

Writing on the Wall

Scenario development in times of discontinuity

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Philip van Notten

Writing on the Wall: Scenario Development in Times of Discontinuity

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Cover, graphic design and editing by zwaar water, Amsterdam, The Netherlands

Dissertation.com
Boca Raton, Florida
USA • 2005

ISBN: 1-58112-265-9

For my wonderful son, Damiaan

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ACKNOWLEDGEMENTS

The past four years have involved working with an inspiring group of people. I am grateful to my colleagues at Maastricht University's International Centre for Integrative Studies (ICIS) for making life as a researcher both enjoyable and stimulating. In particular, I would like to thank my supervisor, Jan Rotmans. His inspirational ideas regularly helped overcome bottlenecks, oversights and my often mistaken belief that the research for this thesis was complete.

My research was funded by the Innovational Research Incentive Scheme on foresight methodology, which was awarded to my co-supervisor Marjolein van Asselt by the Netherlands Organisation for Scientific Research in 2001. The research described in this thesis is a contribution to the scheme together with Marjolein's own work on uncertainty and Susan van 't Klooster's on plurality. I am indebted to Marjolein for her dedication to her task as co-supervisor. Thanks also to Am Slegers whose Master's research contributed to this thesis's Chapter 4!

The research for Chapter 6 was funded by KLICT (Netchains, Logistics, and Information and Communication Technology), to whom I express my gratitude. The research was conducted in partnership with Wageningen University's Agro-technology and Food Innovations (A&F). My thanks go to A&F's Sietze Vellema, Conny van der Heijden and Daniella Stijnen as well as my ICIS colleagues Jan Stel and Derk Loorbach.

The close cooperation with others is a reason for the use of the first person plural 'we' as opposed to the first person singular 'I', despite of the fact that this thesis carries only my name. The second reason is that the first person plural is the preferred style at ICIS.

Besides formal partnerships, I have benefited from regular, informal exchanges with professionals involved in foresight and integrative assessment (IA). These include members of the ICIS network, especially Chris Anastasi, Jerry Ravetz, Frank Ruff, Bernd Kasemir, and the late Poul Harremoës. The COST European Network for Foresight Methodology, funded by the European Commission and hosted by the European Science Foundation, has also been a source of inspiration. My thanks go to the network's management committee especially Dale Rothman, Ted Fuller, Jennifer Cassingena-Harper, and Ruud van der Helm. The Dutch foresight network (NTV) was a watering hole for ideas as well. I enjoyed discussions with Paul Rademaker, Ig Snellen, Thomas Corver, and Bart van Steenbergen, among others. I have also enjoyed the contacts with a group of professionals connected through Shell International's and Global Business Network's scenario work, in particular Joop de Vries, Kees van der Heijden, Robert Bood, Paul de Ruijter, Jaap Leemhuis, and Napier Collins.

Towards the later stages of my research, I worked with the Organisation for Economic Cooperation and Development (OECD) and the United Nations Environment Programme (UNEP). My thanks in particular go to Riel Miller, Edna Yahil, and Marion Cheatle for the enjoyable experience.

I would like to thank those that were involved in the editing, graphic design and printing of my thesis: Susan van 't Klooster, Brian Waniewski, Esther Mosselman, René Janssen, Marin de Swart, Shereen Siddiqui and Auke van den Berg.

Besides professional acknowledgements I would also like to express my gratitude to friends and family. First and foremost among those is my son, Damiaan. Watching my cheerful little boy develop in his first two years has been a wonderful experience. It is to Damiaan that I dedicate this thesis.

I also thank Elisabeth Dobbinga, Damiaan's mother, for her professional and personal support during my research years. I am confident that raising Damiaan together will be an enriching experience for both of us.

I am grateful for the support of my cousins Ariane and Harald, Isabelle and David, Henriette and Reindert, and Aunt Tina. My thanks also goes to Aunts Henriette and Mia for helping with the publication of my thesis. Many thanks also to my ever-supportive sister, Florentine, and to her partner, Marnix, and his family. I would also like to thank my parents, Eleonore and Ferdinand, for their enduring love.

