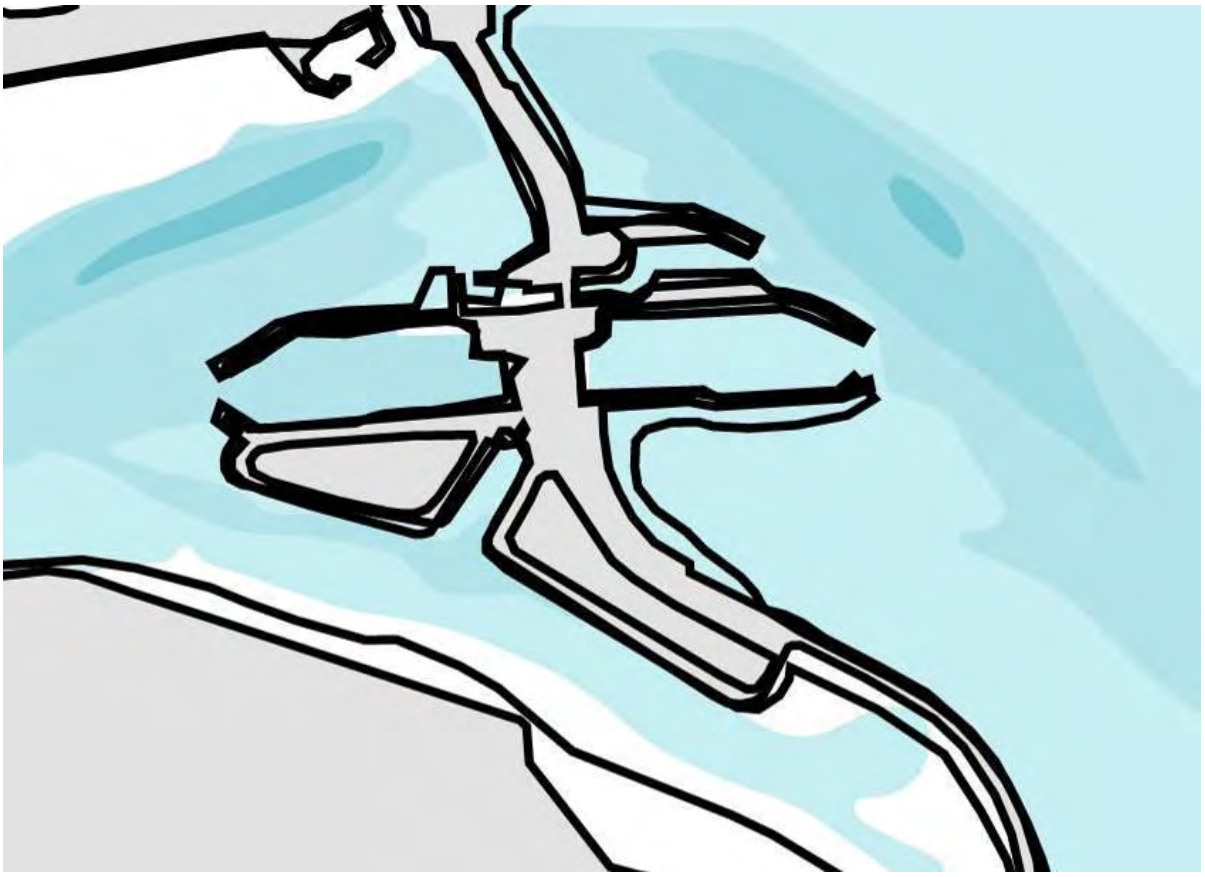
# Do the Undo?

*on the re-opening of dams and debates*
*the case of the Philipsdam, the Netherlands*



M.Sc. Thesis by Arjen Zegwaard

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Irrigation and Water Engineering Group

WAGENINGEN UNIVERSITY
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# Do the Undo?

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the case of the Philipsdam, the Netherlands

Master thesis Irrigation and Water Engineering submitted in partial fulfillment of the degree of Master of Science in International Land and Water Management at Wageningen University, the Netherlands

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MSc-Thesis:

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All images in this thesis, unless stated otherwise, are produced by Ian Officer and Arjen Zegwaard,

based on kindly shared sources from Ian Officer and Jo Groven.

Image on the cover page of this thesis is a zoomed in –cut-out- of the Philipsdam,

based on the same sources

Thesis supervisor: Dr. Ir. P. Wester

Irrigation and Water Engineering Group | Wageningen University

To Haike, my brother and antagonist in discussions on ‘sein’ and ‘free-will’.

Don’t let those car driving-tie wearing-job hunting-stereotypes fool you: studying rocks!

*Trouble, get behind me now*
*Trouble, let me be*

[Dave Matthews – Trouble]

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## Abbreviations and Acronyms

| | in Dutch | in English |
|---|---|---|
| **BOKV** | Bestuurlijk Overleg Krammer Volkerak | Administrative Consultation Krammer-Volkerak |
| **BN/de Stem** | Brabants Nieuwsblad | Provincial Newspaper Brabant |
| **DG-Water** | Directoraat Generaal Water | General Directorate Water (part of V&W) |
| **HhD** | (this thesis) Hoogheemraadschap Delfland | Water board Delfland |
| **KRW** | Kader Richtlijn Water | European Water-framework Directive |
| **IWE** | Irrigation and Water Engineering group | Irrigation and Water Engineering group |
| **LNV** | (Ministerie van) Landbouw Natuur en Voedsel kwaliteit | (Ministry of) Agriculture, Nature and Food quality |
| **LTO-Noord** | Land en Tuinbouw Organisatie Noord | Northern Agri- and Horti- culture Organisation |
| **MER** | Milieu Effect Rapportage | Environmental Impact Assessment (EIA) |
| **MMA** | Meest Milieuvriendelijke Alternatief | Most Environmentally friendly Alternative |
| **MSP** | (this thesis) Brede discussie | Multi Stakeholder Platform |
| **NIOO** | Nederland Instituut voor Ecologie | Dutch Institute for Ecology |
| **PZC** | Provinciaals Zeeuwse Courant | Provincial Newspaper Zeeland |
| **RIKZ** | Rijksinstituut voor Kust en Zee | National Institute for Coast and Sea |
| **RIZA** | Rijksinstituut voor Integraal Zoetwaterbeheer en Afvalwaterbehandeling | National Institute for Freshwater Management and Wastewater Treatment |
| **RWS** | Rijkswaterstaat | Executive department ministry of V&W |
| **UvA** | Universiteit van Amsterdam | University of Amsterdam |
| **SCOT** | Sociale Constructie van Technologie | Social Construction of Technology |
| **V&W** | (Ministerie van) Verkeer en Waterstaat | (Ministry of) Transportation and Water Management |
| **WBD** | Waterschap Brabantse Delta | Water board Brabantse Delta |
| **WsHD** | Waterschap Hollandse Delta | Water board Hollandse Delta |
| **WWF** | Wereld Natuurfond | World Wide Fund for Nature |
| **WZE** | Waterschap Zeeuwse Eilanden | Water board Zeeuwse Eilanden |
| **zLTO** | Zuidelijke Land en Tuinbouw Organisatie | Southern Agri- and Horti- culture Organisation |
| **ZMF** | Zeeuwse Milieu Federatie | Environmental Federation Zeeland |

## Acknowledgments

Though the front-page of this thesis lists my name as the author, it could be questioned whether this is correct. I haven't counted it, but I'm pretty sure that if I did the result would be that at least fifty percent of the words that this thesis consists of, are not mine. All I did was to draw up a story based upon what I've seen and what I've heard. The least that I can do now is thank all those who voluntarily contributed their words, time and thoughts to this thesis. Therefore a big thank you to all the interviewees: René Boeters, Paul de Schipper, Carla Michielsen, Leo Apon, Acronius Kramer, Piet Polak, Jos Beugelsdijk, Simon Groot (and Ruben Dahm for 'connecting the dots') and Anton van Haperen. Steven Visser, Leo Santbergen and Jos Beugelsdijk for thinking along and opening some very useful doors for me. Jan Smits for giving me the opportunity to make it home afterwards.

The cross-infectious coffee breaks with my fellow 'Lumenians', Jilles Schippers, Allan Mugabi and Saskia van der Kooij have been very supportive, thanks! Dres, thanks for being my (distant) sounding board, come back, so we can start with the first stage of *La Tour de Bakel*! I'm really grateful to Ian Officer for his help with figures in this thesis. The figures maybe don't reflect 'reality', but they at least reduce the 'confusion over concepts'. Thanks! Henk and Anneke: Dankewol! This is not just the closure of the last four months; it's the closure of a part of our lives...

And of course Meike, thanks for everything. And more!

## 1. Introduction

"Dutch show New Orleans the way"[1]. I found this headline on a website of the Dutch Embassy in the United States. The website tells a story about Dutch water experts who have been asked to give advice on the flooding safety situation in New Orleans, Louisiana, after hurricane Katrina had struck the city in 2005. In the continuation of the article an architect called David Waggonner explains that this has been done "because 'we share the same problems but the Dutch understand how to co-exist with the water'. As a member of a delegation, led by Senator Mary Landrieu, he travelled to Holland to study how the Dutch manage to protect themselves against the sea. 'There's no country more focused on solving this water management issue. There is so much we can learn from their approach'"[2]. Such words are flattering, for sure. But can we, as Dutch, life up to these expectations? Ok, we've made these things we call our Delta works and we haven't had a serious flooding event since 1953, but in recent years, Dutch newspapers inform us about plans to re-open these praised dams. Re-opening the Haringvlietdam, Brouwersdam, Philipsdam… Do these superstructures, as *Discovery Channel* would probably call them, not function the way we want them to?

**Figure 1: the Netherlands - overview**

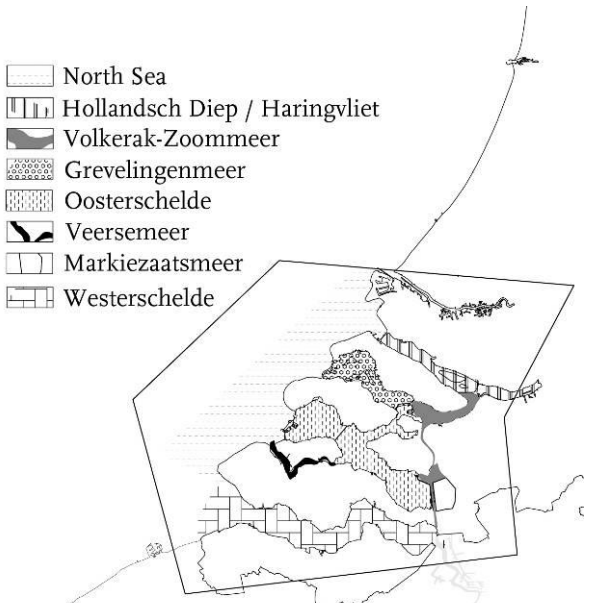


**Figure 2: the Delta waters**

For almost seven years now, I have been trained to be one of the 'water professionals of the future' at the Irrigation and Water Engineering chair group of Wageningen University. During the course of this study we have been drilled with examples of hydro-projects, typically somewhere in 'the South'. These exemplary projects had one common denominator: they usually did not live up to expectations, to their potential. In this context we, as students, had to become aware that technologies are hardly ever exportable, central message was: distrust blue-prints for complex problem solving! In this light one could wonder what 'way' these Dutch 'experts' are going to show to New Orleans. Are we going to burden them with a 'solution'

[1] Source: **http://www.ny400.org/**features_article.php?id=14, visited 26 April 2009

[2] Source: **http://www.ny400.org/**features_article.php?id=14, visited 26 April 2009

which they in a few years will have to reverse, as seems to be happening now to the Dutch Delta?

What is actually happening here, now? In this thesis this is what I will try to find out. For this, I will study one of these re-opening debates that I have come across in the newspapers last year: the Philipsdam. For this study I will provide a short history of the processes taking place around this Philipsdam. For this I will take a look at the arguments used by the different actors. Conceptually, I will base myself on three pillars: actor-network theory, sociotechnicality and discourse analysis. This study will show how fact (de-)construction plays a crucial role in the policy process, how this process confirms Lindblom's 'science of muddling through' - position (1959) with a central role for modelling studies. Finally, it shows how coalitions are formed and complexity is constructed by actors in order to strengthen their arguments.

In the following of this chapter I will further introduce the Philipsdam and explain the objective of this study more in depth. Also, in the theoretical framework, I will explain, based on some philosophical concoctions why I want to study the words used, the arguments, and explain the concepts that I will use. Consequently the problem formulation and research questions will be explained, in order to make it more workable. In the methodology section I will explain how I collected and analysed the data for this study.

## 1.1. The Philipsdam

About 30 kilometres east of the Oosterschelde storm surge barrier the Philipsdam is located (see figure 3 for a historical overview). The construction of the Philipsdam was finished in the year after the Oosterschelde storm surge barrier was opened on 4 October 1986.

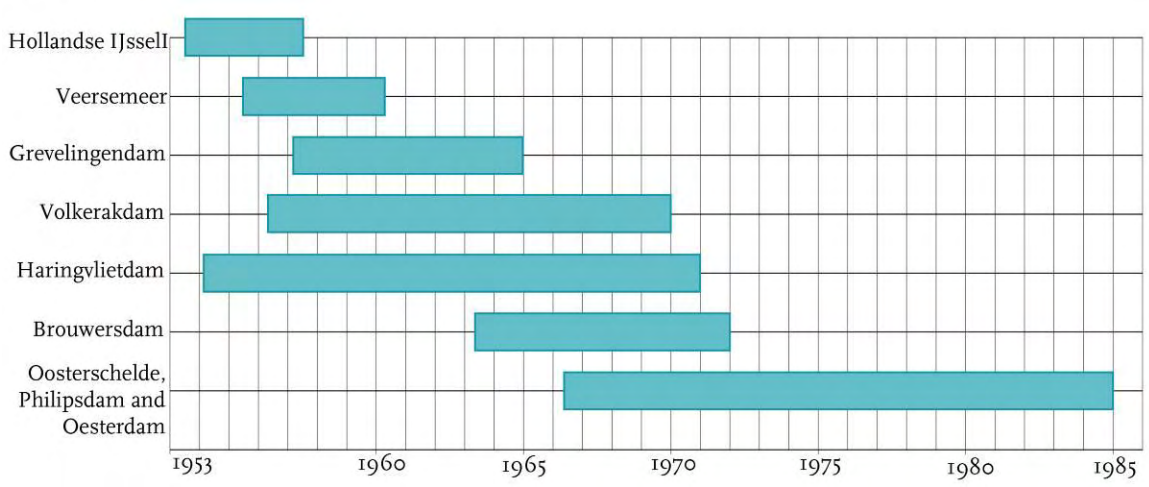


**Figure 3: chronological scheme of the Deltaworks construction**[3]

According to information on the website of the Dutch Water Partnership[4] the construction of the Philipsdam was a direct consequence of the semi open characteristics of the Oosterschelde barrier (see Figure 4).

[3] This picture is taken, with kind permission, from the MSc thesis "*Medicating the Broad Coast: from single coastline towards a coastal landscape zone of size*", by Ian Officer and Jo Groven, November 2008.

[4] This part on the background of the Philipsdam is based on information obtained from the website: http://www.deltawerken.com

This barrier was heavily contested, or if you like, the result of a democratic design-process (e.g. Bijker 2002). The semi-open character of the barrier resulted in a Oosterschelde that remained saline. But also, it caused a reduction of the tidal activity in the Oosterschelde estuary. At the time of the design this reduced tidal activity was foreseen to have two consequences. Firstly, it would result in a situation where salt marches would be left without any water, even during high tide, whereas without a barrier this would not be. Secondly, the reduced tidal activity would likely have a negative effect on the water level of the Schelde – Rijn canal, which is of great importance for the accessibility of the port of Antwerp in Belgium (see Figure 5).


**Figure 4: Oosterschelde storm surge barrier and compartment dams**

In order to overcome these foreseen problems it was decided, by the Delta commission to construct so called compartment dams, of which the Philipsdam is one. These compartment dams where to solve both problems at once, reduce the area of the Oosterschelde, and therewith adjust its capacity to the 'new' tidal capacity. And these dams would provide a stable water level in the Schelde Rijn canal (see Figure 4 for the locations of the Philipsdam and the Oosterschelde Barrier). As a result, the dam was constructed, and until today it forms the divide between the salt Oosterschelde to the west, and the fresh Volkerak-Zoommeer to the east.


**Figure 5: Oosterschelde, Krammer-Volkerak, Schelde Rijn and Zoommeer**

The design of these compartment dams has not been unambiguous. The lengthy discussions and the design of the Oosterschelde storm surge barrier form the arena of this ambiguity. In their chapter on the Oesterdam, Philipsdam and the Belgians, Boermans and Hoeneveld provide a clear introduction into the politics behind the construction of these compartment dams (1984). The initial plans for the Oosterschelde in 1963 were aiming at a permanent closure of the estuary. The debate on the openness of the barrier was closed formally in 1974 by the decision of the national parliament to have a barrier that would maintain tidal

activity. After this discussion a special commission, called 'Compartmenting Oosterschelde' had been installed to figure out the details.

The compartmenting has been contested at both international and local level (see figure 4). Internationally, there was the conflicting interest between Belgium on the one hand, and Rotterdam on the other. Belgium was heavily concerned about the Dutch Delta plans, and, according to Boermans and Hoeneveld was for a large part excluded from the 'design table'. For the Belgians the vitality of their main sea port was at stake. Though it was clear from the start that the Westerschelde would remain open, there remained uncertainty about the Oosterschelde, and thus about their connection with the European network of inland navigation. Logically, Belgium started a lobby for a stable Schelde – Rijn connection, in order to reduce the pressure on the intensively used Westerschelde. The Dutch government and the Dutch main port saw such a connection as a threat to the commercial competitiveness of the Rotterdam based inland navigation shipping sector. The dispute was settled eventually by an agreement on the division of the costs: Belgium would contribute 85 percent of the costs of the connection; the Dutch would become responsible for maintenance and renewal.


**Figure 6: Tholen, Noord-Brabant and the Hollandsch Diep**

Another issue, that played more at the local level was the matter of salt and salinisation of land (ibid.). The island of Tholen, a municipality in the province of Zeeland, which was to be directly connected with both the Oesterdam and the Philipsdam, and the western part of the province of Noord-Brabant, would both benefit from the creation of a fresh water lake on their borders to reduce salinity of agricultural land (see figure 6). The risk of salt water inflow into this fresh water lake had two sources: the sluices in the Philipsdam and the water coming from Antwerp. The sluice problem was tackled by the ingenious design of a sluice that was based on the principle that salt water has a higher density than fresh water (for a artistic impression, see the cover image of this thesis). To maintain a proper water quality in the freshwater lakes, a north to south flushing system was designed, using water from the Hollandsch Diep and discharging into the Westerschelde. In the case of limited supply of water from the Hollandsch Diep's, and a poor water quality in the fresh water lakes this might lead to a trade off between water quality in the Volkerak, affecting agricultural land in Zeeland and Western Noord-Brabant, and water quantity in the province of Zuid-Holland, affecting greenhouse agriculture in the so called Westland. Furthermore, there are, of course, tremendous ecological effects of turning tidal water into stagnant fresh water lakes (ibid.).

In October 2008, a national newspaper 'de Volkskrant'[5] reported on the latest plans of Rijkswaterstaat, which is the part of the Dutch Ministry of Transportation and Water Management that is delegated the task of the practical execution of the so-called 'Waterstaat', this includes the construction of waterways and roads and the maintenance of these. The title of the article states: "Set ajar against the blue-green algae; Deltaworks-plan of Rijkswaterstaat to create an inlet for salt water in the Philipsdam". The article reports on a recently finished study, conducted by a consortium of Rijkswaterstaat, Water boards and provincial governments[6]. The study recommended the construction of a hole in the Philipsdam, north of the sluices, to have tidal activity flush out the blue-green algae from lake Volkerak-Zoommeer.

What has happened? What has changed in the last decade, so that now a closed dam needs to be re-opened again?

The controversies (discussions) around the design of the Oosterschelde storm surge barrier indicate that there is more to dams than just steel and concrete: politics. Dams show to be the outcome of a political debate. Apparently 'hard scientific' knowledge is only one of the inputs of the design process of a structure. This is of course not very surprising. We have already seen in studies concerning water related infrastructure all over the world conducted from a constructivist perspective that the arena of water, and the infrastructure related to it strongly overlaps with the political arena. At the Irrigation and Water Engineering Chairgroup at Wageningen University, where I was 'academically raised', this notion has been of great influence in setting the research agenda. Whether it was for example recently done work on water right, and indigenous people in Latin America (see for example Boelens 2008; Verzijl 2006), on institutional change at the basin level in Mexico (see Wester 2008), on gender aspects of water management (see Zwarteveen 2006), on smallholder irrigation in Zimbabwe (see Bolding 2004), on the everyday politics of irrigation reform in the Philippines (see Oorthuizen 2003), or on irrigation management in South India (see Mollinga 1998), all this work builds upon the notion that there is this marriage between water and politics. After quite some years of being a student at this chairgroup, the notion that there is a relation between water and the political arena, or even a statement like 'water = politics' are common sense to me.

In my first MSc thesis I studied water distribution mechanisms in a tertiary canal in Khorezm, Uzbekistan. My main finding was that this distribution is very much up to the 'everyday politics' in the field. It was very hard for me as an outsider with hardly any Uzbek linguistic skills to dive into these discussions and find out how they function. Therefore, now, with this thesis, I hope that I can do this, dive into the political undertow of a particular water infrastructure, like one of the Dutch Delta dams.

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[5] See: de Volkskrant, 8 october 2008. Didde, R: Op een kier tegen de blauwalgen; Deltawerken Plan van Rijkswaterstaat om een doorlaat voor zout water te maken in de Philipsdam.

[6] See: http://www.volkerakzoommeer.nl/

## 1.2. Objective

In order to structure this research I have formulated the following overall objective:

*To understand the interactions within the Philipsdam's hydrosocial-network concerning the dam's planned 're-opening', by focussing on the relation between the (planned) action and the processes of fact construction and argumentation that are used by the actors involved, in order to promote their stakes.*

The term 're-opening' here has a double meaning. On the one hand it refers to the (planned) physical re-opening of the Philipsdam. On the other hand it refers to the re-opening of the negotiations around this dam. Using the term re-opening also has the advantage that it reduces the time span that needs to be studied here. Focussing on the time since the re-opening limits the analysis to, let's say, starting somewhere in the early 1990's. The use of the word re-opening also has a conceptual connotation. Conceptually the word refers to the 'closure' concept which was brought foreword by Pinch and Bijker (1984). This closure concept will be dealt with in the theoretical framework section.

'Hydrosocial-networks' are, according to Wester, water networks that "are intentionally and recursively shaped around water and its use and are always emergent and becoming as they are precarious and reversible outcomes of modes of ordering" (2008 pp.21). This conceptual notion draws upon actor-network theory (see for example Latour 2005; Law 1994). Modes of ordering refers to how "actors attempt to build messy networks that combine technical, social and economic elements" (Wester 2008 pp.20).

Planned action, fact construction and argumentation are conceptually based on two ideas. First of all it is based on the idea of technologies as being socially constructed (see for example Pinch and Bijker 1984; Winner 1993). Secondly, it is rooted in a discourse analysis approach, since by this approach we can dive into the 'how' questions (Hajer and Versteeg 2005). I want to focus on the arguments used in the (ongoing) negotiations around a hydrosocial-network because, in my view this is the domain in which, in both phases, the social construction, effects and requirements can be made 'visible'. By no means do I want to develop in this thesis a list of arguments that are 'good' and arguments that are 'bad'. Rather, I will try to link the arguments used by different actors in a Foucaultian sense to 'Discourses'.

In the section on the theoretical framework I will deal with the question why I want to use this form of research. In the methodology section I will deal with the translation of this approach to a tool for data collection and analysis.

## 1.3. Theoretical Framework

In this section I'll try to explain to you, the reader, my theoretical scope, my theoretical perspective. I will do this in two steps, formulating my thoughts around two questions: *Why do research* and *What concepts will I use*? First I will start by formulating the way I see the role of research in society, in an effort to try to explain my view on the *why* question. Secondly I will go into the debates on the two theoretical pillars that will play a central role in this research, as mentioned before in the section on the objective of this research: 'sociotechnicality' and 'discourse'. By this I will attempt to formulate how in this case I want to do my research and which conceptual tools I will use.

### 1.3.1. Who's reality?[7]

When arriving at the question on the *why* question of doing research, there is a severe risk of drowning in words that are written by people who are much better capable of doing so, and who have been doing this for centuries now. Therefore, before I start my attempt, I want to make clear that my shot is incomplete and probably irrational at points, I am aware of the fact that what I write is for a great part the result of pure coincidence: I only read and hear, and therewith think, what accidentally has fallen my way during my life so far. Of course there is responsibility on my behalf here in the choices I make what to think about, and therewith what to read and whom to listen to. On this point of choices I will return at the end of this thesis, in the very final section (5.3).

In a very general sense, research and science are always concerned with understanding, the understanding of processes in the world, or even processes far away in outer space, now or in the past. Research and science both have some relationship to 'reality', a relation of *trying to understand*. Ever since human thought started interacting with written words, these interaction have been dealing with questions like: what is *real*, what is *reality*? What can we know about this *reality*? A beautiful example of an attempt of answering these questions is Plato's famous allegory of the cave. More recently, in 1637, another attempt was made by Descartes. In his *Discours De La Méthode* he explains his *cogito ergo sum* axiom, which is Descartes' effort to look for an absolute certainty, which resulted in the idea that one can doubt everything, but that to be able to doubt, I must be: I think therefore I am. Following, on what this *I*, this *me*, then is, he states that it is indubitable knowledge that *he* is a thinking thing. And that thinking is his essence. Later on he adds to that, that because I doubt, my existence is not perfect. This imperfection is related to something that is perfect: God. Consequently, and this is where the question of reality comes in, he wonders how I, as a thinking thing, can say anything with any certainty about what I see, observe, and reality. In this respect Descartes states that because God does not place incorrect images in our minds we can be certain that what we see is reality.

Though this Cartesian line of thinking is often seen as the start of modernity, this does not mean that his reality conception is not contested. Particularly his transcendental solution to the problem of certainty, God placing correct images in our minds, has been disputed. Kant, for example though of a way to circumvent this certainty problem by proposing a model that distinguishes between *Dinge an Sich*, the thing-in-itself and *Erscheinungen,* the appearances of this *Dinge an Sich*, sometimes translated as apparition. According to Kant we cannot 'know' the dinge an sich,

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[7] This part of the theoretical framework is inspired by the course History of Philosophy I and II (Geschiendenis van de Wijsbegeerte I en II) by prof. Rudi te Velde, both readers used for that course and some supportive/additional books:

Bor, J., Petersma, E., & Kingma, J. (2000). De verbeelding van het denken: Geïllustreerde geschiedenis van de westerse en oosterse filosofie. Amsterdam: Contact.;

Achterhuis, H. (1992). De Maat van de Techniek. Baarn: AMBO.;

Doorman, M., & Pott, H. (2008). Filosofen van deze tijd. Amsterdam: Bert Bakker.

& Descartes, R. (2002). *Over de Methode (Original: Discours de la méthode pour bien conduire sa raison, et chercher la verité dans les sciences)*. Amsterdam: Boom.

we can only say something about the way that they appear to us: Erscheinung. In my view, by making this differentiation Kant has provided the core foundation for constructivism. A first move away from (absolute) truth claims.

Though how nicely this division may be, the question that I think is necessary to ask, is whether there is really an *an sich*. I honestly don't know, so I cannot tell. What I do think is that reality is located at the interface where a human being meets the world. When I see a tree, this tree is 'real' to me. The properties, the content of this tree reality differs per person. Do I see a tree as a biomass producer? An oxygen producer? Or as an input for heating up the stove? What I am trying to say is that 'realities' are always mediated, whether they are scientific or not. This notion of mediation is inspired by Haraway, who states: "There is no unmediated photograph or passive camera obscura in scientific accounts of bodies and machines; there is only highly specific visual possibilities, each with a wonderfully detailed, active, partial way of organizing worlds. All these pictures of the world should not be allegories of infinite mobility and interchangeability, but of elaborate specificity and difference and the loving care people might take to learn how to faithfully from another's point of view, even when the other is our own machine" (1988 pp.190). Following from this, this research is not aiming at making any moral judgements, since there is not one true 'reality' it becomes hard, if not impossible, to say that one statement is more true then another. And so, again following Haraway, "science becomes the paradigmatic model not of closure, but of that which is contestable and contested" (1988 pp. 196). On this contestation I will get back in the next section, when I am dealing with Bruno Latour's idea of following controversies, which is, the way I see it, an broad elaboration of the notion formulated by Haraway.

In this thesis I will look at how different realities co-exist, how they have evolved and how they function around controversies. I will do this by looking at how the mediation takes place, in what words, in what language. But, looking at these different realities brings about the epistemological issue of 'double hermeneutics'. Sayer explains this as follows: "The discipline or science concerned with the interpretation of meaning is called *'hermeneutics'*. Using this term we can say that the study of natural objects [...] only involves a 'single hermeneutic' [...] while the study of ideas and concept dependent social phenomena involves a 'double hermeneutics' (Sayer 1992 pp.35). Risk of this issue of double hermeneutics is that one can become sceptical about what we can know, what we can learn. Avoiding this risk I would like to follow Zwarteveen, who in turn follows Haraway in what she sees as the possibilities of knowing: "Haraway argues for 'situated knowledges' which maintains a strong commitment to objectivity – to learning to see well – while denying that everyone will see in precisely the same way. For Haraway, 'seeing well' in not just a matter of having good eyesight: it is a located activity, cognizant of its particularity and of the accountability requirements that are specific to its location. It refuses to posit any subject/object split in the production of knowledge [...]" (Zwarteveen 2006 pp.38). In my view the issue 'double hermeneutics' is also acknowledged when using actor-network theory, and realising that I, conducting this research, am also an actors in the hydro-social network that I study. The notion of double hermeneutics also informs the way I see discourse, which i will try to explain in the next section. Consequently I will not make any 'truth' claims; merely I will look at the storylines behind the current state of the Delta, and by doing so, this research can be seen as one in a constructivist fashion of opening up black boxes.

### 1.3.2. What Concepts?

With the above in mind I want to return to the object of this study: the Philipsdam. What does a constructivist approach mean when we talk about a dam? And how can we analyze language used around this dam, the interface between people and the world around them? In the following section I will introduce the core concepts of this study: sociotechnicality, actor-network theory and discourse analysis.

Constructivism and technology, how can we combine these? In my BSc thesis I conducted research on the sociotechnical conceptualization at the Irrigation and Water Engineering group (Zegwaard 2008). In this thesis I used the metaphor of a painting for explaining how in my view a sociotechnical approach can function. Following this metaphor one could say that in a study dealing with technology and its interaction with people (users) the researcher makes a painting of how he/she is seeing this particular situation. The colour that the painter uses can be reduced to a very limited number of primary colours: research schools. So, in order to paint my picture of the Philipsdam, I will need to create a mix of schools suitable for me. I do not think it is very useful to repeat the discussion that I wrote down in this study, I would like to limit myself to those aspects relevant for this research.

