Core values of the Delta Programme

Solidarity Flexibility Sustainability

– A REFLECTION –

Marjan Slob
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Preface

Solidarity, flexibility, and sustainability are the core values of the Delta Programme. "The core values are the 'shared values' of the organisations involved in the Delta Programme: values that mutually bind the parties, values whose importance is beyond dispute – but that are not automatically reflected in the implementation phase of projects. They may serve as a beacon for the many choices that need to be made when going through the process from an initial exploration to the realisation of major works." *(National Water Plan 2009-2015)*.

The Delta Programme interconnects the short term and the long term. By way of concrete measures, realised in the short term, and structuring Delta Decisions that set the course for long-term development, the programme systematically works up to a system in which water management and spatial design are intertwined in a solidary, flexible, and sustainable manner.

The Dutch water world is on the brink of entering a new phase. The Delta Programme 2015 (DP 2015) that was presented to Parliament in September 2014 comprised proposals for the water policy to be pursued in the decades ahead, involving concrete measures for the first six years. These form part of the preferential strategies up to 2050, and offer a view through to 2100. This means that the days of exploring, discussing, and jointly looking for the best approach are over. It is now a matter of implementing the chosen policy lines as efficiently and sensibly as possible.

This will definitely not be a simple exercise in filling in the blanks. On the contrary: the ideal managers of the intended water policy will have to command paradoxical qualities. They are capable of steering a steady course because they are able to operate in a flexible manner. They are sufficiently familiar with unknown factors to permit uncertainties to penetrate to the very heart of their procedures. They are prepared to take decisions now, with a view to the decision-making scope of future Dutch generations. And they are in a position to seek ad hoc partnerships that will ultimately serve the public interest. This essay is going to demonstrate that these required qualities are closely connected to three core values: solidarity, flexibility, and sustainability.

With the publication of DP 2015, the Delta Programme is embarking on the elaboration and implementation phase. With effect from the autumn of 2014, the decisions must be anchored in regular planning guidelines *(e.g., the Interim Amendment to the National Water Plan)*, and preparations for the development of a monitoring and evaluation system will commence. An array of choices still need to be made in this respect.

The core values are of significance in this process as well. It is up to the parties involved to determine how the core values can best be "interwoven" into the procedures. This essay may possibly offer some inspiration in this regard. For this reason, we are publishing this essay in the autumn of 2014.
For a proper understanding of how the core values operate it will be good once again to review the most recent history of water management. The three core values have been set down in the *National Water Plan 2009-2015* (NWP1), the state plan pertaining to water policy. This plan reflects the Cabinet response to the recommendations of the Veerman Committee, dating from 2008. The core values must provide particular guidance within the so-called Delta Programme: cf. the quote below from the *National Water Plan*.

Core values and premises (from: National Water Plan 2009-2015)

Solidarity, flexibility, and sustainability are core values that are pursued in water policy in a general sense. These values guide the organisational and collaborative processes within water management. Solidarity is reflected in the manner of funding and the prevention of responsibilities being shifted. Flexibility is required in order to be able to move along with, e.g., developments in spatial design and climate change. A final core value is sustainability. This is substantiated by pursuing, in the choice and elaboration of all the goals and measures, significant local commitment, and improvement of the quality of the living environment ("people"), improvement of the quality of eco systems ("planet"), and opportunities for the business community ("profit"). Especially for the development of the Delta Programme, it is important that these values are made explicit.

The Delta Programme is intended to ensure that the Netherlands continues to live up to high flood risk management standards, also in 2050 and 2100, and that proper and fair arrangements are still in place then with respect to the freshwater supply. That is no sinecure, because climate change entails considerable uncertainties – especially for our densely populated delta. Water policy will have to defy those changes and uncertainties; the core values serve as guidelines to that end.

A unique administrative official, the Delta Programme Commissioner, has been tasked with working out, together with a small staff, how such a water policy could be designed in concrete terms. They have taken this task seriously. In the first year – say, up to the state opening of Parliament in September 2010 – they reflected on a plan of approach. The following year, i.e., in 2011, was devoted to a problem analysis of each region or issue. In 2012, they mapped out potential strategies for attaining the goals set (safeguarding flood risk management and proper freshwater management up to 2100). In 2013, they scrutinised the strategies for determining which actually held promise. In 2014, the Delta Programme Commissioner indicated which of the promising strategies were preferable, and submitted a proposal for five overarching "Delta Decisions". Now that they have been adopted, the preferential strategies and Delta Decisions will be implemented. Regional governments will anchor the decisions in their policy plans, and the national government, in anticipation of the *Second National Water Plan*, will implement an interim amendment to the current (first) *National Water Plan*.

Obviously, it is important to know why one strategy has gained preference over another. In other words: which selection criteria have been observed? The answer: i.a., criteria that ensue from the three core values identified. The criteria have been incorporated into the so-called *Evaluation System* that has been compiled over recent years, and that was actually put into operation in 2012. The system ensures that systematic attention is focused on the extent to which a strategy contributes to a more solidary, flexible, and sustainable organisation of the Netherlands. The core values thus have a practical impact; any plans submitted will obviously be modelled on the assessment criteria. The last appendix to this essay details the measures that have been taken to promote the carry-over of the core values.

This means that the Evaluation System has rendered operational the core values in a certain manner. The system provides guidelines and enables transparent choices to be made. However, the system does not specify what those core values actually signify in terms of the water domain, and why it is particularly important to cherish solidarity, flexibility, and sustainability in the pursuit of a climate-proof water policy. This is where this essay comes in. It explores and analyses the core values, provides arguments, opens relevant administrative issues, and shows how the values are given shape (and could be given further shape) within the Delta Programme.

The next generation of water managers will be facing the huge challenge of displaying paradoxical qualities in climate-proofing the Dutch water system. This essay aims to provide insight into the backgrounds to this challenge, in the hope that this will assist the new water managers to disseminate the core values not just to the letter, but also in the spirit..

Structure and justification

What do the values of solidarity, flexibility, and sustainability mean if we relate them to the water domain, how are these core values of the *National Water Plan* given concrete shape within the Delta Programme, and how could these practices be substantiated and expanded further? These are the questions we asked ourselves when writing this text.

The text has the character of an essay. I.e., we have made an effort to review these issues in a structured manner, throw fresh light on existing documents, and articulate our findings clearly. It has not been our intention to present a coherent "value system", nor to conduct an exhaustive study into the manner in which these values are reflected in the Delta Programme – and definitely not to assess whether the Delta Programme is taking the right approach in doing so.

Rather, this text is an attempt to show what happens if a highly complicated issue – safeguarding acceptable levels of flood risk management and freshwater supply in a delta faced with climate change – is in part addressed on the basis of the three "core values". We, the authors, believe that this will open up an extremely exciting field, providing room for developing interesting experiments, new views, and new approaches. This is what we aim to demonstrate here in some detail. Meanwhile, we also hope to make a reasonable case that the impact of this approach reaches beyond both our country and the water sector.
In the month that we have written this – September 2014 – the Delta Programme will be entering a new phase. On *Prinsjesdag*, the official opening of Parliament, the Minister will submit the proposal for the so-called "Delta Decisions" and the corresponding preferential strategies to the House of Representatives, to be discussed in the autumn. Acceptance by the Senate as well will set the course of water policy for several decades. This will mark the end of the first phase – jointly looking for the best ways to carry out the task contained in the *National Water Plan*.

This essay was written intermittently during that first exploratory phase. In 2009 and 2010 we worked on "flexibility" as a core value, in 2012 and 2013 we addressed "solidarity", and in 2014 we looked into "sustainability". These components have been consolidated here, yet each retains its own atmosphere. That atmosphere is not only a logical consequence of the respective themes, but also ties in with the phase the Delta Programme itself was going through at the time of writing. This genesis explains the slightly different approaches to each "value chapter", the measure of repetition in the chapters, and possibly even a conceptual shift here and there.

We have chosen to refrain from pulling this essay into a tight format any further. This would inevitably cost time (ergo money), and – although it would be satisfactory in terms of aesthetics – would yield little additional practical profit. After all, we do not aim to provide any conclusive vision, working method, or overview here. We do wish to inspire those active in the world of water, and/or those interested in the governance of complex societal issues, by encouraging them to review – together with us – the unique manner in which three core values, identified beforehand, are contributing to shaping the Delta Programme, what this is leading to, and what this could lead to in the future.
This essay is structured as follows. We start with a discussion of the value of sustainability. We first attempt to gauge somewhat this beautiful, yet rather slippery concept. Subsequently we indicate how it is given

shape in the Delta Programme. Across the globe, the introduction of sustainability has resulted in an actual paradigm shift, especially as it requires people to expressly take the (distant) future into consideration in whatever they do. This also throws a certain light on the values of flexibility and solidarity: reason for us to commence by discussing sustainability – although the chapter was written last.

This is followed by an exploration of the value of flexibility. This is the most technical, and, in a certain sense the most concrete part of our essay. The point is that flexibility appears to be a key to attaining sustainable policy. The Delta Programme has expended a great deal of effort on developing flexible strategies – as is, in fact, standing policy practice in the water domain. This section will go into the how and why of this flexibilisation.

Solidarity is the final "Delta Programme value" that is presented. This value requires us to reflect on the manner in which uncertainty concerning climate change impacts on various sub-groups of the Dutch population. The control these sub-groups exert over their situation is inversely proportional to their claim on the solidarity of other Dutch residents if they "are troubled by the water", we contend. We have worked out this ground rule for various situations and for future generations, and sketch the implications for policy makers.

This part of the essay has a slightly more theoretical and speculative character than the sections on the other two values. This is because not much has been written about solidarity within the Delta Programme itself, presumably because this value has already been embedded in the water domain to a much greater extent than the relatively new values of sustainability and flexibility that really had to be fitted into the procedures. Perhaps re-gauging solidarity was felt to be unnecessary. However, the uncertainties and long timelines ensuing from climate change definitely shed new light on the value of solidarity, as we contend here. There are sound reasons for reinterpreting solidarity within the water domain as well – but in actual practice these reasons have hardly settled in (yet).

