efforts helped to reduce the effects thereof. In the projects and program leaders managed to combine various roles, even switching between formal administrative roles (for instance a strict focus on institutional arrangements and financial agreements)

and adaptive roles (for instance by encouraging participants to think out of the box and provide free space for experimentation and testing). The most visible lesson of this case therefore is that a truly adaptive organization hovers between roles, between formal and informal, between laws and agreements and flexibility and reflexivity. In doing so, they allow no space for institutionalization of tensions, and instead make these tensions debatable and dynamic.

## **5 - Conclusions and recommendations**

This paper has discussed the self-organization of two network organizations, in order to investigate the role short-term/long-term tensions play in these networks. We have discussed the characteristics of these two programs, and we deduced short-term/long-term tensions from this discussion. These tensions played a role in both cases, sometimes with only a limited effect, sometimes with more severe effects. In both cases the way the tensions were handled mattered a great deal in preventing serious negative effects. We proposed boundary judgments/ receptivity and leadership entanglement as intervening factors in looking at the effects of self-organization on short-term/long-term tensions. Our conclusion was that both cases demonstrated entangled leadership, but that the cases varied on boundary judgments/ receptivity. The Delta Program was considered entangled, but conservative in its boundary judgments, whereas Living with Water was seen as entangled and receptive.

The cases are in different stages of their development: Living with Water has been finalized, whereas the Delta Program really is only starting to develop. The difference in boundary judgments can be partially explained by this different stage. Another important factor can be found in the nature of the networks: while Living with Water was explicitly an impulse program, trying to change its environment of governmental actors and businesses, the Delta Program is founded and developed by governmental actors themselves. Naturally, they will be more inclined to maintain existing structures and competences. That being said, one can wonder how networks such as the Delta Program and Living with Water can reinforce their adaptivity, and thus be able to deal with short-term/long-term tensions in a more flexible manner. We learned in the application of our model to the cases that in both programs not only the

characteristics of the organization mattered, but also the environment in which they functioned. The adaptivity of the environment is an important factor in determining the success of the cooperation within the network, and thus a determinant of the required effort of formal and informal leaders. In *Living with Water* we saw that the environment was brought into the program (e.g. project participants). In the Delta Program we saw that the environment received a place, but that the organization was reluctant to diverge from existing decision-making powers.

By integrating stakeholders into the network process you can weigh their interests along with the others, and you create space to discuss potential tensions. In practice this is difficult (for instance in a situation of conservative self-organization), but on the other hand this step is inevitable in tackling short-term/long-term tensions. It does not necessarily reduce the tension, but it makes it more visible, which limits its dangers. To facilitate this exchange, leaders in these networks have to be able to switch back and forth between short-term interests, such as profit-making or winning elections, and long-term objectives, such as the realization of water management change or implementation of innovative ideas.

A leader in a network organization in a complex environment thus needs to be able to switch between roles and leadership types. He needs to switch between adaptive and administrative leadership, in order to incorporate both the long-term objectives as well as the short-term circumstances and reality. He needs to switch between formal and informal roles, because he needs to play his part of, for instance, project leader or program manager without disregarding his informal role as motivator and mediator. When the network has an innovative long-term objective, the leader furthermore needs to switch between conforming with societal reality and obligations, while at the same time realizing enough innovative potential to fulfill the organizational objectives.

The question that presents itself is: How can leaders do this? Especially the Delta Program case demonstrated an informal adaptive type of self-organization; in which many existing organizational forms and objectives were rather conservative. In the *Living with Water* case we saw that this was much less so the case, however, the program still had to struggle to maintain focus on long-term objectives and allowing innovativeness. On the other hand, both cases did demonstrate highly entangled leadership, *Leadership*

*entanglement is therefore instrumental in increasing adaptivity for dealing with short-term/long-term tensions.*

Entanglement can be enhanced by creating *hybrid roles*. In hybrid roles leaders can switch easier between their different requirements. We saw this in our cases in, for instance, the role of the Delta Commissioner and program managers in the Delta Program case, and in the project leaders and program managers of the Living with Water case. Each of these leaders had a limited set of formal possibilities and power, but enough informal skills to create enough overview to allow formal organizations to open up to shared decision-making. This allowed a better grip on short-term/long-term tensions and weighing short-term/long-term interests.

### ***Recommendations***

In cases of high complexity, enhance entanglement by inserting hybrid roles into the process. By doing so, a process is created in which decisions can be made quicker and easier in the formal network, by making optimal use of informal strategies and leaders. This allows the network to become more adaptive and flexible. However, it does not yet create real adaptivity. In order to create real adaptive self-organization a certain degree of innovativeness must be stimulated. This requires space for experimentation, which can only develop when formal leaders equally support the need for adaptive self-organization. Enabling leaders can convince formal leaders of this, by connecting short-term circumstances and actions to long-term objectives, aligning stakeholders, and thereby easing the way for innovation on both the short term as the long term.