The first school that I want to discuss here is the school of *Social Construction of Technology* (SCOT). This school of thought includes academics like for example Russel (1986), Callon (1980), Winner (1985; 1993), Law, Pinch and Bijker (Bijker et al. 1987; Bijker and Law 1992; Pinch and Bijker 1984). Following SCOT, technology is not just seen as determining human actions, but human action is shaping technology development. As a consequence, studying technology is relevant when looking at how humans interact with the world around them. Winner critically stated that 'the most obvious lack in social constructionist writing is an almost total disregard for the social consequences of technical choice' (Winner 1993 pp.368). Trevor Pinch and Wiebe Bijker distinguish two concepts that a social construction of technology approach needs to take into account: 'closure' and 'interpretive flexibility' (1984). Closure here refers to the moment when the process of technology development reaches some sort of stabilization; i.e. consensus is reached. Interpretive flexibility refers to different ways in which a particular technology can be perceived by the users but also differences in perception that arise during the development of a technology. I would like to add to this that the interpretive flexibility also applies, following Winner, to the consequences of technological choice. In line with this principle of closure and interpretive flexibility, some Actor-Network Theory (ANT) scholars have been focussing on controversies. A controversy refers to a "debate surrounding a technique or scientific fact that has not yet been determined"[8]. This focus on controversies is based on the idea that technological and scientific knowledge is presented in its final form, or, to speak with Pinch and Bijker, it is presented when it is 'closed'. Yet, the "intermediate stages, corresponding to the actual research process, best highlight the connections between scientific work and other types of activities"[9]. Latour distinguishes five main types of controversies that are shaped by uncertainties about:

- "the nature of groups: there exist many contradictory ways for actors to be given their identity;

[8] Definition derived from http://www.demoscience.org/controversies/description.php, visited 17/02/09.

[9] Definition derived from http://www.demoscience.org/controversies/description.php, visited 17/02/09.

- The nature of actions: in each course of action a great variety of agents seem to barge in and displace original goals;

- The nature of objects: the type of agencies participating in interaction seems to remain wide open;

- The nature of facts: the links of natural sciences with the rest of society seems to be the source of continues disputes;

- And, finally, about the type of studies done under the label of a science of the social as it is never clear in which precise sense social sciences can be said to be empirical" (Latour 2005 pp.22, underline by author)

The second school that I want to discuss is that of 'Discourse Analysis'. As mentioned before, the term discourse if frequently connected to the French philosopher / historian Michel Foucault. "For Foucault, discourses are systems of knowledges (e.g. medicine, economics, linguistics) that inform the social and governmental 'technologies' which constitute power in a modern society. Discourses are partly ways of using language, but partly other things (e.g. ways of designing prisons or schools). Foucault's work has given rise to a widely used form of 'Discourse Analysis' [...]" (Yates et al. 2001 pp.233). Hajer and Versteeg, in line with the use of the word discourse, define it more concretely as:

> *"an ensemble of ideas, concepts and categories through which meaning is given to social and physical phenomena, and which is produced and reproduced through an identifiable set of practices. The 'discussion' in other words, is the object of analysis; discourse analysis sets out to trace a particular linguistic regularity that can be found in discussion or debates"* (Hajer and Versteeg 2005 pp.175).

Consequently the authors show that 'Discourse Analysis' fits logically in a constructionist approach. Indentifying three particular strengths of such an approach: "the capacity to reveal the role of language in politics, to reveal the embeddedness of language in practice and to illuminate mechanisms and answer 'how questions'" (ibid. pp.176). Hilhorst explains how this focus on discourses is combining an acknowledgment of co-existing realities and the locality of knowledge: "Firstly, there is always a multiplicity of discourses, and secondly, the relation between dominant and counter discourses is more dynamic than presumed, leading among other things to their renegotiation in local contexts" (1998 pp.19).

On the character of discourse Hilhorst establishes a link with Giddens' 'duality of structure', by stating that "discourses are both medium and outcome of the practises they recursively organise" (idem. pp.20). This duality of discourse has an obvious parallel with what one could call the duality of technology[10], earlier referred to the construction and shaping of technology. This parallel does not mean that I see discourses as technology; instead I see discourses and technology as strongly intertwined, strongly influencing each other. I shall try to explain this relation by the example of Wikipedia. I like to see discourse as (an abstract form of) Wikipedia,

[10] For an theoretical elaboration of the combination of Giddens' duality of structure in relation to technology: Orlikowski (1992). The Duality of Technology: Rethinking the Concept of Technology in Organizations. *Organisational Science*, 3, 398 - 427.

the online encyclopaedia in which everyone, every user, can edit the texts in the encyclopaedia. Consequently, the encyclopaedia is always changing. Furthermore there are multiple Wikipedia's: in different languages, sometimes even in dialects, and some companies even have wiki sections on their company websites. Wikipedia influences my life, my knowledge. For example, if I don't the meaning of a concept, I often quickly look it up on Wikipedia. I of course know that the description can be written by anyone, but it usually gives me a good first impression of the concept. Sometimes, if it's still not really clear to me, I try to look in a different language. This way this encyclopaedia shapes the way how I see the world, my reality. On the other hand, if I come across a statement which I do not agree with, I change it. My changes will in turn cause other user to (dis-)agree, and correspondingly change it. So, apart from shaping my reality, I also have an influence on 'discourse'. Wikipedia, and this is why I use this example, *is* because of a certain technology. The success of the encyclopaedia is largely founded upon the technology that enables us to login and edit the statements. Interestingly enough, this technology in this case is literally a language, a programming language. I would not be surprised, though I haven't checked it, if there would be a section in Wikipedia on this technology itself. This is, the way I see it exemplary for the relation between discourse and technology: strongly intertwined. We cannot look at a damn (technology) without looking at the field of arguments, the ensembles of ideas, concepts and categories around it. Additionally the Wikipedia example also shows the local cultural specificity of discourses, simply because a part of language is culturally/locally determined. By cultural I do not refer to a narrow political notion of culture, but a broad flexible interpretation, giving room, next to also room to e.g. technological cultures and administrative cultures.

In earlier work Hajer introduces what I would call Hajer's 'argumentative approach' to discourse analysis (Hajer 1995). This approach focuses on "the constitutive role of discourse in political processes [...] and allocates a central role to the discursing subjects, although in a context of the idea of duality of structure: social action originates in human agency of clever, creative human beings but in a context of social structures of various sorts that both enable and constrain their agency" (ibid. pp.58). One thus, using this approach, needs not only to look at the ideas, but also the social structures enabling and constraining the implementation of an idea. Furthermore, "the argumentative approach focuses on the level of discursive interaction and argues that discursive interaction (i.e. language in use) can create new meanings and new identities, i.e. it may alter cognitive patterns and create new cognitions and new positioning. Hence discourse fulfils a key role in processes of political change" (ibid. pp.59). Hajer identifies three factors that influence the dynamics regarding the way a particular argument is shaped: *credibility*; *acceptability*; and *trust*. These factors in turn are enforced by the *concepts-storyline* and the formation of *discourse-coalitions*. Basic underlying assumption here is that "the political power of a text is not derived from its consistency (although that may enhance its credibility) but comes from its multi-interpretability. With discourse-coalitions defined as "the ensemble of (1) a set of storylines; (2) the actors who utters these storylines; and (3) the practises in which this discursive practices is based" (ibid. pp.65). Key role in analysis here thus is the role of the storyline of the arguments used. An analysis of this storyline will bring to the light the credibility, acceptability and the generation of trust in the construction of an argument used by a particular actor though, I am also aware that looking at arguments will only bring to light fragment of these mechanisms. Methodologically I will try to bring all this to light by using a co-evolutionary approach. In the next chapter I will go into a nice example of this approach in the California Bay delta, by Norgaard *et al.* (2008)

## 1.4. Problem Definition and Research Questions

Returning now to the Philipsdam and the formulated objective of this research which is to understand the interactions within the Philipsdam's hydrosocial-network concerning the dam's planned 're-opening'. The practical issue at stake here, the Philipsdam, and the conceptual concerns mentioned in the previous section combined leave us here with a question that can be defined as follows:

*What has happened between the early 1990's and 2008? Once there was a high tech sluice constructed to prevent any salt water from entering the lake, and now we need a hole in the dam?*

In other words:

*What happened? And who set the agenda for change this time?*

From this problem definition I come to the following main research question:

*How did uncertainties, argumentative strategies and interpretive flexibility within the Philipsdam hydrosocial-network recursively shape and get shaped by the process of re-opening since the emergence of the blue-green algae problem in the early 1990's?*

In order to make this more workable I divide this question into multiple sub-questions, being:

1. Who are the actors involved in, and affected by, the re-opening plans of Rijkswaterstaat?

This is in my view the most logical and necessary first step to be taken in this research. I do not solemnly want to focus on the official procedure of the plan making, though this forms the backbone of this research, but I am also particularly interested in the actors that are not participating in this plan making, but who do perceive that they are directly affected by the plans. With the use of the word *directly* I aim at limiting myself to only a limited number of actors, like for example mussel and oyster cultivators in the Oosterschelde that might fear that the inflow of polluted water from the Volkerak-Zoommeer will affect their (sea-)parcels. This would make sense since the inflow of fresh polluted waters from the rivers reduced their harvests at the time of the construction of the Deltaworks[11]. Or, another example, the farmers cultivating lands around the now fresh Volkerak-Zoommeer, who fear the salinisation effects, as was mentioned in the article in de Volkskrant.

2. What are the exact plans for the Philipsdam, and how did they come to be?

By this question I want to come to a description of the co-evolutionary history of the plans for the future of the Philipsdam. This co-evolutionary history approach I will discuss in the next chapter.

3. What discourses are used by which actors in the debates around the 're-opening' of the dam and what coalition are there between discourses and actors? When was the debate on this dam 're-opened'? What are the storylines behind the used argumentation?

With this question I want to focus on how people, actors, construct their arguments around the problems they perceive around the Philipsdam and how they construct their argumentation for a

[11] See for an extensive reconstruction of this: de Schipper, P. (2008). *De slag om de Oosterschelde* Amsterdam: Atlas., from page 109 onward. In this book he calls this 'the third disaster' or the oyster disaster.

particular solution. At the same time, the aim here is to explore the storyline of the arguments used by the actors.

4. What methods are used by the different actors to increase the impact of their arguments? Have these changed since the debate was 're-opened'?

With this question I aim at looking at how actors increase the credibility, acceptability, and trust of their arguments and themselves. In this regard I am particularly focusing on (discourse) alliances and the role of knowledge/power.

Finally, after answering the questions above, I want to deal with the question:

5. What does a discourse analysis approach make one see about this particular situation? How does this approach do this? And, what are the main limitations of this approach?

## 1.5. Methodology

In order to analyse the discourses used around the Philipsdam and the plan for the future management of the Philipsdam I will make use of three types of sources based on a differentiation made by Potter (2004):

- Naturalistic interactional material
- Interviews and Focus groups
- Texts

Potter provides a clear overview of the pros and cons of all the three different types of data that can be collected for analysing discourses. Main point he makes in this regard is that naturalistically provided material can withstand what he calls the 'dead social scientist test'; it limits the influence of the scientists categorisation. On the other hand he also acknowledges the positive influence that strategic steering can have in interviews and focus group meetings on the efficiency. In order to be able to learn from both exponents I will try to combine these in this research by analysing naturalistic interactional material and interviews, with strategically chosen actors and finally text, for example official management plans.

For this research I have done a total of nine interviews of which 8 face to face and one over the phone. I do not aim at conducting a representative sample study of the arguments used around this dam; instead I rather would like to in depth analyze the storylines of the arguments used by these representative actors interviewed. I have indentified these representative actors at first in the literature study part of this research. Once the interviews were started I tried to use a 'follow the network' approach. This has been rather difficult since I had only two months available for interviewing. The conducted interviews have been completely and literally transcribed in order to be able to consequently apply an argumentative analysis to it. Because of this requirement all interviews have been recorded on a voice recorder. An overview of the interviews held for this research are listed in the table below, in chronological order (table 1).

**Table 1: interview overview**

| Date | Location | Name | Organisation | Length |
|---|---|---|---|---|
| 10-2-2009 | Middelburg | René Boeters | Rijkswaterstaat dienst Zeeland; Projectleader Plan study | 1:36:16 |
| 19-2-2009 | Hooge Zwaluwe | Paul de Schipper | Journalist at BN/de Stem; Author 'de Slag om de Oosterschelde' | 1:43:51 |
| 24-2-2009 | Goes | Carla Michielsen | zLTO | 1:09:29 |
| 27-2-2009 | Ridderkerk | Leo Apon | Water board Hollandse Delta | 0:38:44 |
| 5-3-2009 | Middelburg | Acronius Kramer | Water board Zeeuwse Eilanden | 0:43:58 |
| 11-3-2009 | Breda | Piet Polak | Water board Brabantse Delta | 1:26:57 |
| 16-3-2009 | Haarlem | Jos Beugelsdijk | LTO-Noord | 1:03:19 |
| 24-3-2009 | Wageningen | Anton van Haperen | Staatsbosbeheer | Phone |
| 25-3-2009 | Utrecht | Simon Groot | Deltares | 0:48:10 |

For this research three meetings have been attended. These meetings are listed below (table 2). Unfortunately it was only possible in one of the occasions to use the voice recorder. Analysis therefore, for the other two meetings, will have to be limited to the notes taken during these meetings.

**Table 2: meeting overview**

| Date | Location | Type of meeting | Length |
|---|---|---|---|
| 16-3-2009 | Dirksland | LTO-Noord member meeting with Jan Smits from Water board Hollandse Delta, René Boeters from Rijkswaterstaat Zeeland and Steven Visser on behalf of the Province of Zuid-Holland | n.a. |
| 18-3-2009 | Dordrecht | Meeting project group: freshwater provision Zuid-Holland-zuid. | n.a. |
| 23-3-2009 | Tholen | Round-table conference permanent parliamentary commission Transportation and Water Management. | 2:14:31 |

For this research use has been made of plans (texts), finished/executed and those currently under debate concerning the Philipsdam, newspaper articles/websites and literature written on the history of the Philipsdam and the background processes. The written materials have been dealt with in the exact same way as the transcribed interviews, making use of argumentative discourse analysis. For the coding of the material I have made an evaluation of the usefulness of the use of coding software, and depending on a brief cost (time required for learning the program) – benefits (time gained by the possible higher efficiency of analysis) analysis I decided to use this software. The software that I have used is ATLAS.ti 5.0, which is an instrument for visual qualitative analysis and knowledge management.

## 1.6. Outline of Thesis

After this introduction into this thesis four more chapters will follow. Before dealing with my findings there will first be a chapter on the setting. This background chapter will go into some relevant processes that are taking place in the Netherlands, e.g. of water managerial policy processes. The processes dealt with are the 'new' Delta Commission, also known as the Veerman Commission, after its chair, the 'Room for the River' project, and its two related issues of 'water storage' and 'de-poldering'. In the second part of this chapter I will deal with some scientific literature on the Dutch water management. Particularly focussing on what some authors refer to as the 'ecological turn' in Dutch water management (Disco 2002). The chapter will finish by briefly discussing some conceptual views on policy processes. Central in this part will be the idea by Charles Lindblom on the 'Science of Muddling Through' (see Lindblom 1959; Lindblom 1979) and a Delta history as a co-evolutionary process regarding science, governance and ecosystems (Norgaard et al. 2008).

Consequently there will be two chapters on the re-opening plans for the Philipsdam. First, in chapter 3, I will examine the process of re-opening. This chapter will be built around two issues: what steps have been taken and what are the roles and perspectives of different actors in the Philipsdam's hydrosocial-network. This will be done in three sections. First the 'exploration phase' of the study will be dealt with, second the 'plan study' phase and the role of Rijkswaterstaat in this and third and final the views of the different actors on their problems and opportunities.

After this, chapter 4 will look at practices of opening and closing that have played a role in the whole process. This 'opening and closing' not only refers to the literal opening or closing of the dam, but also refers to the opening and closing of discussions. Three different aspects of these practises, in three sections will be dealt with: coalitions, radiation and fact construction. Coalitions refers to the, on the one hand, uniting practices of ally-creation and on the other hand coalition formation on discourse level. By radiation I aim at 'techniques' used in argumentation that 'make the issue bigger' by the construction of complexity and issue linking. Finally this chapter will go into how the construction of facts plays a role in these opening and closing practices. This will be done by looking at the role of successively research/modelling, image construction and language. In the section on research/modelling I will look into the storylines of some 'closed' facts, like for example 'flushing with fresh water doesn't work'. In the part on the construction of an image attention is being paid to the role of the media in the process. The last section will show how actors sometimes have different ideas on the relation between words, like salt, brackish and fresh, and the 'truth', which turns out often to be expressed in chloride levels.

Finally chapter 5 will provide the main conclusions and a discussion of these conclusions and the conducted research in general. In that discussion I will critically look at the reality as I have presented it in this thesis. At the very end I'll get my fingers burned on the question whether an individual, like for example me, can bring about change in policy processes, like for example the process around the 're-opening' of the Philipsdam...

## 2. Past, Poldering and Policy Processes

This chapter will deal with the 'larger picture' in which the Philipsdam's story is embedded. I will sketch this larger picture by using two pencils: a historical and a conceptual. The historical pencil will sketch the Dutch water managerial scene, providing a brief account on some typical trends. The conceptual pencil will discuss briefly some conceptual ideas that seem to fit the situation observed in this study. For both sides of this story I will make use of some of the scientific literature available. The section of Dutch water management will try to show how there has been a shift from a concrete mindedness to a eco-mindedness. In the section on the conceptual ideas I will introduce the notion of policy as the 'science of muddling through' and a co-evolutionary process approach to science, governance and ecosystems. By no means do I want to be sceptical or cynical about the role of policy making in our society, I am just looking for a suitable pair of glasses to gain some understanding on what is happening.

### 2.1. An Ecological Turn

The title of this section is derived from an article written by Cornelis Disco, with the title: *"Remaking 'Nature': the ecological turn in Dutch water management"* (2002). In this article Disco builds his case around the controversy surrounding the construction of the Oosterschelde storm surge barrier, particularly focussing on the role that Rijkswaterstaat played in this process. "From its beginnings, Dutch coastal engineering was based on establishing and maintaining an unbreachable line of defense against the sea. Along large sections of the central North Sea coast, a balance of natural forces had produced a barrier in the form of broad beaches and kilometres-wide chains of sand dunes" (ibid. pp.214). Disco continues by explaining how gradually an 'eco-focus' came into play in Dutch water management, also placing this in a broader context of an increasing eco-awareness that has developed since the 1972 Club of Rome report *The Limits to Growth*. Disco sees the controversy around the Oosterschelde storm surge barrier as a *Finale* and a *Turning point* in this history. He concludes: "domains neglected or poorly serviced become objects of contestation among vying professions and ultimately an object of conquest by one or more of them. Something like this happened within the Delta Department of the Rijkswaterstaat in the wake of the political bankruptcy of the project to close off the Oosterschelde estuary with a fixed dam. The environmental and economic opposition to the closing of the Oosterschelde declared a verdict of no-confidence in the hydraulic engineer who had been in control until then, they had no choice but to begin to share power in the Delta Department with biologists and ecologists" (ibid. pp.232). According to Disco and van Vleuten the 'Kier', the re-opening of the Haringvlietdam is an exemplary case of the ecological turn in Dutch water management. "Ecological reconstruction is now in any case a political priority even if this means seriously compromising other functions - except, in extremis, safety" (Disco and van der Vleuten 2002 pp.37). In the following sections I will go into some aspects of this ecological turn, by looking at the Delta Commission and the Room for the River plans.

#### 2.1.1. The Delta Works and the Oosterschelde

*"God created the world, and the Dutch created the Netherlands." The old adage summarizes—albeit in an immodest, not to say blasphemous, way—the popular Dutch view of their relationship to water.*

(Bijker 2002 pp.569)

The quote above nicely summarizes, as Bijkers also points out, a strong tendency in the Dutch hydro-history. Meijerink explains how there was a domination of a 'advocacy coalition' until the

mid-1970's , which had a strong influence on the policy processes concerning water works. This coalition had a strong focus on flood protection. "This coalition consisted of representatives of the Directorate-General for Public Works and Water Management, the Minister responsible for water management, the Cabinet, the vast majority of the Dutch Parliament, most representatives of municipalities, Water boards, and the province of Sealand [Zeeland], and farmer organizations. These parties strongly favoured the implementation of large-scale coastal engineering works without addressing the negative ecological impacts that these works entailed. The coalition attached great importance to safety, moderate importance to economic well-being, and no importance at all to preserving the environment" (Meijerink 2005 pp.1068).

This coalition is strongly related to the first Delta commission. The first Delta commission was initiated after the infamous 1953 flood disaster. This flood disaster took place at the beginning of February of that year when a combination of springtide and a hurricane-force north-westerly wind hit the Dutch Coastal areas. The consequences of the flood were immense: 1,836 people died directly, another 40 people died afterwards as a consequence of the flood, 72,000 were evacuated from their houses and more than 150,000 hectares of land were flooded. Also the surrounding countries Belgium and the United Kingdom were affected by the flood[12]. Twenty days after the flood a commission was installed to provide an advice to the Dutch Parliament on measures they considered necessary to be taken to increase the safety of the Netherlands against flooding[13]. As a result of the advices of the Delta commission the Dutch started constructing the Deltaworks. "The construction of this prestigious water defence project in the Dutch province of Zeeland was a huge undertaking and unique in many aspects, driven by a culmination of the technocratic and scientific regime" (van der Brugge et al. 2005 pp.168). As one can see in figure 7 the Delta works comprises a complex of dams, barriers and bridges. In this complex, as mentioned before, the Oosterschelde storm surge barrier represents a special case.


**Figure 7: overview of the Delta works**

The flagship of the Delta works is the storm surge barrier in the Oosterschelde in the province of Zeeland. This flagship status is articulated by the fact that the Delta expo, the Delta works visitors centre, is located along the centre of the barrier. Wiebe Bijker, one of the 'founding fathers' of the social construction of technology movement has used this same barrier to exemplify his argument

[12] See for more details on this flood disaster the website: http://www.deltawerken.com/English/

[13] See for more details: http://www.zeeuwsarchief.nl/strijdtegenhetwater/Commissie/index.htm

on the politics that are attached to dams: "The Oosterschelde storm surge barrier is not only promoted as a technological wonder; it was also hailed as a marvellously democratic thing. Mockingly—because of its literal compromise character as a thing that can be both open and closed—it can be said to represent the Dutch consensus style of politics. Moreover, the fact that even its technical details were discussed in parliament makes it almost a 'democratically designed' thing. Most important, its operating characteristics are not permanently cast in steel and concrete but can be modified and thus adapted to changing ideas about safety and ecology" (2007b pp.121). The book by de Schipper, called dramatically, but most likely not exaggerating this tumultuous history, *Battle over the Oosterschelde*, deals with this 'democratic' and political aspect of the surge barrier. He tells the story of a hardly formally organized group of 'idealists' that managed to enter this political arena, and had great influence on the final result. This well documented book shows that there is reason to put some question marks behind the word 'democratic' as it is used by Bijker in multiple accounts (2002; 2007a; 2007b).

In his book de Schipper shows that all 'normal' and 'democratic' attempts to influence the design process by all sorts of intellectuals that committed themselves to the Oosterschelde failed (de Schipper 2008). It was only until an anarchistic movement consisting primarily of youngsters from the fishermen's town of Yerseke, by means of illegal action, that it was successfully managed to influence the Delta commission and parry the full closure of the Oosterschelde estuary. The writer even argues that, with the benefit of hindsight, the incredibly expensive 'democratic' design should never have been constructed if only for the ecological damage it has caused by reducing the tidal activity in the Oosterschelde. Bijker here perceives this history differently when he states: "And thus collaboration re-emerged, not only between the Rijkswaterstaat and the construction companies but also between the hydrological engineers and the ecologists. The Rijkswaterstaat recuperated after the slap in the face and regained control over the process, although for the contracting companies the Oosterschelde barrier remained one of the sweetest projects ever. Afterward its revival continued, and by the end of the last century the agency had recovered its central institutional position in integrated water management. The hydrological science and technology deployed in the project were indeed radically innovative, but could only be developed from the basic techniques of previous centuries through the gradual learning process of the Delta school. No surprise, then, that all involved—including the Rijkswaterstaat, the construction companies, environmental action groups, and politicians—are now happy with the barrier. Success has many fathers, and Dutch success even more so" (2002 pp.584). Similarly, in a more abstract fashion, Meijerink states: "After the resolution of the Eastern Scheldt controversy, learning across the safety coalition and the environmental coalition started to develop"(Meijerink 2005 pp.1071).

The 'new' Delta commission, also known as the Veerman Commission, can be seen as contemporary follow-up of the first Delta commission. "The Government of the Netherlands requested an independent Commission of State (the Delta Commission) to give its advice on flood protection and flood risk management in the Netherlands for the next century, while keeping the country an attractive place to live, work and invest. Large parts of the Netherlands lie below sea level and are even now experiencing the effects of climate change and sea level rise. The Netherlands delta is safe, but preserving this safety over the long term involves action now" (Delta Committee: Working with water 2008). The recently presented advice by the Delta commission in September of last year has harvested a great momentum for 'the Dutch water problem'. Simultaneously, criticism was raised concerning the lack of rationality in the Netherlands when

the word 'flooding' is used[14]. Also there have been disputes about the scientific soundness of the report and advices that have been formulated by the 'new' Delta commission[15].

A 'turn' is quite obviously visible when looking at the report by the 'new' Delta Commission. The title of their report is "working with water"[16], this already indicates quite a different approach then the working *against* the water which had been dominant in the technocratic post 1953 flooding disaster era's. In their report the commission comes up with a list of twelve recommendations (Delta Commission 2008a). For the Philipsdam, and the Krammer-Volkerak-Zoommeer there's one recommendation in particular that is relevant, recommendation number eight:

"*The Krammer-Volkerak Zoommeer, the Grevelingen and possibly also the Eastern Scheldt* [Oosterschelde] *must be re-arranged to provide temporary storage of excess water from the Rhine* [Rijn] *and Meuse* [Maas] *when discharge to the sea is blocked by closed storm surge barriers. A salinity gradient (a natural transition between fresh and salt water) in this area is a satisfactory solution to the water quality problem and can offer new ecological opportunities. In this case an alternative fresh water supply must be provided.*"[17] (Delta Commission 2008b pp.10)

The Delta commission clearly makes two points, on the re-introduction of a salinity gradient as a solution for the water quality problem, i.e. the blue-green algae problem and on the storage of river water. The first, the salinity gradient, is going to be dealt with more in depth in the next chapter. The second strongly relates to the 'Room for the River' programme.

### 2.1.2. Room for the River, 'De- poldering' and the Water Framework Directive

The 'Room for the River' policy directive was introduced in the year 2000. Its name pretty much explains what it entails, giving more room to the river for flood control. A shift from a 'fighting against the water' policy discourse to a 'living with water' discourse is clearly visible in the Room for the River programme. In this section I will introduce this programme and the closely related, fashion of 'de-poldering'. I will limit myself to a very brief introduction, and deal particularly with the area's where it has common grounds with the hydrosocial-network studied here. Finally I will list the five main goals of the Water Framework Directive, which is an European policy framework which in currently being implemented.

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[14] See for example: M. Chavannes, NRC-Handelsblad, 4 september 2008 *Bij water en daadkracht stopt het verstand*, Roth & Warner, de Volkskrant, 2 juni 2008 *Kalm aan met die wateroorlog* and Financieel dagblad 2008 *Delta programma te eenzijdig.*

[15] See for example: R. Didde, de Volkskrant, 13 September 2008: "*Dijkverhoging tegen stijgend zeewater: waarom moet dat eigenlijk? Deltacommissie Wetenschappers zijn niet overtuigd van de maatregelen die Veerman c.s. in hun Rapport adviseren*".

[16] In Dutch: "*Samen werken met water*"

[17] Dutch version, in: 'Samen Werken met Water', page 59: "*De Deltacommissie beveelt aan om het Krammer-Volkerak Zoommeer samen met de Grevelingen en eventueel de Oosterschelde in te richten voor de tijdelijke berging van rivierwater voor de situatie waarin hoge rivierafvoeren samenvallen met gesloten stormvloedkeringen in de Rijnmond.*

*De Deltacommissie is van mening dat een zoet-zoutgradiënt voor het Krammer-Volkerak Zoommeer een goede oplossing is voor het waterkwaliteitsprobleem en nieuwe ecologische kansen kan scheppen. Voor alternatieve zoetwater-voorziening moet in dat geval zorg worden gedragen*".

Meijerink gives a nice description of the emergence of the 'new' policy discourse in relation to two (near) river floods: "Whilst in 1953 the country was flooded by the sea, in 1993 and 1995 water levels in the Rhine and Meuse rivers rose to extreme heights and riverine areas were in serious danger. In 1995, 200 000 people were evacuated. In the end, there was no serious flooding, but the Dutch had to conclude once more that water cannot be easily tamed. These shock events raised awareness that in the long term the Dutch would not be able to fight against the water with just higher dykes and better technical infrastructure. It was realized that too much land had been taken from the river and other water systems, and that the natural dynamics and water storage capacity of these systems had to be restored at least partly, to prevent future flood disasters. Besides the shock events of 1993 and 1995, the expected impact of climate change on flood vulnerability in the Netherlands has been an important trigger for the emergence of the new policy discourse 'living with the water'"(Meijerink 2005 pp.1068). As mentioned before, the 'Room for the River' programme can be seen as an exponent of this new policy discourse. Roth and Warner provide an interesting account on some aspects of this programme (2007). In their study they examine the role of participation in the implementation of 'calamity polders'. These 'calamity polders' are areas designated for 'controlled flooding' and are located in "relatively scarcely populated areas with little economic value" (ibid. pp.520). They show how a lack of public participation eventually backfired. In 2001, after controversies around the 'calamity polders' came up, the national government installed a commission, the Luteijn Commission, for examining the relevance of these polders. Roth and Warner show how this commission created its own 'facts' in a "traditional top-down approach" (ibid. pp.524). This top-down approach in general has been heavily criticised (see for example Hajer 2003).

Within this 'Room for the River' framework the initiation memorandum of the Environmental Impact Assessment study has been released in February 2009. In this memorandum the plan for water storage in the Volkerak-Zoommeer, which also was mentioned by the Veerman Commission, is linked to climate change. In this respect the delta area is metaphorically represented as a bathtub. This bathtub in the future will fill up in times of high river discharges and closed sea protecting barriers. The idea is, in the case of the water storage Volkerak-Zoommeer study, to equip the area to buffer the high river discharge. Currently this initiation memorandum is at the stage of a public inquiry procedure.