Obviously, the three values also interact. After discussing the core values (discussions that, in view of their genesis, are quite individual in nature) we briefly outline our view of the dynamics between the core values. We conclude our essay with a number of appendices dealing with sub-aspects of one of the three values. This is for the aficionados.

We dedicate the essay to Annemieke Nijhof, who held the post of Director-General of Water Affairs at the Ministry of Infrastructure and the Environment during the period in which the Delta Programme was set up. It was she who, on a sunny afternoon early in 2009, in a meeting room at the Bankaplein in The Hague, challenged the Delta Programme Quartermaster's Team to enter into a dialogue with the many parties involved about the "shared values", the core values of the Delta Programme, and to explore, outline, and gradually substantiate these values together.

Marjan Slob (independent author and philosopher) and Pieter Bloemen (Delta Programme Commissioner's staff), September 2014.

Contents

Introduction

Dutch water policy must be demonstrably solidary, flexible, and sustainable. That is what the drafters of the *National Water Plan 2009-2015*, the official state plan for water policy, had in mind when they designated solidarity, flexibility, and sustainability as the three "core values" of that policy. With respect to the Delta Programme, according to the Plan, the core values must be "leading" to "the manner of organisation and collaboration in water management".[1] This essay reviews these values for the water domain, and explores the manner in which they (may) impact in actual practice.

A new approach

The Delta Programme has been set up in line with the recommendations of the second Delta Committee, the much discussed Committee chaired by former Minister Cees Veerman. The Cabinet appointed this Committee in 2007 upon realising that climate change could have serious consequences for our delta, consequences that would better be anticipated in policy already. The Cabinet needed advice on the manner in which the Netherlands could improve its flood risk management and keep its freshwater supply up to par in the century ahead – against the backdrop of rapid climate change. In 2008, the Veerman Committee came up with recommendations on the lines along which the government could organise such a climate-proof water policy.[2]

A considerable merit of the Veerman Committee is that it has managed to propagate that the water issues in the Netherlands are not acute yet urgent. Its message to politicians is, as it were: "You will be justified in guaranteeing that living and investing in this country will remain sufficiently safe – provided you will allocate sufficient resources to continuously work on water issues." The Committee apparently struck the right note, because politicians have ensured that those resources have been made available, without waiting for a disaster to occur.

One of the main recommendations of the Committee was to develop a Delta Act.[3] The government has actually formulated and adopted a Delta Act. This Act constitutes the legal basis for the Delta Fund: money earmarked for financing the so-called Delta Programme.[4] The Cabinet also acted upon another

1 The National Water Plan: http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2009/12/01/nationaal-waterplan-2009-2015.html. The Water Act came into force at the end of 2009. The Water Act stipulates that the State must draw up a National Water Plan every six years. This means that the first Water Plan expires in 2015. In order to anchor the Delta Decisions and preferential strategies, an interim amendment to this Plan wsill be enacted at the end of 2014. The second National Water Plan will be ratified at the end of 2015.

2 The Delta Committee was disbanded following the presentation of its advisory report to the Cabinet on 3 September 2008. Source: Delta Committee website, http://www.deltacommissie.com/.

3 The Delta Act came into force in January 2012. The Delta Programme Commissioner was already appointed in 2010. The first Delta Programme was submitted to the House of Representatives in September 2011. The factual information in this paragraph has been derived from the Delta Programme Commissioner's website, http://www.deltacommissaris.nl/.

4 The annual Delta Fund budget amounts to around one billion euros. The Delta Programme Commissioner proposes projects that would need to be considered for funding. Part of the Delta Fund budget goes to maintenance and management of existing water works – expenditure that had generally already been scheduled.

recommendation of the Committee, viz. appointing a so-called Delta Programme Commissioner. In 2010, Wim Kuijken was appointed Delta Programme Commissioner, and he still holds that post. Mr Kuijken is tasked with annually presenting the progress made with respect to the Delta Programme; upon the state opening of Parliament in September, the Minister of Infrastructure & the Environment applies for political approval of the new plans and adjustments. As the "director" of water policy, Mr Kuijken sees to it that Delta Fund resources are allocated to projects that (jointly) best serve the goals of the Delta Programme.

On the face of it, it might seem disappointing to label such procedural and administrative interventions as the main result of a prestigious committee that has examined an extremely complex and serious issue. A second glance, however, reveals an entirely different assessment. Since the Veerman Committee, a substantial budget has been set aside for water management, a budget that does not need to be battled for every year in the political arena. Furthermore, we have an influential government commissioner who monitors the incorporation of water projects into an integrated programme with explicit goals and core values. This generates peace of mind, which creates new options for converting a long-term vision into policy. One of the propositions of this essay is that the manner in which this unprecedented administrative scope has been created and substantiated is what makes the Delta Programme truly trail-blazing and innovative. This time, the main "Delta Work" is not an impressive, physical construction, but rather a new, pioneering process of governance.

We will underpin this proposition as we go, by going into the significance the three core values identified (solidarity, flexibility, and sustainability) have taken on over the years – and could still take on – within water policy.[5]

5 In its advisory report, the Veerman Committee does not refer to core values. It does explicitly identify two "pillars" of the strategy to be followed: risk management and sustainability. The "pillar" concept has disappeared from the National Water Plan (NWP). This is the first document to coin the term "core values", of which sustainability is one – which means that sustainability has evolved from a pillar to a *value*. The other Veerman pillar, "(flood) risk management", has evolved to the eventual policy *objective* in the NWP (along with a proper freshwater supply).

Part 1: Sustainability as a core value

I The significance of sustainability

The word "sustainability" is used by many people in many different contexts, and its significance tends to subtly differ according to the context. This is perhaps inevitable with a word that truly lives and "works". Yet we will venture a brief description here. Any attempt to consider how sustainability as a core value is reflected in the Delta Programme would benefit from certain clarity as to the significance of the term.

The term sustainability in its current sense originates from ecology, in which context it refers to a healthy and diverse ecological system that is capable of sustaining itself. The first authoritative *political* use of the word can be found in *Our Common Future*, a report by the United Nations World Commission on Environment and Development published in 1987 – also known as the Brundtland report.[6] This report advocates sustainable development, which it defines as "a development that meets the needs of the present without compromising the ability of future generations to meet their own needs". For example, the report states that poverty hampers the sustainable use of the natural environment: someone who is hungry now, is hardly in a position to worry about the future. In addition, the UN report postulates that sustainable development calls for the integration of nature conservation and economic development. "Brundtland" thus establishes a clear relation between economic growth, environmental issues, and problems associated with poverty and underdevelopment.

That sustainability leads to the necessity of gathering social justice, nature conservation, and economic development into a single train of thought is embodied by the phrase that gained global acceptance around the year 2000: that of the "three Ps". A situation is sustainable if there is a proper balance between the P for people (the social domain), the P for planet (the ecological domain), and the P for profit (the economic domain). This definition constitutes the basis for the manner in which sustainability is rendered operational in the *National Water Plan*. It states that "sustainability" as a core value is substantiated by "seeking considerable local commitment to and improvement of the quality of the living environment in the selection and elaboration of all goals and measures ("people"), improving the quality of eco systems ("planet"), and creating opportunities for the business community ("profit")."[7] Further down we are going to zoom in on how sustainability is given shape in the Delta Programme. First we will take a brief look at the development and gauging of the concept of sustainability in a broad sense.

According to the current *communis opinio*, sustainability pertains to three domains: people, planet, and profit, which need to be considered as interconnected. Moreover, sustainability is also a normative rather than merely a descriptive concept; it states that we ought to strive for an equilibrium between these domains.

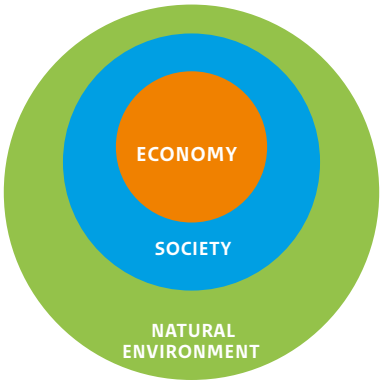
6 The still authoritative report has been named after the Chair of the UN Committee, former Norwegian President Gro Harlem Brundtland. See http://conspect.nl/pdf/Our_Common_Future-Brundtland_Report_1987.pdf.

7 Page 16 of the *National Water Plan 2009-2015*, English translation of the Dutch text.

It goes without saying that the word "sustainable" already existed far before ecology coined it anew in the 1970s. In common parlance, "to sustain" would mean something like to endure, to support, to strengthen. This meaning still glimmers through in the current, more political use of the term. To a remarkably large extent, the exact meaning of sustainability depends on the context – but the future is always implied. Sustainability, therefore, at any rate demands that *three* domains are *balanced, now and in the future*. This is the working definition of the concept of sustainability used in this essay. This working definition opens up an exciting field, but also immediately raises questions once it is applied to, for example, the world of water. These are the questions we are now going to examine, in the hope of clarifying how the concept of sustainability impacts the world of water.

