# THE SOCIAL CONSTRUCTION OF SUSTAINABILITY IN DUTCH WATER COMPANIES

DE SOCIALE CONSTRUCTIE VAN DUURZAAMHEID IN NEDERLANDSE WATERLEIDINGBEDRIJVEN

#### Proefschrift

ter verkrijging van de graad van doctor aan de Erasmus Universiteit Rotterdam op gezag van de Rector Magnificus

Prof. dr. ir. J.H. van Bemmel
en volgens besluit van het College voor Promoties
de openbare verdediging zal plaatsvinden op
donderdag 18 december 2003 om 16:00 uur

door

**Judith Elisabeth Maria Klostermann** 

geboren te Delft

### **Promotiecommissie**

Promotor: Prof. dr. J.M. Cramer

Overige leden: Prof. dr. A.J.M. Smits

Prof. dr. M.P. van Dijk Prof. ir. J.C. van Dijk Prof. dr. J. Grin Prof. dr. A. Ringeling Dr. M. Gastelaars

#### CIP-DATA KONINKLIJKE BIBLIOTHEEK, DEN HAAG

The social construction of sustainability in Dutch water companies – De sociale constructie van duurzaamheid in Nederlandse waterleidingbedrijven

Klostermann, J.E.M.

Thesis Erasmus Universiteit Rotterdam, the Netherlands – With ref. – With summary – 290 pages.

ISBN: 90-327 0326 9

Published by : Alterra Green World Research

P.O. Box 47,

6700 AA Wageningen, The Netherlands

Cover design: Karel Hulsteijn, Alterra, Wageningen

Cover photo : A52 km long pipeline transports surface water from the IJsselmeer to the

dunes near Castricum. Here it flows into the dunes to be infiltrated (Photo:

PWN archive).

Lay-out : Henny Michel-Knaap, MiTekst Service, Bennekom.

All rights reserved. No part of this publication may be reproduced, stored or transmitted in any form or by any means, without prior permission of the author.

## **Contents**

Pre	tace		9
Cha	apter 1	Introduction	11
	Quick		11
1.2	How t	o find a focused research topic	11
	1.2.1	Initiators, hosts and goals	11
	1.2.2	Field study leading to a focus on water companies	12
1.3		ings of sustainability	14
	1.3.1	Origin of the concept: from 'Club of Rome' to Brundtland	14
		Rio Summit and after: views on sustainability	16
	1.3.3	Sustainability as a contested concept	19
		Meanings of sustainability in the water sector	22
		How to study a contested concept?	25
1.4		construction theory	26
		The social constructionist world view	26
		The social constructionist approach to research	27
1.5		eptual framework and research questions	28
1.6	Outlin	e of the dissertation	30
	-	Grounded and ethnographic methods	31
2.1		ıll research design	31
		Methods within the social construction paradigm	31
		Qualitative research	32
		Multiple case study	33
		Grounded theory approach	34
		Selection of sector	35
		Selection of cases	35
2.2		Selection of respondents collection	38 40
۷.۷		Ethnographic interviewing	40
		Taping, transcription and translation into English	41
	2.2.2	Other data	42
2.3		nded analysis	42
2.0		Mixed methods	42
		Atlas-ti and coding procedures	42
2.4		ual case studies	44
	2.4.1	Sustainability themes analysis	48
	2.4.2	Strategy analysis	48
		Operations analysis	49
		Network analysis	50
		Cross case analysis	50
2.5		ation of the method	52
	2.5.1	Criteria for qualitative research	52
	2.5.2	Confirmability and explicitness of biases	52
	2.5.3	Consistency of research steps and auditability	53
	2.5.4	Credibility, authenticity, and internal validity	54
	2.5.5	Transferability or generalizability	55
	2.5.6	Application and action orientation	56
	2.5.7	Efficiency	56
	2.5.8	Consequences of the method for the conclusions	57