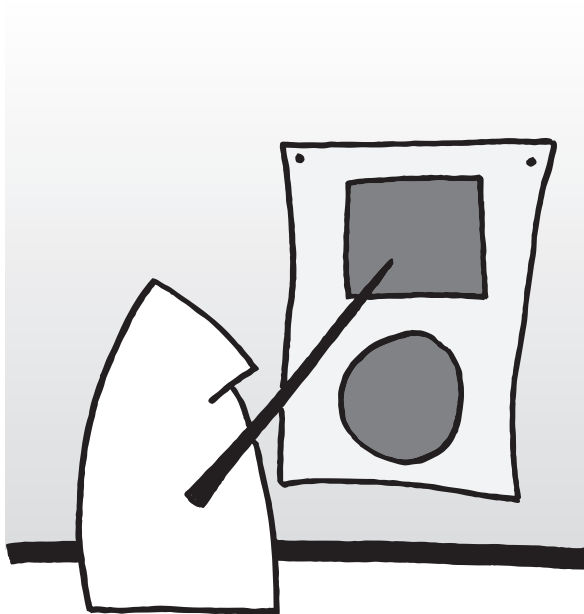
There are a host of friends that I would like to thank. They include those from my years at Leiden University, particularly Rutger Kalsbeek, Ward Schalekamp, Henrik Postma, Remco Aalbers, Michiel den Hertog, Patrick Rutgers and their partners. My thanks also to Juriaan Lempers and Karen Rethmeier, Juriaan Lahr and Francine Stigter! Friends beyond the university context that I would like to thank are Mats Holmberg, Jacco van Uden, Mechteld Bentinck, Ariel and Karin Sobelman, and Simon and Gemma Bird. I would also like to thank the company of friends at the Plankstraat in Maastricht, especially Thijs Peters, Bas Bakermans and Ed Spanjaard. A special thank you to Eduard Kimman for his extraordinary generosity over the years!

In 2001, I had the privilege of being a visiting scientist to the European Environment Agency (EEA) in Copenhagen. My friends in Denmark have been very supportive in often difficult times. I would like to thank my former EEA colleagues, notably Teresa Ribeiro, David Stanners, Charlotte Islev, Eva Carlson, Sofia Guedes Vaz, Ann Dom, Jan Erik Petersen, Peter Gabrielsen, Tony Carritt, Aphrodite Mourelatou, Gorm and Mette Dige, and Peter Bosch and Janet Rodenburg. Special thanks go to David Gee and Vivienne-Taylor Gee who have gone to great lengths to help me and make me feel at home. Thanks also to other, 'non-EEA' friends in Denmark: Cynthia and Mikkel Selin, the Bothmanns – Gyrithe, Kirstin and Hans Christian –, Hanne Shapiro, Kristian Borch and Christina Dall! I am especially grateful to the Moltkes, my family away from home. Lastly, I want to commemorate Michele Fontana, with whom I shared an office at the EEA, whose untimely death on October 8th, 2001 was a great shock. I wish his partner, Chiara, and their sons Leonardo and Martino, strength in the future.

The Hague, November 2004

1

introduction



I INTRODUCTION

1 Times of discontinuity

“Night fell on a different world”^[1] on September 11th, 2001, so argued President George W. Bush in an address to Congress shortly after the attacks in New York, Washington, and Pennsylvania. The September 11th attacks were daring, spectacular, and effective. In the US, the immediate direct effects of ‘9/11’ included stock market depreciations, declines in New York property prices, cancellations of Hollywood productions, and soaring political fortunes of the president. Indirect effects worldwide included the upsurge in the value of the Pakistani rupee, the bankruptcy of two European airlines, revival of the Northern Ireland peace talks, and the fall of the Taliban regime in Afghanistan.