The relation between the three domains

The "balance between the three Ps" formula slightly veils the fact that – from a purely logical point of view – the relation between these domains is not an equal one. The three domains do not exist independent of one another; they overlap – and not in an identical manner. Sustainable economic growth takes place *within* a society featuring sufficiently fair social relationships (it would be unnatural to focus on the needs of future generations while members of the present generation are unable to meet their most basic needs). This sufficiently socially fair society, in its turn, forms *part* of a sufficiently healthy and diverse natural system. An actual sustainable balance between the three Ps would make the economy a system that does not sponge off the social system, and the social system one that does not sponge off the natural environment. In other words: the natural environment, encompassing the broadest field of vision, would define the preconditions that truly sustainable economic and social developments would have to meet. This is schematised in the figure below.[8]



This representation of sustainability is well defensible and not uncommon. For example, the authoritative World Resource Institute calls a healthy living environment the "foundation" of economic opportunities and human well-being.[9] However, the World Resource Institute has a well-defined agenda: it is a global research organisation that focuses on the protection of a healthy environment. The diagram above also originates from the "green" quarter. Other diagrams and presentations provide a different outlook of the relation between the three domains, entailing a less comprehensive depiction of the P for "planet".[10] However, we have opted for this diagram. Not because we believe that "green" issues deserve more attention (that would be a political consideration), but rather because we believe that the natural system au fond determines the conditions for existence of human life. We regard this as a factual statement.

8 Scott Cato, M. (2009). *Green Economics*. London: Earthscan, pp. 36–37.

9 See http://www.wri.org/.

10 See, for example, the figures on p. 2 of Adams, W.M. (2006) in *The Future of Sustainability: Re-thinking Environment and Development in the Twenty-first Century.* http://cmsdata.iucn.org/downloads/iucn_future_of_sustanability.pdf.

A boundary that is both hard and dynamic

In our field exploration of the three domains we encountered an extreme precondition (the outer circle): the natural environment must, in any case, be such as to enable humans to survive – in the literal sense of "not dying".[11] That boundary has been defined, as it were, with insight into our biological existence. Fortunately, the survival of the human species is not at stake in the Netherlands, which renders this statement rather abstract from a policy and political point of view. Nonetheless it is good to realise that this lower limit defines the key in which the sustainability debate takes place – especially from a global perspective.

This is also related to the origin of the word: in the 1970s, humanity began to realise that *our own behaviour* could bring this lower limit dangerously close. The natural environment - long regarded as the imperturbable setting of human actions – has started to change, in part as a result of human action.[12] Acid rain, dirty ditches, the hole in the ozone layer; all of a sudden, such detrimental phenomena in "nature" appeared to be (in part, anyhow) dependent variables of our behaviour. The concept of "sustainability" emerged as a response to that growing awareness.

At the time, the appeal to take heed of the natural system in which we live was imbued with a heavy sense of doom. Trends were extrapolated in a linear manner, and the scenario seemed clear: humanity was irrevocably heading for big trouble. Meanwhile, the concept of "sustainability" has somewhat eased away from a single (doom) scenario, thus creating room for the awareness that even the hard and fast preconditions that the natural system sets for human life at any time are not fixed once and for all. The agricultural revolution has enabled the earth to feed more mouths now than we initially thought possible. Technological innovations allow us to live comfortably in what used to be brutal circumstances. The climate is changing, as is ecology itself, rendering life in other locations on earth gradually possible or, conversely, impossible.[13] The lower limit for human life definitely always lies somewhere at any given time – but we do not know exactly where, and that limit is not fixed either. The same applies, to an even larger extent, to the zone in which the other domains – people and profit – run into trouble. These zones exist, without a doubt, but cannot be pinned down objectively, nor are they constant. This given places sustainability scenarios in a certain light: although such scenarios can be highly meaningful thinking exercises, they should not be assigned any predictive value. The number of uncertain variables involved is too large to so warrant.

Interventions change boundaries

Critical boundaries can thus be presumed, but not clearly defined. The fact that *people* constitute one of the domains to which sustainability pertains makes describing this system even more complicated. After all, our actions within the system – and thus the impact of those actions – are affected by our knowledge (and views) of that system.[14] That is what those earlier doom stories left out of account. In fact it is quite simple: if human behaviour can harm the natural system, we can also develop ways of life that acknowledge and respect the importance of that natural system. This would give us room to manoeuvre. This insight entails a responsibility on our part – but also gives us hope. This tends to be the general outlook on the call for sustainability nowadays.

11 The quality of that life is left aside in this thinking exercise. After all, determining the quality of life implies observing standards, holding a vision, and making considerations, which defies its neutrality.

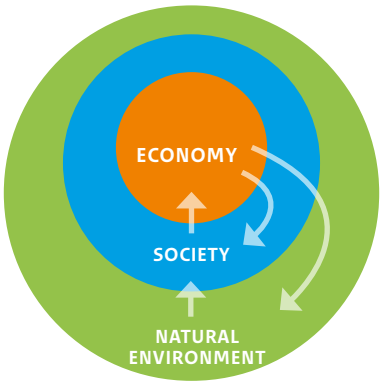
12 The report The Limits to Growth published by the Club of Rome in 1972 was the first to clearly place the possibly disastrous consequences of human action to the environment – and thus ultimately to ourselves – on the agenda.

13 It would even be conceivable for the human species to mutate and adapt to natural circumstances we have, in part, created ourselves. The science fiction genre eagerly explores such thinking exercises. For the philosophical significance of this idea, see e.g. Fred Keijzer's *Filosofie van de toekomst: over nut en noodzaak van sciencefiction* [Philosophy of the future: about purpose and necessity of science fiction]. Lemniscaat, 2010.

14 This is what Canadian philosopher Ian Hacking calls the "looping effect". Ian Hacking, *The social construction of what?* (2000, 1999), Cambridge MA: Harvard University Press.

From this perspective, planet is the domain with the broadest *scope*, but the *central* domain is people. It is the hub of the system, and it is there where we "feel" the effects of the other two domains. In the 1970s, we noticed that the economy of that time brought us prosperity, but also depleted the natural system to a dangerous extent. The impact of the economy rebounded, as it were, from the natural system's cushions back to the social domain. We experienced personally that the natural system had entered its problem zone. However, the social domain is also the place from which we can influence the balance between the three domains. Ever since this dawned on us, we have been searching for other ways to gain prosperity.[15]

The effects are felt in the social domain – and this is where the motor for change is located. This feedback loop typifies the relationship between the three Ps, and results in the following refinement of the diagram above[16]:



Crisis: lack of balance

Sustainability mongers hold a special view of the crisis phenomenon. To them, the fact that a crisis occurs can only mean that the three Ps have been out of balance for too long. A lack of attention to a particular domain has caused the aggregate system to stagger; the interests of that domain have been neglected too thoroughly and for too long. Hence the emphasis that sustainability places on seeking a balance between the three domains. Such a crisis may originate in the P for *profit* domain (e.g., a stock exchange crash) or in the *planet* domain (a freshwater shortage) – but such an occurrence is predominantly referred to as a crisis on account of its adverse consequences for *people*. It is a crisis because people lose their homes as a result of the collapse of the stock market, or because their food crops have scorched. In this sense, too, the social domain takes precedence.

15 Consider technologies that contribute to greening the economy, and designing according to the cradle-to-cradle principle.

16 The diagram could be refined even further by introducing a distinction between various causes and consequences. We humans are leading when it comes to the consequences; the word crisis is used in particular – but not exclusively – in the event of major consequences for people. Whether or not something constitutes a crisis is not always for people to decide, but the crisis itself does not necessarily need to involve people; the extinction of coral could be designated as a crisis. And the key to alleviating that crisis – i.e., restoring the balance – also lies with the P for people. The causes may be situated within our sphere of influence to a greater or lesser extent. A social or economic crisis is often caused by the attitudes adopted by people (or rather, the group of people who have the upper hand). One could say that in such cases, a crisis is brought about by an internal cause. Since the 1970s we have been aware, as mentioned earlier, that a crisis in the natural system may also have an internal cause (over-cropping, pollution, et cetera). This does not alter the fact that some natural phenomena manifesting as a crisis still have a cause that is external to people (volcanic eruptions, tsunamis, et cetera). We call that being struck by "Fate" (see Part 3 of this essay, about solidarity, for a further exploration of "Fate").
The climate change that is causing so much turmoil in the water world occupies an intermediate position in this respect. This climate change ensues, at least in part, from human action, and can thus be attributed to a (partly) internal cause. Yet in actual practice– for a range of reasons that will be specified further on in this essay – administrators tend to attribute climate change to external causes. It is good to keep this in mind, precisely because climate change has constituted a key reason for setting up the Delta Programme.

In situations in which people are acutely driven into a corner, an array of resources will be employed to avert such a crisis. A crisis calls for action, for intervention – often under great pressure of time. People must be saved (now!), and the interests of the business community or nature must temporarily be set aside to this end. In acute emergencies, short-term interests dominate – which is fully justified and appropriate in such situations. In other words, attention to the *relationship* between the three Ps has slackened. In times of emergency, such as a dyke bursting, popular insurrection, or large-scale disinvestments as a result of (perceived) insecurity, the debate on a desirable balance stops. Such situations call for action. However, measures to relieve distress unfortunately now tend to be far from subtle; there is a real danger that a panicky society tends to rob Peter in order to pay Paul. Long-term interests, in particular, will be sacrificed to relieve short-term needs.

An example from the water world may clarify the dynamics outlined above. In the depression years and during World War II, dyke maintenance was neglected. In one fell swoop, the disastrous flood of 1953 put the importance of proper flood defences on the map again. In our wording: the effect of the lack of investments rebounded forcefully off the "nature" cushions back to the social domain. Preventing another such flood became a top priority. The government spared no trouble or expense to attain this goal. The Netherlands responded by building the Delta Works – an admirable, impressive, yet costly and not particularly flexible intervention that by itself caused damage to, for example, the tidal system: damage that has been curtailed somewhat in subsequent years through a host of (expensive) adaptations.

Sustainable policy provides stability

Pursuing a sustainable policy means: ensuring that society as a whole steers clear of the danger zone in which one of the three domains is compromised to such an extent that significant social issues ensue – which in their turn necessitate hefty interventions. Administrators acting with sustainability in mind will, in other words, attempt to prevent the crises that arise from the neglect of one of the domains. If they manage to pursue such a policy, it will provide society with stability. A sustainable system is a stable system.