This means that at least two aspects play an important role in realizing adaptivity: creating hybrid roles, and supporting connective capacity of stakeholders and leaders. The relations between stakeholders should be good: everyone in the process should be able to share his process dilemmas, which means a high degree of trust and reflexivity is required of the participants. In doing so, the receptivity of all stakeholders is enhanced, and participants become open to wider boundary judgments. Practical suggestions for program managers and project leaders therefore include the following: *allow enabling leadership/ hire mediators; stimulate dialogue between stakeholders on their interests and perceptions; and create hybrid roles.*

## References

- Arcadis (2009), *Spaarkaat. Een evaluatie*. 9 oktober 2009, 110402/WA9/141/000849/wm
- Ashmos, D.P., D. Duchon & R.R. McDaniel Jr. (2000), 'Organizational Responses to Complexity: the Effect on Organizational Performance', *Journal of Organizational Change Management*, 13(6): 577-594
- Ast, J.A. van (2000), *Interactief watermanagement in grensoverschrijdende riviersystemen*. Thesis Erasmus Universiteit Rotterdam. Delft: Eburon
- Börzel, T.A. (1998), 'Organizing Babylon – On the Different Conceptions of Policy Networks', *Public Administration*, 76: 253-273
- Bressers, N. (forthcoming), *The Impact of Knowledge and Innovation Programmes. In search of evaluation methods applicable in complex networks*, (thesis). Erasmus University of Rotterdam
- Bressers, N., F. Avelino and H. Geerlings (2010), Short- versus Long-term and other Dichotomies: Applying Transition Management in the A15-project. In: Geerlings, H., Y. Shiftan, and D. Stead (eds.) (2010), *Transition towards Sustainable Mobility: the Role of Instruments, Individuals and Institutions*. Ashgate Publishing
- Bressers, N. (2010), *The impact of multi-actor innovation programmes in the Netherlands. A new method of evaluating complex networks*. ECPR Graduate Conference, Dublin, August 30-September 1. 2010
- Buuren, A. van, J. Edelenbos, and E.-H. Klijn (2010), *Gebiedsontwikkeling in Woelig Water. Over water governance bewegend tussen adaptief waterbeheer en ruimtelijke besluitvorming*. Den Haag: Boom Lemma uitgevers
- Edelenbos, J. (2010), *Water als Spanningsvolle Verbinding. Over water governance en het belang van beweeglijk bestuur*, Den Haag: Boom Lemma uitgevers
- Etzkowitz, H. (2003), 'Innovation in Innovation: The Triple Helix of University-Industry-Government Relations', *Social Science Information*, 42: 293-337
- Jeffrey, P. & R.A.F. Seaton (2004), 'A Conceptual Model of 'Receptivity' Applied to the Design and Deployment of Water Policy Mechanisms', *Journal of Integrative*

- Environmental Sciences*, vol. 01, no. 03, pp. 277-300
- Gerrits, L. (2008). *The gentle art of Co-evolution, a complexity theory perspective on decision making over estuaries in Germany, Belgium and The Netherlands*. Rotterdam: Pytheas.
- Kickert, W., Klijn, E., & Koppenjan, F. (. (1997). *Managing Complex Networks*. London: Sage.
- Klijn, E.-H. (1996), *Regels en Sturing in Netwerken. De invloed van netwerkgeregels op de herstructurering van naoorlogse wijken*. Delft: Eburon
- Kuks, S.M.M. (2004), *Water Governance and Institutional Change*. Enschede: University of Twente
- Norgaard, R. (1984). *Co-evolutionary Development Potential*. *Land Economics* , 53 (4), 160-173.
- Schie, N. van (2010), *Co-Valuation of Water. An institutional perspective on valuation in spatial water management*. Rotterdam: Erasmus University
- Senge, P. (1990). *The Fifth Discipline: The Art and Practice of the Learning Organization*. New York: Doubleday.
- Termeer, C.J.A.M. (2009), 'Barriers to New Modes of Horizontal Governance. A sense-making perspective', *Public Management Review*, 11(3): 299-316
- Teisman, G.R. (1995). *Complexe besluitvorming: een pluricentrisch perspectief op besluitvorming over ruimtelijke investeringen*. Den Haag: VUGA.
- Teisman, G.R. (2005). *Publiek Management op de grens van chaos en orde: over leiding geven en organiseren in complexiteit*. Den Haag: Sdu Uitgevers.
- Teisman, G.R., Buuren, A. van, & Gerrits, L. (2009). *Managing Complex Governance Systems, Dynamics, Self-Organization and Co-evolution in Public Investments*. New York: Routledge.
- Uhl-Bien, M., Marion, R., & McKelvey, B. (2007). *Complexity Leadership Theory: Shifting leadership from the industrial age to the knowledge era*. *The Leadership Quarterly* , 18, 298-318.