Many of the attacks’ immediate effects were temporary, but some of them were more enduring. Schwartz^[2] argued that the attacks changed history irrevocably, singling out the damage that they have done to the American and global economy, claiming that the West will be paying a “bin Laden surtax” for years to come. Two years after the attacks, George Soros^[3] argued that ‘9/11’ changed the course of history because it “introduced a discontinuity into American foreign policy”, which involved the president using 9/11 as an excuse for implementing a radical foreign policy agenda. The assumptions on which the discontinuity was based predated the tragedy, according to Soros. The origins of these assumptions can be traced back to such myths of American culture as the ‘White Man’s Burden’, ‘Destiny’, and ‘Providence’^[4], which have often influenced past US foreign policy. On a structural level, then, the September 11th attacks are arguably symptomatic of the ‘clash of civilizations’^[5] and such forces as globalism and tribalism^[6] manifested in tensions between US’ and other cultures’ and interests. It remains to be seen what the meaning of ‘9/11’ is on a broader historical level.

Although the significance of ‘9/11’ is subject to debate, it is symbolic of a general sentiment of discontinuity whereby we feel vulnerable to undefined and highly disruptive events. Recent catalysts of this sentiment are eye-catching developments such as the SARS (Severe Acute Respiratory Syndrome) and bird flu outbreaks, the Enron and Parmalat scandals, political assassinations in Sweden and the Netherlands, regime changes in Iraq and Afghanistan, and terrorist attacks in Bali, Istanbul, Madrid, and various parts of the Middle East. Nowotny et al.^[7] argue that:

Gone [...] is the belief in simple cause-effect relationships often embodying implicit assumptions about [...] linearity; in their place is an acknowledgement that many - perhaps most - relationships are non-linear and subject to ever changing patterns of unpredictability.

However, recent discontinuities should not be seen as evidence that discontinuities occur more frequently now than they did before. Looking back in history we see

that disruptive processes are common. For example, 25 years ago few Europeans would have predicted the upcoming upheavals on their own continent: the collapse of communism, Berlin as the capital of a reunited Germany, the wars in the former Yugoslavia, the single European currency, and the near doubling of the number of European Union member states. Changes elsewhere have been no less discontinuous and unforeseen: the fall of the Asian tigers, the emergence of the Internet and mobile telecommunication, and the presidency of Nelson Mandela.

Discontinuity is a notion that features in a variety of contexts and disciplines ranging from law to geology to mathematics. What we call societal discontinuity involves the interaction of events and processes such as those described above that involve or produce some form of structural change in society. Globalisation, technological innovation, increased knowledge about our world, and temporal acceleration^[8] make for an increasingly complex or interconnected world. Greater interconnection means that events and developments can have a further reach, as the occurrence of the West Nile virus in the New York area illustrates. The virus was never seen in the US before 1999 and it was most likely carried to New York from Africa through an infected person or an imported bird. The warm summer of 1999 provided the conditions for the spread of the virus, leading to 62 severe reported cases of disease, resulting in six deaths. In 2002, nearly 2000 cases were reported, of which 94 were deaths. The broad reach and rapid spread of computer viruses is another example of interconnectedness. Increased interconnection means that small changes can have discontinuous effects.

Past cases of discontinuities invite the question whether discontinuity and its complex societal manifestations can be understood and perhaps anticipated. Such publications as *The Age of Discontinuity*^[9], *The Fourth Discontinuity*^[10], *The Great Disruption*^[11], and *Inevitable Surprises*^[12] have sought to do just that. Although several of these analyses have been influential in stimulating debate, dealing with the possibility of discontinuous, contingent, and unexpected developments in policy-development is a relatively new area of interest^[12;13]. The September 11th attacks and subsequent events have further stimulated the interest in discontinuities.

2 Foresight and Integrated Assessment

Society has contemplated its future for centuries as illustrated by classic novels such as Thomas More's *Utopia* (1516), Edward Bellamy's *Looking Backward: 2000 – 1887* (1887), H.G. Well's *The Time Machine* (1895), Aldous Huxley's *Brave New World* (1932), and George Orwell's *Nineteen Eighty-Four* (1949), as well as the science fiction work of Jules Verne and Isaac Asimov. More recently a genre involving the popular scientific, often utopic predictions of technology-driven, future prosperity has emerged^[14]. Examples of these publications are McLuhan's *Understanding Media* (1964) and Toffler's *Future Shock*^[15]. However, according to De Wilde, this type of

future exploration is problematic because of its neo-liberal finalism and its simplistic view of societal progress. The literary and popular scientific interest in contemplating the future has been joined by the study of the future and the complex interaction of processes that shape it. Early signs of an academic interest in the future can be traced back to H.G. Wells' article in *Nature*^[16]. Herman Kahn's work at RAND and the Hudson Institute^[17;18;19;20;21] arguably laid an important foundation for modern day study of futures-oriented issues.