Whereas times of emergency are governed by the adage of "let tomorrow take care of itself", a balanced system creates the space and calm to look at the long term, and distribute existing resources sensibly across short-term and long-term goals. This will ultimately turn out to be far more cost-efficient, because it enables investments to be made at advantageous moments. This flexibility also expands the possibilities for coordinating the measures with ambitions in other fields, such as nature, shipping, and recreation. Furthermore, sustainable policy results in social stability and confidence in the future. It expands our opportunities for taking care of tomorrow as well.[17]

Room for several balances

Our working definition of sustainability read: a system is sustainable if *three* domains are *balanced, now and in the future*. Above, we discussed the manner in which sustainability accounts for three domains, we examined the inter-relationship, and indicated that the introduction of the *planet* domain would stretch the time span to such an extent that a policy can only be called "sustainable" if it expressly takes its *future* effects into consideration. Therefore space and time are connected here. A metaphor may explain what we are driving at: if we view human action as a boomerang, all of a sudden we appear to throw the boomerang quite a bit further than we had previously assumed. As a result, the boomerang returns quite a bit later than what we are accustomed to. The awareness that our (administrative) care also extends to the natural system itself turns out to be a true *game changer*; the introduction of sustainability entails a fundamental change of scope with respect to both space and time.[18]

17 Sustainability would thus lead to a script featuring an actor whom prevailing policy would assign no more than a minor supporting role, if any: the future generation. Further on in this essay we will pursue in greater depth the position of future generations within the Delta Programme.

18 In less ornate wording: planet responds extremely slowly to human action. Therefore, by including the planet as a variable in the system, policy is all of a sudden liable for effects that may occur in the distant future.

One more comment on the words *equilibrium* and *balance* before we examine how the "sustainability" value is further rendered operational in the Delta Programme. In the absence of hard and fast criteria, and unrelenting, pre-determined boundaries whose overstepping leads to a crisis, it is up to us to determine what relation between the three Ps we wish to characterise as a *balance*.[19] Thus, the context is highly determinative for what constitutes an acceptable or good balance. Furthermore, the fact that the relation between the three domains is sustainable does not say much about the specific momentaneous equilibrium between the domains. The relation between the domains can vary considerably over time, without the system as a whole, or one of its parts, being jeopardised. A system can even be temporarily out of balance – yet still be sustainable. In fact, *each* balance between the domains that keeps the aggregate system safely away from a problem zone can be called sustainable. Therefore, this "balance" advocated by the definition of sustainability is intrinsically volatile, mobile.

Politicians aiming to engage in sustainability know that they need to heed three fixed variables (people, planet, profit). However, these fixed variables cannot be translated into fixed standards or reference points. This means that the practical substantiation of sustainability will always be open to debate. One could also say: science can feed the political debate on sustainability, but it cannot provide any definite answers – let alone take over the debate.

All things considered, the call for sustainability provides politicians with little to go on. It is not possible to deduce a particular policy that follows naturally from the pursuit of balance. However, sustainability does offer a lead for the *practical* wisdom politicians need to rely on.[20] Politicians may be expected to sense society's running into difficulty due to a prolonged lack of attention for one of the three domains. It helps if they incorporate the knowledge of the impact of the current balance into their quest for the balance of tomorrow.

In a society that seeks balance between the three domains, any prolonged neglect of a single domain is less likely – however that balance may turn out exactly, and however the exact relation between the domains may fluctuate in time. The political battle concerning the right balance between the three Ps may cause a great deal of social turbulence at any given time. "Stability" is perhaps the last word that would spring to mind among administrators at such a moment. But, viewed from the broad scope sustainability calls for, that turbulence may also occur while the course is still stable. It is this type of stability that sustainability insists on – the stability of steering consistently clear of the problem zones that give rise to crises.

If this works, a society may end up in an upward spiral. A system that is stable (in that sense) will allow politicians and policy makers the time to look for more subtle policy instruments. In other words, they may engage in sustainable policy.

19 Ergo, balance is defined here in an instrumental sense. A balance is achieved if the dominant parties are satisfied with the existing relation between the three domains; it is merely the name given to the outcome of a political process.

20 Ideally, politicians excel in *phronèsis*, practical wisdom. Practical wisdom involves making proper considerations, rather than rigid inferences. Arriving at a good consideration requires (according to Aristotle) not just a keen mind, but also living through values. Achieving sustainability pre-eminently calls for *phronèsis*.

II Sustainability within the Delta Programme

In the section above, we described "sustainability" as a value that requires decision-makers and administrators to take serious account of the impact that policy may have on the natural system. The equilibrium between *people*, *profit*, and the new factor, *planet*, must be sound, i.e., steer clear of the problem zones that give rise to crises. In principle, many balances can exist between these three Ps, and those balances will shift over time. There is, therefore, considerable (political) scope for different types of sustainable policy. However, sustainable policy does demand that the balance of any given moment will always stay clear of those problem zones. The specific balance does not need to be stable; stability is achieved by the balance in the *aggregate* system over a *longer period of time*. Sustainability thus directly and inevitably pertains to the long run; decision-makers and administrators are asked to look relatively far into the future.

Now that we have discussed the general implications of the "sustainability" value, it is time to take a more concrete and practical look at how sustainability is manifested within the Delta Programme. This will demonstrate that it is the serious and consistent incorporation of this value – ergo: the quest for equilibriums that ensure long-term stability in the aggregate system – that renders the Delta Programme so exceptional and innovative in administrative terms.

Political dynamism surrounding the Delta Programme

The object of the Delta Programme is: safeguarding flood risk management and ensuring a sufficient supply of freshwater. First and foremost, this object serves the people. People need to be protected from flooding; people need to have good drinking water – because if something goes wrong with people, we really have a crisis on our hands. Immediately after that, it is profit that pops up: we want policy to protect invested capital, and to serve agriculture and shipping. Attention is also paid to the intrinsic value of *planet* (for example, the damage that salinisation can cause to Nature does carry weight in decision-making), but neither Nature nor spatial quality have been designated as objectives of the Delta Programme.

However, once the focus is on the manner in which we can attain the above goals (protecting people, profit, and planet – in that precise order), the significance of the *planet* domain rises sharply. This is because the idea of sustainability convinces us that neglecting the natural system for (too) long will irrevocably lead to crises in the economic and social systems. So, if we wish to prevent crises – a key task of the administration – we will have to expressly include the natural system into our plans.

It has become clear, meanwhile, that human behaviour is highly likely to lead to climate change. From a global perspective, it is incumbent upon us to adjust the behaviour of mankind in the hope of limiting such climate change ("mitigation"). As a national programme, however, the Delta Programme focuses on "adaptation", adapting to the changing climate – for pragmatic reasons, it treats climate change as an external factor which Dutch residents must try and deal with. This is based on the awareness that the slow, yet in part actually already irrevocable changes in the climate may have a huge impact on the inhabitants of the delta, and thus require that we look far ahead.

The key achievement of the Veerman Committee is that it has imbued politicians, administrators, and policy-makers with the necessity of a visionary water policy, in such a manner as to motivate these parties to act on their convictions by initiating the Delta Programme. The current maxim is that water policy must be robust up to 2050, and make allowances for options that may play a role up to 2100. In administrative and financial terms, the Delta Programme is a hefty intervention – the type of intervention politicians usually only decide on in an attempt to defuse a crisis. However, the Delta Programme has not been preceded by

any crisis;[21] on the contrary: it is intended to ward off future crises (and avoid the often far from subtle troubleshooting policies that often follow a crisis). When we look at it this way, by setting up the Delta Programme politicians have proven that they are capable of jumping over their own shadows.

In the *National Water Plan 2009-2015* (NWP), published at the end of 2009, sustainability is elaborated on the basis of the usual three Ps. According to the NWP, this means that all goals and measures are selected and elaborated with a focus on seeking "considerable local commitment to, and improvement of, the quality of the living environment "("people"), improving the quality of eco systems ("planet"), and creating opportunities for the business community ("profit"). The report goes on to specify this focus. In the context of the Delta Programme, *planet* pertains to the living environment and eco systems, "whose quality must, as a minimum, be maintained by the water projects". Attention to people means: "actively seeking to involve citizens and civic society organisations in the Delta Programme, reducing the turmoil caused by intervention", whilst *profit* calls for "considering the private sector and a possible international profiling of the Netherlands when implementing measures." All in all, sustainable water management is based on the following rationale: "moving along with natural processes where we can, putting up a fight where we have to, and capitalising on opportunities for prosperity and well-being".

The report refrains from a well-defined and specific substantiation of why exactly this is deemed sustainable water management. Yet the description is not inconsistent with other statements in the NWP regarding sustainability, and it provides a clear rule of thumb. It is also clear that the balance between the three Ps is sought in the Netherlands. That speaks for itself: although sustainability is a theme that spans the entire globe, the administrative mandate of the Delta Programme is vested at the national level. Hence, perhaps, that the P for people does not mention socio-economic rights, let alone human rights, but instead makes a case for administrative virtues such as organising commitment and avoiding turmoil.

The Delta Programmes

In the very first Delta Programme, *Delta Programme 2011: Working on the delta: investing in a safe and attractive Netherlands, now and in the future*, submitted to Parliament for approval in September 2010 by the Minister of (then) Housing, Spatial Planning and the Environment, the words "sustainable" and "sustainability" feature a total of 25 times. Usually in a general sense, i.e., as a core value substantiated on the basis of the three Ps; the wording is similar to that used in the *National Water Plan*. Occasionally, the words are used in a more specific sense, for example, in a paragraph on page 39 about the "sustainable use of gravity" for drainage purposes. Here, sustainability seems to refer to the use of "green" energy sources rather than (seeking) a proper balance between the three Ps. On page 42 it says: "Sustainability as a value applies to both the programme as a whole and its implementation." Ergo, sustainability turns up here (also) as a governance virtue. "... its implementation [the passage continues] is based on the standard classification of people, planet and profit." This suggests that the three Ps constitute a way to elaborate "sustainability as a governance virtue".