Similar to the 'Room for the River' issues, areas around the Westerschelde are involved in currently ongoing discussions about de-poldering. De-poldering involves 'giving back' reclaimed land to the water. The Netherlands has a rich history of land reclamation (see figure 8). Though after World War II two the tendency was to reclaim as much land from the sea as possible, historically the de-poldering fashion is not even so surprising. If you look at a (historical) map of the Zeeuwse delta, traces of all sorts of 'drowned lands'[18] can be found, with Saeftinghe as the most obvious example, but there are also Koudekerke, with the still remaining 'plompe' tower as the silent witness, Reimerswaal, Moggershill and Orisant[19]. Currently the scene of battle regarding the 'ontpoldering' is the agricultural area in the east of Zeeuws Vlaanderen, in the very south of the Zeeland province, the Hertogin Hedwigepolder. The process and discussions seem to follow a similar trajectory as the 'calamity polder' described in the above. Here also a commission

[18] In Dutch: "*verdronken land*"

[19] See for more info: http://www.verdronkenland.nl and the novelesque http://www.orisant.com/

has been installed to give an advice on the current dispute, the Nijpels Commission[20]. It would be a thesis study, at least, on itself to go into these discussions[21] and how in this process facts are constructed and contested. For this thesis it is relevant, as will be shown in chapter four, that in these discussions nature and agricultural representation organisations are opposed to each other, and these same representative organisations meet each other again in the Philipsdam discussions.

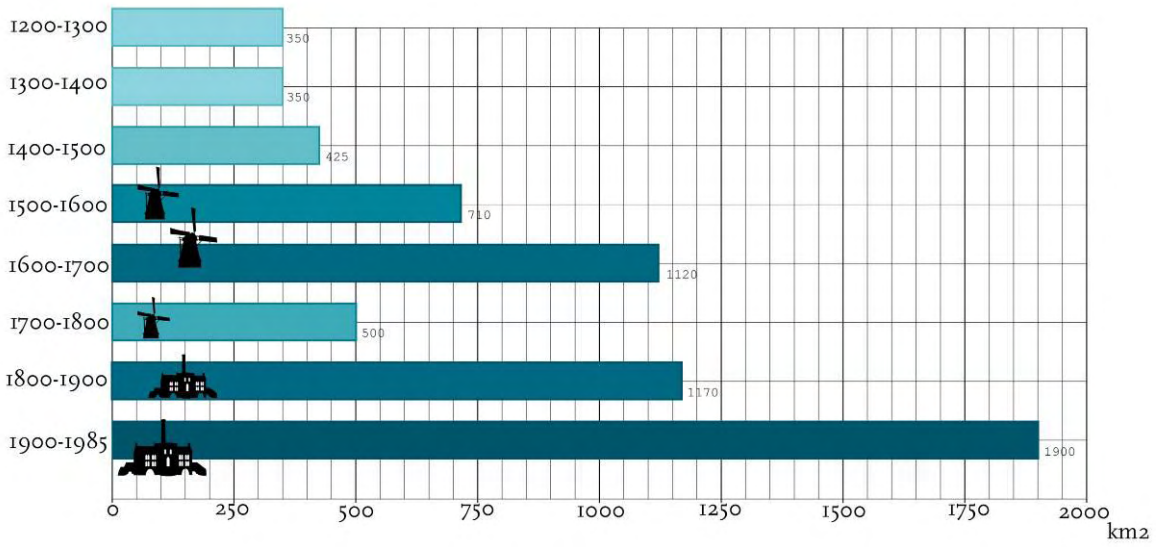


**Figure 8: land reclamation per century in km² [22]**

Twenty five years of European cooperation on their common water and environmental policies has resulted in a long list of rules, regulations, directives, protocols, etcetera. On 22 December 2000 the 'Directive 2000/60/EC of the European Parliament and the Council of 23 October 2000 establishing a framework for Community action in the field of water policy', in other words: the European Water Framework Directive[23]. The directive functions as an integrating framework.

"The purpose of this Directive is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater which:

1. prevents further deterioration and protects and enhances the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystems;

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[20] See for example: A. Schreuder, NRC-Handelsblad, 22 october 2008: "*Nijpels heeft de Zeeuwen nog heel wat uit te leggen*"

[21] See for anti-de-poldering arguments: http://www.ikmaakmezorgen.nl

[22] This picture is taken, with kind permission, from the MSc thesis "*Medicating the Broad Coast: from single coastline towards a coastal landscape zone of size*", by Ian Officer and Jo Groven, November 2008.

[23] The section on the European Water Framework directive is based upon the Integrated Water Management course reader of 2006 (HWM-21306), edited by L. Santbergen and the website: http://www.kaderrichtlijnwater.nl, visited 22 April 2009.

2. promotes sustainable water use based on a long-term protection of available water resources;

3. aims at enhanced protection and improvement of the aquatic environment, inter alia, through specific measures for the progressive reduction of discharges, emissions and losses of priority substances and the cessation or phasing-out of discharges, emissions and losses of the priority hazardous substances;

4. ensures the progressive reduction of pollution of groundwater and prevents its further pollution, and;

5. contributes to mitigating the effects of floods and droughts" (E.U. 2000 pp.5)

The Water Framework Directive is influencing the process around the Philipsdam by setting boundaries to possibilities and formulating procedural requirements.

Concluding, one can "observe institutional changes beyond discursive shifts, particularly in terms of new legislation and procedures. [...] Furthermore the traditionally closed, technocratic and 'etatist' political cultures of the Dutch water management has become more open-minded and new coalitions on nature development in river basins are emerging in flood plain projects" (Wiering and Arts 2006 pp.336).

## 2.2. Some Conceptual Thoughts on Policy Processes

Before going into the 'findings' chapters of this thesis (chapters 3 and 4) in this section I want to address two issues. This section will not be a framework, nor will it be rooted on some sort of 'grand story'. I am not a political scientist and I would not want to get my fingers burned on matters that lie beyond my field of study. I just want to make an effort to try to understand what I have seen 'in the field'. The first issue that I want to deal with is policy making as the science of muddling through (Lindblom 1959; 1979). As second issue that I want to touch upon is an idea of how policy evolves over time, in relation to science, governance and ecosystems: a co-evolutionary approach (Norgaard et al. 2008).

Lindblom formulates two approaches for complex problems: the root and the branch method (1959). The root method is also known as the rational comprehensive method, or, mean-end relationship method. This method takes an calculative approach, by formulating goals (ends) and specifying weights to these goals. Consequently policies are 'tested' with a rational maximisation function. According to Lindblom this is typically a technological approach. "Ideally, rational-comprehensive analysis leaves out nothing important. But it is impossible to take everything into consideration unless 'important' is so narrowly defined that analysis is in fact quite limited" (1959 pp.84). Since capacities, being intellectual or financial, are in practise always limited, this method does not work for solving complex problems, he argues.

The branch method on the other hand, also named the 'incremental method' conceptualises means and ends as fundamentally intertwined. The choice for a particular policy in this case heavily relies upon agreement. On the importance of this agreement he states: "In an important sense, therefore, it is not irrational for an administrator to defend a policy as good without being able to specify what it is good for" (Lindblom 1959 pp.84). Lindblom argues that 'incrementalism', or 'muddling through': "is and ought to be the usual method for policy making"

(1979 pp.517). For me though, the muddling through is only relevant in a descriptive sense, in labelling processes that I come across, not by advising on how thing should go.

After now having made this distinction between this rational comprehensive method and the incrementalistic method I want to conclude this chapter by dealing shortly with an article written on the history of the California Delta (Norgaard et al. 2008). I want to do this for two reasons. Firstly, because they provide an interesting case study on a policy process in the complex socio-ecological systems: the California Delta. This Delta has interesting similarities with the Dutch Delta. Secondly, because they have portrayed the Delta history as a co-evolutionary process between science, governance and ecosystems. In combination with the above mentioned 'muddling through', this co-evolutionary perspective has been very clarifying to me, in the course of this research. In their article they make three arguments. "First, visions of the Delta's future must be both dynamic and open to surprise" (ibid. pp.2). By this argument they make a case for approaching problems in the Delta as dynamic socio-ecological problems. Secondly, they argue that "how the system is understood and governed needs to be seen as endogenous to its processes of change" (ibid.). And finally: "how science is undertaken and how science interacts in the policy process have been adapting, globally and for the California Delta, to this more integral, dynamic understanding of the human predicament" (ibid.). The writers present an interesting historical account on the Delta, which I am not going to repeat here. What I do want to repeat is the way I see it, their core message, on how their "portrayal highlights both how Delta ecological processes change and how the way scientists at different times have bounded problems and focused on some interactions out of the immense complexity of the Delta, while ignoring others, is intertwined with governance objectives and past and intended transformations of the environment. There are diverse ways of understanding, interacting with, and governing the Delta and different actors align with different ways. Over time, some ways dominate and affect mutual selection. Surprises and the continued presence of diversity usurp path-dependencies, and new ways of seeing or acting upon the Delta gain currency" (ibid.).

The way I see it, both ideas mentioned above, 'muddling through' and a 'co-evolutionary' approach argue against a reductionist approach of complex problems. This might seem as labouring an obvious point, in practise it appears not to be. In the following chapters I will try to show how this case, the Volkerak-Zoommeer, is co-evolutionary muddling through!

# 3. Re-Opening of Dams and Debates

*Alert: blue-green algae (Cyanobacteria) in the Volkerak-Zoommeer basin. Cyanobacteria is poisonous. Salinity is lethal for the Cyanobacteria, the blue-green algae. Sometimes one and one makes three... Open up the Philipsdam, turn the basin saline, re-establish estuarine nature in the basin, case closed. Right? No, the agriculture needs the fresh water from the basin. Hmmm. New problem. Establish alternative fresh water supply for agriculture, case closed. Right? No... Measures cost money, as always, but who is going to pay? Fresh water is needed, but is this water available? Oh, and what about that salt water leaking through the Volkerak-sluices in the north? How substantial is this leakage?*

In the following chapter I describe what happened with the Philipsdam since the blue-green algae surfaced in the early 1990's. I will analyze what action has been undertaken since the problems emerged and by what factors this process was shaped. This will be done at two levels, first within the core process, the currently ongoing plan study, secondly at the level of (bureaucratic) institutions, with the various actors representing organisations. Following, I provide a descriptive account of the shaping aspects of this process. By this I mean that I will look into how the processes around the Philipsdam and the Volkerak-Zoommeer, affect its surroundings, both physically, in terms of interaction between water bodies, and institutionally. Consequently, I deal with the question how problems are formulated and interpreted by the different actors that are part of what I earlier have called the Philipsdam's hydrosocial-network. Analyzing the interpretive flexibility of the situation will be done for both now, the current problems that are recognized and formulated by actors, and for the problems that are foreseen for the future, if planned or proposed changes are to be executed. In this chapter I will plentifully utilize the literally transcriptions of the interviews held and meetings that I have attended, by doing so I try to limit my influence to a minimum, though still being substantial.

## 3.1. The Exploration Phase

In 2003 Rijkswaterstaat started the project "exploration solution directions Volkerak-Zoommeer"[24]. This project has been executed under the command of the General Directorate Water[25] and the plan for this project has been specified by the Administrative Consultation Krammer-Volkerak (BOKV)[26]. Involved parties in this BOKV are the Ministry of Agriculture, Nature and Food quality (LNV), the Ministry of Transportation and Water Management (V&W), the three provinces involved, Zeeland, Noord-Brabant and Zuid-Holland, the three Water boards Zeeuwse Eilanden (WZE), Brabantse Delta (WBD) and Hollandse Delta (WsHD) and the seven municipalities bordering the Volkerak-Zoommeer. The goal of this exploration project has been to develop directions for structural solutions. The main reason for starting this project was that "since 1994 there has been an increase in inconvenience caused by the blue-green algae and it became clear that the ecological development was not going in the preferred direction"[27]. The

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[24] In Dutch: *'Verkenning oplossingsrichtingen Volkerak-Zoommeer'*

[25] In Dutch: *'Directoraat Generaal Water'*

[26] In Dutch: *'Bestuurlijk Overleg Krammer Volkerak'*

[27] Original: *"Maar vanaf 1994 is er in toenemende mate sprake van overlast door blauwalgen en werd steeds duidelijker dat de ecologische ontwikkeling niet de gewenste kant op ging"*. Source: Samenvatting Verkenning Oplossingsrichtingen Volkerak-Zoommeer, November 2003

exploration project resulted in a list of eight possible outcomes of development directions, varying from a total 'reset' of the system, a return to the situation as it was before 1987, to a Volkerak-Zoommeer with fresh-stagnant water.

The formulation of the objective of the exploration phase reads: "The exploration of the directions for development of the Volkerak-Zoommeer needs to provide solution directions for the realization of the long term ambition in which tackling the blue-green algae problem on the mid-long term is imperative"[28]. Practically it is formulated that by the year 2035 the system needs to be 'sustainably functioning' with a high level of self-regulation.

According to the exploration study "the main cause of the blue-green algae problem is the large supply of fertilizers by the river coming from Brabant and the Hollandsch Diep"[29].

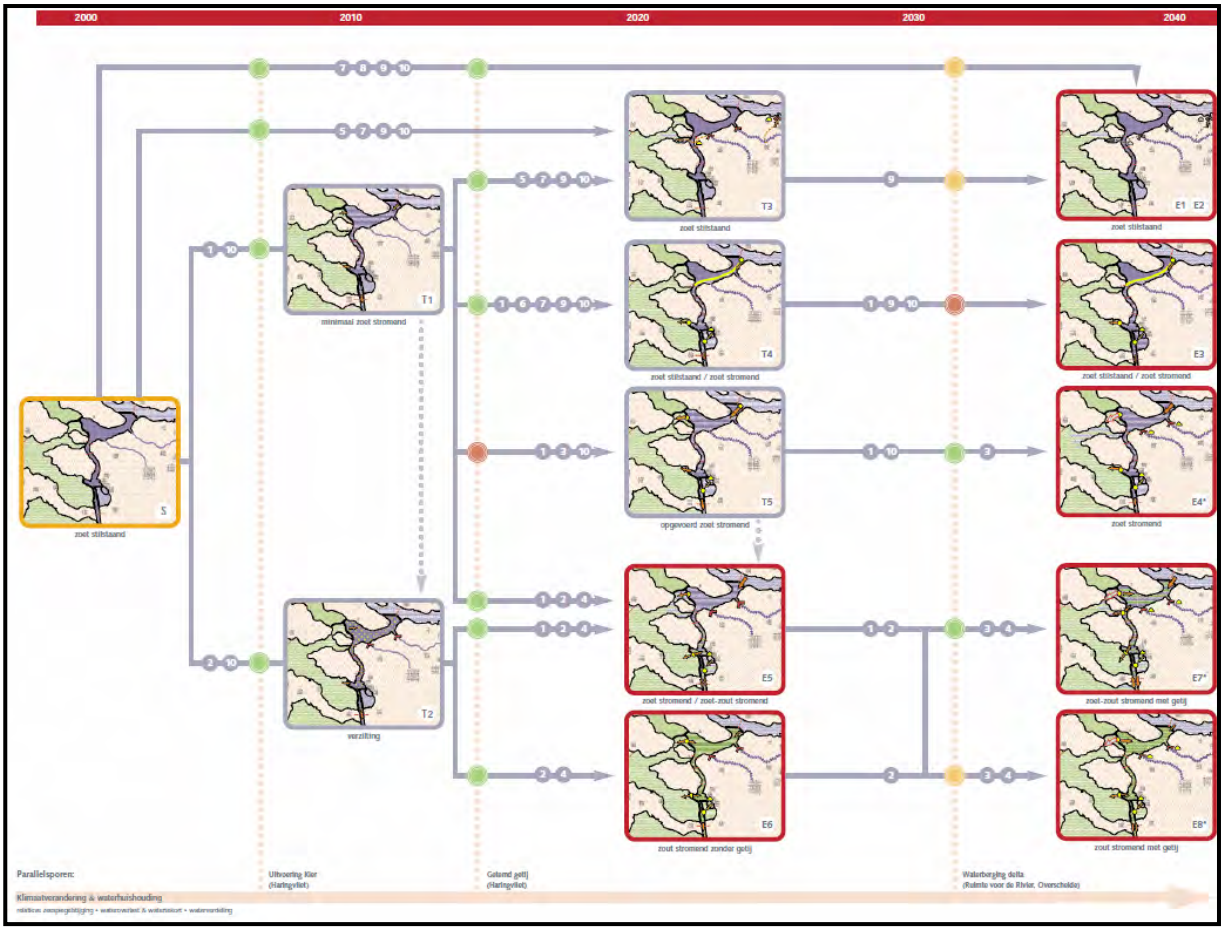


**Figure 9: route-map exploration solution directions**

**[Source: Routekaart Verkenning Volkerak Zoommeer, see: http://volkerakzoommeer.nl]**

[28] Original: "*De Verkenning oplossingsrichtingen Volkerak-Zoommeer moet oplossingsrichtingen aanreiken voor het realiseren van het lange termijn streefbeeld, waarbij de aanpak van het blauwalgenprobleem op de middellange termijn leidend is*". Source: Rapport Verkenning Oplossingsrichtingen Volkerak-Zoommeer, November 2003, p.12

[29] Original: *"De belangrijkste oorzaak van het blauwalgenprobleem is de grote aanvoer van meststoffen vanuit de Brabantse rivieren en het Hollandsch Diep"*. Rapport Verkenning Oplossingsrichtingen Volkerak-Zoommeer, November 2003, p.10

The exploration is conducted by what is called a shared approach. In this shared approach the solution directions are developed by a 'solution direction team' consisting of employees of RIZA (National Institute for Integrated Freshwater Management and Wastewater treatment), RIKZ (National Institute for the Coast and Sea), de Bouwdienst (Construction Service), Rijkswaterstaat Zeeland and Hoogheemraadschap West-Brabant (after a merger with 3 Water boards currently part of the Waterboard Brabantse Delta). The formulation of the solution direction resulted in what is called a route map, which can be seen in figure 9. On 6 June 2002 a workshop was organized with stakeholders from the region, and the ideas mentioned here where developed into eight 'destinations' by the solution direction team. The first results were presented to a group of experts working at the national government, provincial government, water- and nature managers and research institutes.

I will now briefly describe the eight 'destinations[30]', as they are called in the exploration projects end report.

1. A fresh and stagnant Volkerak-Zoommeer. In this option the Volkerak-Zoommeers water quality is to be improved by limiting the inflow of nutrients from the Brabant catchment area, which is currently discharged by the rivers 'Dintel' and 'Vliet', and the inflow from the Hollandsch Diep upstream.
2. A fresh and stagnant Volkerak-Zoommeer, disconnecting the 'Dintel' and 'Vliet'. This option is basically the same as the first. The only difference is that the two rivers coming from Brabant are now diverted to the Oosterschelde and Hollandsch Diep, and no longer into the Volkerak-Zoommeer.
3. A fresh stagnant Volkerak with a canal outside the dyke and a fresh flowing Zoommeer. In this option there is new dam constructed in the Volkerak causing the rivers from Brabant to end up in a canal that connects the Hollandsch Diep with the Zoommeer, and therewith compartmenting the Zoommeer from the Volkerak.
4. A fresh flowing Volkerak-Zoommeer. In this option water from the Hollandsch Diep is diverted to the Volkerak-Zoommeer, which in turn discharges into the Oosterschelde.
5. A fresh flowing Volkerak and a fresh-saline flowing Zoommeer. This option is similar to option 4, but the Zoommeer is flushed with saline Oosterschelde water.
6. A saline flowing Volkerak-Zoommeer. Flushing with water from the Oosterschelde, with a subdued tidal activity, with a range in the Volkerak-Zoommeer of approximately half a meter.
7. A fresh-saline Volkerak-Zoommeer, with tidal activity. A fresh-salt water interaction similar to the situation before 1987, fresh water coming from the Hollandsch Diep, saline water from the Oosterschelde.
8. A saline flowing Volkerak-Zoommeer, with tidal activity. Similar to option 6, though now with full tidal activity, ranging up to 1,5 meters.

After the formulation of these eight 'destinations', a second workshop was organized on 10 April 2003, in which an inventory was made of the stakeholders preferences. This inventory was made using the themes *safety*; *water management*; *shipping*; *nature and landscape*; *recreation*; and *residing*

[30] In Dutch: *'eindstation'*

*and working*. Eventually from this workshop it was concluded that the first 3 options, all founded upon a fresh stagnant Volkerak-Zoommeer, are not desirable. It is concluded, option seven is the most favourable option. The remark is made that the agricultural stakeholders prefer option 4, and mark the options with a saline or fresh-saline Volkerak-Zoommeer as undesirable, or even calling it unacceptable. According to the report this bi-polarity of destination number 7, being the most popular on the one hand, and 'unacceptable' on the other was the reason for organizing an extra session during the workshop in which the possibilities for alternative fresh water supply for the agriculture in the region (western Noord-Brabant, Tholen and st. Philipsland and Zuid-Beveland).

The report of the exploration project concludes that there are three favourable solution directions:

1. Estuarine dynamical. Construction of a new structure in either the Philipsdam or the Oesterdam. The Volkerak-Zoommeer will be the arena for the transition from the fresh river systems (Hollandsch Diep) and the Oosterschelde. Tidal range will be 1 – 1.5 meter. It is noted that, given the high costs of the required new structures, this option will only be a realistic possibility in case the Volkerak-Zoommeer is to be used as a water storage buffer for river water. In that case policy goals concerning safety, water quality and ecological recovery can be attained in a cost effective manner. The salinity level in this option will cause the algae to disappear.
2. Dynamic arm of the sea. In this direction a connection with the Oosterschelde is established by constructing a structure in either the Philipsdam or the Oesterdam. The inflow of water from the Hollandsch Diep will be minimal, down to such a level that the salinisation of the upstream waters is prevented. Again, as it is for the estuarine dynamical direction, this direction will only be a realistic possibility when combined with the water storage buffer for safety issues. The increased salinity level in this option will cause the algae to disappear.
3. River dynamical. In this direction a continued flow of water from the Hollandsch Diep is diverted to the Oosterschelde and the Westerschelde. The residence time of the water in this option will be reduced to a maximum of 30 days, reducing the likelihood of blooming algae. It is noted that this option is favourable to the agriculture in the region.

For the mid-long term, it is reported that there are two favourable options:

1. Fresh water measures. In this option the currently existing structures are to be used for a flow of fresh water. The idea is to divert water from the Hollandsch Diep, via the Volkerak and Zoommeer unto the sluices at Bath, where it is diverted into the Westerschelde at low tide. The sluices at Bath currently have a capacity of 125 $m^3$/sec, which will be just enough to reduce the residence time of the water in the Volkerak-Zoommeer to the desired 30 days. This will only be possible though, when there is enough water available from the Hollandsch Diep. In case of a discharge in the Dutch rivers of 1200 $m^3$/sec, the entire flow is needed for preventing salinity problems in the Nieuwe Waterweg, which is the canal that is dug between Rotterdam and the North Sea. In case of a river discharge below 1350 $m^3$/sec, insufficient water will be available for flushing the

Volkerak-Zoommeer. According to the report, an analysis of the discharges of the river Rijn over the period 1989 and 2002 show that a continues year-round availability of the 125 $m^3$/sec is scarce.

In the report it is stated that early 2003 Rijkswaterstaat, with consultation from the BOKV, filed a request for a onetime experiment for this measure, to examine the effects this would have. In July 2003 this request was declined by LNV minister Veerman. Main reason that was given for this decline is the possible negative effects it might have on the 'Land van Saeftinghe', a nature conservation area in the Westerschelde, where the water was planned to be discharged. According to Carla Michielsen, who works as a representative for the zLTO, the Southern Agri- and Horti- culture Organization, this decline negatively affected other requests:

*"[...] then the application is frozen, because the jurists at LNV didn't know what to do with this, and so the procedure is frozen and V&W did not persevere [...] consequently we said, ok, this request was for the summer, this has a lot of effects on the Land van Saeftinghe, then try the winter and spring [...] then there is sufficient water available. It seems to me that is very difficult between ministries to re-start such a permission trajectory"*[31].

2. Saline water measures. In this option for the mid-long term saline water will enter the Volkerak-Zoommeer by making use of the currently existing structures. This will have two effects, first the residence time of the water in the basin will be reduced, and secondly the blue-green algae cannot cope with the increased salinity levels. In this option adaptations to the fresh water system in Brabant are required.

After finishing the project exploration water quality, in November 2003, a plan study was launched, with the idea to draw upon the findings of the exploration study, towards the formation of an actual plan. The next section of this chapter will deal with this plan study.

[31] Goes, 24-2-2009, interview Carla Michielsen, ZLTO [23:30]: *"dan is de aanvraag stilgelegd, omdat de juristen binnen LNV dachten, ja nu weten we toch niet wat we hier mee aan moeten. Dan wordt de procedure stilgezet. En verkeer en waterstaat heeft dat niet doorgezet. [...] toen hebben we gezegd van, nou ok, dan hebben we in de zomer en voorjaar, dan heeft dat veel effecten op het land van Saeftinghe, maar probeer het een keer in de winter, [...] dan heb je toch voldoende water. Nou dat, blijkbaar is het dan toch heel lastig tussen ministeries om weer in zo'n vergunningstraject te komen"* [056-058]

## 3.2. The Plan Study Phase

The plan study was launched with a initiation memorandum Volkerak-Zoommeer[32] in December 2004. The plan study is currently in its finalizing stage, with its probable climax this summer, when it is up to the Secretary of State, Huizinga, from the Ministry of Transportation and Water Management, to take a decision on the future of the Volkerak-Zoommeer. In this section I will deal with this plan study, what has happened since the start of the study. In this section I will analyze first of all what the current status of this study is and consequently dive into its recent history to examine how this study has developed over time. For this analysis I will make use of the interviews done with actors that form part of the hydrosocial-network, meetings that I have attended during the course of this research. Furthermore I will draw from written material as the initiation memorandum, the information bulletins that have been published by the plan study and vested interactional documents.

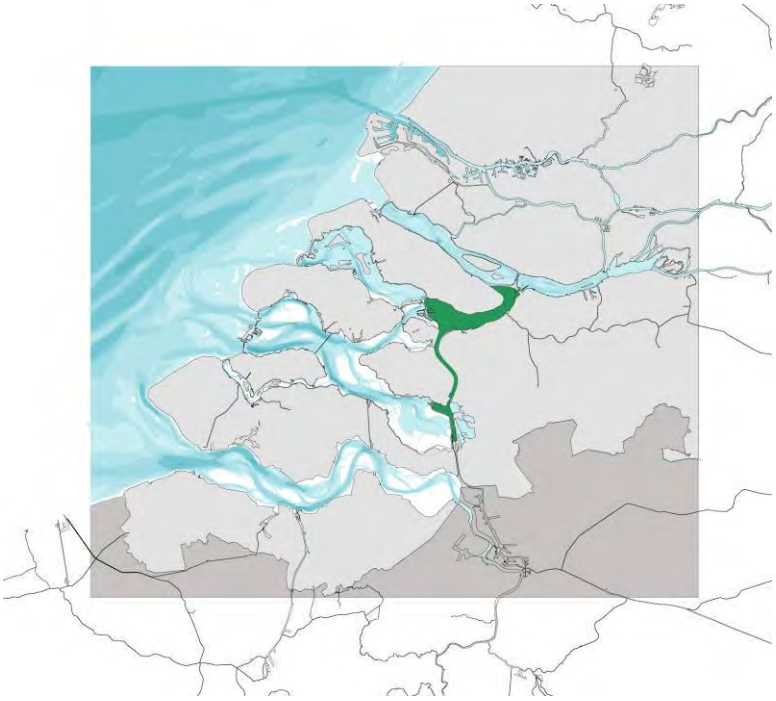

**Figure 10: Volkerak-Zoommeer**

### 3.2.1. Setup

René Boeters: [...] *It has been a very participatory process with a substantial contribution by regional and local governments.*

Arjen Zegwaard: *that is, mainly the Water boards and provincial governments?*

Boeters: *Yes, the provinces are the main 'pullers', followed by the waters boards*

Zegwaard: *are all provinces involved?*

Boeters: *Yes, that is what makes it so complex, it* [Volkerak-Zoommeer] *is located in three provinces, three Water board have to do with this, seven municipalities and the national government. So that's quite a circus. Anyway, the process has been run reasonably well, with certain outcomes that can be read in the newspapers. Currently we are busy writing the report and this summer it will get exciting to see whether the Secretary of State dares to take a decision.*[33]

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[32] In Dutch: '*Startnotitie Volkerak-Zoommeer*'

[33] Middelburg, 10-2-2009, interview René Boeters, project leader plan study, Rijkswaterstaat dienst Zeeland [6:15]: "Boeters: *Nou ja vooral ook hier in de regio hoor, het is een erg participatief project geweest, met veel inbreng*

The 'circus' which René Boeters, who on behalf of Rijkswaterstaat works as the project leader of this plan study, refers to, took off with the initiation memorandum Volkerak-Zoommeer in December 2004. In this initiation memorandum the central issue was referred to as "since the early 1990's we are facing severe water quality problems. The ecosystem is not functioning properly causing an annually returning problem with the blooming of the blue-green algae. This bloom of algae can cause other species' mortality and causes severe inconvenience to the users and the surroundings"[34]. The goal of the plan study is to develop structural solutions for the Volkerak-Zoommeers problems, which in the long term (2040) will lead to a sustainably functioning ecosystem in the Volkerak-Zoommeer. The initiative for the study has been taken by the BOKV and the General Directorate Water. The plan study is the formal continuation of the exploration study described above. According to the initiation memorandum this exploration study will result in a limited number of possible successful solutions. Furthermore they build upon the notion developed by the exploration study that a structural solution can only be met when radical measures are taken. Because of this, it was decided to split up the plan study in two phases. In the first phase, the memorandum states, the blue-green algae problem will be leading and the idea is to improve the Volkerak-Zoommeers conditions in such a way that the likelihood of unwanted algae bloom, on the mid-long term (2015) will be reduced to the minimum. The second phase of the plan study is focused at improving the overall water quality and taking the more radical measures for the long term (2040) that will lead to a more sustainable ecosystem. The alternatives that form the basis of the investigation are based upon the exploration study and the procedural requirements that are set by the Environmental Impact Assessment[35] (MER), which is a consequence of an environmental law. The alternatives taken under investigation are: fresh alternative; the saline alternative; the reference alternative; and the most environmentally friendly alternative. The fresh alternative aims at flushing the basin with fresh water from the Hollandsch Diep. The saline alternative aims at flushing the basin with water from the Oosterschelde estuary. The referential alternative will examine what will happen if the current situation is continued. And finally the most environmentally friendly alternative in which "the adverse effects for the environment are to be prevented, or at least, for as far as this is not possible, these are to be limited, while making use of the best existing ways for protecting the environment."[36]

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*van de regionale en lokale bestuurders.* Zegwaard: *dat zijn dan de waterschappen en de provincies?* Boeters*: ja, provincies als voornaamste trekkers zou ik bijna zeggen, en dan waterschapsbesturen.* Zegwaard: *en alles drie provincies zijn dat ook?* Boeters: *ja dat is het complexe er ook van, het ligt in drie provincies, drie waterschappen bemoeien zich der ook mee. 7 gemeenten en het rijk, dus dat is al een heel circus. Maar goed, dat is een redelijk goed verlopen proces geweest, met bepaalde uitkomsten die in de kranten te lezen zijn, en nu zijn we bezig dat zo goed mogelijk te rapporteren, en dan de komende zomer wordt het spannend of de staatssecretaris een besluit durft te nemen.* [022-026]

[34] Original: *"sinds het begin van de jaren '90 is er echter sprake van ernstige waterkwaliteitsproblemen. Het ecosysteem functioneert niet goed waardoor er sprake is van een jaarlijks terugkerende blauwalgenbloei. Deze algenbloei kan tot sterfte van andere soorten leiden en veroorzaakt grote overlast voor gebruikers en omwonenden".* Source: Startnotitie Planstudie Waterkwaliteit Volkerak Zoommeer.