Such terms as foresight, futurology, futures research, prospective analysis, and future studies refer to the research of futures-oriented issues. The distinctions between the terms are often ambiguous. One definition of foresight is the skill of making meaning of looking ahead^[22]. Another is:

The process of developing a range of views of possible ways in which the future could develop, and understanding these sufficiently well to be able to decide what decisions can be taken today to create the best possible tomorrow^[23].

In comparison, future studies aims to "discover or invent, examine and evaluate, and propose possible, probable and preferable futures"^[24]. We do not express a preference for one term over another, in part because we have no interest in joining the semantic debate. For the purposes of consistency in our research, we use the term foresight to refer to the study of the future.

Cross-disciplinary by nature, foresight addresses relationships among complex societal problems from as wide as possible a point of view. It draws on such disciplines as psychology, history, policy science, economics, environmental science, and business administration. Whether foresight is a field or discipline in its own right is subject to debate. Marien^[25] argues that if ever foresight was, its diversity ensures that it is certainly not a discipline now. Others disagree^[26;27], with some arguing that although foresight as a scientific discipline has not yet reached maturity, it is no longer in its adolescence^[28].

Foresight emerged in decision-making contexts following the Second World War, in US military strategic planning at the RAND Corporation, and in French spatial planning at DATAR. In the 1960s, General Electric and Royal Dutch/ Shell introduced foresight techniques to their corporate planning procedures. In the 1970s, foresight was applied in speculating about socio-economic and environmental futures. The 1972 Club of Rome report *The Limits to Growth*^[29] is perhaps the most renowned and controversial example of a foresight study in the public domain. Today, foresight initiatives are undertaken in a range of contexts^[30], from small and middle enterprises (SMEs), to regional and national foresight studies such as the UK foresight programme^[31;32;33], from environmental assessments for public policy such as the United Nations Environmental Programme's Global Environmental Outlook^[34] to the outlooks of the RIVM Netherlands Institute of Public Health and the Environment^[35].

Foresight aims to make complex societal problems understandable in order to speculate about their possible development. Persistent^[36], messy^[37] and ‘wicked’^[35;38;39;40;41], complex societal problems are characterised by their unstructured, unsolvable nature. They can merely be contained or managed. They are the subject of conflict due to divergent interests and perspectives of those people they involve, but also to the urgency of the problem, which prevents their comprehensive analysis. Complex problems are also described as composed of a tangled web of interconnected problems: multi-disciplinary, cutting across various disciplines and socio-cultural, economic, technological, environmental, and institutional, which separate in various spatial or geographical scales. Complex problems are relevant for our research because the interaction of events and processes in society might lead to discontinuity.

The study of complex problems is also the focus of a school of thought called Integrated Assessment (IA)^[35;42;43;44]. IA is a structured process of dealing with complex issues that uses knowledge from various scientific disciplines and/or stakeholders to offer integrated insights to decision-makers¹. IA attempts to shed light on complex issues by illuminating a wide analysis of causal relationships and strategic options. In doing so, IA analyses the evolution of problems in their past, present, and future contexts. Holism rather than reductionism is the philosophy underlying IA.

IA originated^[8] in the USA and in Europe in the seventies^[8]. In Europe, it stemmed from demographic and environmental research; in the USA, from economic cost-benefit analyses of environmental problems. The approach is connected to such fields as technology assessment^[45], risk analysis^[46], and policy studies^[47]. However, IA distinguishes itself from these disciplines by using the idea of integration as its point of departure^[8]. One can distinguish between two categories of IA methods^[35;42;43]. First, there are analytical techniques such as models and risk assessments involving a rigorous research method. Second, there are participatory techniques such as policy exercises and focus groups. Judging from experimentation with IA methods, the engagement of stakeholders in participatory processes helps to improve the quality of IA by drawing on non-scientific knowledge, values, and preferences^[48] but many of its methods are still under development.