In *Delta Programme 2012: Working on the Delta: acting today, preparing for tomorrow* the words "sustainable" and "sustainability" are found 18 times - as a core value, or in the by now generally adopted rationale of "moving along with natural processes where we can, putting up a fight where we have to, and capitalising on opportunities for prosperity and well-being". On one occasion, sustainability is used in the context of management and the use of the available sand supply, in which respect the report states that the various interests must be weighed in a transparent manner. This explicitly calls for seeking an acceptable balance. The word "sustainable" is used twice in the Appendix to the Delta Programme 2012, both times in the sense of "a long shelf life".

21 In all fairness, however, we have to admit that the destruction of New Orleans by hurricane Katrina in 2005, and Al Gore's documentary *An Inconvenient Truth* in 2006 played into the hands of the Veerman Committee; politicians had every reason to want to take a firm stand. In a "global village", a crisis may not need to occur in one's own country to nonetheless bring about a broadly supported sense of crisis.

In *Delta Programme 2013: Working on the delta: the road towards the Delta Decisions* the words appear 14 times, most of which in a general sense, as a prevailing core value of the programme. They also feature in a more concrete passage on "sustainable and effective management of the flood plains". Here, sustainability involves a desirable form of management: a governance virtue.

In *Delta Programme 2014: Working on the delta: promising solutions for tasking and ambitions* (i.e., towards the end of the pioneering phase of the administrative process) the words "sustainable" and "sustainability" appear 24 times, in the three senses identified earlier: sustainable as a general core value and appeal (paradigm), sustainable as a renewable use of resources (green), and sustainable as a particular integrated, iterative form of administration (governance).

In *Delta Programme 2015: Working on the delta: the decisions to keep the Netherlands safe and liveable*, the word "sustainable" is found 18 times and the word "sustainability" twice. Therefore, the value has actually turned into an adjective here, a way of doing things. In this document, sustainable is used in the predominant meaning of: an approach that is also viable in the long run ("sustainable protection", "sustainable use of groundwater", "sustainable and robust flood risk management"). On four occasions reference is made to a permanent equilibrium. These tie in with our earlier examination of the value of "sustainability" as an appeal to achieve an equilibrium or equilibriums between the three domains, in order for the aggregate system to steer clear of a crisis, now and in the future.

An explanation of "sustainability" as a core value [22] refers to the intended integrated approach and the intention to connect the short and the long term. This calls for a form of "magnanimous thinking", the report states. "It is not the sectoral point of view that is determinative in the planning phase and the design, but rather the quality that can be delivered in a broad sense". This means that sustainability is reflected here in an appeal to break free from sectoral thinking, and adopt a much broader-based and more integrated approach to the development of areas. Throughout the programme, sustainability officially represents the balance between domains – including the green domain – yet in the justification of projects and sub-projects it is often interpreted as merely "green".

Adaptive delta management

A direct result of the exceptionally long sightlines that the Delta Programme entails is that policy-makers are faced with considerable uncertainties. As yet we are unable to accurately gauge the scope and nature of the impact of climate change, simply because we lack the knowledge to do so.[23] Then how does one proceed? The approach that has gradually been developed and adopted within the Delta Programme has been christened "adaptive delta management". This method focuses on linking short-term decisions to long-term taskings. To that end, several strategies are being developed which allow switch-overs, if necessary. The strategies themselves are preferably flexible, and wherever possible they tie in with investment decisions involving other fields, such as Nature, shipping and recreation. In practical terms, the Delta Programme thus translates the "sustainability" value embraced by politicians into the adoption of adaptive delta management in the development of strategies.

22 *Elaboration of the core values within the Delta Programme*, op. cit., p. 12.

23 Gauging the consequences of climate change is notoriously difficult, because the climate system is a so-called "complex system"; i.e., its properties cannot, in principle, be (entirely) derived from the properties of the individual constituent parts. We can understand the basic principles of wind and sea currents, evaporation, the growing or melting of glaciers, et cetera. We know that these are sub-systems of the climate, and furthermore we know that these sub-systems interact. But we cannot exactly fathom how they interact. Moreover, in many cases, the results of a change in a sub-system are non-linear to the aggregate system. This means: a minor change in a sub-system may have major consequences for the aggregate system ("the butterfly effect").
The consequence of our lack of insight into the exact interconnectivity of the various climate sub-systems is that although we know that the climate is changing, this does not yet tell us how the various climate sub-systems are changing. Thus, it is difficult for us to model the impact of climate change. Hence the contradictory forecasts that are going around, for example, from an accelerated rise in sea levels to the (temporary and local) fall of sea levels.
More measuring is always useful, as is more accurate measuring, but only a conceptual break-through (better insight into the interaction between the sub-systems) will lead to better models and, therefore, to better forecasts within a complex system.
See: http://en.wikipedia.org/wiki/Complex_systems.

Adaptive delta management (ADM) can be regarded as the art of dealing intimately with the huge uncertainties with which climate change confronts the world. Today's delta managers do not push these uncertainties aside, nor do they experience them as a slightly embarrassing lack of knowledge, but they rather give them a distinct place in their way of working.[24] Within this working method, acknowledging these (multifarious) uncertainties follows naturally from insight into the nature of the situation in which we find ourselves. It is, as it were, a form of meta-knowledge that the manager incorporates into the policy process. Uncertainties force one to "stay light-footed", in order to be able to adjust one's course if this seems appropriate in the light of new information. In addition, ADM invites managers to take account of ambitions in other fields when selecting, designing, and scheduling measures primarily focused on flood risk management and freshwater supply: this is what is meant by the phrase "adaptive and integrated". The new motto is: "Looking far ahead without translating this into an "ultimate image nailed to the distant horizon"."[25]

In a certain sense, the current managers thus distance themselves from the large-scale civil engineering interventions as described in the advisory report by the Veerman Committee. The Veerman Committee deliberately based its recommendations on the most extreme climate scenario, and explored the measures needed to protect our country with respect to the situation which that scenario would lead to in 2100. That thinking exercise produced quite drastic measures. For example, the Committee recommended that the IJsselmeer level be raised by 1 to 1.5 metre – a costly project that would require major spatial interventions in the area around the IJsselmeer lake. An adaptive delta manager would question such a measure, based on the blackest scenario. After all, such a prediction might just as well *not* come true – which would mean, in retrospect, that unnecessarily large sums of money have been wasted, and, moreover, an unnecessarily great deal of social turmoil would have been created. It would be better, according to the adaptive delta manager, to take such short-term measures as are required anyhow, thereby making allowances for any additional measures that might be needed in the long run. Subsequently, it is imperative to monitor closely how the situation develops. If a situation is clearly heading for a crisis, intervention is, obviously, essential. However, if this is not evidently the case, one would do better to gather focused information, explore various options for additional measures, and ensure that these options will actually be open, including in the longer run. The motto here is: "Level-headed and alert – and having plans ready on time."

Administrators who familiarise themselves with uncertainties are less likely to retreat into a reflex of "playing it safe". In a fundamentally uncertain situation – such as the one to which climate change is exposing the Dutch water system – such a creed loses its authoritative power. The deeply rooted uncertainties we are facing now cannot be redeemed. However cautious it might seem to base oneself on the worst case scenario, from a broader perspective this might, in fact, constitute reckless behaviour.[26] Current delta managers are expected to keep multiple options open, always remain alert to relevant new information from all three domains, be continuously prepared to adjust their procedures if this seems advisable based on that new information, and have their plans ready on time. Moving along in a deliberate and controlled manner, and making allowances for ambitions in other domains in each intervention, now seems the best way to ensure long-term stability in the aggregate system.

24 Adaptive delta management is a method developed and adopted by the Delta Programme to "deal with uncertainties in a transparent manner", according to the Delta Fact *Deltascenario's en adaptief deltamanagement* [Delta scenarios and adaptive delta management], http://deltaproof.stowa.nl/Publicaties/deltafact/Deltascenario_s_en_Adaptief_deltamanagement.aspx?pId=55. This also states: "Adaptive delta management (ADM) is an approach (under development) to deal with uncertainties in a sensible manner, by looking far ahead to the long-term taskings, and linking them to the present."

25 Both quotes can be found on page 21 of the *National Water Plan*, op. cit. [in Dutch].

26 Especially in the water domain, taking the blackest scenario as one's point of departure can be quite reckless from various perspectives. In financial terms, because it involves taking extremely expensive measures that, in retrospect, may turn out unnecessary; in social terms, because these measures encroach deeply on existing (spatial and human) structures and relations; and in political terms, because the measures substantially reduce the scope available in other policy areas (health care, education), which may have repercussions – especially if later on (some of) the measures are found to have been unnecessary.

Calculating with the future

The Delta Programme has a clearly defined goal: ensuring that by 2100 our offspring will live in a robust, resilient and sustainably organised country that has adequate arrangements in place regarding flood risk management and the freshwater supply. But what exactly is needed to achieve that goal, i.e., what the Netherlands will look like in the future, is being established as we go. It is incumbent upon delta managers to connect this long-term perspective with the present. They do so in relative calm – after all, the Dutch water system is not affected by a crisis right now – which affords them time to explore various equilibriums between the three Ps, and map out the long-term impact of choices that are open. This in turn increases the chance of the equilibriums within the aggregate *people-planet-profit* system of continuing to steer clear of the problem zones. In other words, such a policy also reinforces stability in society in the long run. Thus, it does what sustainability calls for.