[35] In Dutch: Milieu Effect Rapportage

[36] Original: *"waarbij de nadelige gevolgen voor het milieu worden voorkomen, dan wel, voor zover dat niet mogelijk is, deze met gebruikmaking van de beste bestaande mogelijkheden ter bescherming van het milieu, zoveel mogelijk*

The memorandum indentifies various policy frameworks which will affect the possibilities for the Volkerak-Zoommeer. On the international level these are Bird- and Habitat- directives and the European Water Framework Directive (KRW)[37]. On national and provincial level various governmental memoranda are relevant. Ongoing projects that are identified as possibly having effects of the study are Room for the River project[38], the changed management of the sluices of the Haringvliet and the 'creek plan'[39] 'Bierkreek', on the island of Goeree-Overflakkee. The effect of the different alternatives will be differentiated over the different types of uses. These types of uses are: Shipping; Freshwater supply, agriculture and regional water management; living and recreation; and fishery.

### 3.2.2. Process

In the information bulletin of the Plan Study, dated June 2005, all four alternatives are briefly discussed. Concerning the fresh alternative it is mentioned that this alternative strongly depends on the availability of water coming from the rivers Rijn an Maas during the different seasons. For the saline alternative it is mentioned that the blue-green algae cannot survive chloride levels above 9 grams per litre. Furthermore it is posed that the experience from the Veersemeer and Grevelingenmeer are used for the confirmation of expectations. The information bulletin also mentions the arithmetical model that has been developed by the University of Amsterdam (UvA) in collaboration with Rijkswaterstaat. This model can predict the effect of large scale measure on the bloom of the blue-green algae. Exploratory calculation on various flushing scenario's indicate that both options appear to be suitable for fighting the blue-green algae.

In May 2006 the information bulletin reports that the first phase of the plan study in finished. On what happened so far they report:

"*In September 2005 the assignment was given to Royal Haskoning* [a Dutch consultancy firm]. *Part of the plan study is executing an effect-study using 1d, 2d and 3d hydrodynamic models. This is going to be conducted by Delft Hydraulics and the University of Amsterdam. For the first phase Royal Haskoning has used 1D models to study seven alternatives and mapping the current situation. Based on this the BOKV has, on the 6 March 2006, selected 2 options that will be researched further in the second phase of the plan study: one fresh and one saline. The second phase has now started*"[40].

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*worden beperkt."* (Wm, artikel 7.10, lid 3). Source: Startnotitie Planstudie Waterkwaliteit Volkerak Zoommeer.

[37] In Dutch: "*Kader Richtlijn Water*"

[38] In Dutch: "*Ruimte voor de Rivier*"

[39] In Dutch: "*Krekenplan*"

[40] Original: "*In september 2005 is de opdracht gegund aan Royal Haskoning. Onderdeel van de Planstudie is het uitvoeren van effecten- studies met behulp van 1D, 2D en 3D stromingsmodellen. Dit wordt gedaan door WL | Delft Hydraulics en de Universiteit van Amsterdam. Voor de eerste fase zijn 1D modellen gebruikt. Royal Haskoning heeft zeven varianten bestudeerd en de huidige situatie in beeld gebracht. Op basis hiervan heeft het BOKV (Bestuurlijk Overleg Krammer Volkerak) op 6 maart 2006 twee varianten aangewezen voor verder onderzoek in de tweede fase van de Planstudie: één zoet en één zout. De tweede fase is nu van start gegaan*" . Source: Informatie bulletin planstudie Volkerak Zoommeer, May 2006

In the same bulletin some remarks are been made about the availability of fresh water. It is noted that substantial amounts of water will have to be let in from the Hollandsch Diep into the Volkerak-Zoommeer. The availability of this water depends on the flow rates of the rivers. The remark is made that this water is also needed to prevent salinisation in the locations in the more northern parts. In relation to this water availability attention is also paid to the relation with the planned changes in sluice management at the Haringvliet sluices. In 1970 the Haringvliet estuary was closed off by the Haringvliet dam. At the time this bulletin was published, the plans were to open up the Haringvliet sluices at high tide. This plan, often referred to as the 'Kier[41]', is seen as a significant step in the recovery process of the delta of the rivers Rijn and Maas. In the plan it is settled that the Haringvliet sluices will remain closed in case the river discharge are too low, in that case all water will be diverted to the Nieuwe Waterweg, to stop the intrusion of saline water in the direction of Rotterdam. When such a situation would occur, there would also be no fresh water available for flushing the Volkerak-Zoommeer. Later on it is stated that both options will have additional fresh water requirements. René Boeters in the same bulletin states: "Both alternatives encompass a demand for fresh water. It is possible that a realistic and affordable solution for the Volkerak-Zoommeer will impel an administrative reconsideration of the freshwater distribution in the Delta area"[42]. In that same bulletin Mrs. Dwarshuis, deputy for the Zuid-Holland province, and member of the BOKV, states that to her, one of the pre conditions for the solution in the Volkerak-Zoommeer is that there should be no additional salinisation of the northern delta and the Haringvliet. Additionally she states explicitly that there are no choices made for one particular option.

Finally, the fresh and salty options are discussed in the bulletin. For the fresh option it is again stated that the probability of this option strongly depends on fresh water discharge in the rivers. This is mentioned as being a 'crucial' issue. On the saline option it is stated that, based on the modelling study done by the University of Amsterdam, the blue-green algae will not survive chloride levels exceeding 8 grams per litre. Additionally the remark is being made that this also reduces the probability of unwanted side effects. Based on the conclusions so far the BOKV has selected two options that need to be researched more in depth in the second phase of the plan study, a fresh one and a saline one.

One year later, in July 2007, the information bulletin headlines: "Flushing with saline water appears to be the only solution for the Volkerak-Zoommeer"[43]. In the article it is claimed that both the fresh and the saline option are extensively examined and the most important conclusion is that only the saline option will result in a lasting solution. This conclusion is founded upon research done by a combined effort of Delft Hydraulics (currently named Deltares) and the

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[41] The word 'kier' is somewhat difficult to translate to English. Close translations are 'crack' in leaving a door on a crack, or 'ajar' in setting the windows ajar.

[42] Orginal: Boeters: *'Aan beide alternatieven zit een vraag naar zoet water vast. Het zou kunnen zijn dat reële en betaalbare oplossingen voor het Volkerak-Zoommeer nopen tot een bestuurlijke heroverweging van de verdeling van het zoete water in de delta.'* Source: Informatie bulletin planstudie Volkerak Zoommeer, May 2006

[43] Original: "*Spoelen met zout water lijkt enige oplossing voor Volkerak-Zoommeer*" Source: Informatie Bulletin planstudie Volkerak-Zoommeer, July 2007

University of Amsterdam. For a second opinion on the modelling approach Finnish, German and Dutch 'blue-green algae experts' where consulted.

In the fresh water option the modelling calculations are conducted with the assumption that a maximum of 150 $m^3$ per second is available. Idea behind this assumption is that more inflow will cause salinisation of the fresh water supplies in the more northern areas. The study shows that this 150 $m^3$ per second is not sufficient to get rid of the blue-green algae. In addition, it is very likely that this 150 $m^3$ per second in dry summer will not be available. Thus, the bulletin reports, the fresh alternative is not effective!

For the saline alternative the research departed from an assumed inlet capacity of 100 $m^3$ per second. The model showed that this capacity is sufficient to get rid of the algae. Remark that needs to be made is that there will be salinisation effects on the Hollandsch Diep and Haringvliet, caused by the lockage of ships in the Volkerak sluices (located on the north side of the Volkerak Lake). Besides there is also a potential risk other algae species to start blooming in the Volkerak-Zoommeer. Obviously another consequence will be that the basin cannot be used anymore for the withdrawal of fresh water, and thus alternative fresh water supply is required, which will be expensive.

Based on the reasoning mentioned above, the BOKV conducts complementary research on the effects of a saline Volkerak-Zoommeer. These studies will be conducted by Rijkswaterstaat and the Water board Brabantse Delta.

Later that year, in December 2007, a new information bulletin was put out. In this bulletin a brief overview is given of the main issues that are being studied: salt intrusion in surrounding water bodies; varieties of tidal regimes; relation to plans of water storage; and freshwater provision for agriculture.

### 3.2.3. Rijkswaterstaat

On his role, as an employee of Rijkswaterstaat Zeeland, René Boeters says: "My job is to make the process, in which we look for structural solutions for the Volkerak-Zoommeers water quality problem, thus the blue-green algae inconvenience as the central phenomenon, run smoothly. This turned out to be a complicated process. Currently we are in the final phase, the reporting phase; administratively we have made clear in what direction we should go"[44]. Boeters, and thus Rijkswaterstaat, have played a central role in the plan study. This speaks not only from the official central position that Rijkswaterstaat has been given by the BOKV, it also speaks from the interviews with Boeters in many of the more extensive newspaper articles on the Volkerak-Zoommeer situation[45]. In all interviews held for this research with employees of Water boards, I, as interviewer, was asked whether I already had spoken with Mr. Boeters. In my interview with Simon Groot, who works as a researcher/advisor at Deltares, involved in the modelling process, he identified Boeters as 'the key person'[46] in the process. Therefore, in this section, I will provide a description of how Boeters describes the course of the plan study process so far.

**Figure 11: area covered by Rijkswaterstaat**

First of all the question arises how it is possible that things have come this far, that 'we' are now planning on re-opening one of our delta works of which we, as Dutch, ought to be proud. On this, Boeters states: "It turns out that the delta works function and have functioned very well in terms of safety. There are some side effects however, which are less positive and those concern the ecology and water quality"[47]. These side effects occurred in the basins that have been closed off,

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[44] Middelburg, 10-2-2009, interview René Boeters, project leader plan study, Rijkswaterstaat dienst Zeeland: "*Het is mijn taak het proces goed te laten verlopen waarin gezocht wordt naar structurele oplossingen voor dat waterkwaliteitsprobleem in het Volkerak-Zoommeer, dus de blauwalg overlast, het voornaamste fenomeen. Dat is een heel ingewikkeld proces gebleken toch wel, we zitten nu in de laatste fase, de rapportage fase, maar we hebben al wel bestuurlijk het nodige duidelijk gemaakt, aan bestuurders duidelijk gemaakt welke kant het op zou moeten*" [020]

[45] See for example: de Volkskrant, 8 October 2008. Didde, R: "*Op een kier tegen de blauwalgen; Deltawerken Plan van Rijkswaterstaat om een doorlaat voor zout water te maken in de Philipsdam*"; BN/de Stem, 16 August 2008: "*Gevolgen Afsluiting smaken zout en zoet*"; BN/de Stem, 8 July 2008: "Strijden tegen een blauwgroene soep".

[46] Utrecht, 25-3-2009, interview Simon Groot, Deltares: "[...] *ik bedoel, die* [Boeters] *is echt de spin in het web*" [017]

[47] Middelburg, 10-2-2009, interview René Boeters, project leader plan study, Rijkswaterstaat dienst Zeeland: Boeters [8:50]: "*Het blijkt dus dat die delta werken op het gebied van veiligheid heel goed functioneren, en*

also by the compartment dams Oesterdam and Philipsdam. These where constructed "to reduce the size of the estuary, which it still was back then. Because of this reduction there still remains a substantial tidal variability, despite the fact that here [the Oosterschelde Storm Surge Barrier] the opening is reduced"[48]. The Volkerak-Zoommeer has turned fresh, and receives water from the rivers from Brabant and Hollandsch Diep with high nutrient contents. Additionally the basin has an old sea soil, which in summer delivers phosphates. In sum, this results in a situation where the blue-green algae can easily develop. Question then is whether these problems have been foreseen at the time of planning the Oesterdam and Philipsdam and plans were made for the prevention of this, by for example flushing. "Well, not really about flushing. There are people who have warned that it might happen, and thus suggestions have been made about biological management, as it is called. Taking measures in order to cushion the inflow of nutrients, by putting plants on the shores. These plants filter the water, when working according to plan. Experiments have been done even with the setting out of pikes, to get rid of the bottom grubbing fishes, which are growing in number. Also the introduction of more natural varying water levels has been suggested, high in summer, low in winter [...] but all this didn't pay off. The problem has just grown too big and proved incontrollable. Thus, consequently we now conduct a study to arrive at real structural solutions"[49]. The problem annually returns and dates back to around 1994. The bird mortality incident in 2002 provoked the start of the exploration study.

The study started off with eight alternative pathways, and as shown in the previous section, this after a while melted down to two options, a saline and a fresh one. The saline option taking water from the Oosterschelde. The fresh one diverting water from the Hollandsch Diep through the Volkerak-Zoommeer to the Oosterschelde and/or Westerschelde. Of course, there are also other options possible, looking for example at a combination with the Grevelingenmeer, which is recently also in the newspapers, since plans are being made to re-open the Brouwersdam[50]. When asked about the possibility of combining these cases Boeters responded: "currently there's a tendency of linking of issues. Yes, we slowly realise that it is more convenient to approach the

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*hebben gefunctioneerd maar dat er toch een aantal bijwerkingen zijn waar je toch wat minder blij mee moet zijn, en die hebben toch te maken met ecologie en waterkwaliteit*" [039]

[48] Middelburg, 10-2-2009, interview René Boeters, project leader plan study, Rijkswaterstaat dienst Zeeland: "*Deze dammen zijn gebouwd om het estuarium, wat het toen nog was, te verkleinen, waardoor er dus toch nog wel redelijk getij verschil zou blijven, ondanks dat je hier* [Oosterscheldekering] *de opening wat hebt verkleind"* [041]

[49] Middelburg, 10-2-2009, interview René Boeters, project leader plan study, Rijkswaterstaat dienst Zeeland: "*nou, niet echt over doorspoelen. Er zijn wel mensen die gewaarschuwd hebben dat van het zou wel eens kunnen gebeuren, en dus is er wel nagedacht over, biologisch beheer zoals dat dan heet. Maatregelen treffen om dat dus zoveel mogelijk op te vangen die toevoer van voedingsstoffen, door oeverplanten te creëren, oeverzones te creëren. Die filteren dan het water als het goed is Er zijn zelfs experimenten geweest met het uitzetten van snoeken, om zeg maar al die bodemwoelende vissen kwijt te raken die hier steeds meer komen. Er is gekeken naar wat meer natuurlijke pijlvariaties, dus in zomer laag, winter hoog, als ik het nu goed zeg, ja, een soort regen model. Maar dat heeft allemaal niet geholpen. Het probleem is toch gewoon groot geworden en niet te controleren gebleken. Dus vandaar dat we nu die studie uitvoeren naar een echte structurele oplossing.*" [052]

[50] See for example: Provinciaalse Zeeuwse Courant (PZC), 24-1-2009: *"Getij biedt Grevelingen Kansen"*

delta as a whole, paying attention to the links, and see if it is possible to have the separate parts enforcing each other, instead of solution seeking per compartment"[51].

In the same interview with Boeters he states that the real investigation started in 2005. "After three-quarters of a year we found out that fresh water flushing just doesn't works. The blue-green algae does not disappear"[52]. This was concluded based upon the modelling studies that have been conducted by Deltares, I will deal with the details and implications of these models in the next chapter. With this model the flushing with fresh water has been tried up to 150 $m^3$ second. Output of the model was that this amount of water in not sufficient to lose the algae. There is of course a possibility of flushing with more water. On this, Boeters states: "well, then you can go and use 300 cubic meters, but simultaneously we have looked whether this 150 cubic meter withdrawal from here [Hollandsch Diep] would be available, and it turned out that it's not!"[53] The reason why its not available is that the water in water scarce periods is needed to keep out the saline water in the Nieuwe Waterweg. By this it is tried to avoid salinisation of the agricultural area's like Delfland, Westland and the area around Gouda. After these two reasons for discarding the fresh option had been established, the unavailability and the ineffectiveness, a process has been initiated with the surrounding parties. Here Boeters said: "[...] guys, it seems to be the case that the Volkerak-Zoommeer cannot remain fresh, and all users of Volkerak-Zoommeers fresh water consequently will face a problem"[54]. The administrative response to this news was that the pre-condition was set that, in case the basin would be turned saline, simultaneously measures needed to be taken to have an alternative supply system of fresh water for the affected users. The identified affected users where at the first merely those users that currently directly take fresh water from the Volkerak-Zoommeer. Being in Zeeland the Reigersbergse polder, Tholen and St. Philipsland and the western parts of Noord-Brabant.

The effect of this administratively set pre condition in 'the field' was that regional multi stakeholder platform (MSP) processes[55] where organised. Initially three MSP's where set up: Reigersbergse Polder; Tholen and St. Philipsland; and western Noord-Brabant. In these MSP sessions firstly an inventory has been drawn of the consequences of a saline Volkerak-Zoommeer

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[51] Middelburg, 10-2-2009, interview René Boeters, project leader plan study, Rijkswaterstaat dienst Zeeland [20:40]: "*Ja dat is iets van de laatste tijd, om dat te gaan koppelen. Ja we komen er nu steeds meer achter dat het gewoon handiger is om de delta als een geheel te beschouwen, en goed te letten op de verbindingen, kijken of je het zo kan doen dat het elkaar versterkt in plaats van per compartiment te gaan denken*".[070]

[52] Middelburg, 10-2-2009, interview René Boeters, project leader plan study, Rijkswaterstaat dienst Zeeland [17:40]: "*We kwamen er na driekwart jaar achter dat dat zoete spoelen gewoon niet kon, dat werkte niet. De blauwalgen verdwijnen niet*". [059]

[53] Middelburg, 10-2-2009, interview René Boeters, project leader plan study, Rijkswaterstaat dienst Zeeland [29:00]: "*. Dan kan je zeggen, nou dan ga je toch naar 300 kuub, maar ondertussen hebben we ook gekeken of die hoeveelheid van 150 wel beschikbaar zou zijn, om hiervan* [Hollandsdiep] *af te tappen in de zomer, nou die is er dus niet*" [091]

[54] Middelburg, 10-2-2009, interview René Boeters, project leader plan study, Rijkswaterstaat dienst Zeeland [31:00]: " [...] *Van mensen, het ziet er naar uit dat het Volkerak Zoommeer niet zoet kan blijven, en alle gebruikers van het huidige zoete water van het Volkerak Zoommeer die hebben dan dus een probleem*" [092]

[55] In Dutch, in the interviews, frequently referred to as *'Brede Discussies'*

for different actors, particularly the agricultural sector. Secondly possible mitigating measures are explored. The measures identified can geographically be divided in two. In the Reigersbergse polder the field of vision focussed basically on two possibilities for alternative fresh water sources, the diversion of the in Brabant naturally percolating water (in the so called Brabantse Wal) to this polder in Zeeland and the possibility of using water of a waste water purification plant which is located nearby. The other geographical area is Tholen, St. Philipsland and western Noord-Brabant. Here the idea for alternative fresh water supply focussed on the increase of the discharges of the two rivers in the area, the Dintel and the Vliet. The idea is to do so by diverting water upstream in the Hollandsch Diep, at Moerdijk, via the Rodevaart, through Zevenbergen into the Dintel. Boeters: "The connection basically already exists, though; Zevenbergen has interrupted this by filling it. Back in the days water was running through Zevenbergen, through de Rodevaart. They filled this in and turned it into a parking lot, which will have to be re-established"[56]. Extra discharge in the Dintel and Vliet can also be established, by letting water in from the Wilhelminakanaal, north of the city of Breda. Once an increased freshwater discharge is established in the Dintel and Vliet, a share is to be diverted to the islands of Tholen and St. Philipsland by means of a siphon or a water pipe over the bridge. The sluices between the Dintel, Vliet and the Volkerak will have to be re-activated, since they currently only function in case of occurring blue-green algae in the Volkerak. These sluices will need some technical adjustments, to minimize intrusion of saline water through these sluices into the Dintel and the Vliet.

Apart from the above mentioned regions, southern Zuid-Holland is also affected by a saline Volkerak-Zoommeer. Directly via the fresh water inlets which they currently have on their south side of the island of Goeree Overflakkee. For the loss of these inlets, an already existing plan, 'plan Bierkreek', is being taken into consideration. This plan encompasses the merging into one inlet and relocation of the inlet to the north, taking water from the Haringvliet. This plan was already made by the Water board Zuid Hollandse Delta as a possible solution for the problems they have with the blue-green algae from the Volkerak-Zoommeer, which stopped their intake of water in summer.

This is not all though. In a later phase of the plan study it turned out that most likely saline water will also leak through the Volkerak sluices, on the north side of the Volkerak. On this Boeters states: "But on the upper side, we are facing the leakage of salt, which we really cannot block. Consequently the surface water here [eastern Haringvliet] will turn less fresh. [...] but still... it won't get as salt as it currently is here [Volkerak]"[57]. In the next chapter on fact construction I will deal with two shaping uncertainties of these alternative freshwater issues: how much salt leaks, and, will alternative freshwater supply be possible? Especially this last mentioned issue of leakage of salt water to the Haringvliet is currently the hot potato in the process. In January of this year a

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[56] Middelburg, 10-2-2009, interview René Boeters, project leader plan study, Rijkswaterstaat dienst Zeeland [35:00]: "*Nou ja, de verbinding die ligt er eigenlijk al. Ware het niet dat zevenbergen hier de verbinding heeft onderbroken door te dempen. Er liep vroeger water door zevenbergen, een rode vaart. Die hebben ze dicht gegooid voor een parkeer terrein. En dus die zou hersteld moeten worden*" [103]

[57] Middelburg, 10-2-2009, interview René Boeters, project leader plan study, Rijkswaterstaat dienst Zeeland [47:00]: "*Nou dat gaat om hoeveelheden van nou, ja, waar hebben we het over? Want het wordt nog steeds niet zo zout als het nu hier is* [Volkerak]." [128]

MSP process has been started on the freshwater issues in southern Zuid-Holland and is currently still ongoing.

Next to all the freshwater user in the direct surrounding of the Volkerak-Zoommeer, there's another function of the basin that plays a role in this process: the shipping function. With the Schelde-Rijn connection the Volkerak-Zoommeer has one of Europe's busiest inland navigation routes running through its basin. As was mentioned in a chapter above, on the construction of the post-disaster delta works, the Belgians have contributed substantially to establish a stable inland shipping connection with Rotterdam and therewith connection to the rest of Western Europe's inland navigation network. When asked how Belgium has been involved in the process Boeters stated: "let me put it this way, they have been informed. And we sat around the table with them a couple of times. By this we tried to find out what consequences this would have for them [Belgians]. These discussions turned out to be rather difficult, since they did not commit themselves what this would entail for them. At the same time they did pose all sorts of requirements for the research we should undertake, and in particular how we should do so. Conversely, we didn't think that was very reasonable… difficult. But, they have heard about it!"[58].

At this moment, as mentioned before, the plan study is in its finalising stage. The Secretary of State, Mrs. Huizinga is bound to take a decision this summer. As a preparation for this decision in the Parliament, a parliamentary commission paid a visit to the area in which apart from visiting some spots in the area, there was a round-table conference organised with Rijkswaterstaat (Mr. Boeters), the BOKV, affected municipalities and representatives of actors-group that have a stake in the debate.

### 3.3. Actors Interpreting Problems and Opportunities

In this section I deal with relevant (groups of) actors, that make part of the hydrosocial-network, that shape, or are shaped by the plan study. This section builds upon Latours "nature of groups" uncertainty (2005 pp.22) in which he deals with the relation between groups and identity. Within this hydrosocial-network actors are given a form of identity by the formulation of problems and opportunities that shape and are shaped by the process of re-opening. In this section I try to show how this has happened. I do this by making use of the stake-formulation as it was propagated at the round-table meeting with the parliamentary commission on 23 March 2009 at the council chamber of the municipality of Tholen. I start this description by looking at formulations put forward by the non-BOKV members at this conference, supplemented by, when available, the interviews I held with representatives of these parties. These represented parties are: drinking- and industrial- water company Evides; Zeeuwse Environmental Federation (ZMF); Dutch Oyster Association; LTO-Noord (Northern Agri- and Horti- culture organisation, in this case representing Zuid-Holland); zLTO (Southern Agri- and Horti- culture organization, in this case representing Noord-Brabant and Zeeland); and Natuurmonumenten (National Nature conservation

[58] Middelburg, 10-2-2009, interview René Boeters, project leader plan study, Rijkswaterstaat dienst Zeeland [41:00]: "*Uhm, die zijn geïnformeerd, laat ik het zo zeggen, over wat er zou kunnen gebeuren. En we hebben een paar keer met ze aan tafel gezeten om er achter te komen van nou wat zouden voor jullie de consequenties zijn, en ja, dat zijn een beetje lastige gesprekken geworden omdat ze zich niet helemaal bloot geven, wat dat zou kunnen betekenen voor hun. Gelijktijdig hebben ze wel allerlei eisen gesteld aan wat wij moesten onderzoeken, en hoe, vooral, we dat moesten onderzoeken, en dat vonden wij weer niet redelijk, dus dat is een beetje….. lastig. Ja, maar ze weten er van*" [116]

association). The sequence used here will be the same as it was used at the conference. After these descriptions I will do the same with the Water boards.

### 3.3.1. Evides

Being a drinking and industrial water company, providing water to the area south of the city of Den Haag, until the Belgian border, Evides is happy with the integrated approach used in this process "partial solutions don't do much good for us"[59]. Concerning the consequences of the planned salinisation of the Volkerak-Zoommeer, the representative of Evides (of whom I don't know a name) sums up three points, inlets, where the changes in the Volkerak-Zoommeer will have an effect. First of all, the inlet at Koert. "That's one of our planned intakes. Our current intake is located directly after the Haringvliet sluices. Already there has been a decision taken ['Kier-besluit] affecting that inlet. The government has spoken to us about that and has taken care of an alternative solution [...] the problem is, that due to the salinisation of the Volkerak- Zoommeer this new inlet will also salinise."[60] The second inlet that will be affected is the one at Bernisse. This inlet is used for industries. "These demand high quality standards. Currently their water is 'normal' fresh water, by this I mean chloride levels of 70 – 80 mg per litre. Earlier today, is was stated that this water would not become saline, but it would become less fresh [by René Boeters, Rijkswaterstaat]. The drinking water norm is 150 mg per litre though, and with the current water there is little room to manoeuvre [...] this drinking water standard is based on public health. It's a matter of taste, but also, particularly with heart and vascular diseases, thus, sodium levels. This norm of 150 mg per litre does not come out of the blue"[61]. Third point is the

**Figure 12: relevant inlets Evides**

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[59] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: "*En wij hebben niet zo veel aan deel-oplossingen*" [077]

[60] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: "*dat is voor ons een toekomstig innamepunt, het huidige innamepunt van ons ligt achter de haringvliet sluizen, daar is ook eerder besluitvorming over geweest, daar heeft de overheid met ons gesproken en daar is gezorgd voor een alternatieve oplossing* [...] *maar het probleem is dat door de verzilting, van het Volkerak Zoommeer, bij Koert, ook verzilt, dus dat is een oplossing waar wij nog naar moeten kijken.*" [077]

[61] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: "*Die stelt daar ook hoge eisen aan. En dat is nu gewoon zoet water, en dan heb ik het over 70 tot 80 mg/litre chloride. Net werd er gezegd het wordt niet zout het wordt minder zoet, maar de drinkwaternorm is 150 mg/litre, met het huidige water is daar niet zo veel ruimte* [...] *Maar de drinkwaternorm, die is gebaseerd op volksgezondheid, dat heeft te maken met smaak, maar ook, met name ook hart en vaat ziekten, dus het natrium gehalte. Die 150 mg/litre die komt niet uit de lucht vallen*". [077]

Bereplaat. In a normal situation the water of this inlet is deducted from the Biesbosch. The only issue here is that there is an emergency inlet. This emergency inlet will be affected by a salinised Volkerak-Zoommeer. The drinking water company's representative doesn't expect much direct problems from this, but it will affect the inland navigation. "This will have consequences for the inland navigation; luckily we are ranked high in the displacement progression"[62]. This displacement progression is a priority list that has been formulated in the National Water Plan, and indicates which functions have the highest priorities in times of water scarcity.

### 3.3.2. Zeeuwse Environmental Federation

The ZMF's representative, Gijs van Zonneveld, in his contribution highlights two issues. First of all, he points at the opportunities that are shaped by a possible salinised Volkerak-Zoommeer. He does this in an effort to move away from the alternative freshwater supply discussion, that has been the centre of attention the last couple of minutes. He does acknowledge the appropriateness of this attention. He points at the opportunities by presenting a coalition between the ZMF and the Dutch Oyster Association: "I'm sitting here next to Kees van Liere [Dutch Oyster Association], this is not entirely a coincidence, since we have, together with the Producers Organisation Oyster, looked at what possibilities there are for combining oyster production, the economic utilisation of the delta waters, and better conditions for nature. These prove to combine very well"[63]. Next to this, what he calls 'sustainability for both', he stresses that it's time to move ahead: "In fact we know what we need to know. More is always possible. The basic information is available, I think. I would like to incite all, the Secretary of State in particular, to take a decision on what direction we are going to take. No more waiting"[64].

**Figure 13: area covered by ZMF**

[62] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: *"Dat heeft wel weer de nodige gevolgen voor de scheepvaart, maar wij staan gelukkig hoog in die verdringingsreeks"* [077]

[63] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: *"Ik zit naast Kees van Liere, en dat is niet helemaal toevallig, omdat wij eigenlijk samen met de oester en de p.o. oester, producenten organisatie oester, samen hebben gekeken naar wat voor mogelijkheden zijn er nu om kweek, economisch benutten van de delta wateren te combineren met een betere omstandigheden voor de natuur. En die blijken heel goed gecombineerd te zijn"*[078]

[64] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: *"Eigenlijk weten we wat er te weten valt, het kan altijd meer. Ik denk dat de basis informatie heel*

### 3.3.3. Dutch Oyster Association

Mr. Van Lier advocates a re-establishment of a connection between the fresh rivers and the Oosterschelde on the short term. Furthermore he affirms the story drawn up by the ZMF. "Our current production areas are located in the Oosterschelde and Grevelingenmeer. It will be clear cut that we embrace the option of a saline Volkerak-Zoommeer, since this might result in additional production area"[65]. On the current status Oosterschelde he states: "in the Oosterschelde we observe a system that is ecologically jammed [...] we would like to see, especially in winter time, a dosed inflow of fresh water into the Oosterschelde. This would imply additional nutrients which in turn would enforce our competitive position"[66]. In this respect he advocates for a pilot study, and he claims to have Rijkswaterstaat, WWF and ZMF as his allies. Van Lier subsequently indicates the gravity of the problems with the Japanese Oyster plague, which was also mentioned briefly by the ZMF representative.