Where foresight is more future-oriented, IA focuses on making complexity manageable for policy making. The IA community has a more natural scientific orientation than the various foresight schools, which are dominated by social scientists, but the two communities overlap with regard to methods that they use. Both use

¹ References to Integrated Assessment literature proposed by Van Asselt, Rotmans, & Rothman (2004) include: Dowlatabadi and Morgan (1993), Parson (1996), Bailey et al. (1996), Morgan and Dowlatabadi (1996), Robinson (1996), Rotmans and van Asselt (1996), Weyant et al (1996), Schneider (1997), Rotmans (1998), Jäger (1998), Tol and Vellinga (1998), Toth and Hiznyik (1998), Rotmans and Dowlatabadi (1998), Kasemir et al. (1999), van Asselt (2000), Rotmans and van Asselt (2002) and Kasemir et al (2003).

mathematical projections and scenario development, and they share the opinion that methods are best used in combination with one another^[49].

Societal discontinuity is a relatively new area of concern in IA^[50;51;52] and foresight. Since the 1970s the consideration of change and discontinuity has gained some ground over predictive forecasting^[53], which tended to reason from continuous developments and linear processes. It is argued that although studies of the future traditionally reasoned from the idea of continuous developments and linear processes. A departure from this historical or evolutionary determinism seems to have occurred^[54] as well as interest created to reflect systematically on discontinuity.

3 Focus of the research

The research described in our thesis focuses on the idea of discontinuity in the context of IA and foresight methodology. It is argued that foresight methodology has hardly been reflected on^[12;55;56]. Reflection on IA methodology is considered similarly appropriate^[35;43;57] especially in view of the interest in societal discontinuity in contemporary public debate. We chose to focus on methodological aspects of IA and foresight in order to gain insight into current practice. In the context of IA and foresight, methodology addresses the means whereby a study is conducted. This includes not only method, but also issues of context, timing, objective, facilitation, logistics, participants and expertise, and scientific philosophy. Subsequently, we did not focus exclusively on methods or techniques in our research. Rather, we were interested in the full range of factors that influence the process of exploring discontinuity with a view to contributing to the methodological improvement of IA and foresight².

We chose as the centrepiece of our research the investigation of the ways in which discontinuity is addressed in scenario development. We did so for two reasons. First, scenario development is arguably the most common approach in foresight^[58] and it is also regularly applied in IA. Therefore, short of a comprehensive and undoable analysis of IA and foresight in the current thesis, an analysis of contemporary scenario development was appropriate. Second, according to the literature, scenario development is an approach that is well suited to exploring the idea of discontinuity^[32;59] and therefore an analysis of contemporary scenario practice and its treatment of discontinuity also seemed fitting.

Scenarios are coherent descriptions of alternative hypothetical futures that reflect different perspectives on past, present, and future developments, which can serve as a basis for action^[60]. Scenario development aims to combine analytical knowledge with creative thinking in an effort to capture a wide range of possible future developments in a limited number of outlooks. Scenario development assumes that the future is

² Other methodological issues such as uncertainty and plurality are addressed in the Netherlands Organisation for Scientific Research's (NWO) Foresight Methodology programme, led by Dr. Marjolein van Asselt, of which this research is a part. See also Van Asselt et al (2003).

uncertain and the directions in which current developments might range from the conventional to the revolutionary³. Scenario development can be interpreted as a strictly defined method or as a more general philosophy, applicable in a variety of manners. We maintained the latter interpretation in the research described in this thesis.

The RAND Corporation was the first to use scenarios for decision-making purposes in post-Second World War military strategic planning^[54;61;62]. Since then scenario uses, users, methods, and audiences have greatly diversified. The use of scenarios is referred to by various names each stressing numerous applications and contexts: scenario planning, scenario analysis, scenario thinking, and scenario learning. Because the focus of our research is on methodological aspects of scenarios, we prefer to use the term scenario development.