In all probability, this quietly working towards future measures, while at the same time taking actions that are useful under the current circumstances, will work out considerably simpler and cheaper than taking much more rigid (emergency) measures later on, because this method enables a subtle "adjustment" of interventions in the water system. Moreover, managers who are aware of the future can prevent certain measures from turning out to be *unfeasible* later on, because current decisions will have cut off those options, as it were. For example, granting a project developer permission to build at a location where in a few decades' time the dykes will be likely to need widening is asking for trouble.

Adaptive delta managers make "broad-based" choices; they do not just make decisions pertaining to what is needed now or in the near future, but they supplement those decisions by ensuring that options for taking more far-reaching measures in the future remain open, since they realise that this future still holds a great many uncertainties. Postponing decisions is not always possible nor wise, but neither is making final decisions now regarding the realisation of measures after 2050. Good delta managers will address high-risk dyke sections now, give priority to tackling bottlenecks in the rivers, and make agreements with managers and consumers regarding the initial measures to be taken towards ensuring a reliable freshwater supply level. Meanwhile, they will also make arrangements for any additional long-term interventions, for example, by exerting influence on zoning plans.

In point of fact: turning points

Traditionally, a manager likes to engage in *back-casting*. He or she substantiates the image of the future held by politicians in technical terms, and starts to plan back on that basis: what steps must be taken and in what order, to ultimately attain the desired goal? However, there is hardly any point to those measures if there is no "ultimate image nailed to the distant horizon", and, at the very most, preconditions can be set for the result (*in casu*: a high flood protection level and a reliable freshwater supply). That is why adaptive water managers have developed a different approach: in designing their strategies, they employ so-called "turning points". An turning point is the presumed moment at which the current strategy is no longer adequate due to the changing circumstances. Such a turning point is, for example, the moment at which a polder has become too salinised to continue current agricultural methods. Delta managers monitor developments, extrapolate them with calculation models, and assess roughly when a turning point could arise. Starting from that turning point, they calculate back to establish the reorganisation measures that need to be taken now in order to prevent the situation from reaching that stage. These measures are plotted over time in a so-called adaptation path. An adaptation path thus places the required measures in a logical order and indicates their throughput time.[27]

The innovation vis-à-vis traditional back-casting is that such adaptation paths may comprise different types of options. In principle, an adaptation path leaves open several options in order to face up to the turning point. This makes it possible to change strategies along the way without causing too much trouble – in

27 The adaptation paths method is summarised in Figure 3 of Delta Fact factsheet *Robuustheid/Veiligheid* [Robustness/Security], Deltares, October 2012. http://deltaproof.stowa.nl/Publicaties/deltafact/Robuustheid_veiligheid.aspx?pId=27.

terms of sustainability: this allows one to opt for a slightly different balance between the three Ps later on. That openness is important, because uncertain situations are especially prone to producing new facts (in the form of knowledge, hypotheses, technology, but also wishes, interests, alliances) that would render another strategy more appropriate.

Adaptive delta management also calls for "linking investment agendas".[28] In urbanised deltas such as the Netherlands, a host of key, heterogeneous interests revolve around water. In such situations, it would be wise to think and work in an "integrated" manner, viz. taking account of the impact the intended intervention may have on *all three* domains. Especially for that reason, it is good if interests can be "linked", for example, by designing a flood plain in such a way that Nature would be the better for it and entrepreneurs would see opportunities. This would perhaps induce parties outside the water domain to co-fund. For water managers this entails, in actual practice: consulting with non-peers, and gathering information beyond their own expertise, based on the realisation that this is the only way to be able to keep the *aggregate* system stable in the long run.

Future generations

Water managers do not just think back from the turning point; they also think ahead (up to 2100). The maxim here is that they opt for measures that will not frustrate additional long-term measures. In terms of adaptive delta management: "the future scope for decision-making must be safeguarded in the best possible manner".[29]

In an open and uncertain situation, such as the behaviour of the Dutch water system under climate change, the current decision-makers *cannot* determine what the delta must look like in 2100. They simply lack the information to do so. But that is not the end of it: today's decision-makers should not want to determine what our country will look like after they have gone. The generations that come after us may have other preferences or opportunities. For example, they may prefer to live in cities, letting agricultural areas go wild. Or they may long for vast, green residential areas that take up a lot of land. If we act now according to what we think will be important to future generations, we deprive future Dutch residents of the possibility to decide such things for themselves. This means that, rather than taking a democratic stance, we are behaving like some sort of enlightened despot: we already know now what is good for them. In positive wording: there is a lot to be said for relatively simple measures if they enable us to keep open or even considerably expand the options for future citizens. Thus we provide future generations with an opportunity to find their own equilibriums.[30]

In some cases, safeguarding a future option might constitute too great a burden on our current society. The option will then be sold, as it were, by saying: 'Sorry, other interests prevail right now'.[31] Within adaptive

28 A phrase from Delta Fact *Deltascenarios en adaptief deltamanagement, op. cit*. This Delta Fact lists the four cruxes of adaptive delta management:
1. linking the short term to the long term
2. incorporating flexibility into the possible solutions
3. working with multiple strategies that enable changing from one to another
4. linking various investment agendas to one another

29 Working with turning points is not always necessary, nor possible. For example, sand replenishment along the coast, as a flood risk management strategy, is fully flexible. And the natural fluctuation of peak river discharges is so great that any upward trend resulting from climate change would not be noticed over time. Furthermore, the protective measures require a long throughput time. For these types of situations other forms of adaptive delta management have been developed, but it would go beyond the bounds of this essay to examine these in detail here.

30 Based on an interview with Pieter Bloemen of the Delta Programme Commissioner's staff for the purpose of *Mensenrechten in beweging: privacy, klimaatverandering en de internationale rechtsorde* [Human rights on the move: privacy, climate change, and the international legal order], a book by Marjan Slob and Esmée Schilte, NwA'dam, 2014. See Chapter 3: 'Omgaan met de ecologische ondergrens' [Dealing with the ecological lower limit].

31 Non-flexible measures often reduce the options open to future generations. A decision now to thoroughly strengthen existing dyke rings around a river will make it more difficult later on to switch to a policy that will give this river more room; not just because this in itself will call for costly measures, but also because it will entail a substantial destruction of capital. Paradoxically, some non-flexible measures may expand future generations' scope for decision-making. This is the case if certain fundamental, costly measures are implemented now, viz. at the expense of the current generations, whilst at the same time such a measure sketches a clear course which still leaves a lot of options open. The trick is, obviously, for policy-makers to see the difference between these measures – and act accordingly.

delta management, that is not taboo, as long as it is a conscious and well-considered choice. I.e., as long as it is based on a comparative political assessment of the long-term and short-term interests, focused on what would be most conducive to the stability of the aggregate system over a longer period of time; and sometimes that will be tackling a bottleneck now.

A new type of administration

The Delta Programme can be regarded as an intervention in the relation between the physical and the administrative systems. It is a way to reorganise the relation between these two systems.

The main change, perhaps, is that the Delta Programme is not so much a *project* but rather a long-term *programme* in which short-term decisions are linked to long-term taskings. A project focuses on a pre-determined goal; the outlines of the resources and know-how relevant to attaining that goal are, as a minimum, well-defined. A programme is far more open in this respect. The goal is indicated (in this case: flood risk management and sound freshwater management) but not specified in detail. Even fewer statements are made beforehand on the manner in which these goals will be attained, the partners who might assist in attaining the goals, and the know-how that is essential to attaining the goals. On the contrary: a programme leaves room for the gradual incorporation of advancing insights into policy and measures, in an iterative process.[32] The hope and expectation is that this will, step by step, result in an adequate solution.

Moreover, the Delta Programme is not a State programme, but a national programme. The first matter of importance is that all administrative tiers are expected to collaborate on flood risk management and on an efficient freshwater management of the Netherlands as a whole – setting aside their own regional interests if need be. The substantiation of this tasking is not a matter for the State to consider in *splendid isolation*; instead, the State is expected to seek alliances with all administrative tiers – provinces, district water boards, municipalities – in order to arrive at an optimum execution of the national tasking at hand. "The difference between a State tasking and a national tasking is far from marginal, although it might seem that way," states a recent report evaluating the administrative approach of the Delta Programme.[33] In a State tasking, attention is focused on the "major" issues for the State. In a national tasking, the State asks the regions "how the State taskings can be addressed in such a manner as to align them with regional agendas".

This type of administration will generate, at least in theory, more stability because it reduces the risk of irritations between administrative levels. The approach may also result in higher-quality and cheaper solutions. The option of establishing the optimum administrative scale level for addressing a specific water issue anew in each case that arises sometimes enables a departure from generic policy in favour of customised policy. An example: whereas legislation previously rendered flood risk management operational by setting out the minimum requirements to be met by a dyke ring along its entire length, a new standard stipulates that for each inhabitant of the Netherlands who is protected by a dyke, irrespective of where he or she lives, the risk of drowning must never be higher than 1:100,000. Local managers sometimes know that improving a small section of a dyke already enables them to guarantee that safety. In other words: they know that tackling the entire dyke ring to that end would constitute *overkill*, and they are given the scope to act according to their knowledge. Because the State focuses on results rather than methods within the Delta Programme, administrative scope is created for another type of solution, a solution that may be quite cost-efficient.

32 The word "iterative" is popular within the Delta Programme. This mathematical concept refers to repeating a certain calculation, each time taking the outcome of the previous calculation as the basis for the new calculation. In process terms, this results in a type of feedback loop, while the outcome still changes each time. Presumably, this is why it is deemed an appealing metaphor for adaptive delta management.

33 *Samen verder werken aan de delta: de governance van het Nationaal Deltaprogramma na 2014* [Continuing the work on the delta together: the governance of the National Delta Programme after 2014] by public administration scientists Arwin van Buuren and Geert Teisman (Erasmus University Rotterdam, February 2014). The quotes in this paragraph can be found on p. 13.