Chap	ter 3	History of the Dutch drinking water sector	58
3.1	Purpos	ses of the historical analysis	58
3.2	Preced	ling developments (1400-1850)	58
3.3	Birth o	f the drinking water sector (1850-1890)	60
3.4	Switch	ing to governmental ownership (1890-1910)	62
3.5	Growth	n of the distribution network (1910-1950)	64
3.6	Legisla	ation and growth of demand (1950-1970)	70
3.7	Enviro	nmental pollution (1970-1990)	72
3.8	Lookin	g for sustainable solutions (1990-1995)	75
3.9	Debate	about liberalization (1995-2000)	77
3.10	Summ	ary: shared views	80
Chap	ter 4	PWN: balancing production and nature	83
4.1	Introdu	icing PWN (Provinciaal Waterbedrijf Noord-Holland)	83
4.2	How is	the term 'sustainability' used at this company?	84
4.3	Theme	es associated with sustainability at PWN	85
	4.3.1	Balancing water production and nature	85
	4.3.2	Life cycle analysis	86
	4.3.3	Sustainable energy	86
		Long-term investments	86
	4.3.5	Future-oriented technology	87
	4.3.6	Raw materials and waste management	87
	4.3.7	Prevent surface water pollution	88
		Theme overview	88
4.4	How d	oes sustainability fit into PWN's strategy?	89
	4.4.1	Aim for high water quality and guaranteed supply	89
		Innovate organization	90
		Aim for low costs	91
	4.4.4	Protect nature	92
	4.4.5	Governmental monopoly	92
		Aim for larger scale	93
		Water chain	93
	4.4.8	Second opinion on foreign markets	94
		Strategy overview	94
4.5		at kind of 'sustainable practices' does this lead?	95
		Sustainable water supply	95
		Balancing water production and nature	96
		Reduction of groundwater extraction	98
	4.5.4	Nature-friendly management of infiltration areas	99
	4.5.5	Dealing with drainage problems	99
	4.5.6	Innovative technology	100
	4.5.7	Green energy	101
	4.5.8	Water chain cooperation	102
	4.5.9	Household water	102
	4.5.10	Overview of sustainable activities	103
4.6	PWN's	network	103
	4.6.1	The Province of Noord-Holland	104
	4.6.2	Nature organizations	106
		Vewin and colleague companies	109
	4.6.4	Ministry of the Environment	110
	4.6.5	European Union, the Ministry of EZ, and the energy sector	111
	4.6.6	Consumers and large customers	112
		Water boards	113
	4.6.8	Municipalities	114
	4.6.9	Overview of network influences	114

4.7	Case-specific Conclusions	116
Chap	pter 5 WMO: the stakeholder debate	118
5.1	Introducing the company: WMO	118
5.2	How is the term 'sustainability' used at this company?	119
5.3	Themes associated with sustainability at WMO	120
	5.3.1 Protect groundwater	120
	5.3.2 Sustainable groundwater extractions	121
	5.3.3 Sustainability depends on stakeholders	122
	5.3.4 Human-oriented approach	122
	5.3.5 Balance of societal and company interests	123
	5.3.6 Broadening the concept	124
	5.3.7 Theme overview	124
5.4	How does sustainability fit into WMO's strategy?	125
	5.4.1 Influence of the liberalization debate	125
	5.4.2 Stabilizing demand	127
	5.4.3 WMO's cultural values	129
	5.4.4 Aim for larger scale	129
	5.4.5 Develop market activities	130
	5.4.6 Water chain	132
	5.4.7 Strategy overview	132
5.5	To what kind of 'sustainable practices' does this lead?	133
	5.5.1 Preventing desiccation	133
	<ul><li>5.5.2 Hesitant implementation of sustainability</li><li>5.5.3 Overview of sustainable activities</li></ul>	134 134
5.6	WMO's network	135
5.0	5.6.1 The Province of Overijssel	137
	5.6.2 Water boards	140
	5.6.3 Nature organizations	142
	5.6.4 Municipalities	144
	5.6.5 Customers	144
	5.6.6 Farmers	145
	5.6.7 The Ministry of Environment	146
	5.6.8 Overview of influences	147
5.7	Case-specific conclusions	148
	·	
6.1	pter 6 Nuon: sustainability as a market opportunity Introducing the company: Nuon	<b>150</b> 150
6.2	How is the term 'sustainability' used at this company?	150
6.3	Themes associated with sustainability at Nuon	152
0.0	6.3.1 Environment and long term	153
	6.3.2 Use renewables and minimize damage	153
	6.3.3 LCA methodology	153
	6.3.4 Groundwater or surface water?	154
	6.3.5 Theme overview	155
6.4	How does sustainability fit into Nuon's strategy?	156
	6.4.1 Being a multi-utility company	156
	6.4.2 Expansion strategy	157
	6.4.3 Leader in sustainability	159
	6.4.4 External image building	159
	6.4.5 Technological innovation	160
	6.4.6 Aiming for low costs	161
	6.4.7 EFQM quality model	161
	6.4.8 Strategy overview	162
6.5	To what kind of 'sustainable practices' does this lead?	163
	6.5.1 Sustainable energy	163