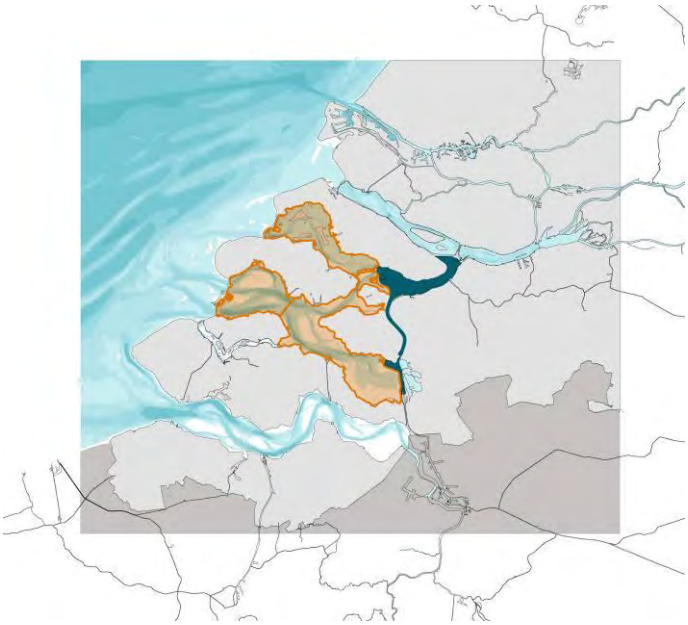

**Figure 14: area covered by Oyster Association**

### 3.3.4. LTO-Noord

Spatially, Mr. Bikker, the representative for LTO-Noord, wants to focus his response to the southern Zuid-Holland. The solutions for the areas south of 'his' area might be realistic, he states, "but in the north we are not ready yet. And that is what worries us..."[67]. Bikker stresses that the process in the north is in a premature state, in contrast with 'the south' where the solutions seem to be ready for the decision making process. He furthermore states that the problem should be seen in the light of national discussion regarding storm water buffering and safety: "also in the

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*goed beschikbaar is, ik zou ook iedereen, en de staatssecretaris in het bijzonder op willen roepen om te zeggen we nemen nu een beslissing over welke kant het op moet. Niet weer wachten*" [078]

[65] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: "*de productiegebieden zijn de Oosterschelde en het Grevelingenmeer, niet het Krammer-Volkerak, het zal duidelijk zijn dat wij het voorkeursalternatief zout Krammer-Volkerak omarmen. Dat betekent toekomstgericht dat dit water productie gebied zou kunnen betekenen*" [079]

[66] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: "*Wat we graag zouden zien is dat we, met name in de winter periode, is dat er gedoseerd zoet water ingelaten wordt, in de Oosterschelde. Dat betekent extra nutriënten. Dat betekent extra voedselaanbod. En dan zou onze concurrentie positie, zeker ten opzichte van een land als Frankrijk en Ierland, sterker worden*" [079]

[67] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: "*Dat is op zich, zijn dat mogelijk reële oplossingen, maar in het noorden zijn we nog niet zo ver. En dat, dat geeft ons toch wel zorgen*" [081]

light of the broader discussions that take place nationally [...] we cannot avoid looking at this solution without looking also at the broader perspective"[68]. Also, on the importance of the LTO-Noords stakes he mentions: "the economic importance of the greenhouse agriculture is of serious proportions, and it cannot do without freshwater in dry periods, not on the short term. We did emphatically sum that up. This is what the 2003 dry year has shown"[69]. All in all, he claims, the problem is bigger than just the Southern Islands. A comprehensive solution is required.

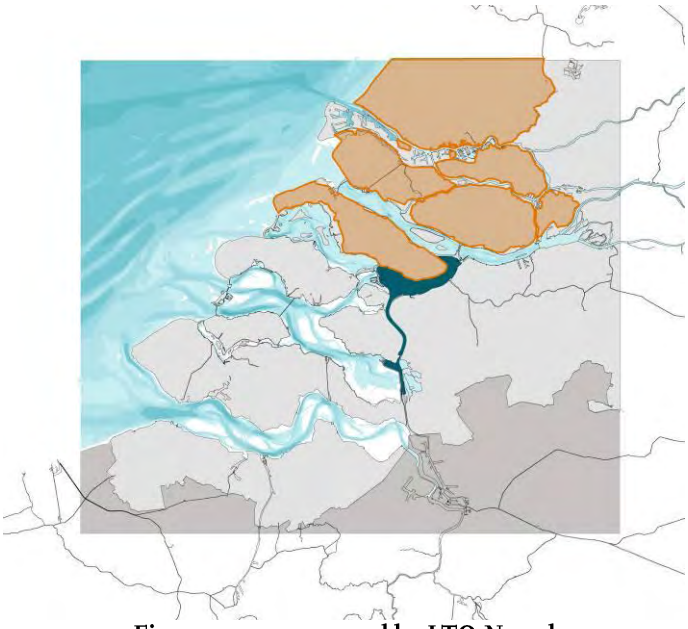

**Figure 15: area covered by LTO-Noord**

In order to get to know the background of the argumentation above I now also draw from an interview held with Jos Beugelsdijk, who works at the LTO-Noord as a policy advisor for southern Zuid Holland. In the interview Beugelsdijk explains that the LTO-Noord got involved in the whole discussion around the Volkerak-Zoommeer relatively late. Beugelsdijk: "I work in close collaboration with the zLTO. My predecessor [at LTO-Noord] also worked closely together with the zLTO. He made a deal with the zLTO, saying your role is more important around the Volkerak-Zoommeer than our role. If you [zLTO] represent us, Zuid-Holland in the Volkerak-Zoommeer discussion, we will the same for you in the Kier discussion"[70]. Another reason why the LTO-Noord started paying attention to the Volkerak-Zoommeer discussion a bit late was because they initially did not expect a saline solution for the blue-green algae problem. The Volkerak-Zoommeer became really a priority at the moment when the backward-salinisation at the Volkerak sluices into the Hollandsch Diep and Haringvliet was brought forward. Beugelsdijk also put emphasis on the importance of the economic position of the greenhouse agriculture in this region for the national economy.

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[68] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: "*ook in het licht van de bredere discussie die landelijk loopt,* [...] *ik denk dat je er niet aan ontkomt om deze oplossingen in een breder perspectief te bekijken*" [081]

[69] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: "*Want de problematiek in het noorden, qua economisch belang is van een dermate omvang, het is niet zo dat de glastuinbouw, we hebben dat niet zo nadrukkelijk gesommeerd, de laatste weken op korte termijn zonder zoet water kan*" [081]

[70] Haarlem, 16-3-2009, interview Jos Beugelsdijk, LTO-Noord [13:00]: "*ik werk heel nauw samen met de zLTO, mijn voorganger, die het hier voor mij deed, werkte ook nauw samen met de zLTO, en die had tegen de zLTO gezegd van, jullie hebben rond het Volkerak Zoommeer een belangrijkere rol als wij dat hebben, als jullie nu de rol rond om het Volkerak invullen ook voor zuid Holland, dan zullen wij het doen ten aanzien van het kierbesluit, wat er is gevallen in 1998, en zullen wij dat doen, als daar ook landbouw belangen voor het zLTO in liggen ook voor jullie mee te nemen*" [022]

According to Beugelsdijk the opinions around the plans for Volkerak-Zoommeer are strongly influenced, for Zuid-Holland, by the process that took place ten years ago, around the re-opening, or crack ('Kier') in the Haringvliet dam. This happened, according to Beugelsdijk because "the agricultural organisations have made a big mistake. The deal was made in a top-down way, with too little communication with the supporters. As a result, they are very emotional about these issues"[71]. It is not a possibility though, to re-open the discussion on the 'Kier': "the secretary of State even said to Mrs. Dwarshuis [deputy of the Zuid-Holland province and currently BOKV chair] last fall, we will persevere with the 'Kier'! Whatever may happen!"[72]. Beugelsdijk also links the issue with the whole fresh water distribution system in the delta, the large amounts of water needed for the Nieuwe Waterweg in that, the new Maasvlakte that is being constructed and the power of, what he calls, the 'harbour barons'.

### 3.3.5. zLTO

Mr. De Koeijer, the zLTO's representative at the round table conference with the parliamentary commission meeting tries to move the discussion away from terms like 'estuarine dynamics' and advocates to make 'the economy' the central issue: "maybe estuarine dynamics is not the most appropriate to take as the central issue since this is an abstract concept which everyone interprets differently. If you make the economy the central issue we can meet each other in the discussion, then you'll arrive at solutions"[73]. He continues by stating that a good economy is beneficial for all parties, including nature. A little later he states: "it's not so bad that we don't have toll roads. Infrastructure is mainly a governmental investment. The economy benefits from this"[74], and fresh water supply, he reasons, is also a type of infrastructure. This is quite a unique

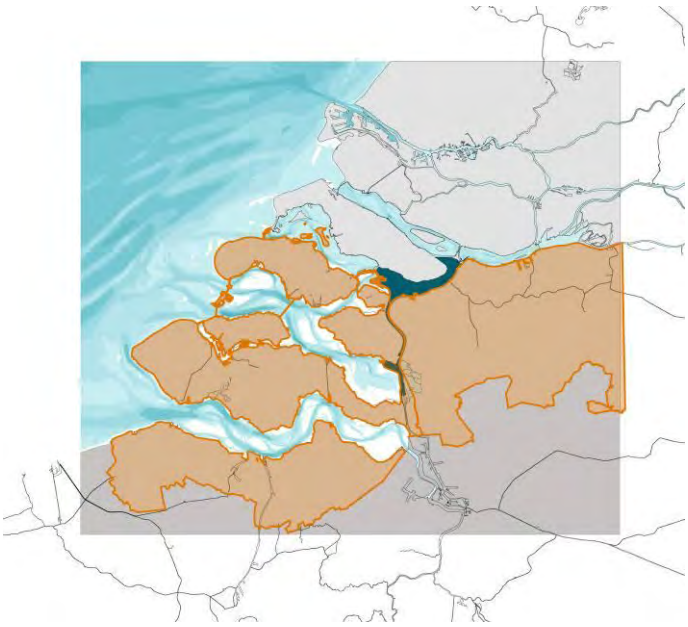

**Figure 16: area covered by zLTO**

[71] Haarlem, 16-3-2009, interview Jos Beugelsdijk, LTO-Noord [34:00]: "*Nou landbouw organisaties hebben daarbij een grote fout gemaakt. En dat is dat men dat op top down niveau heeft afgesproken, en niet voldoende gecommuniceerd heeft naar de achterban, dat heeft heel veel emotie bij de achterban opgeroepen*" [068]

[72] Haarlem, 16-3-2009, interview Jos Beugelsdijk, LTO-Noord [34:00]: "*de staatssecretaris heeft mevrouw Dwarshuis van het najaar nog aangesproken van, nou, de kier gaat door, wat er ook gebeurd*" [085]

[73] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management [1:26:00]: "*En misschien is estuarine dynamiek ook niet zozeer het goede om centraal te stellen want dat is een abstract beeld waar een ieder zijn eigen beelden of vormen aan trek. Maar als je economie centraal stelt, dan kun je elkaar vinden in deze discussie en dan komt je er uit*" [083]

[74] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: "*Het is niet zo erg dat wij geen tolwegen hebben, infrastructuur is vooral een overheidsinvestering, daar profiteert de economie van*" [083]

case, he reasons, since nature falls in line with agriculture, unlike the Westerschelde case [in the 'de-poldering' discussions].

In an interview held for this research Carla Michielsen, who works as a representative for the zLTO, at the water staff for Zeeland and western Brabant, mentioned that the division between LTO-Noord and zLTO is to be explained by looking at its historical organisational set-up. In the past the zLTO has chosen to keep certain individual advisory jobs 'in house'.

Michielsen identifies the blue-green algae problem as the central issue in the Volkerak-Zoommeer discussion. "In the Volkerak-Zoommeer we are facing a blue-green algae problem. [...] the residence time of the water is 3 months here, at least. That's strongly determining the bloom of the blue-green algae"[75]. The inconvenience, being an inlet stop of fresh water from the Volkerak-Zoommeer into the agricultural areas now depends on the weather conditions, whether it's a warm summer, and the direction of the wind, since the blue green algae are floating on the water and easily transported by the wind. Michielsen uses the rule of thumb that: "if the water temperature of the Volkerak-Zoommeer is 20 degrees Celsius, we will see the blue-green algae floating layers in two weeks time. Mostly around the end of July, beginning of August"[76]. On the plan study she states that they, the zLTO, was not in favour of the saline alternative. Gradually, as the time went on, the realization grew that the fresh alternative was not likely going to be the one to be executed. Michielsen: "In that whole discussion on the blue-green algae and the Volkerak-Zoommeer, the formation of the image of the blue-green algae of course played an important role. If the algae occurs in a moat, or water in the city, signs are placed and fences are being put up"[77]. And also, in the year of the fish mortality, the blue-green algae was identified as the wrongdoer, but it has never been proven, though the zLTO has requested for this. And for the agriculture in general the image creation plays also an important role: "the image creation, if you look at agriculture, is that we just spill the water, whereas we have the feeling that we don't do so. And not just a feeling, from the experience in the everyday operational management we know that we don't"[78]. Concluding, on the plan study process, Michielsen is reasonably satisfied with the results

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[75] Goes, 24-2-2009, interview with Carla Michielsen, representative at zLTO: "*Volkerak-Zoommeer hebben we wel met blauwalgen te maken,* [...] *en dat komt omdat de verblijftijd van het water hier 3 maanden is, minimaal. En dat is heel bepalend voor algenbloei*" [018]

[76] Goes, 24-2-2009, interview with Carla Michielsen, representative at zLTO: "*als de watertemperatuur 20 graden is van het Volkerak-Zoomeer dan is er weer twee weken de tijd, en dan krijg je van die blauwalgen drijflagen, en vorming, en dan is het meesstal, ja afhankelijk... eind juli, begin augustus*" [038]

[77] Goes, 24-2-2009, interview with Carla Michielsen, representative at zLTO: "*En die hele discussie over de blauwalgen en het Volkerak-Zoommeer heeft de beeldvorming over de blauwalgen natuurlijk wel heel sterk meegespeeld. Als in een vest of in een stadswater blauwalgen optreden dan komen er borden omheen, en hekwerken*" [067]

[78] Goes, 24-2-2009, interview with Carla Michielsen, representative at zLTO [54:00]: "*de beeldvorming van, ja als je het dan even op landbouw richt, zeg maar, is dat wij gewoon met water morsen, zoals we dat in dialect noemen, en water verkwisten, en terwijl wij dat gevoel dus absoluut niet hebben, of, niet alleen dat gevoel niet hebben, ook vanuit onze bedrijfsvoering ook wel weten*" [139]

so far, though she states: "I won't be satisfied until the provisions are there. I'm positive about the process, though I would have liked it if the process went on a bit quicker"[79].

### 3.3.6. Natuurmonumenten & Staatsbosbeheer

Mrs. De Wilde, of Natuurmonumenten, starts off by putting emphasis on the important national and international nature-value of the delta area. Natuurmonumenten is very much pleased with the intention of re-establishing tidal dynamics in the basin, of which they consider the salinisation of the Volkerak-Zoommeer to be one first step. In her contribution Mrs. de Wilde promotes a publication made by Natuurmonumenten, called "Best of Both Worlds" to have an interesting perspective on the region. Furthermore she emphasises the need for an integrated approach, since "with only thinking within disciplines we won't get there"[80].

**Figure 17: area covered by Natuurmonumenten and Staatsbosbeheer**

Mr. van Haperen, working for Staatsbosbeheer, mentions, similar to Mrs. De Wilde, that Staatsbosbeheer is supporting the idea of a more dynamical delta. He also mentions that Staatsbosbeheer and Natuurmonumenten are strong allies in this discussion. In the process nature and agricultural organisation where initially imprisoning each other. Before the first MSP meeting in Tholen and St. Philipsland took place, they had a meeting, and aligned their stakes to a situation that would be beneficial for all parties. In western Noord-Brabant the same procedure followed, and, later on the currently still running process for southern Zuid-Holland started. In this last process Staatsbosbeheer is not represented though, but Natuurmonumenten is.

### 3.3.7. Water Board Zeeuwse Eilanden (ZWE)

Because the WZE did not actively communicate their stakes at the round-table conference with the parliamentary commission, the account on their interpretation of the problems around the Volkerak-Zoommeer I therefore base on the interview held with Mr. Acronius Kramer, who works at the Water board, and has been participating on their behalf in the plan study process and the related fresh water discussions.

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[79] Goes, 24-2-2009, interview with Carla Michielsen, representative at zLTO: *"ik ben pas tevreden als de voorzieningen er liggen. Dus, ik ben positief over het proces tot nu toe, alleen ik had dat nog iets sneller wel gewild, en ik ben pas tevreden als de voorzieningen er liggen"* [184]

[80] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: *"dat is natuurlijk ook een integrale aanpak die we in dit gebied nodig hebben, want vanuit alleen maar sectoraal denken komen we er niet"*[084]

Mr. Kramer starts off by explaining that the issue is a loaded one: "It's a centuries-old scene of battle between economy and ecology, because there used to be a freshwater provision for a part of Zeeland and western Brabant [...] coming from the Volkerak-Zoommeer. And, due to the bad water quality the fresh Zoommeer is basically a failure. Current the idea is to go for a saline solution. A fresh option is unfeasible in the long term. Consequently the freshwater provision in the area, and that's a very sensitive issue in this story, will need a proper solution. And well, that easily been said, reality proofs to be unruly"[81]. For this Water board the plans mainly effects the Reigersbergse Polder and Tholen and St. Philipsland, and more particularly the agriculture in those area's: "this mainly concerns the agriculture in the area. Currently 70% of the systems that we manage have brackish water. We can also do our water managing job with brackish water, as long as the quality of that water is good. [...] these [the agricultural sector] are represented in our public assembles and our board. There they put a strong political pressure on freshwater"[82]. When talking about Tholen and St. Philipsland, Kramer points out that the current situation is also far from perfect since in summer the blue-green algae causes a stop of freshwater inflow. The two area's in this region both have their own particularities.

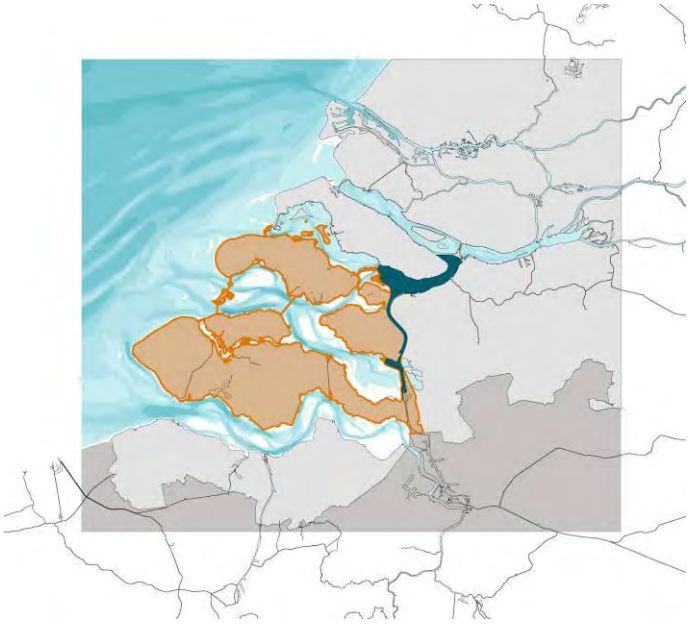

**Figure 18: area covered by WZE**

Tholen and St. Philipsland, firstly, have quite a complex history when it comes to its water managerial system. In the 1990's plans were made by the Water board to create a water managerial system that would deliver the water up until the individual parcels. "This would cost 50 to 60 Guilders per hectare, because they are the ones requesting for the water, they will also have to pay for the provision of it. In the voting on this issue the majority voted 'no'. That's

[81] Middelburg, 5-3-2009, interview with Acronius Kramer, Water board Zeeuwse Eilanden [1:30]: *"het is een beladen onderwerp, misschien heb je dat wel een beetje geproefd ja. Het is natuurlijk het eeuwenoude strijdpunt van ecologie en economie, want er was natuurlijk een zoetwatervoorziening voor deel van Zeeland en West Brabant.* [...] *vanuit het Volkerak Zoommeer en door een slechte waterkwaliteit is dat zoete Zoommeer eigenlijk mislukt. En nou wordt er dus gedacht van maar kiezen voor een zoute oplossing. Zoet is voor de lange termijn onhaalbaar. Dat betekend dus dat je voor die zoetwatervoorziening, en dat is het hele gevoelige punt natuurlijk in dit hele verhaal, proberen goede oplossingen te bedenken. Nou, en dat wordt wel makkelijk gezegd, de praktijk is weerbarstig hè".* [007-009]

[82] Middelburg, 5-3-2009, interview with Acronius Kramer, Water board Zeeuwse Eilanden: *"dit is vooral in het belang van de landbouw, kijk wij hebben ons natuurlijk 70% van ons beheer is brak water systemen, en wij kunnen ons werk als waterbeheerder ook als brak water systemen doen, als de kwaliteit maar goed is.* [...] *die zijn dus ook vertegenwoordigd in onze algemene vergadering en bestuur, en daar wordt een hele zware politieke druk gelegd op die zoetwater"* [015]

something they regret until today"[83]. Consequently, the Water board in this area is only taking care of the water level management. The Water board does not make any additional investments in the water system in the area. The agricultural sector in the area now says, if you are going to compensate for the falling away of the Volkerak-Zoommeer as a fresh water source, do it properly. On this compensation plan, Kramer explains: "then they are going to look at how to compensate for the currently present provisions. If you then look at the amount of water needed, well, yes, you'll need quite some water. That's going to cost millions, those investments. We still have to look whether it all will be profitable and whether the agricultural sector is willing to cover a part of the costs themselves this time"[84].

Secondly, there's the Reigersbergse polder, which is quite a different story. This polder is currently using water from the Zoommeer via a small pumping station. With a saline Volkerak-Zoommeer this will also be omitted. A project group has been started for exploring the option of alternative fresh water for this area under the heading "water out of the shore"[85]. In this group the two Water boards, the municipality of Woensdrecht and the drinking water company Evides are participating. Evides has a pipeline that runs through the area, taking water from the Biesbosch through Brabant to Zeeland. This industrial pipeline also provides water to some of the fruit growers in the area. Next to this pipeline there are two other possibilities for alternative freshwater supply in the area. Firstly, there is a discharge point of decontaminated effluent coming from industries at Moerdijk nearby. Secondly, there is also the possibility to divert the seepage water which is now naturally available at the Brabantse Wal, the area on the eastern shore of the Schelde-Rijn connection in Brabant. All three possible sources have their pros and cons. The water from Moerdijk has a high salt content and additionally is the use of effluent water in an area possibly doing harm to the areas image, causing land values to drop. The water from the Evides pipeline has two annotations, its capacity is limited and the high quality water comes at a price. Finally the water from the Brabantse Wal is water with a high quality and currently is just wasted into the Westerschelde. Problem with this water is though, that is won't be available at the most critical times, and therefore it will have to be stored somewhere. Water storage will require land and there will be a risk of growth of algae. In March of this year the Board has decided that the effluent water in the current state is not suitable for agricultural purposes.

#### 3.3.8. Water Board Brabantse Delta (WBD)

Dike-grave Vos, of the Water board Brabantse Delta is surprised that during the conference with the parliamentary commission much attention is being paid to Zuid-Holland. On the possibility

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[83] Middelburg, 5-3-2009, interview with Acronius Kramer, Water board Zeeuwse Eilanden [8:30]: "*toen heeft het waterschap in de negentiger jaren daar een plan voor gemaakt, en dat kostte dan, weet ik het, 50 of 60 gulden per hectare, hè, want zij vragen dat, dus zij betalen daar dan ook een extra omslag voor, voor die voorzieningen hier. Nou en toen is dus die stemming geweest en toen heeft de meerderheid het afgestemd. Daar hebben ze nu nog steeds spijt van.*" [030]

[84] Middelburg, 5-3-2009, interview with Acronius Kramer, Water board Zeeuwse Eilanden [11:00]:"*En daar wordt gekeken van nou, ja, hoe moet je nou de bestaande voorziening compenseren. Als nadeel compensatie, en hoeveel water heb je nodig om heel die gebieden te bedienen. Ja, dan heb je nogal wat nodig. Dat wordt een miljoenen klus. Die investeringen, dan moet het ook blijken of het allemaal rendabel is en of die landbouw daar zelf ook iets aan mee wil betalen*" [036]

[85] In Dutch: "*Water uit de Wal*"

of a saline Volkerak-Zoommeer he states on all parties that make part of the BOKV, including the WBD: "all parties within the BOKV came to the conclusion that salinising is the only solution for the blue-green algae problem in the Volkerak-Zoommeer. We should stick to this commitment, and we as a Water board will do so"[86]. But, he also reasons that, since the current problem is an effect of the delta works, which were constructed by the national government, they should also be the ones paying for the consequences now.

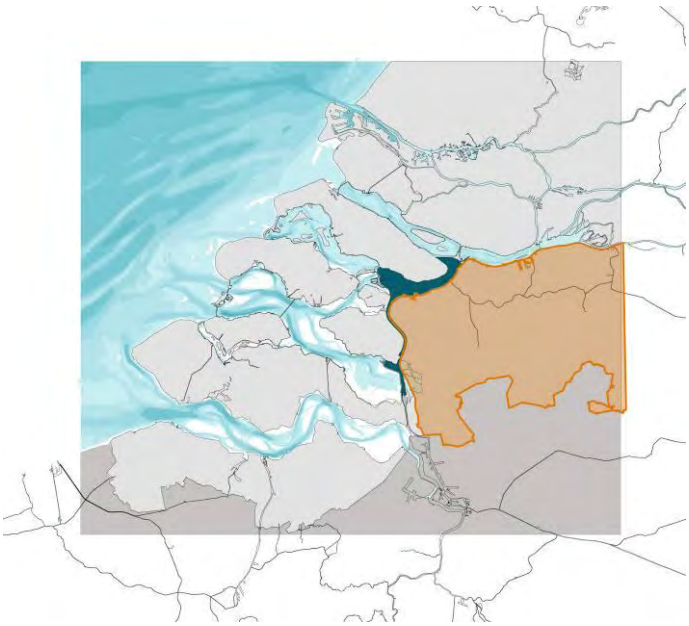

**Figure 19: area covered by WBD**

In an interview with Mr. Polak, who works as a senior policy advisor for the Water board Brabantse Delta, it becomes clearer what the position of the Water board is in the whole process. The negative effects of a possible saline Volkerak-Zoommeer can be summarized under one denominator: salinisation. Before going into the details of this salinisation in the Brabantse Delta area, Polak first explains that the plans for the Volkerak-Zoommeer also carry risks. There is a risk, for example, that the blue-green algae will be replaced by a different kind of algae plague, which then will be salt resistant. An important aspect of the salinity consequences will affect the two rivers in the area, the Dintel and the Vliet. Polak: "the plan study organisation has requested from us to study the ways to fight the saline water leakage in the sluices. The construction service of Rijkswaterstaat looked into what technological provisions can be taken for this, to limit the salt intrusion of the Dintel and Vliet to the minimum"[87]. Another important step in looking for ways to mitigate the salinisation effects is the provision of alternative fresh water. In this respect a MSP has been initiated. Polak: "this resulted in a required freshwater discharge of 25 cubic meters per second. This will be allocated for both the freshwater supply as for the flushing against salt water intrusion in the sluices that will occur when ships are being locked. The calculations showed that 15 $m^3$ is needed for the freshwater supply for agriculture, additionally there will be a need of an

[86] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: *"hebben alle partijen binnen BOKV de conclusie getrokken dat verzilting de enige oplossing is op het vraagstuk blauwalg in het krammer Volkerak, daar moet je ook voor blijven staan, dat doen wij ook als waterschap"* [099]

[87] Breda, 11-3-2009, interview with Piet Polak, senior policy advisor Water board Brabantse Delta [A-15:05]: *"wij hebben toen op verzoek van de planstudie organisatie een onderzoek gedaan naar bestrijdingsmaatregelen bij de sluizen, en de bouwdienst van Rijkswaterstaat die heeft gekeken welke technische voorzieningen dat er aangebracht konden worden. Om de zout belasting vanuit het Volkerak naar de Dintel en de Vliet zo beperkt mogelijk te laten"* [045]

approximate 2 or 3 $m^3$ for Tholen and St. Philipsland"[88]. Crucial bottleneck in the formation of plans is the village Zevenbergen. These 25 $m^3$ litres per second will have to flow through the village centre. The former harbour is now filled up, and turned into a parking lot. This harbour will have to be re-opened, creating possibilities for recreation in Zevenbergen. Problem is though that one will be bound to the shape of the former harbour, and this will not be sufficient for the transportation of 25 $m^3$ per second. This could be absorbed by diverting a portion of the flow around the village.

Another possibility for getting the fresh water is to increase the water inlet from the Wilhelmina channel. This water originates from the areas around Tilburg. This water is problematic because it is a carrier of the brown rot bacteria. If that water is used by farmers in western Brabant for sprinkling their potatoes they are susceptible to brown rot in their potatoes. For that reason the agricultural sector, de zLTO prefers not to have water from this channel in the system.

The issue also has its effects on the recreation in the area. Upstream of the sluices in the rivers yacht-basins are located, in which the boats now, in summer are floating in a green mess. Logically these like the idea of a saline Volkerak-Zoommeer.

#### 3.3.9. Water Board Hollandse Delta (WsHD)

The Water board Hollandse Delta supports the idea of a saline Volkerak-Zoommeer. Dike-grave Mr. Geluk, in his reaction at the parliamentary commission meeting: "Water board Hollandse Delta has the opinion that the Volkerak-Zoommeer will have to be turned saline because that's better for the environment. This has extensively been shown by the environmental study that has been conducted in the area. But, you will have to work on solutions for the leakage of salt"[89]. These solutions will be a necessity since the separation between salt and fresh, which the Water board always had assumed to be hard, turned out not to be. This came out in October, November of last year. Geluk: "the Haringvliet normally has a chloride level of 150 milligrams maximum, this shall be increase to 300 milligrams of chloride. This means that the horticulture in the area will face a tremendous problem [...] because on 300 mg chloride horticulture cannot remain"[90]. Geluk wonders how this is possible, since the national policy is to promote the green-port Westland, and the main-port Rotterdam. Both are going to be cut off from good quality fresh

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[88] Breda, 11-3-2009, interview with Piet Polak, senior policy advisor Water board Brabantse Delta [A-21:55]: "*En daar is uit voort gekomen dat het een wens is om hier 25 kuub per seconde in te laten. En dat zou dan zowel voor zoetwatervoorziening gebruikt moeten worden als voor het terugspoelen van het zoute water wat hier met het schudden van schepen binnenkomt, en uit de berekening is gekomen dat gemiddeld hebben we in totaal 10 kuub nodig om het zout terug te dringen en 15 kuub zou er nodig zijn voor de zoetwater voorziening van de landbouw, en daarvan moet ook nog een gedeelte van, daar nog bij, bij die 15 kuub zeg maar, van 2,3 kuub om het naar Tholen en st Philipsland door te voeren*" [060]

[89] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: "*wij als waterschap Hollandse delta zijn van mening dat het Volkerak-Zoommeer zout zou moeten worden, omdat dat beter is voor het milieu, dat is uitgebreid aangetoond in die milieu studie die daar is geweest naar het Volkerak Zoommeer. Maar dan moet je wel wat doen aan oplossing van dat zout lek.*" [088]

[90] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: "*waar het Haringvliet normaal iets van 150 mg chloor maximaal heeft op gevoerd zal worden naar 300 mg chloor, dat betekent dus dat daar de tuinbouw een groot probleem heeft.* [...] *want op 300mg chloor kun je ook geen groenteteelt meer doen*" [088]

water"[91]. He concludes his contribution by warning that if the measures for compensation are not ready and the Volkerak-Zoommeer will turn saline, you can be sure that the people in the area will fiercely revolt!