The form of administration opted for in the Delta Programme chimes with a transition "that can be observed across the globe" from "government" to "governance", state the public administration scientists who have drafted the evaluation report.[34] Whereas "government" involves centralised control, "governance" is a matter of establishing smart links between domains, scale levels, and stakeholders. The government and the House of Representatives have granted the Delta Programme Commissioner the authority to look for such links, "beyond the constitutional arrangements".[35]

At the end of 2013, these same public administration scientists conducted a survey among the professionals involved in the Delta Programme. The results indicate that the programme is quite successful. "Many respondents commend the pro-active nature of the Delta Programme", the authors report. "Many consider it a historic feat that this is being effected without a disaster as the immediate cause."[36] The general view is that the impetus created by the Veerman Committee has been utilised effectively. The respondents pay particular tribute to the process-oriented organisation of the Delta Programme. In terms of content, their work has not changed much; the innovation is that they now feel they are truly working on a joint project.[37] They regard the Delta Programme's focus on the long term as "unique".[38] Obviously, it is not all roses – for example, the respondents express some concern about the sustainability of the methods, now that the programme is entering the implementation phase of the preferential strategies – but at least it has made a good start.

In conclusion

In the first section of our reflection on sustainability, we have defined sustainable policy as: ensuring that such a *balance* is maintained between the *three domains* of people, planet, and profit, *now and in the future*, that the aggregate system remains stable. The second section describes adaptive delta management as the manner in which the Delta Programme attempts to process the sustainability value in its systems.[39] In summary, adaptive delta management accommodates the components of the sustainability values we have identified in the following ways:

- *Three domains:* adaptive delta management explicitly calls on managers to look for possible links between domains, scale levels, and stakeholders. "Linkage" and "integrated approaches" are catchwords within adaptive delta management. The fact that the Delta Programme is a national programme makes it easier to identify – and capitalise on – linkage opportunities.
- *Now and in the future:* adaptive delta managers are expected to realise that the future might confront us with new know-how, technologies, and interests. They are strongly urged to ensure that the strategies they are implementing now are robust and flexible, if at all possible. Robust in the sense that they hold an adequate response to the taskings that ensue from the plausible futures sketched by the Delta scenarios. And flexible in the sense that it will be relatively simple to accelerate or slow down the realisation of measures, if the circumstances so necessitate. The importance of looking ahead has been made operational in the Delta Programme by explicitly stating dates (policy must have been *elaborated* up to 2050, and must have been considered up to 2100).
- *Balance:* balance is achieved if society, the business community, and the natural system relate to one another in such a manner as to preclude a crisis from arising. Working with adaptation paths forces us to seek a balance at any given time, in the political process, and based on the most recent information. Furthermore, the maxim to opt for measures that enable additional measures to be taken in the longer run leaves future generations the room for designing their own balances between the three domains.

The following section of this essay deals with flexibility and examines the train of thought underpinning adaptive delta management in greater detail.

34 Van Buuren and Teisman, *op. cit.*, p. 3, paragraph 1.2.

35 Van Buuren and Teisman, *op. cit.*, paragraph 1.3.

36 Van Buuren and Teisman, *op. cit.*, p. 12.

37 Van Buuren and Teisman, *op. cit.*, p. 17.

38 Van Buuren and Teisman, *op. cit.*, p. 19.

39 For the aficionados: Appendix I details how the sustainability value has been substantiated within the Delta Programme in the course of time.

Part 2: Flexibility as a core value

We have discussed how sustainability has changed the policy playing field, and described how sustainability has actually been substantiated in the Delta Programme through the introduction of adaptive delta management. The following section – written at an earlier date than the previous one – will take a more in abstracto look at the manner in which policy-makers can face uncertainties: by acknowledging them, and by responding flexibly.

I Scope of the problem

Climate change forces the government to anticipate a possibly high-risk situation, surrounded by major and multifarious uncertainties. If the government wishes to take seriously its responsibilities, it will need to set down policy now, despite these great uncertainties. The key question will then be:

How does one pursue responsible policy in situations featuring high, complex, and uncertain risks? [40]

We will explore this question by first indicating why it is climate change in particular that presents policy-makers with new questions. Subsequently, we will sketch a line of reasoning: four recommendations to substantiate the tasking ensuing from climate change in a responsible manner.

Even though the pace is still uncertain, as are the exact causes and effects, by now most scientists agree on one thing: the earth is warming, and this in part is caused by human activities.[41] In the long run, this warming may lead to major risks for the Dutch delta, particularly in the field of water management.[42] We could attach probabilities and figures to the plethora of phenomena to be expected, but such figures are the product of competing scientific models, each of which is still recognised as deficient. As a result, the figures move within a very wide bandwidth. The models and outcomes of the calculations differ to such a large extent that it would literally make a world of difference whether the one or the other scenario materialises. This entails that we can no longer utilise the full potential of one of our intellectual trump cards – the data series and statistics pertaining to climate and the living environment that we have amassed over many decades.

40 By no means all of the policy questions arising with respect to climate change can be typified as complex, risky, and surrounded by uncertainties. Yet we will focus here on the approach to tackling such problems, because they are the most urgent: they present the government with the biggest problems, and little experiential knowledge has yet been gained in this field.

41 That consensus has been reached by the Intergovernmental Panel on Climate Change, a UN organisation in which scientists from across the globe collaborate. Their findings can be read in the policy-makers summary of the fourth IPCC report, published in 2007: http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf.

42 Expectations are that the sea level will rise, river peak discharges will increase, and parts of the Netherlands will become saline. Furthermore, the Dutch weather will presumably become more changeable. This means: more heavy downpours that will burden inner cities and infrastructure, and possibly periodic freshwater shortages.

The measurement data is less reliable for various distinct reasons. First of all, the climate constitutes such a vast and languid system that it is still not clear what line we could best draw through the data we have gathered since the start of our systematic measurements. Consequently, on the basis of the data we possess, we cannot determine the exact trend of the development: is it a hockey stick or a straight line, and if so, what is the line's exact gradient? This uncertainty explains the vast bandwidth within the predictions currently made. This leads to the practical problem that we cannot properly calculate how high our dykes will need to be in a hundred years' time, in order to adequately protect the country.

In addition, there is a strong impression that the measurement data shows an increasingly fickle pattern. The measurements perhaps follow a trend, but the fluctuations around that trend are becoming larger. In practical terms this means: more frequent heavy showers, more frequent periods of great drought, in short: more extreme weather conditions. This extreme weather is seldom life-threatening, yet it does cause a lot of nuisance – from inner dykes running dry to overloaded sewage systems; from a river water level that is so low as to impede shipping, to inundated basements. Whereas a rising sea level is a concern for the future, more extreme weather is already causing problems.

Finally, we must factor in the possibility that global warming could reach a particular crucial threshold value which would "tip over" the entire climate system. A graphic representation would look like a radical twist in the historical line. The current scientific status quo does not give any specific answer about the possible tipping points, and not even about the variables that are decisive in this respect.

Administrators aim to attain a goal with the policy they pursue. They usually draw up a blueprint of that goal, as it were, and subsequently reason back to the present in order to determine the policy steps that are required to attain that goal properly and on time. The advantages of this so-called "back-casting" are evident: it justifies the policy course, defines the pace and sequence of the steps required, and enables a strict allocation of responsibilities. "Blueprint thinking" thus creates administrative clarity and calm.

However, in a situation involving large, uncertain risks, back-casting on the basis of the desired future situation does not constitute responsible administration. Not just because such a blueprint for the future cannot but be based on uncertain data, but also because back-casting can easily cause administrative alertness to slacken, which could have dangerous consequences: the parties involved head for the ultimate goal they have set, take the steps outlined to get there, and organise the type of feedback that shows whether or not those steps are being taken.[43] In a situation of uncertainty, however, information from a range of perspectives would be helpful – precisely because it is impossible to determine beforehand what information exactly would be relevant. Consequently, this calls for a large measure of alertness, openness, and learning ability on the part of policy-makers. They will have to be prepared for the unexpected. How does one design a policy process that accommodates the as yet unforeseen?

Along with the scientific differences of opinion regarding the phenomena that climate change will presumably have in store for the Netherlands, there is social dissension about the approach to tackling the problems. What would be wise: relying on technological innovations or focusing on changing human behaviour? How can the government justify a policy that spends great sums on a possibly huge yet still uncertain problem – sums that could also be used to resolve concrete, undisputed problems relating to healthcare, education, or traffic congestion? Perceptions of mankind and convictions discord when it comes to these questions. Scientific knowledge cannot provide a way out here; this is the political domain.

43 In other words: classical "blueprint thinking" automatically leads to over-specialisation; the intended measures are significant within a single, unique system (such as Dutch water management). But what if that system itself is changing, as appears to be the case as a result of climate change?

Ergo, uncertainties galore, and in all shapes and sizes. Climate change is thus a prototypical "untamed problem": neither in cognitive, nor in normative terms is there an unequivocal perception of the situation (what is going on, and what needs to be done). One thing is certain: looking ahead on the basis of looking back is not sufficiently effective in this situation.[44] Yet the government is convinced that inaction is not an option here. Although the exact impact of climate change is uncertain, it is clear that it could cause major discomfort and economic damage; floods could even pose a quite direct threat to the lives of Dutch citizens. Consequently, safety is at stake. Guaranteeing safety is a primary responsibility of the government – according to political philosophers, even the main reason for citizens to give up their sovereignty at all. Measures that keep the country safe and liveable in a changing climate are often comprehensive and require a long preparation time. That is why waiting for more certainty regarding the exact nature and scope of the changes in store for us is not always an option. In some cases, it will then be too late to take effective measures. This places the issue expressly on politicians' and policy preparers' plates. They will have to act in uncertainty. They are faced with the challenge of creating policy *now* in order to avert possible unfavourable futures.