	6.5.2 Groundwater and desiccation	164
	6.5.3 Nature relationships	166
	6.5.4 Household water	166
	6.5.5 Industry water	167
	6.5.6 Overview of sustainable activities	168
6.6	Nuon's network	169
	6.6.1 European Union and Ministry of Economic Affairs	169
	6.6.2 Ministry of Environment	170
	6.6.3 Provincial governments	171
	6.6.4 Municipalities	174
	6.6.5 Customers	175
	6.6.6 Water boards	176
	6.6.7 Nature organizations	177
	6.6.8 Vewin, Kiwa and colleague companies	178
	6.6.9 Overview of network influences	181
6.7	Case specific conclusions	182
	·	
	pter 7 Delta: strengthening regional ties	185
7.1	Introducing the company: Delta	185
7.2	How is the term 'sustainability' used at this company?	186
7.3	Themes associated with sustainability at Delta	187
	7.3.1 Use renewable resources - within carrying capacity	187
	7.3.2 Whole system approach	187
	7.3.3 Reduction of environmental damage	187
	7.3.4 The future, the long term	188
	7.3.5 Society has to define sustainability	188
	7.3.6 A rational, objective approach	188
	7.3.7 Pragmatic action	188
	7.3.8 Overview of themes	189
7.4	How does 'sustainability' fit into Delta's strategy?	189
	7.4.1 Stay an independent, regional multi-utility company	189
	7.4.2 The need to function commercially	191
	7.4.3 Value, Profit, and Warmth	192
	7.4.4 Efficiency improvement	192
	7.4.5 Growth	193
	7.4.6 Further diversification	194
	7.4.7 Product differentiation	194
	7.4.8 Better service	195
	7.4.9 Warm relationship with shareholder	196
	7.4.10 Strategy overview	196
7.5	To what kind of 'sustainable' practice does this lead?	197
	7.5.1 Operating commercially leads to sustainability	198
	7.5.2 Societal responsibility	199
	7.5.3 Overview of sustainable activities	201
7.6	Delta's network	202
	7.6.1 The Province of Zeeland	203
	7.6.2 The Province of Noord-Brabant	205
	7.6.3 Large customers	206
	7.6.4 The EU and the Ministries of Economic Affairs and Environment	208
	7.6.5 Municipalities	210
	7.6.6 Water boards	210
	7.6.7 Nature organizations	211
	7.6.8 Vewin and other water companies	212
	7.6.9 Overview of network influences	212
7.7	Case specific conclusions	213

Ch	apter 8 Cross case analysis	215
8.1	,	215
8.2	· · · · · · · · · · · · · · · · · · ·	216
	8.2.1 Which societal actors are involved in the networks?	216
	8.2.2 What is said about external influences?	217
	8.2.3 Does it show in their language?	218
	8.2.4 Is it visible in their perceptions of sustainability?	220
	8.2.5 Conclusion: the network does influence perceptions, but it's a dialogue	222
8.3	, ,	222
	8.3.1 What are their strategies and what position has sustainability?	222
	8.3.2 How and why are strategies constructed?	225
	8.3.3 Conclusion: perceptions of sustainability hardly influence strategy	228
8.4	·	229
8.5	i i	230
	<ul><li>8.5.1 Why do companies develop sustainable activities?</li><li>8.5.2 Conclusion: many factors explain activities</li></ul>	230 236
8.6	· · · · · · · · · · · · · · · · · · ·	236
0.0	Expanded model of sustainability in water companies	
Ch	apter 9 Conclusions, reflection and recommendations	240
9.1	,	240
	9.1.1 Answers to the research questions: shared views	240
	9.1.2 Responsibility for nature and desiccation	241
	9.1.3 Groundwater or surface water	243
	9.1.4 The effect of liberalization on sustainability	244
0.0	9.1.5 What about water saving?	246
9.2	,	248
	<ul><li>9.2.1 Processing a concept: Meanings in the course of time</li><li>9.2.2 From consensus to action and back</li></ul>	248 249
	9.2.3 The continuing story of divergence and consensus	249 251
9.3		251
٥.٠	9.3.1 Recommendations	252
	9.3.2 Suggestions for further research	253
9.4		254
Re	ferences	256
Su	mmary	264
Ju	ininal y	204
An	nexes	
1	Info sheet	269
2	Interview scenario	271
3	List of interviews for field study in 1998	279
4	List of codes	280

#### **Preface**

During my study biology I became one of the 'goat's wool socks', as environmentalists were nick-named at that time. When I graduated in 1989, a societal change was taking place: environmentalism became the political mainstream. In an atmosphere of optimism I started doing consultancy work at TNO in the area of environmental policy. After several years, however, I wondered why it was so terribly hard to bring sustainability ideas into practice, if everybody believed this was important. Were we all selfish liars, were we just too stupid to understand the global ecosystem, or were the commies right after all, and was this all the fault of capitalism? In other words, I experienced a lack of knowledge about people, organizations, and societal processes.