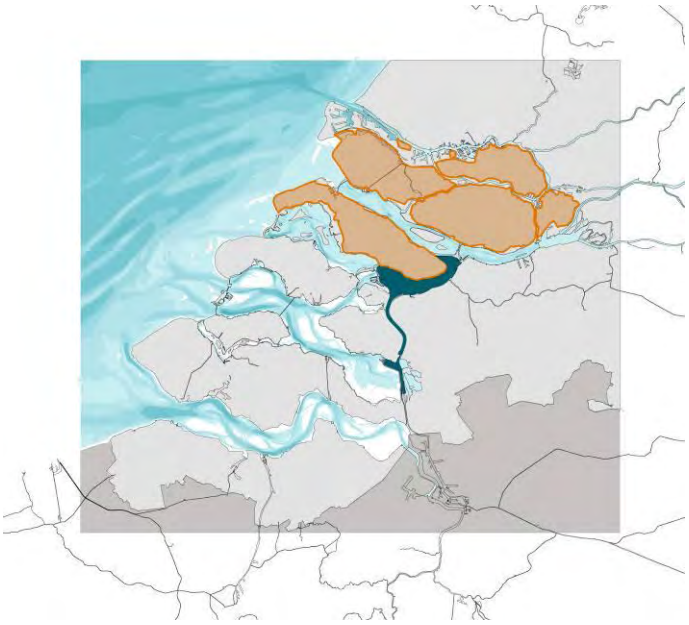

**Figure 20: area covered by WsHD**

In an interview that I had with Leo Apon, policy advisor at the Water board Hollandse Delta the statement made by Geluk is confirmed. It may appear that solutions are ready for Zeeland and Brabant, for Zuid-Holland things are still in the open. He explains that in this area, and also in Delfland, which also receives water from the Hollandse Delta, highly specialised cultivation standards apply. For some cultivators a chloride level of 200 milligrams per litre is even to much. In the polders in these area a large amount of flushing takes place, resulting in high quality levels. Apon: "If it's doubled [the chloride levels] large problems may be the result, at least that's what the agricultural sector says"[92]. The issue for the Hollandse Delta has several complicating aspects. At first, there was no reason to be concerned about the Volkerak plan. For the current inlets in the Volkerak, on the south side of the island of Goeree Overflakkee the Water board had already a plan in stock: plan 'Bierkreek'. This plan was in the past already studied in order to move the inlets to the north of the island, taking water from the Haringvliet. These plans where initially made to bypass the blue-green algae problem in the area, and where now taken into consideration again. But then, the problem of the backward salinisation appeared. This new problem, combined with the issues already at stake with the discussion that was made on the 'Kier', the pressure increased on the fresh water supply of the agriculture in the region. All in all this has been reason to initiate a MSP in the region. Complication with this MSP is that it is conducted under huge time pressure, since it should be ready for the public inquiry procedure on the National Water Plan this summer. The whereabouts of this MSP procedure, will dealt with more in detail in the next chapter of this thesis.

[91] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: "*Bij de Nota Ruimte is er ingezet op de greenports, Westland, en op de main port Rotterdam, beide worden dus straks verstoken van goed, goede kwaliteit zoet water*" [088]

[92] Ridderkerk, 27-2-2009, interview with Leo Apon, policy advisor at Water board Hollandse Delta: "*Een verdubbeling, zou, althans dat is wat de landbouw roept, zou tot problemen kunnen leiden.*" [022]

### 3.3.10. Hoogheemraadschap Delfland (HhD)

At the conference with the parliamentary commission, the dike-grave Mr. van Haersma Buma made a plea stressing the complexities of the whole situation. He states that: "what is lacking in the plan study on the Volkerak-Zoommeer is that we are dealing here with an engineering system. All the waters are interconnected. If you turn one switch, it has effects on the other side. [...] we're saying, you should look into the fine-woven structure of the system. What I want to repeat here one more time, it really makes me revolt, that the change towards a 'little less sweet' will make the whole system change radically. Ecologically it is not used to being saline anymore!"[93]. He continues by stating that making plans on such a complicated and sensitive system should be considered a national issue.

**Figure 21: area covered by HhD**

## 3.4. Missing Masses[94]

The Philipsdam and the Volkerak-Zoommeer is a lake which is clearly a direct consequence of human action. The appearance of the Cyanobacteria in the Volkerak-Zoommeer is seen as a consequence of human action. On the type of human action causing this algae the opinions differ. Some see the algae as a consequence of the nutrients supplied by the Brabantse rivers, coming from agriculture in that area. Another possible explanation is that the nutrients originate from the soil of the Volkerak-Zoommeer, which in summer releases phosphates. Finally it is also the Delta works in general which are being blamed for the growth of the blue-green algae.

In turn, the Philipsdam, the Volkerak-Zoommeer and the blue-green algae, as 'non-human actors' also shape the human actors in the network. This shaping takes place in various ways. Firstly there transportation. The Philipsdam forms a crucial node in the road network, connecting the island of Tholen and st. Philipsland to the Grevelingendam and therewith to Goeree-Overflakkee and Schouwen-Duiveland. Also in the water transportation network, the Philipsdam and Volkerak-Zoommeer play an important role, by forming the inland navigation connection

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[93] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: "*in de studie van het Volkerak-Zoommeer is nou precies vergeten dat we een ingenieursysteem zijn, en dat boven die waterweg het aan elkaar verbonden is, als je aan een knop draait, dan gaat het aan de andere kant. [...] Dus wat wij zeggen is, je moet dus heel goed naar die fijnmazigheid kijken, zo simpel is het verhaal. Omdat een beetje minder zoet, ik wil het toch nog een keer herhalen, ik wind me daar echt over op, dat doet het hele systeem over klappen, want het is ecologisch helemaal niet gewend aan dat meer zout*" [087]

[94] The term missing masses refers to the chapter by Latour, B. (1992). Where are the Missing Masses? Sociology of a Few Mundane Artifacts. In W. E. Bijker & J. Law (Eds.), *Shaping Technology/Building Society: Studies in Sociotechnical Change* (pp. 225-258). Cambridge, MA: M.I.T. Press. This section is an attempt to make an argument for the inclusion of non-human actors – e.g. technologies, technological devices – in sociological analysis.

between Rotterdam and Antwerp. And furthermore, being a freshwater body, it shapes human action by providing fresh water for agriculture and recreation, and in some cases, if the blue-green algae is blooming, it is shaping by its non providing of this fresh water. In this respect it needs to be said that the influence of the blue-green algae is spatially bound. This influence is only noticeable in the bordering areas.

In the whole process that has taken place around the Philipsdam and Volkerak-Zoommeer, one can see how the process has been focussed on the extermination of the blue-green algae. Rijkswaterstaat has done this, 'because it was their assignment'. In the process we can notice how the scope gradually evaluated from fresh flushing, to studying both fresh and saline alternatives toward a focus on the re-establishment of the estuarine dynamics. It becomes also clear that over time also the complexity of the problem appeared to grow. It is interesting to see how costs, and discussions on costs, have limited impact on the process, and it is only until now, that these are becoming more and more the object of discussion. Overall it seems that the process is slowly spreading, moving North.

How this is spreading, or 'muddling through', so to say, will be the central issue in the next chapter.

# 4. Dimensions of Black Boxes: Coalitions, Radiation and Fact Construction

*Step out the front door like a ghost into the fog*
*Where no one notices the contrast of white on white*

*And in between the moon and you the angels get a better view*
*Of the crumbling difference between wrong and right*

[...]

*Round here we always stand up straight*
*Round here something radiates*

[Counting Crows – Round Here]

Let me open this chapter by explaining what I want to make clear. I want to deal here with mechanisms that play a role in the process of re-opening the Philipsdam. These mechanisms are both opening and closing mechanisms, which may seem a bit contradictory, since we are talking about the plans to re-open the Philipsdam. The goal of this chapter is; to show that this, in fact, is exactly what is happening in this process. Some people want to open the dam; some want to keep is closed. Some people want to have a Volkerak-Zoommeer with estuarine dynamics, others prefer it to remain fresh, and flush the basin with water from the rivers. In the arena of the Philipsdam's hydrosocial-network various mechanisms are allocated by the different actors. Opening debates to keep the dam closed. Closing debates to re-open the thing. In this chapter I'll examine the role of coalitions, radiation and fact construction as driving agents in the mechanisms of opening and closure. By coalitions I refer to actors that team up in a discussion and the discourse coalitions. With radiation I aim at the ways in which the Philipsdam's re-opening is linked to other processes that take place, in the past, present or future. By fact construction I mean to show how in this whole processes facts are constructed like Latourian black-boxes (see Latour 1987) and how simultaneous ongoing processes try to either close these boxes or apply tactical crowbars to keep them open.

## 4.1. Coalitions

The Netherlands is the country where the word *polder* was invented, as a noun, and in which currently is also being used as a verb, *to polder*. To polder refers to a consensus driven type of policy making, which is supposedly typically for the decision making processes around the polder, and frequently claimed to be typically Dutch. In this 'polderred' and 'poldering' country the role of coalitions is crucial. In this section I examine some of the coalitions that were formed within the Philipsdam's hydrosocial-network, which I have come across while conducting this research. This section is informed by the "nature of objects" uncertainty (Latour 2005 pp.22). I do not claim that this will result in a complete or full overview of the coalition, but I do think that this examination will provide insight in how the role of these coalitions has shaped the process of re-opening the Philipsdam.

### 4.1.1. Allies

One thing that sticks out from the parts of the process that I have observed for this thesis is that the formation of coalitions is a frequently used method. Another thing that is noticeable is that

this coalition formation is very dynamic. One would expect, that is at least what I did, that there are natural allies, and natural opposites. In the Dutch case I expected to find a historically grown opposition between the agricultural sector and nature conservation organisation, since these have competing interest, in terms of land, water and managerial claims. Personally I also expected to find the agricultural sector, even though they are divided in this area into two representational organisations, the LTO-Noord and zLTO, to be backing each other up, since both have to deal with marginalising tendencies. The agricultural sector in the last decades has formed the arena of all sorts of transformations.

Boeters explains in the interview that at an administrative level the already existing institutionalised coalition, the BOKV was assigned by the secretary of state: "to increase the basis for the support of a possible solution, Den Haag came up with the idea of giving the assignment of the plan study to the BOKV. This is an already existing group, with all the people that are involved with the Volkerak-Zoommeer. To give the assignment to them was quite smart, to increasing the basis for the plans. This then, in turn will provide the results to the secretary of state. This has created a administrative basis. And they have even have covered a part of the costs of the study, also useful!"[95]

The 'higher' goal of the nature conservation organisations that I have encountered in this hydrosocial-network is for all the same. Natuurmonumenten, Staatsbosbeheer and the Zeeuwse Environmental Federation all strive after a 'more dynamic delta' of which they consider a saline Volkerak-Zoommeer as a first step. Between Natuurmonumenten and Staatsbosbeheer there is, and has been, a strong coalition. As Anton van Haperen of Staatsbosbeheer explains: "Quirien Smeele [representative of Natuurmonumenten] and me, we do everything together in this process"[96]. According to van Haperen the two organisations have so far worked as a team in the process. As mentioned before in the chapter above van Haperen explained that the agricultural sector and nature conservation organisations where 'imprisoning' each other at first. He refers here to the processes particularly in Tholen and St. Philipsland, but also to the Reigersbergse polder and western Brabant, in these last two areas the MSP processes where started some time later. In order to break open the status quo of imprisoning, the relevant agricultural organisation, zLTO, and the two mentioned nature conservation organisations had a meeting and looked if they could arrive at some sort of consensus. It turned out, according to van Haperen that there was a possibility, being the pre condition that a saline Volkerak-Zoommeer would only be considered as a possibility if an alternative fresh water supply for the agricultural sector has been taken care of. According to van Haperen the zLTO did not want this consensus yet to be announced publicly, since their backing members were not informed yet. A result of this consensus coalition was that

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[95] Middelburg, 10-2-2009, interview René Boeters, project leader plan study, Rijkswaterstaat dienst Zeeland: "*hebben ze in Den Haag bedacht van, weet je wat, om draagvlak voor mogelijke oplossingen te vergroten gaan we de opdracht van de planstudie gaan we geven aan bestuurlijk overleg Krammer-Volkerak. Dat was een bestaande club, met alle bestuurders die zich bemoeien met het Volkerak-Zoommeer, om daar de opdracht neer te leggen. Het initiatief neer te leggen van jongens ga die planstudie uitvoeren en kijk naar die oplossingen en dat was natuurlijk wel slim om in ieder geval draagvlak te vergroten. Want dan komt zo'n club dus met de oplossing, en dat is in de vorm van een advies aan de staatssecretaris.* [...] *En het heeft voor veel bestuurlijke betrokkenheid gezorgd, ze hebben ook nog mee betaald aan studies, dus dat was ook handig*" [234]

[96] Wageningen, 24-3-2009, interview Anton van Haperen, representative Staatsbosbeheer: "*Quirien Smeele* [natuurmonumenten] *en ik* [van Haperen] *zijn twee handen op een buik*" [004]

the representatives of the nature conservation organisation had meetings with farmers in the area. About these meetings on Tholen van Haperen mentions that these where heated meetings, but after three or four evenings they did arrive at some sort of consensus. On the effectiveness of this alliance between the two parties that where at first sight poles apart Carla Michielsen, who has been one of the two persons representing the zLTO's stakes in this process, states: "when we agreed with the nature organisations and other parties upon the importance of freshwater supply, it was up to the government to make a move. Zegwaard: since this was such a block… Michielsen: And still is!"[97]. That this alliance between these two sides was not officialised at that time also surfaces in the fact that the zLTO did not sign the so called 'delta manifesto', which was drawn up by multiple actor organisations[98]. Though not having singed it, according to van Haperen, the zLTO did defend its content at one of the meetings. Later in the process, at the round-table conference with the parliamentary commission Mr. de Koeijer, the representative of the zLTO at that meeting pointed at the uniqueness of this alliance in the open stating: "this time nature and agriculture nicely agree on the direction for solution. Unlike, for example, the discussions on the Westerschelde"[99]. This Westerschelde he refers to concern the discussions on de-poldering, in which reclaimed land, which is currently being used for agricultural purposes, is being 'given back to the sea'. In these discussions nature and agriculture have completely opposite stakes. So where they 'collide' in 'de-poldering', they 'polder' to a consensus coalition in the Philipsdam case.

Also in the part of the plan study dealing with the technical research coalitions have been formed. Simon Groot of Deltares explains in an interview that researchers of the University of Amsterdam claimed that they found the solution for the blue-green algae problem in the Volkerak-Zoommeer, being flushing it with fresh water (150 $m^3$ per second). Groot: "consequently René Boeters said: ok interesting. And thus he has asked us to give an advice on this, together with the University of Amsterdam, on what they should do. And together with Amsterdam we repeated the calculations"[100]. The result, as known from the previous chapter is that the bottom line of these studies is that the fresh option does not satisfy. Later in this chapter I will dig deeper into the role of these modelling studies, for now it is relevant to know that Rijkswaterstaat has assigned the modelling job to Deltares, with Amsterdam as their subcontractor.

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[97] Goes, 24-2-2009, interview Carla Michielsen, representative at zLTO: "*want toen wij het er over eens waren met de natuurorganisaties en andere partijen dat die zoetwatervoorziening zo belangrijk was, ja maar toen hadden de overheden zo iets van, jeetje…*" Zegwaard: "*ja, dan hadden ze een groot blok* " Michielsen: "*ja. nu nog steeds*" [106]

[98] This Delta Manifesto has been signed by: ANWB, Brabant Zeeuwse Werkgeversvereniging , HISWA, Kamer van Koophandel Zeeland, Koninklijke Schippersvereniging Schuttevaer, Natuurmonumenten, RECRON, Producentenorganisatie van de Nederlandse Mosselcultuur, Staatsbosbeheer, Stichting Het Zeeuwse Landschap and Zeeuwse Milieufederatie

[99] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: "*dit keer zijn natuur en landbouw het aardig goed eens in de oplossingsrichting. Dat is anders dan bij de Westerschelde discussie bijvoorbeeld*" [083]

[100] Utrecht, 25-3-2009, interview Simon Groot, Deltares: "*Nou, vervolgens heeft René Boeters dat opgepakt, en heeft gezegd van, ok interessant, en heeft dus aan ons gevraagd om samen met Amsterdam een onderzoek te doen en waterstaat te adviseren over wat men moest doen. Dus vervolgens hebben wij samen met Amsterdam die sommen overgedaan*" [023]

When analyzing the stake-formulations of the different actor representatives at this round-table conference, it turns out that there are more coalitions actively propagated.

One interesting way in which collations played a role in the conference was what I would call 'the creation of the idea of a coalition'. This is for example done by Mr. Zonneveld when he states: "No more waiting! We should make use of this moment of communality, as we are sitting here, to take a step forward!"[101]. Later that same conference one person tried to do an attempt to create a broad coalition by asking the members of the parliamentary commission to confirm that they endorse a sense of urgency for finding a solution is this situation.

Another one of these propagated coalitions is the interesting alliance between the Oyster producer's organisation and the Zeeuwse Environmental Federation. Both these organisations have also signed the Delta Manifesto. Gijs van Zonneveld, representing the Zeeuwse Environmental Federation in his contribution points out that the person sitting next to him, Mr. van Lier, from the Oyster producers organisation is not purely accidentally his neighbour in this conference. He claims that their goals are basically the same: "we are striving after the same goal. You can see that there is some sort of a coalition possible. A shared stake; to make sure that the delta waters are managed in a more natural way. More sustainable for both!"[102]. This statement is confirmed by Mr. van Lier in his contribution. He, for the short term, promotes the idea of conducting a test with letting in fresh water into the Oosterschelde: "we would like to see a pilot study in which for a short period of time the fresh-saline connections are re-established. Such a pilot study is our project. For that project we have multiple allies: Rijkswaterstaat, WWF, ZMF… all are lined up in the same direction. That's what I would like to point out to the parliamentary commission"[103]. In terms of their geographical orientation this is not so surprising. For both these parties the Oosterschelde is very important, be it ecologically in terms of its nature value or economically in terms of its fishing grounds.

Where nature, recreation and other organisations teamed up in the above mentioned Delta Manifesto, a similar procedure was undertaken by the so called 'Bernisse Commission'. Members of this commission are the Hoogheemraadschap Delfland, Water Company Evides, Harbour industry Rotterdam and Water board Hollandse Delta. In a letter to the BOKV this commission expresses their concerns about the process around the Volkerak-Zoommeer. These concerns deal with the following topics: water supply for the industries in the Europoort/Botlek area; the

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[101] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: *". Niet weer wachten. We moeten nu de gemeenschappelijkheid, zoals we nu ook bij elkaar zitten, benutten om een stap verder te zetten"* [078]

[102] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: *"wij streven dus naar hetzelfde en je ziet hier dus dat er een soort coalitie mogelijk is, een gemeenschappelijk belang, om er voor te zorgen dat de deltawateren natuurlijker beheerd worden. Dat is duurzamer voor beide*" [078]

[103] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: *"maar dat zou in ieder geval voor een korte periode het herstel van de zoet-zout verbindingen, en we zouden daar graag ook, met ingang van volgend jaar ook in de vorm van een pilot willen doen, dat is ons project, en we hebben daar verschillende bondgenoten, Rijkswaterstaat, WWF, ZMF, alle gezichten, niet alle gezichten, alle lichten staan op groen wat dat betreft, daar zou ik graag de leden van de vaste kamer commissie verkeer en waterstaat op willen wijzen*". [079]

possibility for growth of the water supply pumped at Bernisse; water supply for level control and water quality; water supply for horti- and agri- culture; climate change in relation to the plan study; and process of interest consideration.

The examples of coalitions in the above show that the alliances can very well be between different sectors. It also shows that the coalitions tend to be spatially orientated, in terms of their regions. This can also be illustrated by the example of the agriculture in the delta area. Early on in the process the LTO-Noord made a deal with the zLTO on promoting their stakes. As Beugelsdijk of the LTO-Noord explains: "I work in close collaboration with the zLTO. My predecessor [at LTO-Noord] also worked closely together with the zLTO. He [the predecessor] made a deal with the zLTO, saying: your role is more important around the Volkerak-Zoommeer than our role. If you [zLTO] represent us, Zuid-Holland in the Volkerak-Zoommeer discussion, we will the same for you in the Kier discussion"[104]. This deal did not work out that well, as he explains, since: "the zLTO was supposed to represent us, but, just like it goes with more things in life, first you look at you own stake, then you look again at your own stake and by then you have forgotten what you where supposed to take along for the other. Well, because of that we are now busy with a catching up trajectory"[105]. Beugelsdijk does continue that they have initiated this catching up trajectory after they were warned by, among others, Carla Michielsen [of the zLTO]. All in all the evolution of the whole situation regarding the Volkerak-Zoommeer has caused that there is proverbial wedge between the 'South' and 'North'. In which the South refers to the areas in Zeeland and Brabant, and North refers to the areas in Zuid-Holland. On this Leo Apon, from the Water board Hollandse Delta states: "all different parties have different stakes. It is just that regarding Zeeland and Brabant a lot of issues have been solved. All parties are happy, so to say, that it will be executed. Various problems have been solved, compensated. Zuid-Holland still remains open. Some issues are going to have to be dealt with"[106].

On governmental level it seems that pretty much all parties are aligned. With most of them making part of the BOKV there is a broad coalition in favour of a saline Volkerak-Zoommeer. Apon states on this: "All provinces agree on this matter. They all want a more saline Volkerak-

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[104] Haarlem, 16-3-2009, interview Jos Beugelsdijk, LTO-Noord [13:00]: "*ik werk heel nauw samen met de ZLTO, mijn voorganger, die het hier voor mij deed, werkte ook nauw samen met de ZLTO, en die had tegen de ZLTO gezegd van, jullie hebben rond het Volkerak-Zoommeer een belangrijkere rol als wij dat hebben, als jullie nu de rol rond om het Volkerak invullen ook voor Zuid-Holland, dan zullen wij het doen ten aanzien van het kierbesluit, wat er is gevallen in 1998, en zullen wij dat doen, als daar ook landbouw belangen voor het ZLTO in liggen ook voor jullie mee te nemen*" [022]

[105] Haarlem, 16-3-2009, interview Jos Beugelsdijk, LTO-Noord [13:30]: "*want de zLTO zou dat wel meenemen, maar zoals het altijd gaat in het leven, je kijkt eerst naar je eigen belang, en dan nog een keer naar je eigen belang, en inmiddels ben je de belangen die je mee zou nemen voor een ander vergeten, nou in dat kader zijn we nu bezig met een inhaalslag*" [025]

[106] Ridderkerk, 27-2-2009, interview with Leo Apon, policy advisor at Water board Hollandse Delta: "*allerlei partijen hebben verschillende belangen. Het is alleen zo dat ten aanzien van Zeeland en Brabant, is er al een hoop opgelost, en zijn alle partijen bij wijze van spreken blij, dat het gaat gebeuren, er zijn allerlei mogelijk problemen opgelost, gecompenseerd, en Zuid-Holland ligt nog een beetje open, daar moeten nog een aantal zaken geregeld worden*" [010]

Zoommeer. We are pretty much isolated... The national government is also already convinced..."[107].

#### 4.1.2. Discourse Coalitions

Another way is which coalition's play a role in this hydrosocial-network is the formation of discourse coalitions. By this I mean the phenomenon observed when actors make use of a discourse that one would naturally expect to be used by another actor. Most notable in this respect is the role of Rijkswaterstaat. Paul de Schipper, journalist for BN/de Stem and author of a historical book on the construction of the Oosterschelde storm surge barrier observes a tendency in the approach of Rijkswaterstaat: "they [Rijkswaterstaat] are still a powerful actor. They are now green inspired, instead of concrete inspired. But in the essence they remain the same..."[108]. In the second chapter this tendency has been referred to as the ecological turn in Dutch water management. This ecological, green, underpinning can be traced back in the presentations as they are given by René Boeters in the LTO-Noord member meeting and at the conference with the parliamentary commission. The problem is clearly formulated as being an ecological problem. The language used appears to be a hybrid between a civil engineering-technological discourse and an ecological-nature discourse. Take for example a citation from the interview with René Boeters:

*"To make use of it that you get ecologically well functioning water, you need low rates of nitrates and phosphates. Additionally the soil is also a problem. The soil additionally delivers phosphates. This can be dredged, as has been suggested in the past. But, despite the size of such a job, the soil will keep on delivering these phosphates. And it thus does not solve that much. In cooperation with the Water board we have thus looked into how we can arrive at a fresh system with a properly functioning ecology"*[109].

I will not state here that the old, to speak with de Schipper, 'concrete minded' Rijkswaterstaat would have chosen the dredging option here. But it is telling to see how Boeters speaks of a properly functioning ecology. This vocabulary cannot be seen separately from ecological tendency's at higher levels, with the demand for Environmental Impact Assessment[110] and the ongoing introduction of the European Water-framework Directive[111] and the result of the second

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[107] Ridderkerk, 27-2-2009, interview with Leo Apon, policy advisor at Water board Hollandse Delta: *"alle provincies zijn wel het eens. Die willen allemaal dat het zouter wordt. Dus zuid Holland daar hebben we ook geen steun meer aan. Nee, we staan daar redelijk alleen* [...] *het rijk is ook al lang om"*. [147-149]

[108] Hooge Zwaluwe, 19-2-2009, interview Paul de Schipper, journalist BN/de Stem: *"het is nog steeds een heel grote macht. Ze zijn nu groen bevlogen in plaats van beton bevlogen, maar in essentie maakt dat natuurlijk niet zo veel verschil uit"* [100]

[109] Middelburg, 10-2-2009, interview René Boeters, project leader plan study, Rijkswaterstaat dienst Zeeland*: "Ja, je hebt om echt gezond ecologisch functionerend water te krijgen heb je gewoon hele lage gehaltes nodig aan nitraten en fosfaten, en dan levert bijvoorbeeld ook die bodem weer een probleem, en daar kun je niks aan doen, die levert gewoon na. Je kan gaan baggeren, maar dan gaat die laag daar onder gewoon... dat is ook wel eens gesuggereerd, baar het dan maar, maar afgezien van dat dat nogal een klus is blijft die bodem gewoon fosfaat na leveren, dus dat lost niet zoveel op. We hebben wel gekeken naar, samen met het waterschap dat dit[wijst] gebied beheert; wat zou je nou moeten doen om toch wel in een zoet systeem te komen tot een toch wel goed functionerende ecologie"* [077]

[110] In Dutch: "*Milieu Effect Rapportage*"

[111] In Dutch: "*Kader Richtlijn Water*"

delta commission, the Veerman commission, all emphasizing the environmental impacts of policies.

In the parliamentary commission meeting it was interesting to see that some actors tried to shift the problem formulation, which is predominantly in terms of sustainability, estuarine dynamics, etcetera, to a more economic focus. For example Mr. de Koeijer of the zLTO stated straightforward: "Maybe we should make the economy the central issue. A powerful economy is of added value for all sectors. Maybe 'estuarine dynamics' is not the most appropriate to put the central focus on since this is an abstract concept which everyone interprets differently. If you place the economy as the central issue we can find each other in this discussion, and solve things"[112]. This is maybe not such a surprising move from a representative of the agricultural sector which has a mainly economical interest in a good fresh water provision system. Mr. van Lier, representative of the Oyster association, also having a economic interest in the process states: "What we see at the Oosterschelde is that we are facing a ecological system which is jammed"[113]. Where the zLTO tries to move the focus from ecology to economy, in order to get their stakes represented, the oyster association is using an eco-vocabulary to do so.

Finally there are the Water boards. Water boards seem to play a sort of chameleon role when it comes to their stakes and arguments. This is maybe also not so surprising given that they share a praised democratic history, with some of them having been formed in the 13th century. Ever since then they have played a significant role in the consensus seeking policy processes, as was mentioned above. Traditionally the board members are often strongly connected to the agricultural sector. Water boards are thus the institutional crystallisation of the Dutch 'poldering'-history. Today there's more representation of other representative organizations like nature organizations. In the interview with Leo Apon of the Water board Hollandse Delta he told me to differentiate between the official and administrative[114] sides of the Water boards. The Water boards thus are somewhat situated 'in the middle', with a executive branch and a policy oriented branch. The Water board can say one the one hand, our job is water level management and, as Kramer (ZWE) states: "we can also do our job as water manager also with brackish systems"[115]. On the other hand there is the pressure of representing the agricultural sectors water stakes, Leo Apon for example states: "Here we have the most sensitive cultivation types. All this is

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[112] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: "*Misschien moet je ook de economie centraal stellen. Een krachtige economie is een plus voor natuur en een plus voor de andere sectoren, daar lift alles op mee. En misschien is estuarine dynamiek ook niet zozeer het goede om centraal te stellen want dat is een abstract beeld waar een ieder zijn eigen beelden of vormen aan trek. Maar als je economie centraal stelt, dan kun je elkaar vinden in deze discussie en dan komt je er uit*" [083]

[113] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: "*Wat we zien dus, in de Oosterschelde, dat is dat er sprake is van dat het ecologisch systeem in de knel zit*" [079]

[114] In Dutch: *"Bestuurlijk en Ambtelijk"*

[115] Middelburg, 5-3-2009, interview with Acronius Kramer, Water board Zeeuwse Eilanden: *"wij kunnen ons werk als waterbeheerder ook als brak water systemen doen"* [015]

greenhouse horticulture. Yes... That's difficult. [...] It's going to be complicated. Are you going to deal with this... [...] That's why we are a little bit against it in Zuid-Holland"[116].

#### 4.1.3. Remarks on Coalitions

Quite obviously, and most probably also no too surprisingly, coalitions, whether being 'actor-actor' coalitions or 'discourse' coalitions, are a popular 'tool' being used by different actors to increase the weight of their argument. The strategy of formation of coalitions turns out to be matching a complex-ecosystem problem, like we are dealing with here. Coalition links are highly flexible and dynamical, they are shaping and shaped by the process that is taking place. The example of the initial coalition between the zLTO and LTO-Noord, which over time lost its momentum shows that even within a sector coalitions are variable. It turns out that coalitions are not especially formed within these sectors, as expected. Instead in this case the geographical location has been of stronger influence. The coalition between zLTO and nature conservation shows that apparently allies can be formed between two anticipated 'enemies', as they are in discussion on de-poldering.

In short, coalitions in the discussion on the re-opening of the Philipsdam turn out to be temporal, flexible, issue-induced, inter-sectoral and geographically oriented.