The thesis' title *Writing on the Wall* is a reference to the warning of impending discontinuity in the biblical tale of Belshazzar, King of Babylon, described in the book of Daniel. Belshazzar hosted a lavish feast for more than a thousand dignitaries for which he had used gold and silver goblets taken from the temple in Jerusalem years before by the Babylonians. The goblets were sacred but the king and his guests drank from them anyway. During the feast a hand appeared and wrote an inscription on a wall, "Mene mene tekel u-pharsin". The terrified king called on his magicians to explain what the writing on the wall meant. Only Daniel, the head of the king's magicians, could decipher it: "You have been weighed in the scales of God's judgement and have been found too light." Daniel explained that the writing was a warning to Belshazzar that his days as king were numbered because of his arrogance towards God, and that his kingdom would be split in two. This dramatic turn of events was not long in coming. Babylon was overrun that same night, the king was killed, and his kingdom was divided between the Medes and the Persians. Sudden, structural change such as the end of Belshazzar's kingdom is a feature of discontinuity. The challenge is to decipher the writing on the wall.

The title *Writing on the Wall* also refers to the popular method of group brainstorming, used in scenario development. In scenario workshops, brainstorming is used to produce ideas about possible future events and developments. These ideas are put in writing on paper or post-its, which are then posted on a wall for all involved to see and consider.

4 Framework of the research

Research objective

The research described in the current thesis seeks to establish an understanding of the meaning of discontinuity in the context of IA and foresight in general and in particular

³ For research of uncertainty in IA see Van Asselt (2000), Van der Sluijs (1997), and Walker et al (2003).

the manner in which it is addressed in scenario development. By doing so, we aim to contribute to the improvement of discontinuity-oriented methodology. To do so we addressed such research questions as:

- What types of scenarios are there? What are their functions? How are they developed?
- How is discontinuity interpreted in the context of IA and foresight in general, and in scenario practice in particular?
- To what extent can contemporary scenarios be considered discontinuity-rich? How are such scenarios developed?
- What factors should be taken into account in discontinuity-oriented scenario development?

We did not set ourselves the task of assessing the overall value of scenario development. Because it is already commonly used we considered methodological questions to be more useful and interesting than existential questions. Only where discontinuity is concerned did we address existential issues to a limited degree. Furthermore, we did not aim to judge the output and use of individual scenario studies. Instead, our focus was on whether and how discontinuity is or can be addressed in scenario development. Lastly, our aim was not to invent the ultimate scenario method for identifying future discontinuity. Instead, we used a broad methodological scope to investigate how the idea of discontinuity is addressed in scenario development and what factors might inspire or impair discontinuity-oriented scenario development, as a basis for a methodological proposal.

Research methodology

To our knowledge no scientific investigation of scenario development has addressed the issue of discontinuity. Accordingly, we argue that a theoretical basis for scenario development in relation to discontinuity is necessary before hypotheses could be formulated with a view to falsification^[63]. Although we suspect that the idea of discontinuity is not as embedded in scenario practice as sources in scenario literature^[32;64;65;66;67] suggest, our research aimed to generate hypotheses without a particular premise as a leading principle.

Consequently, the first steps in the research have an exploratory or ‘self-conceptualising’ character, aiming to develop a conceptual framework rather than to test one⁴. The exploratory process led to a conceptualisation of the idea of discontinuity

⁴ A distinction was made between self-conceptualising and pre-conceptualised research by Kees van der Heijden in a peer review workshop for the Futures Methodology programme (September, 2003, Maastricht). He explained that self-conceptualising research was open and exploratory in nature and free of a predetermined frame of reference or set of assumptions regarding the subject of study. In contrast, pre-conceptualised research does reason from a common theory or framework.

for scenario development. The concept allowed us to investigate the degree to which contemporary scenarios are discontinuity-rich. It also provided the basis for evaluation. The evaluative part of the research involved an empirical investigation of factors that inspire and impair discontinuity-oriented scenario development. Establishing a body of knowledge informed by both theoretical and empirical insights allowed for the formulation and testing of a hypothesis in an experiment. The hypothesis derived from our research was framed as:

Discontinuity-oriented scenario development involves fostering the interplay of influential factors whereby inspiring ones are mobilised and impairing ones are quashed.