Fortunately I heard that Jacqueline Cramer, who had been my former boss at TNO, was looking for someone to do a PhD on sustainability at the Faculty of Economic Administration of Tilburg University. This was my chance to read all the social scientific theory that I had missed, and maybe also to contribute something to the big societal question: HOW can we make this work? Taking the job was one of the best choices of my life, because I loved every day of it. No classical PhD-dips for me.

Half way the project, I had to say goodbye to my colleagues at Tilburg University. The social constructionist project I had formulated with their help fitted better with the Social Sciences Faculty at Erasmus University Rotterdam, so I moved. An advantage of this was that I now saw the oldest Dutch water tower from the window of my workroom. More importantly, Erasmus University gave me all the support I needed to finish my research successfully: extra funding for an assistant to type all the interviews, a special software program, advice from competent and engaged colleagues, and emotional support whenever this was necessary.

This last year, I had to finish the dissertation next to a full time job at Alterra and it was no fun at all. Ilse and Hans, thank you for allowing me to finish this in YOUR time. Hans, you helped me out in every way you could detect, which included working on this dissertation. One hundred thousand kisses for you. Friends and family have not seen me for quite a while, except when I needed them to take care of Ilse. Mama, papa, Reinhilde and Valerie: thank you for making space in your agenda's.

I also want to express my gratitude to all the other people who have helped me during the past six years. Jacqueline, your support never failed. You encouraged me to formulate my own deepest questions and to find my own methods to answer them. Your view on a PhD is that it should not only lead to scientific results, but also to personal development. This PhD was an invaluable experience for me that I will benefit from for the rest of my life.

Colleagues of Tilburg University, especially Job de Haan, Rian Drogendijk, Roland Leeflang and Gelske Terpstra, thank you for helping me with the research design. The choices you advised me to make prooved to be the right ones. Colleagues and ex-colleagues of ESM, especially Nigel Roome, Nicole van Nes and Frank Boons, thank you for your friendship, encouragement and critical advice. Writing a PhD can be lonely, but because you were there it wasn't. Marja Gastelaars, your experience helped me not to drown in my self-made sea of data. Anja de Groene, Frank Wijen and Albert Bakker, thank you for the feedback on my coding methods. Trude de Groot, thank you for guiding me through the formalities during this last year. Without you, I would not have become a doctor. Marja Spierenburg and Reinhilde Klostermann, you gave your advice to casually over the years, but I know exactly what impact it had on the book. So thank you for lending me your expertise. Dear colleagues from

the PhD network, KEEP IT SIMPLE was the advice Nicole gave herself and me during the writing process, and I pass it on to all of you, especially Susanne van de Wateringen, Robert van den Hoed, Celine Louche and Paolo Perego. It was great to listen to your stories and to share my work with you. Finish those dissertations please so I can read them!

Rian Kloosterman, Fred van der Vegte, Koos Gerritsen, and Pieter Stoter: thanks for letting me in. All the other people from the water companies, especially Hans van der Werf, Hans Haarlem and Martien den Blanken, thank you for your time, your openness and your interest in my research. I hope this dissertation helps you to continue the sustainability debate and to strengthen the position of the water sector in Dutch society. I would have liked to thank

I want to thank the promotion committee for the comments on the manuscript. It gave some stress but also more contentment in the end.

Herman Rotermundt as well, but unfortunately he is not there anymore.

Everybody who helped me type the interviews, especially Eliza Leendertse, Gerdi and Hans, thank you for doing this enormous job without becoming angry with me. Patricia Godrick and Iris Borger, thank you for improving the quality of the text. I had learnt many things already, and now also some English. I also want to thank a few people who provided the necessary funding. Marise Pols, your efforts to create the PhD position went beyond what can be normally expected of a coordinator of a Science Shop. You made me feel at home in Tilburg, and still I went away. I hope I can make amends with this result. Tim van der Avoird, thank you for keeping your part of the bargain, that we would stay in contact. Erasmus University, especially Wim Hafkamp and Borg van Nijnatten, thank you for your faith in me and for making the bureaucratic part so easy. And finally Alterra, especially Erik Westein, Bert Jansen, Karel Hulsteijn and Henny Michel, thank you for getting me through the very last stages of producing the book.

Judith Klostermann, 4 October 2003



View from the workroom in Rotterdam