### 4.2. Radiation

*"Actually, to be honest, it was not really clever to start off the study process by approaching it as a closed system. At first the idea was to flush it or turn it saline, with limited effort, the rest of the world wouldn't notice a thing. But it turned out that a solution for the system itself was needed. Bit by bit we discovered: Guys! This is impossible! There's such a radiating effect, so much influence!"*[117]

René Boeters, interview Middelburg, 10-2-2009

The radiation referred to here is very similar to Latours "Nature of Action" uncertainty. He describes this uncertainty as: "in each course of action a great variety of agents seem to barge in and displace original goals" (2005 pp.22). This, what I will call here the 'radiating effect', this influence on other systems has been, and still is, playing an important role in the process as it is going on since the early 1990's. This radiation has been influential in two ways. First there is what I would call the construction of complexity, or maybe it's more accurate to even call it the construction of the idea of complexity. In this construction a sort of blurred layer of complexity is put on top of the situation. One could also call this a shift to a more abstract policy discourse. Second way is the linking of issues. Herewith it is tried to broaden the hydrosocial-network, or, to connect two or more previously separated networks. In the continuation of this section I provide

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[116] Ridderkerk, 27-2-2009, interview with Leo Apon, policy advisor at Water board Hollandse Delta: "Apon: *we hebben hier de meest gevoelige teelten, dit is allemaal glastuinbouw, ja... dat is een lastige...* [...] *Het zal wel lastig worden dit. Dus ja, dat is een moeilijke, hoe ga je daar mee om* [...] *daarom zijn we er in Zuid Holland een beetje op tegen.* [134-138]

[117] Middelburg, 10-2-2009, interview René Boeters, project leader plan study, Rijkswaterstaat dienst Zeeland: "*als ik het je eerlijk zeg, eigenlijk zijn we niet zo handig begonnen door het Volkerak-Zoommeer als een afgesloten systeem te zien. Kijk het eerste idee was, voor die oplossingen met beperkte inspanningen, gaan we het of spoelen of zout maken. En daar merkt de rest van de wereld eigenlijk niet zo veel van. Maar dat is wel gewoon een oplossing voor het systeem zelf. In de loop van de tijd zijn we er achter gekomen van, jongens, het kan helemaal niet, het heeft zo'n uitstalend effect, zo veel invloed"* [263]

some empirical examples that I have encountered in the interviews and meetings during the fieldwork for this thesis.

### 4.2.1. Constructing Complexity & Issue Linking

As the quote in the introduction points out, things turned out to be much more complicated than it had been assessed at the start of the plan study. This complexity is also used in some of the arguments made in the process. Most of the times the complexity is illustrated by examples of how this one Volkerak-Zoommeer situation influences other systems. These cases will be dealt with later in this section, on the linking issues. What also happens though, is sticking to general terms. The person representing Water Company Evides at the parliamentary round-table conference for example stated: "we do not benefit from partial solutions, we like the idea that it is now being dealt with as a whole"[118]. Similarly, at the same occasion, dike grave Haersma Buma of Hoogheemraadschap Delfland states: "in the Volkerak-Zoommeer study it is forgotten that we are dealing here with an engineering system, if you turn one switch, it'll move to the other side..."[119]. Typically both of the actors in these examples do not have any direct benefits from the plan to turn the Volkerak-Zoommeer saline. On the contrary, it seems...

**Figure 22: Volkerak-Zoommeer - involved regions**

The linking of the Volkerak issue to other issues is a tactic used in many instances. In this section I will deal with some which I have come across in this research. For convenience sake I will classify these issue linking practices in past, current and future issues.

I'll start off with the issues from the past which are being linked to the Volkerak-Zoommeer process. Essentially there are two issues that have strong connections with each other, the 1953 flooding disaster and the construction of the Oosterschelde storm surge barrier. Let's first look at this issue of the barrier construction. This basically comes down to actors stating that the current problem, the blue-green algae problem in the Volkerak-Zoommeer is a direct consequence of the delta works. At the conference this link was being used, as was mentioned before, in discussion

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[118] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: "*En wij hebben niet zo veel aan deel oplossingen, dus wij vinden het prettig dat het nu in zijn totaliteit wordt bekeken*" [077]

[119] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: "*in de studie van het Volkerak Zoommeer is nou precies vergeten dat we een ingenieursysteem zijn, en dat boven die waterweg het aan elkaar verbonden is, als je aan een knop draait, dan gaat het aan de andere kant*" [087]

on who is going to cover the costs of the measures that will need to be taken now. In this respect it was stated twice at the conference that since it was the national government who has built the dams, they should also cover the costs of its consequences. The '53 disaster link is a link that I expected beforehand to come across more frequently in the interviews, especially after having read the book on the battle over the Oosterschelde storm surge barrier by Paul de Schipper. In this book its s central theme that in Zeeland you are not allowed to talk about water managerial matters if you 'were not there at the time'; if you 'haven't experienced the disaster yourself'. To my surprise this is not really an actively promoted link with the present. Carla Michielsen did refer to it, by stating: "I'll be last person to say that safety is not important. If there's one part of the Dutch population that knows what the word safety means, it'll have to be Zeeland. You are being raised with that notion here [in Zeeland]"[120]. Some interviewees play down a little the relevance of this argumentation. For example Jos Beugelsdijk says: "What should we care about? The flooding disaster of 1953 is in the past now for so long now"[121].

Current issues that are being connected to the Volkerak-Zoommeers problematic nature are being used much more frequently. I will here deal with a few examples: gooses; brown rot; Nieuwe Waterweg/water distribution; the 'Kier'; and the de-poldering discussions.

In the coffee break at the LTO-Noord member meeting in Dirksland, in Zuid-Holland, I was talking to one of the present farmers. According to him, in this whole discussion an important aspect is being neglected: gooses. He calls himself a 'normal' farmer, cultivation 'the typical stuff'[122], on his plots nearby Dirksland. One of the really big problems that he and his neighbours face are gooses. The number of gooses increases because of the many nature-area developments, which are often combined with changes of the inland water management system. For example the creation of the new 'boezem'[123], this has been planned as a consequence of the 'Kier'. In these new 'nature' area, gooses land in the neighbourhood, and therewith increasing the manure load on their lands...

A second linked issue which also originates from agricultural practices is the brown rot. Brown rot is a fungal disease, particularly affecting potatoes. Journalist Paul de Schipper perceives a direct connection between brown rot and the blue-green algae: "at a certain moment in time, that's what I have come across, it happens that the potatoes here, in western Brabant, have brown rot, due to high temperatures in summer. Consequently they flush the system with water from the Volkerak. But if there are the blue-green algae in the Volkerak, they can't flush. As a result you have brown rot"[124]. Carla Michielsen, representative for Zeeland and western Noord-Brabant at

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[120] Goes, 24-2-2009, interview Carla Michielsen, representative at zLTO: "*Ik zal de laatste zijn om te zeggen dat je niks aan veiligheid zou moeten doen, als er een bevolkingsdeel is in Nederland die weet wat veiligheid betekend dan moet je in Zeeland zijn, want dat wordt je met de paplepel meegegeven*" [132]

[121] Haarlem, 16-3-2009, interview Jos Beugelsdijk, LTO-Noord: "*Waar zal je je druk om maken? Ik bedoel de overstromingsramp 1953 is al zo lang achter ons*". [106]

[122] Original: "*standaard spul*"

[123] '*Boezem'* is the Dutch word for a channel with no fixed water level.

[124] Hooge Zwaluwe, 19-2-2009, interview Paul de Schipper, journalist BN/de Stem: "*maar er is dus een situatie op een gegeven moment, daar ben ik wel eens tegen aan gelopen, wat er altijd gebeurde was, als ze hier bruinrot in de aardappelen hebben, hier in West-Brabant, vanwege de warme temperaturen zomers, dan spoelen ze*

the zLTO explains that the brown rot fungus is related to the Wilhelminakanaal. This Wilhelminakanaal is a possible source of fresh water for the two rivers in this area, the Dintel and the Vliet. The Wilhelminakanaal receives water from the east of Brabant, all the way to the Maas, in the province of Limburg. Michielsen: "disadvantage of the water from the Wilhelminakanaal and the Maas is that it contains the brown rot bacteria, which is an annoying disease in potato cultivation [...] in fact, this [western Noord-Brabant] is one of the areas in the Netherlands which is regarding this brown rot, pretty much 'clean'. By an active inlet of this water this risk will get increased. I don't mean to say that there's no risk if you take the water from the larger rivers..."[125]. Michielsen thus prefers alternative solutions for the fresh water supply of these areas. This image is confirmed by Piet Polak, who works as a senior policy advisor at the Water board in this area. He explain on the possible consequences of using water from this Wilhelminakanaal and the brown rot fungus: "Now they just condemn the bunch of potatoes with the bacteria for consumption. For the rest they just leave the lands as they are. The following year they can just keep on sprinkling. But if this would occur more frequently, in the future they might lock the area..."[126].

Third issue which is being linked to the plans for the Volkerak-Zoommeer is the discharge flowing through the Nieuwe Waterweg. More than 1000 $m^3$ is discharged to the North Sea over the Nieuwe Waterweg, which is a substantial fraction of the entire fresh water flow entering the Netherlands over the two large rivers, the Rijn and Maas. Before the water reaches Rotterdam and the Nieuwe Waterweg, it first flows past the north side of the Volkerak-Zoommeer, over the Hollandsch Diep and Haringvliet. As Leo Apon (WsHD) explains: "Look, this structure here [points at the Haringvlietdam] is the steering structure. It basically functions as a communicating vessel with the Nieuwe Waterweg"[127]. Consequently, if you adapt something in that system, you are altering the entire water distribution system of the western Netherlands. Almost every interviewee mentions the relation between the Volkerak-Zoommeer and the amount of water flowing through the Nieuwe Waterweg. René Boeters (RWS), for example, mentions this in his presentation at the LTO-Noord member meeting in Dirksland. In this presentation he states: "the water from the rivers is needed for keeping out the sea water in the Nieuwe Waterweg (1000 – 1500 $m^3/s$) [...] Using freshwater for the Volkerak-Zoommeer (150 $m^3/s$) will lead to unacceptable

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*dat altijd door met water uit het Volkerak. Maar als er blauwalg in het Volkerak zit, kunnen ze niet doorspoelen. Dus heb je bruinrot*" [017]

[125] Goes, 24-2-2009, interview Carla Michielsen, representative at zLTO: "*en nadeel daarvan is, dat in het Wilhelmina kanaal, en maaswater zit bruinrot bacterie, en bruinrot bacterie is een vervelende ziekte in aardappel teelt.* [...] *En eigenlijk, dit is een van de gebieden in Nederland die nog redelijk bruinrot vrij is, zeg maar, en door dat water actief in te laten loop je meer risico, dat wil niet zeggen dat je geen risico zou lopen als je het uit de grote rivieren zou halen*" [046]

[126] Breda, 11-3-2009, interview with Piet Polak, senior policy advisor Water board Brabantse Delta [A-25:41]: "*Nu wordt gewoon de partij aardappelen waarin de bacterie zit wordt afgekeurd voor consumptie, zeg maar, en wordt er verder met het gebied wordt er niks gedaan, dus dat kunnen ze gewoon ook het andere jaar blijven beregenen. Maar goed, naarmate dat steeds vaker voor zou komen, zeg maar, ja dan zou je dan toch in de toekomst een gebied op slot kunnen zetten*" [067]

[127] Ridderkerk, 27-2-2009, interview with Leo Apon, policy advisor at Water board Hollandse Delta: "*Kijk het waterwerk, hier, zit de stuurknop* [haringvlietdam, op kaart] *dit is eigenlijk een communicerend vat* [haringvliet en nieuwe waterweg]". [067]

salt intrusion in the Rijnmond area"[128]. In this respect an interesting question was posed at the round-table conference by Mr. Rikus de Jager, member of parliament for the CDA, to mr. Boeters: "Well, a solution could be the un-deepening of the Nieuwe Waterweg. Move the shipping activities to the west, which is an autonomous development that we'll need to have to accelerate. As a result you'll need much less water in the north, and you've got your water for flushing. What is your response to this?" Boeters: "Yes, that could be a possible solution, more fresh water available for flushing. My estimation would be that you would need approximately to double the flow size that we've tested so far. That's 300 $m^3$ per second. Still that's a lot of water, which possibly flushes away the blue-green algae. But what you do then is using 300 cubic meters for a system that eventually uses 30 cubic meters per seconds for agricultural purposes, and thus are you repeating the trick of the Nieuwe Waterweg, more or less. But ok, it's possible. Another phenomenon will be the result of this, being the fact that you'll need to find a way to get rid of these 300 cubic meters again. You'll need to discharge it somewhere"[129]. This story by Mr. Boeters, on the plan study's view on the freshwater availability in relation to the possibility of flushing the Volkerak-Zoommeer with fresh water is confirmed by Simon Groot. Mr. Groot was on behalf of the current Deltares involved with the modelling studies that form part of the plan study. Mr. Groot explains: "we first looked solemnly at the fresh possibilities. Salt was completely not in the picture yet... we just looked, well, is this 150 correct [solution option as it was opted by researchers from University of Amsterdam], are the residence time needed correct. According to us this 150 $m^3$ per second is not sufficient. If you could divert 1000 $m^3$ per second through the system all algae will surely disappear. [...] But there is no 1000 $m^3$ per second fresh water available [...] 1000 $m^3$ is a possible theoretical solution, but in reality this water is not there, so it's not a practical solution. When this was settled [...] we did some calculation of how much water you would need to do the job. That turned out to be much more!"[130]. The Nieuwe Waterweg/distribution point is brought forward by almost all actors that I've spoken to in the

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[128] Dirksland, 16-3-2009, LTO-Noord member meeting – Powerpoint Presentation René Boeters "*Rivierwater is nodig om zeewater tegen te houden in Nieuwe Waterweg (1000 – 1500 $m^3$/s)* [...] "*Gebruik van veel zoet water voor Volkerak-Zoommeer (150 $m^3$/s) leidt tot onaanvaardbare zoutindringing in Rijnmondgebied*"

[129] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: de Jager:"*Nou, oplossing zou kunnen zijn om de Nieuwe Waterweg te verontdiepen, zeescheepvaart naar het westen opschuiven, dat is een autonome ontwikkeling, dat moeten we wat sneller laten lopen. Dan heb je daar aanzienlijk minder water nodig met de verbetering van de situatie aan de noordkant en u heeft uw zoete water wat u hier nodig heeft om het hier door te spoelen. Wat is daar nou de reactie op?"* Boeters: *"ja, dat zou een oplossing kunnen zijn, meer zoet water beschikbaar voor het spoelen. Ik schat zelf in dat je dan ongeveer de dubbele hoeveelheid nodig hebt dan dat we die nu hebben uitgetest in de zomer maanden, dus dat is 300kuub. Dat is nog steeds heel veel water, mogelijk dat je daarmee de blauwalg wegspoelt, dan ben je wel 300 kuub water aan het aanvoeren voor een systeem waaruit uiteindelijk maar 30kuub wordt gebruikt voor de landbouw, dan herhaal je de truc van de Nieuwe Waterweg, min of meer, maar goed, dat kan. Een ander fenomeen dat je dan krijgt is je moet 300 kuub, maar mogelijk ook meer, moet je ook weer kwijt. Je moet het ook afvoeren*" [051-052]

[130] Utrecht, 25-3-2009, interview Simon Groot, Deltares: *"we hebben dus eerst de zoete oplossingen, dus, zout was nog helemaal niet aan de orde, we hebben gewoon gekeken van nou, klopt die 150 kubieke meter per seconde, kloppen die verblijftijden, die dan nodig zijn. En volgens ons is 150 kuub dus niet voldoende, als je er 1000 kubieke meter per seconde zoet water doorheen stuurt, ja dan groeien er echt geen algen meer* [...] *Alleen het probleem is, er is geen 1000 kubieke meter per seconde zoet water beschikbaar.* [...] *is 1000 kuub per seconde wel de theoretische oplossing maar in de praktijk heb je het water niet, dus is het geen praktische oplossing. Dus, toen we daar uit waren* [...] *toen hebben we wat sommetjes gemaakt van hoeveel heb je dan nodig, nou, dat bleek dus een stuk meer*" [037]

course of this research. Carla Michielsen (zLTO) stipulates that: "the Nieuwe Waterweg is a channel which is dug by us"[131]. Leo Apon similarly states: "it's a consequence of human action, constantly bigger ships, constantly deeper dredging and constantly more salt intrusion. It's been a conscious choice to do this, to keep the salt out. Otherwise Gouda will salinise"[132]. For Jos Beugelsdijk this is reason to state: "look again at the entire Dutch water system. And if you do so, and you say, let's seal off the Rijnmond [Nieuwe Waterweg]... then there's a lot of water that you don't need any more"[133]. Piet Polak (WBD) suggests exploring possibilities of installing for example an inflatable barrier in the Nieuwe Waterweg: "Well, look, what the real solution will be is something you'll have to study. It is possible though, that there are measures that can be taken in the Nieuwe Waterweg, which cost less money, that will provide you extra water to divert through the Volkerak-Zoommeer"[134].

Fourth issue that is being linked to the Volkerak-Zoommeer is the 'Kier'. The word 'Kier' in this area refers to the discussion that has taken place, to open up the Haringvlietdam and therewith let in sea water into the Haringvliet. This process has made the word 'Kier' somewhat burdened with emotions. In a newspaper article on the Volkerak-Zoommeer plan study the Volkskrant headlined: On a 'Kier' against the blue-green algae[135]. Rijkswaterstaat was not really happy with this headline, as René Boeters said: "The Volkskrants headline maker probably like it, on a 'Kier', but we were not so happy with it, because then you create a link with this [the Haringvliet] which is still quite controversial"[136]. On the LTO-members meeting in Dirksland, the 'Kier' issues proved indeed to be a controversial issue. After the presentation by Rijkswaterstaat and the Water board Hollandse Delta, questions from the audience came asking whether it was not possible to reconsider the 'Kier' decision, now that this Volkerak-Zoommeer issue also comes into play. Steven Visser, who has been hired as an independent facilitator of the MSP-process on the freshwater provision southern Zuid-Holland, explained in response that a "reconsideration of the Kier has no place on the [political] agenda"[137]. He continues by stating that though the 'Kier' may

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[131] Goes, 24-2-2009, interview Carla Michielsen, representative at zLTO: "*Dat is trouwens ook een gegraven kanaal hè, de Nieuwe Waterweg*" [119]

[132] Ridderkerk, 27-2-2009, interview with Leo Apon, policy advisor at Water board Hollandse Delta: "*ook door menselijk toedoen, steeds grotere schepen, steeds dieper baggeren, en steeds meer zout naar binnengaan, dat is gewoon een bewuste keuze geweest. Om dat zout naar buiten te krijgen, gewoon, anders verzilt Gouda*". [067]

[133] Haarlem, 16-3-2009, interview Jos Beugelsdijk, LTO-Noord: "*en ga dan het totale watersysteem in Nederland nog een goed bekijken. En kan je dan het totale watersysteem als je zegt van, ik gooi Rijnmond dicht, dan heb ie een heleboel zoet water niet meer nodig*" [125]

[134] Breda, 11-3-2009, interview with Piet Polak, senior policy advisor Water board Brabantse Delta: "*nou, kijk wat de oplossing is, daar zou je natuurlijk naar moeten studeren. En het kan best zijn dat er met minder geld maatregelen getroffen zouden kunnen worden aan de nieuwe waterweg zeg maar, of in die omgeving, dat je daardoor meer water naar het Volkerak zou kunnen sturen*"

[135] See: de Volkskrant, 8 october 2008. Didde, R: *Op een kier tegen de blauwalgen; Deltawerken Plan van Rijkswaterstaat om een doorlaat voor zout water te maken in de Philipsdam*

[136] Middelburg, 10-2-2009, interview René Boeters, project leader plan study, Rijkswaterstaat dienst Zeeland: "*de koppen maker van de Volkskrant vond het leuk, op een kier, maar wij waren er niet zo blij mee want dan leg je de link met hier* [Haringvliet sluizen] *waar nog te veel over te doen is*" [152]

[137] Dirksland, 16-3-2009, LTO-Noord member meeting: "*kier heroverweging staat niet op de agenda"* [118]

be a fixed [closed] issue, the compensative measures that are going to be taken for that can still be adjusted to the 'new' Volkerak-Zoommeer's influence. There are indications that the Secretary of State, Mrs. Huizinga, is resolute in this, and wants to see the Haringvlietdam on a 'Kier' by the end of 2010. It is quite clear that the Kier issue combined with the Volkerak-Zoommeer is specifically relevant for the areas in Zuid-Holland. It is also referred to though, as an exemplary case for how to deal with the mitigating measures. As Piet Polak (WBD) states: "... the same way as it happened back then with the Kier decision in the Haringvliet. There it was decided that the salt could come to a certain fixed point. [...] and consequently we're going to move the inlets. And we're going to think about a solution for the drinking water supply, all on the expense of the national government. But you notice now, that they're now much more reticent in that regard"[138]. Jos Beugelsdijk (LTO-Noord) explains why there's such an emotional burden on the whole 'Kier' issue: "a study to the Kier is much older. But, devising and execution are two separate things. Well, at a certain moment in time a decision was made, and the agriculture said, ok, we will cooperate on this, on two conditions. Firstly we need a warrantee that the current fresh water supply will be untouched. Secondly, if the salt intrusion appears not to stop at 'Spui' [which is the fixed, agreed upon point until where the salt is 'allowed' to enter the Haringvliet], but intrudes further, we close the dam immediately. It's not going to be a matter of open or closed, no we need to have room to manoeuvre. And well, the agricultural organisations have made a big mistake here. The deal was made in a top-down way, with too little communication with the supporters. As a result, they are very emotional about these issues"[139].

Leo Apon (WsHD) put's these sentiments in a broader context: "After the Delta works, the decision on the Kier was made, now the plans regarding the Volkerak-Zoommeer and the Veerman commission... Yes, people feel a threat. Those forces are rather great. We are the only ones opposing. What also plays an important role is that Zeeland and Brabant will improve their situation. They'll get a pipeline through western Brabant. Via the Rodevaart, I'm not too sure. [...] They will just receive fresh water. And especially Tholen and St. Philipsland improve their situation. They're going to get the best water in the world, which they've never... well, yes they had the water, but never used it. That's an odd story as well. They're making a lot of fuss now, but for

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[138] Breda, 11-3-2009, interview with Piet Polak, senior policy advisor Water board Brabantse Delta [A-38:30]: "*Op dezelfde manier waarop dat indertijd ook met het kierbesluit in het Haringvliet gebeurd is. Toen was ook besloten van, nou, tot hier mag het zout worden* [...] *en dan de inlaten gaan we verplaatsen, we gaan iets bedenken voor de drinkwater voorziening. Allemaal op de kosten van het rijk. En daar merk je nu dat ze veel terughoudender in zijn*" [114-117]

[139] Haarlem, 16-3-2009, interview Jos Beugelsdijk, LTO-Noord [34:00]: "*een studie naar het kier besluit lag er al veel langer, alleen ja, bedenken en uitvoeren zijn twee aparte dingen, toen is dat min of meer, in dat kader is toen het kier besluit gekomen, toen is, in het kier besluit is op een bepaald moment gezegd van, ok, vanuit de landbouw, wij willen daar wel aan meewerken. Op twee voorwaarden, in de eerste plaats zoet watervoorziening voor de Zuid-Hollandse eilanden zoals die er nu is, moet gewaarborgd blijven, en in de tweede plaats, als mocht blijken dat de verzilting niet stopt bij het spui, maar verder gaat, moet ogenblikkelijk de kier weer dicht. Dus het is niet zo van, open, of dicht. Nee, je moet kunnen spelen. Nou landbouw organisaties hebben daarbij een grote fout gemaakt. En dat is dat men dat op top down niveau heeft afgesproken, en niet voldoende gecommuniceerd heeft naar de achterban, dat heeft heel veel emotie bij de achterban opgeroepen*" [068]

years they've had fresh water right at their front porch, but they didn't take it. Well, that's just my interpretation"[140].

In his 'interpretation' Apon already touches upon the future issues that are being linked to the Volkerak-Zoommeers problematic nature. Before dealing with the future-issues, I'll now briefly deal with how the current fashion of 'de-poldering' is sometimes linked to the Volkerak-Zoommeer. This de-poldering fashion has already been touched upon in the section on coalitions. In that respect it was mentioned that the Volkerak-Zoommeer is special since nature and agriculture are on the same side, at least, when we talk about the agricultural sector in Brabant and Zeeland. The de-poldering discussions are in this case referred to as an example of how nature and agriculture also can 'collide'. On this de-poldering Paul de Schipper states: "The stupidity about it is that they have pushed the rivers in a corset. And so it is inevitable that it gets too narrow for the flow to pass trough. Consequently it's starts to flood, and action is needed. Giving room to the rivers is thus inevitable"[141].

The project 'Room for the Rivers' is also being linked to the Volkerak-Zoommeer. This project is linked to the Volkerak-Zoommeer regarding the storage of storm water, as René Boeters explains: "... I think you are referring to water storage. Then you are talking about highly incidental occurrences in which the river water needs to be stored in the Volkerak-Zoommeer. Zegwaard: Yes, and it's also one of the 12 points [of the Veerman Commission]. Boeters: Yes, it is a part of the 'Room for the River'-package, measure to buffer peak river discharges. For such occasions they have decided that the Volkerak-Zoommeer should function as a buffer basin for the water then would otherwise end up here [on lower areas] in case the storm surge barriers are closed... that this really is a bathtub filling up"[142]. At the moment a plan study is also taking place on the water storage possibilities of the Volkerak-Zoommeer, and has been placed under the umbrella of

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[140] Ridderkerk, 27-2-2009, interview with Leo Apon, policy advisor at Water board Hollandse Delta: "*ja, vanuit de Deltawerken, toen is het kierbesluit gekomen. Nu het Volkerak-Zoommeer weer, plannen van Veerman weer. Ja, men voelt zich bedreigd ja, en die krachten zijn nogal groot, wij zijn de enige dwarsliggers, en, ja wat natuurlijk meespeelt kijk in Zeeland en Brabant gaan ze er straks alleen maar op vooruit, want zij krijgen een zware pijpleiding over West-Brabant. Komt via de Rode Vaart, geloof ik. weet ik veel waar dat kreng ligt.* [...] *zij krijgen gewoon zoet water straks, en zeker Tholen en st. Philipsland die gaan er op vooruit, die krijgen het mooiste water van de wereld. Die hebben, of nou ja, ze hebben het wel, maar ze hebben het nooit gebruikt. Dat is ook een raar verhaal op zich. Ze schreeuwen moord en brand, maar jarenlang hebben ze zoetwater voor de deur gehad en toen hebben ze het niet gepakt. Dat is dan weer mijn interpretatie*"

[141] Hooge Zwaluwe, 19-2-2009, interview Paul de Schipper, journalist BN/de Stem: "*het stomme is natuurlijk, ze hebben die rivieren, ook in Nederland, allemaal in een korset gedrongen. Allemaal in een korset gedrongen, en dan ontkom je der niet aan dat als de boel te nauw is en der niet meer door kan, en het begint te overstromen, of dreigt te overstromen, dat je iets moet doen. Dus dat je de rivieren de ruimte moet geven, daar ontkom je bijna niet aan"* [255]

[142] Middelburg, 10-2-2009, interview René Boeters, project leader plan study, Rijkswaterstaat dienst Zeeland: "*maar dan heb je het over hele incidentele gebeurtenissen dat de rivier afvoer geborgen moet worden dop het Volkerak-Zoommeer. Volgens mij doel je daar op, waterberging*" Zegwaard: "*dat wel toch één van de twaalf punten geloof ik..*" Boeters: "Ja, *dat is een onderdeel van het 'Ruimte voor de Rivier'-pakket. Van maatregelen om dus verhoogde rivier afvoer op te vangen hebben ze bedacht van nou dan moet het Volkerak Zoommeer maar als een buffer bekken dienen voor het water dat er wordt aangevoerd en wat anders hier terecht zou komen, en als dan hier alles dicht staat, dus al die stormvloedkeringen, dan is dit een badkuip die vol loopt.*" [200-202]

the 'Room for the River' project. The 'new' Delta Commission, the Veerman Commission, refers to the Volkerak-Zoommeer in their eight recommendations for the future:

"*The Krammer-Volkerak-Zoommeer, together with the Grevelingenmeer, and possibly the Oosterschelde should be set up as a temporary storage of surplus river water from the Rijn and Maas. The fresh-salt transition (a natural link between fresh and saline water) will be a good solution for this area, for its water quality problem and may provide new ecological opportunities. In that case an alternative freshwater provision needs to be established.*"[143]

This recommendation by Veerman has had its impact. In almost every interview the link between the Volkerak-Zoommeer and the Veerman commission is being mentioned. Veerman clearly relates the current situation to a possible future one, in 2050. In the recommendations made by the Veerman commission, Boeters (RWS) critically remarks: "What is striking about Veerman is that he has thought of solutions for this area [Zeeland] and for this area [Zuid-Holland], but he didn't really say anything about this [Goeree Overflakkee]. He mentions that more river flow could go this direction [Volkerak-Zoommeer], but he didn't make clear whether this also should go over the Haringvliet. He said that we'll have to stop using the amount of water flowing through the Nieuwe Waterweg"[144]. Boeters also mentions the idea by Veerman to increase the IJsselmeer water level by 1,5 meters, to increase the Dutch fresh water buffer. This water then would be available also for the horti- and agri- culture in Zuid-Holland. This idea thus influences the discussion on the possibilities for alternative fresh water provision for southern Zuid-Holland, which is currently ongoing.

That all these different policy streams, like room for the river, project water storage, the delta commission not always make things clearer is mentioned by Beugelsdijk (LTO-Noord): "well, you've probably heard of 'Room for the River', which was initiated in 1998, in which the whole gang is being looked at again. How's the relation between water and safety. Apart from that the blue-green algae has been recorded to increase in amount. These two matters are being jumbled up all the time, also by the agricultural sector. Sometimes that's just really confusing… "[145].