Factors that inspire are those that stimulate the exploration of discontinuity. In contrast, impairing factors hinder discontinuity-thinking. Influential factors might also have a ‘double-edged’ effect with both inspirational and impairing aspects, depending on the influence of other factors. The hypothesis implies that one can create conditions for the exploration of discontinuity. We aimed to do that in a systematic manner in order to make a discontinuity-oriented scenario process reproducible.

Research Methods

Reviews of foresight and scenario literature underlay our research and the empirical findings are based on interviews and an experiment.

A review of IA and foresight literature was necessary in the first, exploratory stages of the research in order to develop a conceptual framework. This literature helped to establish the history and basic principles of scenario development and various interpretations of the idea of discontinuity. In the latter case, we extended our scope of investigation to include such fields as history, policy studies, and the natural sciences in order to develop our conceptual basis.

We reasoned that general statements about scenario development could not be made without first establishing an overview of contemporary scenario practice. The rare examples of structured overviews of scenario processes^[68; 69;70;71;72;73] generally focus on particular aspects of scenario development. Therefore, we carried out a rudimentary overview of 100 scenario studies conducted in the past 20 years along with an in-depth analysis of 30, by analysing such documentation as project reports and publications. In some cases interviews were conducted in order to support the details of the documentation. This research led to a development of a typology for scenarios with which scenario studies might be compared. The typology was used to investigate how contemporary scenario studies address discontinuity.

A combination of interviews, archive research, and unsystematic participant observation was used in the reconstruction of one discontinuity-rich scenario study entitled ‘VISIONS for a sustainable Europe’. VISIONS was the study of choice because we judged the scenarios it produced to be relatively discontinuity-rich and because the study was

extensively documented. Much use was made of such primary sources as papers, progress reports, workshop proceedings, and correspondence. We chose to conduct interviews with members of the VISIONS scenario team in the expectation that they would provide ‘behind the scenes’-commentary and reflections on the process to complement the information in the archive material. Unsystematic participant observation involved the participation of the author in a number of VISIONS meetings.

In the VISIONS reconstruction, the various methods were used in combination with one another in accordance with the research strategy of triangulation^[74]. The strategy involves the use of different methods and sources of information so that the validity of the observations from one source can be checked and complemented by observations from another. In the classical use of the term triangulation a distinction is made between the principal source of study and the supporting source. However, in the VISIONS reconstruction we did not distinguish between principle and supporting sources. Instead, we used the idea of triangulation in a manner which allowed us to switch between different types of sources and methods^[75]. In doing so, differences between the output of the various sources were used as leads for further investigation.

The comparative review and the reconstruction provided the basis for the formulation of the above-mentioned hypothesis about discontinuity-oriented scenario development, which we tested in an experiment. We chose an experimental approach because it provided the opportunity for real-time observation. The experiment involved the preparation, conduct, and analysis of two workshops with a diverse group of participants in order to simulate a natural scenario exercise as best as possible. The design was developed on the basis of general characteristics of the discontinuity-oriented scenario studies that we identified in developing our typology of scenarios, and on insights regarding the inspiring and impairing factors that we derived from the VISIONS reconstruction. Four observers, an audio recorder and a video camera recorded the experiment. The subject of study was the future of the controversial European salmon aquaculture industry where the potential for discontinuity is considered great.

The steps taken in our research and the output that it delivered are described in Figure 1.

5 Audience and structure

Scenario development and its various applications are discussed in Chapter 2. We first address the basic principles of scenario development. In large part, the chapter relates to the common features and differences between the various types of contemporary scenarios. These are organised in a typology for scenarios, presented in the form of a ‘scenario cartwheel’. Chapter 3 discusses various interpretations of the idea of discontinuity in scenario development, and in related sources. The chapter