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[143] Delta Commission, chaired by Veerman, 12 aanbevelingen voor de toekomst [12 recommendations for the future]: "*Het Krammer-Volkerak Zoommeer samen met de Grevelingen en eventueel de Oosterschelde inrichten voor de tijdelijke berging van het overtollig rivierwater van Rijn en Maas. Een zoet-zoutgradiënt (een natuurlijke overgang tussen zoet en zout water) voor dit gebied is een goede oplossing voor het waterkwaliteitsprobleem en kan nieuwe ecologische kansen bieden. In dat geval moet er een alternatieve zoetwatervoorziening komen*" p.12

[144] Middelburg, 10-2-2009, interview René Boeters, project leader plan study, Rijkswaterstaat dienst Zeeland: "*Het opvallende van Veerman is dat hij, heeft oplossingen bedacht voor dit gebied* [Zeeuwse eilanden] *en voor dit gebied* [Zuid-Holland], *maar hier* [Overvlakkee] *heeft ie zich eigenlijk niet over uitgesproken. Dus hij heeft gezegd, nou meer rivier afvoer langs deze kant, moet kunnen, hij heeft niet gezegd of het dan ook via de Haringvliet moet, hij heeft gezegd van, nou we moeten maar af van de hoeveelheid zoetwater die door de nieuwe waterweg moet*" [190]

[145] Haarlem, 16-3-2009, interview Jos Beugelsdijk, LTO-Noord: "*goed, je hebt ooit wel gehoord van ruimte voor de rivieren, wat in 1998 is neergezet, daarbij is dat totale spel nog een bekeken van hoe zit dat met water en veiligheid, maar buiten dat om in zijn totaliteit constateerde men ook op bepaalde plaatsen dat de blauwalg steeds sterker toe nam, die twee zaken worden nu continue door elkaar heen gegooid, ook in de agrarische sector, met ziet ook af en toe, door de bomen het bos niet meer*" [022]

### 4.2.2. Remarks on Radiation

The radiating effect, in this case of argumentation, the construction of complexity and the linking of issues has been observed in both 'opening' as 'closing' arguments. Though it appears from the studied arguments that this differentiation in practice is much more shaded, arguments are commonly formulated conditionally, both sides radiate their arguments. On the one hand there's the nature conservation groups that radiate by framing the re-opening of the Philipsdam as the first step in a much larger complex of measure that need to be taken. On the other hand, actors that are a bit more hesitant with the whole re-opening idea, radiate the issues by linking it to the entire Dutch water distribution system. Furthermore, this section also has shown how there's some discrepancy between the formal set-up of processes, for example in this case a plan study on the one hand, and on the other hand a farmers everyday practice. What the plan study identifies as the problem (e.g. blue-green algae), and its relations with other aspect (e.g. fresh water provision issues), a famer might interpret the problem (e.g. gooses) and its functioning (e.g. alternative freshwater supply causing increased numbers of gooses) completely differently. Thus, next to the strategic use of radiation in strengthening actors' arguments, it might just as well be a consequence of discrepancies between actors' perceptions of 'reality'.

## 4.3. Fact Construction

*"If facts are constructed through operations designed to effect the dropping of modalities which qualify a given statement, and, more importantly, if reality is the consequence rather than the cause of this construction, this means that a scientist's activity is directed, not toward "reality," but toward these operations on statements."*

(Latour and Woolgar 1979 p.237)

Following Latour and Woolgar in this case, the Volkerak-Zoommeers current 'reality' is an effect of constructed facts. In this section I will try to show how facts in this process have been and still are constructed. Later in time, as was mentioned in the theoretical framework section in the first chapter of this thesis, Latour in line with this identifies "the nature of facts" (2005 pp.22) as one of the five main uncertainties that shapes controversies. To gain insight on how these fact constructions work I will look at some controversies, or uncertainties. Models have been extensively used during the course of the plan study, but, as I will show in this section their results are not always unambiguous and uncontested. In the process of fact construction the media seems to play an interesting role which appears to be similar to the role of a referee in football. Finally this section will show, by using the example of water quality, how the different actors can in some cases talk in almost completely different languages when talking about presumably the same thing.

### 4.3.1. Modelling Through

*"Back at that time Rijkswaterstaat already had a monopoly on knowledge. The delta plan embodied Rijkswaterstaat. Rijkswaterstaat had much more power than the Parliament. That's one thing we found out soon enough in Den Haag"*[146].

(de Schipper 2008 pp.75)

The debate on the Volkerak-Zoommeer has been, and still is a debate in which research plays a leading role. First in establishing a route map for the plan study and following for exploring what options will 'work' and which do not. Later on, in the discussion on the freshwater provision of southern Zuid-Holland, the discussion rose on the reliability of the established facts.

Contesting facts, contesting outcomes of studies turns out to be a powerful weapon in discussions. When the Belgians were informed about the Volkerak-Zoommeers plan study, in the difficult sessions with Rijkswaterstaat they played their cards close to their chests, according to Boeters, and: "at the same time they did come up with various demands on what we should research, and, especially, how we should research this. In turn, we didn't think that was really fair..."[147]. The demand on this 'how' were methodological issues: "well, they think that we should use all sorts of 3d models and whatsoever. Researches on what the consequences could be. While we think that you can also calculate this in a different way. So that's what we did, we just calculated it, but not in their way"[148].

Next to this contesting approach, research and science also plays a role in the creation of credibility. On this René Boeters explain that after Deltares came to a conclusion: "these we've submitted to independent [foreign] experts, for their approval [...] because, the outcome that the fresh option won't work, that's not trivial, so we wanted to be sure" Zegwaard: "what kind of experts where they?" Boeters: "they were blue-green algae experts. Or algae experts. Two from Finland, in the Baltic sea they have similar problems. One from Berlin, from the Humboldt University, who knows a lot about algae. And someone from the NIOO, which is the Dutch Institute [for Ecology]. They were not involved in the plan yet. They were steering the group, as independent experts. They also know a lot about the blue-green algae. And finally Jef Huismans, professor at Amsterdam University has also been involved"[149].

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[146] Original: "*Rijkswaterstaat had, als het om waterbouw en dijken ging, toen al het monopolie op de kennis. Het Deltaplan was Rijkswaterstaat. Rijkswaterstaat was veel machtiger dan de Tweede Kamer. Dat hadden we daar in Den Haag al gauw in de gaten*"

[147] Middelburg, 10-2-2009, interview René Boeters, project leader plan study, Rijkswaterstaat dienst Zeeland: "*Gelijktijdig hebben ze wel allerlei eisen gesteld aan wat wij moesten onderzoeken, en hoe, vooral, we dat moesten onderzoeken, en dat vonden wij weer niet redelijk*" [116]

[148] Middelburg, 10-2-2009, interview René Boeters, project leader plan study, Rijkswaterstaat dienst Zeeland: "*Nou ja, die vinden dat wij met allerlei 3d modellen en noem maar op moeten onderzoeken wat de consequenties zijn van hoe zout het dan wordt. Terwijl wij denken van nou, dat kun je op een andere manier ook uitrekenen, dus dat hebben we gewoon uitgerekend, maar niet op hun manier*" [123]

[149] Middelburg, 10-2-2009, interview René Boeters, project leader plan study, Rijkswaterstaat dienst Zeeland: "*Dat hebben we voorgelegd aan onafhankelijke experts nog. Om te toetsen of dat echt wel goed was* [...] *ja, want kijk, goed, de hele uitkomst van zoet houden werkt niet, dat was, dat ging nogal ver dus dat wilden we wel*

Before this closure procedure, as Pinch and Bijker (1984) would probably call this, by (foreign) experts could take place, quite a lot had happened already. Researchers of the University of Amsterdam had approached René Boeters (RWS) with a possible solution for the blue-green algae problem. Simon Groot, from Deltares reports on their advice: "in other words, flushing [with fresh water] turned out to be a solution. They had used a confined modelling instrument to reach this conclusion"[150]. According to Groot the model used in this case was limited, not in the sense of its algae modelling, but in the hydrodynamic aspects of this model: "they had made a 1-dimensional, almost 0-dimensional schematisation of the basin"[151]. This model resulted in a 'go' for a 150 $m^3$ per second fresh water flushing option. With this in mind René Boeters asked Delft Hydraulics (now part of Deltares) with the University of Amsterdam as subcontractor, to double-check together the numbers. The Deltares model showed a 'no-go' for the 150 cubic metre option. The scientists expected that the difference in outcome was the result of the different ways in which they had modelled the algae bloom. Groot: "Consequently we have, together with Amsterdam, repeated the calculations, but now with our models. With our model particularly means a more detailed hydrodynamic model, the water movement. The result was that the horizontal and vertical movement of the water is important for the end result. Even if you make the algae models almost exactly the same, which we have done on statement level, looking at our model and the model of Amsterdam"[152].

But, then, how reliable is this result? According to Groot there are various variables which you can influence in a model: "There are some aspects which you just have to think about. In that sense a model is a resource. You can indicate sensitivity, but in fact, only experience, build up in the past 25 years, with algae modelling, not just in waters in Zeeland, but also in the IJsselmeer and the

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*zeker weten.*" Zegwaard: "*wat waren dat voor experts?*" Boeters: *Nou dat waren blauwalgen experts, of algen experts, twee uit Finland, die in de Baltische zee.. daar hebben ze ook wel problemen met dat... een meneer uit Berlijn van de Humboldt universiteit, die veel over algen weet. En nog iemand van het NIOO, dat is dus het Nederland instituut, en die nog helemaal niet betrokken was bij dat plan. Die bestuurden dat als onafhankelijk deskundigen, maar die weten ook veel van blauwalgen. En ja, Jef Huismans van de universiteit van Amsterdam, de professor daar is er ook nog bij betrokken geweest*" [249-253]

[150] Utrecht, 25-3-2009, interview Simon Groot, Deltares: "*Met andere woorden, doorspoelen was volgens de UvA een oplossing. En daar hadden zij een beperkt model instrumentarium voor gebruikt, daar rolde een antwoord uit*" [021]

[151] Utrecht, 25-3-2009, interview Simon Groot, Deltares: "*ze hadden een 1-dimensionaal, bijna een 0-dimensionale schematisatie van het gebied gemaakt*" [021]

[152] Utrecht, 25-3-2009, interview Simon Groot, Deltares: "*Dus vervolgens hebben wij samen met Amsterdam die sommen overgedaan, maar dan met onze modellen, En met onze modellen bedoel ik met name een gedetailleerder hydrodynamisch model, dus waterbeweging, en daar kwam uit dat de detaillering in de horizontaal en de vertikaal wel degelijk belangrijk was voor het eind antwoord, dus ook al maak/beschrijf je de kinetiek van de algen ongeveer hetzelfde of gelijkt. En dat hebben we dus ook op statement niveau vergeleken, het algen-model van Amsterdam en ons algen-model*" [023]

Randmeren[153], can give you the confidence that your model, under particular circumstances, approximately gives a good description of the situation"[154].

Also in the discussions on the freshwater provision of southern Zuid-Holland, models play an important role. At first southern Zuid-Holland wasn't really interested in what would happen to the Volkerak-Zoommeer, as long as they would be compensated for the inlets which they would lose, making use of the 'Bierkreek' plan, which was already developed. The problems started here when it turned out that there would be backward salinisation over the Volkerak sluices, leaking saline water into the Hollandsch Diep and Haringvliet. This salinisation has been predicted by Rijkswaterstaat, says Leo Apon (WsHD), but: "there is quite an uncertainty. That's something we found out only last week. Maybe, the vertical component of salinity in water is hard to model, and therefore it might be overestimated... That could be the entire problem... Then we're having this entire discussion for nothing"[155]. This uncertainty also came to light at the meeting of the project group freshwater provision southern Zuid-Holland which I have been able to attend. In this meeting drinking water company Evides requested for more details on this saline leakage. Vincent Beijk, from Rijkswaterstaat Zuid-Holland reacted on this: "The numbers that we presently have all have a bandwidth. Because we're now at the edge of yes or no, complicated or simple measures. It's just a model. And though people prefer not to hear this, it's just a model of reality. The hardness of numbers is always an apparent hardness..."[156].

### 4.3.2. Construction of an Image

The 'normal' national media, has not played a very visibly dominant role in the debates so far, but without being visible, the media does have an influence. There have been some articles written, which I have already mentioned in this thesis, but their impact is limited. Carla Michielsen (zLTO) says on this: "well, the media does play an important role. The media only puts the pen to the paper in case of too much or too little water. The media picks up the highs and lows, so to say, but on average they are not so interested"[157]. This image is confirmed by Leo Apon (WsHD). He

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[153] Dutch for : *'border lakes'*

[154] Utrecht, 25-3-2009, interview Simon Groot, Deltares: "*Zo zijn er een aantal aspecten die je gewoon moet overdenken. In die zin is een model dus een hulpmiddel. En het kan je een gevoeligheid aangeven. Maar het is eigenlijk de opgebouwde ervaring in de afgelopen 25 jaar, met algen modellen, niet alleen in de Zeeuwse wateren, maar ook in het IJsselmeer en de randmeren, die het gevoel geven dat jouw model, onder die en die omstandigheden, wel ongeveer de situatie goed beschrijft*" [059]

[155] Ridderkerk, 27-2-2009, interview with Leo Apon, policy advisor at Water board Hollandse Delta: "*dat er wel een grote onzekerheid is, daar kwamen we van de week achter, dat er wellicht, die modellering, het is niet die verticale gelaagdheid van zout is moeilijk te modelleren, en dus waarschijnlijk is het zout in de hogere lagen overschat. Daar kan het hele probleem al wel eens zitten. Dan voeren we allerlei discussie... voor niks zelfs*" [014]

[156] Dordrecht, 18-3-2009, meeting project group Fresh water provision southern Zuid-Holland: "*Op de getallen die wij presenteren zit een bandbreedte, en omdat we op het randje van wel niet zitten betekent die bandbreedte wel of niet, of, simpele of ingewikkelde oplossingen. Het is maar een model, en ook al wil men dat liever niet horen, het is maar een model van de werkelijkheid. Hardheid van getallen is altijd een schijn hardheid*" [018]

[157] Goes, 24-2-2009, interview Carla Michielsen, representative at zLTO: "*nou de media die speelt natuurlijk wel een heel belangrijke rol, dat de media alleen bij teveel en te weinig water in de pen schiet, en een zout Volkerak-Zoommeer in de pen schiet* [...] *en als er weer blauwalgen probleem is, in de pen schiet. De media heeft, die piekt op de pieken en de dalen zeg maar, en wat er gemiddeld genomen gebeurd daar zijn zij minder geïnteresseerd in.*" [145]

explains that it is particularly alive in the agricultural media: "it is in the 'eastern agrarian daily', and who knows what. At the drop of a hat they write about the Volkerak-Zoommeer, since farmers are all worried about it. Threatened. The media plays an important role, particularly with the formations of the image in the agricultural sector. But the ordinary media... not really, not yet"[158].

According to de Schipper there's a strong link between the government and the media: "This has to do with Dutch journalism, or with journalism in general. That has to do with the government giving easier access to the media, they have instruments for doing so. A battery of pr-officials. Shock absorbers, as I call them. They can just manipulate the media. I know plenty of examples from my surroundings. In the case of the delta plan people were being moulded towards the pride of Holland: constructing dams, concrete and asphalt. Currently the media are being moulded into the green-gospel..."[159].

At the parliamentary round-table meeting it proved that people are well aware of it when the media is present. Tellingly, at the time that the conference was reaching the moment for its conclusion, a person remarked that "I don't want to read in tomorrow's paper that..."

It was already mentioned before that the creation of an image is playing an important role in this whole process. It also seems that this image construction is very well thought-out in some cases. The presentations by René Boeters (RWS) and Jan Smits (WsHD) at the LTO-Noord member meeting in Dirksland both start off with pictures of dramatic scenes with the blue-green algae. Furthermore in these presentation data is presented of the year 2003 as the example year. This is being done because this year is supposed to be a representative dry year. At the project group meeting in Dordrecht Mr. Ketelaars of water company Evides raises this point. According to him: "this is scaring people silly!"[160]. As a response one of the other project group members said: "we do have to take into account that this will be 'normal' in 50 years!"

### 4.3.3. Language

In this section I will very briefly go in to how some people speak different languages when talking about presumably the same thing. As an example I will provide an overview of how people frame and interpret differently what water quality is to them. Roughly there are three ways of talking about water quality that I have ran in to.

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[158] Ridderkerk, 27-2-2009, interview with Leo Apon, policy advisor at Water board Hollandse Delta: "*wel in het agrarische dagblad oost, en weet ik wat, daar staat om de haverklap wat in over het Volkerak Zoommeer, want boeren maken zich er allemaal heel druk over, bedreigend, dus die media speelt een heel duidelijke rol, ook bij de beeldvorming binnen de landbouw. Maar de gewone media.. nog niet zo*" [165]t

[159] Hooge Zwaluwe, 19-2-2009, interview Paul de Schipper, journalist BN/de Stem: "*dat heeft te maken met de Nederlandse journalistiek, of met de journalistiek. Dat heeft te maken met het feit dat de overheid nou eenmaal makkelijker toegang geeft tot de media, die heeft instrumenten daarvoor, een batterij voorlichters, schokdempers noem ik het altijd. Die kunnen gewoon de media kneden, ik daar zat voorbeelden van in mijn omgeving. Je ziet dus, wat je, in de zaak van het deltaplan werden de mensen helemaal in de richting van Hollands glorie, dammen bouwen asfalt beton gekneed, en nu worden de media in het groene evangelie gekneed*" [087]

[160] Dordrecht , 18-3-2009, meeting project group Fresh water provision southern Zuid-Holland: Ketelaars: *"met dat droge jaar jaag je de mensen de stuipen op het lijf*" Response: "*we moeten er wel rekening mee houden dat dat over 50 jaar normaal is*" [022-023]

First of all, what I would call the metaphor of water as a living being. This is for example done by Paul de Schipper (BN/de Stem) when he talks about the inlet that has been constructed in the past in the Veersemeer. He states: "There an inlet structure. That's the oxygen supply of the Veersemeer. That's the intravenous injection of the Veersemeer. The Oosterschelde keeps the Veersemeer in a good shape"[161].

Secondly, there are the people who are mainly concerned with salinity, in terms of its chloride levels. Interestingly though, different people allocate different definitions of what is saline, brackish or fresh water. Throughout this thesis it was already mentioned how René Boeters (RWS) sometimes states that the water, in the Haringvliet, won't become saline, but that it'll turn 'less fresh' or maybe a bit more brackish. Not so surprisingly, people affected by this change see this differently. The spokesmen of Evides at the parliamentary round table conference responded: "it was mentioned just before that the water is not going to become salt, but will turn less fresh. Well the norm set for drinking water is 150 mg/litre. With the current water there's little room to play"[162]. Mr. Kramer (WZE) has a different idea of freshness of water: "In this region [Reigersbergse polder] the water has a chloride level of 450 mg per litre. Well, for Zeeland standards that fresh water"[163]

Finally, at the LTO-Noord member meeting one the members in the audience stated: "All the time here people talk about chloride levels, but what about sodium? That has also large consequences for the soil life, that also needs to be taken into account!"[164].

#### 4.3.4. Remarks on Fact Construction, or, Dimensions of Black Boxes

The construction of facts has been of strong influence of the whole process. In the above sections we can easily identify Latourian 'black-boxes' that are being established, constructed, while on the other hand there's actors trying to open them up, and deconstruct them. Crucial in the different phases of the process so far has been the use that has been made of these black boxed facts. To give an example, Amsterdam presented the 'fact' to Rijkswaterstaat that 150 cubic meters of fresh water would make the algae disappear. Rijkswaterstaat decided to not to consider this fact 'closed', but instead have a second opinion on the case. Deltares presented a 'no'. Consequently both boxes were opened up, and Amsterdam and Deltares were assigned the job to construct a new 'fact' together. The resultant message, as we know be now, was: Fresh flushing won't do the job! Now it would be easy to conclude that Rijkswaterstaat wanted a saline solution from the start, but I won't do so. Merely, it's a consequence of what Lindblom would call 'muddling through'. I'll go into this in the discussion in following chapter. Apart from showing how some facts have been (de-

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[161] Hooge Zwaluwe, 19-2-2009, interview Paul de Schipper, journalist BN/de Stem: "*En daar zit een heel doorlaat werk in. Dat is dus de zuurstofaansluiting van het Veerse meer. Dat is het infuus van het Veerse meer. Doe Oosterschelde houdt hier het Veerse meer gezond*" [030]

[162] Tholen, 23-3-2009, round-table conference parliamentary commission Transportation and Water Management: "*Net werd er gezegd het wordt niet zout het wordt minder zoet, maar de drinkwaternorm is 150 mg/litre, met het huidige water is daar niet zo veel ruimte*" [077]

[163] Middelburg, 5-3-2009, interview with Acronius Kramer, Water board Zeeuwse Eilanden: "*in dit gebied* [Reigersbergsche polder] *nou hebben we water van 450 mg., dat is voor Zeeuwse begrippen zoet*" [056]

[164] Dirksland, 16-3-2009, meeting LTO-Noord members: "*er wordt de hele tijd over chloride gesproken, hoe zit het met natrium? Heeft ook veel gevolgen voor bodemleven, moet ook meegenomen worden*" [123]

)constructed, the above section has also shown that this (de-)construction is also consciously being allocated in arguments, with an arbitrator role for the media.

Interestingly an important tool in the whole construction of agreed upon' facts has been the number of dimensions of the model used. Apparently, the facticity of a fact is directly related to the number of dimensions of a model, or, to put it differently: apparently black boxes, in this case literally, have dimensions...

# 5. Conclusion & Discussion

In 3 January of this year I started writing this thesis, though it was still called my proposal back then. I started writing because my thinking got triggered by the newspaper article in the Volkskrant on the plan to open the Philipsdam 'a crack'. I formulated my fascination in a short sentence: how did it come this far? By this aiming at the plans that, at first sight, appeared to reverse our glorious hydro-history, by re-opening one of our famous delta works. The idea was to tackle this question by looking at uncertainties, argumentative strategies and interpretive flexibility within the Philipsdams hydrosocial-network, since the emergence of the blue-green algae problem in the early 1990's. In the continuation of this chapter I will list the conclusion of this research, followed by a critical discussion.

## 5.1. Closing Time...

*Now it's closing time, the music's fading out*
*Last call for drinks, I'll have another stout*

[Tom Waits - I Hope That I Don't Fall in Love with You]

This study has shown that the process of re-opening the Philipsdam recursively shapes and is strongly shaped by the (de-)construction of black-boxes (Latour 1987). Where on the one hand facts are being constructed by some actors, others simultaneously try to unravel these facts and contest their relevance. In this process of opening and closing of black boxed facts, the role of one of the actors stands out: Rijkswaterstaat. Formally Rijkswaterstaat is assigned the job to study the possible solutions for the Volkerak-Zoommeer and its blue-green algae by the BOKV, which in turn has been assigned this job by the Secretary of State of the Ministry of Transportation and Water Management. In practice, the future of the Volkerak-Zoommeer is largely going to depend on what Rijkswaterstaat decided to study, what not to study and what to present as 'the facts'. Rijkswaterstaat clearly holds what Foucault would probably call a strong knowledge-power position. As has been shown in the study, Rijkswaterstaat has been assigned the power to decide what to study, and what not. For example in the case when the University of Amstersdam researchers presented their modelling outcomes of fresh flushing as a possible solution for the blue-green algae problem in the Volkerak-Zoommeer, and Rijkswaterstaat decided to go for a 'second opinion' by Deltares. When the 'Belgians' in turn contested the 'Dutch' calculations, and proposed alternative methodologies, Rijkswaterstaat decided, in turn, against this.

Apart from providing insight in the powerful role of Rijkswaterstaat in this process this study has also show how research conducted under the umbrella of a policy process becomes political itself., confirming Latour and Woolgars statement on this that was dealt with at the start of section 4.3. This is clearly shown by the example of the modelling dispute between Deltares and Amsterdam that has been described in section 4.3.1. The model used by the Amsterdam researchers was criticized for being not dynamic and having too few dimensions. Eventually the dispute was settled by incorporating the Amsterdam knowledge in the Deltares model, resulting in a more robust 'fresh flushing doesn't work and a saline solution does work'-fact. Interestingly though, in the currently ongoing discussion on the alternative freshwater provision for southern Zuid-Holland the models indicated that there might be salinisation problems in the Hollandsch Diep and Haringvliet. The model used here is said to be 1-dimensional. Again the outcomes of the modelling study will have large implications on measures for alternative fresh water supply that

consequently will or will not need to be taken. Fascinatingly the results here are based on a 1-dimensional model, with quite a bandwidth, but Rijkswaterstaat now says that the decision needs to be taken based on this model and the 'facts' that are currently 'known'.

The study has furthermore shown that the muddling through concept, which has been developed by Lindblom is a highly applicable view on this policy process. As already was suggested by the wordplay in 'modelling through', model studies and the therewith closely related fact construction play a crucial role in this process. Another aspect in this is the discrepancy between governmental and institutional parochialism and plurality of day to day practice. With Lindblom, I do not think this 'muddling through' is a bad thing, rather its inevitable in the case of complex or wicked problems. This study has not only shown that muddling takes place, it is also a descriptive account on *how* this happens, how this evolves. It has shown how a blue green algae problem gradually turned into a salinity problem, after this the salinity problem slowly evolved into simultaneously discussions on leakage, (the design of a sluice) and discussions on mitigation measures, and the economics and politics behind this mitigation.

Besides, this study has shown how the forming of collations and the construction of complexity shapes, and is shaped by, ongoing processes. Coalitions, ally formation, turns out to be highly dynamic flexible, spatially oriented and not uncommonly between 'natural enemies'. The radiating effect in the argumentation, the construction of complexity and linking of issues turns out to be an important strategy in the discussion. In this respect it catches the eye that pro-open actors link this Philipsdam discussion to a larger *–this is only just the first step in the right direction-*frame, whilst actors that are more wary about the possibility of re-opening link it to more concrete problems, like for example brown rot fungus in potatoes and the 'Kier'-decision.

When looking at the language used in the discussion it becomes clear that different actors have different interpretations of some particular concepts. Most striking example here is that of 'water quality'. This indicates that the employment of particular discourses and therewith related definitions is politically in itself.

## 5.2. Looking Back

When looking at the research question that I have formulated in the first chapter of this study, one issue still remains untreated. This is the fifth sub question:

*What does a discourse analysis approach make one see about this particular situation? How does this approach do this? And, what are the main limitations of this approach?*

In essence this question is answered by the quote from Hajer and Versteeg: "Foucaultian approaches of discourse analysis regard power and knowledge as fundamentally intertwined. Creating a joint understanding of the world, developing knowledge following particular conceptual guidelines is power. This idea, that power is examined in creating the very terms with which politics is conducted should not stand in the way of an analysis of strategic behaviour. The type of discourse analysis advocated here might be looking for regularities in the terms that are employed in a discussion, but it does so in the awareness that it is actors that utter statements and that those actors might do so with certain tactical or strategic goals in mind" (2005, pp.181). The approach has in this case indeed helped me to find regularities in the terms employed by the different actors. It has given me the opportunity to examine the argumentation used in the discussions. You might have noticed that there is no section included in this thesis under the heading *recommendations*. This 'gap' is a direct result of the approach chosen for this study; I

made me see what is happening, and how this is happening. The chosen approach does not make me see what is good or bad therefore I have tried to keep as far as possible from any of these moral judgements, and thus also from recommendations on what should be done. Thus it enables one to answer *how* questions but *what should be* question our out of the picture.

Then the other two conceptual pillars used in this research: sociotechnicality and actor-network theory. On this study being a sociotechnical one, I think it is hard to say whether a study is truly sociotechnical, since the word itself is multi-interpretable. I do think that I can say that this study has been a sociotechnical one. What I have done is examining the 'technical' aspects within a 'social domain' pre-eminence: words. Words build up the 'bridge' between man among themselves, and between man and technological artefacts. In this respect actor-network theory has been particularly useful, both conceptually as methodologically. Conceptually by establishing a view on 'reality' in which there is room for both human and non-human actors. Methodologically by shaping the basis for a 'follow-the-network'-approach.

The combination of the discourse analysis approach with the used software for coding has proved to be very workable for me. It requires quite some time, especially at the start of the coding process, to find out which codes to use, and, much more time consuming, which not. Making use of the software has forced me to work in a systematic way which has surely been beneficial for the end result. The approach has 'forced' me to systematic transcribe my interviews, analyse them and, maybe even the most effective aspect, to repeatedly re-read these transcriptions.

This brings me to the main limitation of this approach: time. Though I am happy with the level of 'in-depthness' of the data, this did require a tremendous time input. Transcribing interviews and analysing them, turned out to require much more labour then I had foreseen at the time of writing my proposal. Consequently I had to make concessions in the number of interviews that I could do for this thesis. The initially planned 10-20 interviews in practise boiled down to 9 interviews, of which one was over the phone (which is not ideal, but more a practical compensation for a appointment that had been missed by the interviewee). No doubt that this has influenced the content of this thesis. I have not spoken to any Belgian nor to an algae researcher from the University of Amsterdam. It would also have been nice to interview a representative of the harbour in Rotterdam, and I could list many more people. Apart from being a consequence of the chosen approach, this limitation also comes as a result of the thesis itself. Two months of 'fieldwork' is not much. Much is determined by the willingness of the interviewees to schedule some time for me. When it comes down to this point, ignoring a few exceptions, I have been very surprised in a positive way by the cooperation offered. I also think that the limited number of interviews is partially also mitigated by the meetings which I was kindly asked to attend. Returning to the limitations of the discourse analysis approach in general it also needs to be remarked that this approach is, in my view, only possible when one really masters a language, so for me this is, for now, only possible in Dutch, my mother tongue, though I realise this does not apply to those blessed with a better functioning 'head for languages'.

### 5.3. The Banality of Salinity

Before leaving you, the reader, alone, and finish this thesis, there's just one more thing I would like to share my reflections on. The point is that throughout the process of writing this thesis there has been one recurring question. In a complex problem, like the one this thesis has been built around, and the processes around it, trying to solve whatever is thought of that needs to be solved, where does this leave me, as an individual, 'man' in the singular?

Let me try to explain what I mean by this question. From the co-evolutionary history described in this thesis, it would be a natural conclusion that, from an individualistic perspective, things happen, because they happen. For example, if René Boeters of Rijkswaterstaat would not have been René Boeters, but a completely different person, say X, things would not have been that much the same. The plan study would be assigned to Rijkswaterstaat, who in turn would assign the job to X. Would the outcome - what is going to happen to the Philipsdam - be much different? The decision ultimately will be taken by people who have been elected. These people will be influenced by an uncognisable number of influences. Do they like fishing in fresh water? Or do they prefer sailing? Or did their child at the dinner table the evening before tell a story of what he/she heard in the schoolyard about how fresh water only makes a tiny little fraction of the world's water storage. Who knows?

I think that historical lessons tend to show how little room to manoeuvre there is for an individual. Hannah Arendt has shockingly shown this in her book on Adolf Eichman, in this book she coined the phrase 'the banality of evil' (Arendt 2007 (1963)), showing how this individual, by some authors referred to as the architect of the second World War's holocaust, in essence was a very 'ordinary' man. And thus showing how little influence we, as a 'man in singular' have. This banality, this room to manoeuvre consequently might be so small that it seems as if 'man in singular' is no more than a puppet on string, under influence of larger (muddling through) 'movements'. In literature this line of thought has resulted in fascinating naturalistic or deterministic novels. In for example novels like Kafka's classic *The Trial* (Kafka 2002 (1935)) and the Japanese novelist Haruki Murakami's (modern classic) *The Wind-up Bird Chronicles* (Murakami 2007 (1994)) the leading characters in a strange passivity, or resignation, endure fascinating experiences. In my perception this stream in literature is popular (given their popularity I conclude that I am not the only one fascinated by this) because the reader is fascinated by this resignation, which seems unnatural at first sight, by at the same time very much recognisable, the banality of action in day to day life. In my view, this double feeling, this unnatural feeling and recognitions, is somewhat comforting. Apparently we think we do have room to make choices. Returning to this particular case, the banality of salinity, if René Boeters would have been replaced by X, and I am not arguing here that he should've, I tried to stay as far as possible from any kind normative judgements throughout the entire thesis, and I will keep on doing so until the very end, but *if* he had been replaced by X, and X had chosen to trust the 'fresh flushing works' conclusion by the Amsterdam researchers, the basin would have remained fresh for sure, where it is now likely to be turned saline.

At least,

For a while...

Arnhem, 11 June 2009

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