The government is attempting to curb the consequences of climate change in two ways: by addressing the causes of climate change, and by adapting the Netherlands to the expected impact of climate change. Addressing the causes (mitigation) is a task that goes beyond national governments. European and global forums are setting down rules for, e.g., reducing greenhouse gas emissions; rules that the Netherlands can and has to implement in policy. This policy practice is, by its very nature, a process with a substantial "top down" component. Adapting the Netherlands to climate change is a task that falls primarily upon national, regional and local authorities. It does not just involve the literal adaptation of the territory, but also the administrative organisation of the country.

Getting adaptation policy adopted appears to be no easy matter. "Citizens take it for granted that the government safeguards flood risk management, but do not perceive this as an urgent issue requiring political priority", the Veerman Committee states. The VROM-raad [Dutch Advisory Council for Public Housing, Spatial Planning, and the Environment] also finds that the Netherlands has lost its feeling for water issues. "Viewing climate change from an administrative perspective makes it clear that the most unfavourable conditions for policy come together in this issue."[45] After all: the subject matter is abstract, whilst the consequences of climate change are uncertain and anyhow materialise later on. As potential gains will not be manifest until much later, administrators cannot book any direct results during their term of office. Moreover, they cannot guarantee that the predominantly large investments will prove effective. Consequently, administrative success is hard to claim. "The failure of a disaster to occur as announced can be attributed to the preventative measures that have been taken, but also to the fact that the risks have been overestimated", the WRR [Dutch Scientific Council for Government Policy] comments.[46]

In many respects, developing and implementing adaptation policy is, therefore, an administrative problem "from hell". However, it is not all doom and gloom. Administrators may regard the fact that citizens and businesses devote so little attention to flood risk management as an indirect compliment; apparently, they have virtually blind faith in the government in this regard. So far, this has kept at bay a negative spiral, with e.g. people leaving the Randstad conurbation on account of alleged flood risks, resulting in a depreciation of land and investments in that area.

44 A certain measure of predictability of the future is the ratio among administrative instruments such as the Social Cost Benefit Analysis (SCBA), a method to express the future return of an investment for society. Climate change reduces the applicability of the instrument. Data sets from the past describe the "old" (climate) system, and therefore do not say a great deal about what we may expect in the future. Yet it is evident that the actual climate developments are highly determinative for the return of investments in, e.g., preventing local damage due to climate change. Consequently, a standard SCBA approach might not be the most appropriate for the transition we are in now. Berry Gersonius of UNESCO-IHE is currently working on models enabling a cost-benefit analysis under specific forms of uncertainty.

45 *De hype voorbij* [Beyond the hype], p. 51.

46 *Onzekere veiligheid* [Uncertain safety], p. 94.

Looking for smart adaptations to climate change may also constitute a source of innovation. Technical and scientific know-how of water management already is a Dutch export product and a PR instrument, and will definitely remain so now that efforts are being focused on adaptation policy.

The administrative innovations generated by adaptation policy may also be exploited. The Netherlands may seize the opportunity to assume a pioneering role in the exploration of responsible ways to incorporate uncertainties into policy. Furthermore, measures intended to counteract the adverse consequences of climate change may have a favourable effect on other policy fields. Widening a river bed may yield fine recreational spots; architectural solutions to have houses "move along" with water may enhance urban allure. Administrative alertness and creative thinking enable us to kill multiple birds with one stone, virtually all the reports state. This means that it is not just for defensive reasons that time and money is spent on the further development of smart adaptation policy.

II Four recommendations for achieving adaptive policy

Recommendation 1: Think in terms of vulnerabilities

For a country to respond adequately to the climate changes that come about would first and foremost require a change of outlook. Many of the current practices relating to flood risk management will not in themselves require any drastic adjusting, yet they will be viewed in a different intellectual and moral light. This reversal may be designated as a transition from thinking in terms of risks to thinking in terms of vulnerabilities, or (viewed from a more moral dimension) as a reversal from prevention as the leading value to precaution as a guideline for action.

Risks

The classical approach to flood risk management is focused on curbing risks. To that end, water managers go by a formula originating from the insurance business: Risk = probability x effect (damage). Consequently, within the logic of this formula a risk may be reduced by working on the "probability leg" of the formula (improving dykes reduces the probability of a dyke giving way) or by addressing the "damage leg" of the formula (flood-proof houses reduce the impact of a possible flood).

A great deal of experience has been gained meanwhile with this classical "risk-based approach", and it has given rise to administrative and legal practices. The actual practice is highly valuable and ensures that administrators will never light-heartedly abandon this outlook. However, this approach also has limitations that predominantly come to light in the event of major uncertainties in the field, such as is the case with climate change. The fact is, the above definition of risk lacks a "sense of uncertainty". Researchers often conscientiously list the uncertainties involved in the calculations of probabilities and damage, but they are not reflected in the ultimate formula – on the contrary, the formula entices one into an illusory precision, into decimal places. Therefore, in the main product of the classical outlook on risks – the calculated probability – uncertainties remain invisible. Uncertainties seem to have been "consumed", as it were, in the procedure.[47] In the event of climate change, involving so many profound uncertainties, such an approach obscures the problem that should occupy centre stage: uncertainty.[48]

This is not a plea for writing off the classical definition of risk; this cannot be justified in view of the high cost of the practice that has evolved around this approach, as stated above.[49] It is, however, good to examine the mental world this outlook on risks entails. Once "risk = probability x effect" is the point of departure, efforts will be focused on identifying and quantifying risks. The impetus will then be: looking for more information – information that might not be available in the event of complex, uncertain policy problems. Because it is by now clear that such information will not become available for some time, this is a route that insufficiently "mobilises". Such an approach will tend to reduce rather than boost the actual resolve, and thus has a paralysing effect.

47 It is interesting to take a look at the history of thinking in terms of uncertainties and risks. Whereas the WRR report *Onzekere veiligheid* [Uncertain safety], published in 2008, adopted a quite sceptical stance towards the classical definition of risk, the 1994 WRR report *Duurzame risico's* [Sustainable risks] takes this definition as its point of departure without a shadow of a doubt. The latter report, incidentally, contradicts the 1989 VROM report *Omgaan met risico's* [Dealing with risks], which according to the WRR advocates a "technological-scientific risk-based approach" that is inadequate, because it does not make allowances for normative differences. Thus, in 1994 the WRR already displayed a feeling for normative uncertainty, but it had not yet raised uncertainty to the principle of its thinking.

48 Another ironic consequence of the classical definition of risk is that the more the government reduces flood risks, the more attractive a region becomes. The population grows in such an area, as do investments, and thus the possible damage a flood may cause. Thus, the flood risk may remain constant or even increase, despite huge efforts. So the classical definition of risk obscures not just uncertainties, but efforts and successes as well. As a result, the risk-based approach "reinforces itself"; once this road has been taken, going back will come at an extremely high cost. A certain "rigidity" thus sneaks into the system. Cf. further down under Step 3.

49 Moreover, certain sub-phenomena associated with climate change may also be explored and managed through the classical definition of risk; after all, the *trend* of the changes is not uncertain at all, so administrators may very well use the classical definition to determine (minimum) measures to respond to that trend. We will come back to this in the paragraph on "no regret" measures.

In short: calculating risks will always remain useful for an inter-comparison of measures aimed at achieving similar goals. However, in situations featuring profound uncertainties, the formula is not suitable for determining whether or not risks are socially acceptable.

Focus on uncertainty

Most reports intended as a concrete preparation for policy do mention the uncertainties surrounding climate change, but still take the classical definition of "risk = probability x effect" for granted. Among scientific and expert communities, however, a reversal in thinking may be observed that occasionally also seeps through in policy. It involves a way of thinking that takes uncertainty as its point of departure and central notion – i.e., thinking *from the perspective of* uncertainty. Various advisory councils claim that it would be good if policy preparers and politicians were to adopt this new way of thinking. "Rather than attempting to reduce uncertainty, administrators must learn to accept uncertainty as a permanent given" the VROM-raad states.[50] In its recent report *Onzekere veiligheid* [Uncertain safety], the WRR also advocates a transition to a new way of thinking about physical safety issues.

This new approach to risks and uncertainty compels, as it were, a different leading moral principle. The classical risk-based thinking – originating, as stated above, within the insurance world – departs from a situation in which outcomes randomly fall to (groups of) people, yet the mechanism behind the distribution of those outcomes is clear. In such a situation, many are running a (fairly calculable) risk. Each individual is responsible for reducing the probability of undesirable outcomes – that is why we lock our doors, install smoke detectors, and get our vaccinations – but even this "good" behaviour does not guarantee a good outcome. We may have bad luck, and in this situation we believe it is a matter of solidarity to compensate people who happen to have bad luck. This is the rationale behind (collective) insurance. From this point of view, the combination of dykes and the disaster relief fund constitutes a collective insurance against flooding; solidarity is the moral principle associated with classical risk-based thinking.[51]

Climate change presents us with uncertain risks. In terms of Rawls' analysis of justice[52]: the veil of ignorance about the *nature* of our situation has been lifted. We know we are vulnerable, although we do not exactly know where and how. The future consequences of climate change that have currently been outlined – and the ratios behind those predictions – are so diverse that one prediction coming true would, in actual practice, result in a crucially different world than another prediction coming true. An awareness of vulnerability befits such a situation. Vulnerability is the perceived inability to counteract all possible damage.[53] An insurance company cannot design insurance products that would be cost-effective in all those possible future situations. After all, it is not a matter of a tad more or a tad less theft or fire damage, but of a dyke collapsing or not, or being able to supply vast agricultural and horticultural areas with freshwater, or not.

Because the effects of climate change are highly diverse and in many cases highly uncertain, the government cannot assume the role of national insurer either. This does not mean that the government should sit back and relax. On the contrary. In a classical model, uncertainty may perhaps be regarded as an exonerating circumstance: the government could not take its share of responsibility, because the situation was not clear. Ergo, uncertainty here appears as an ex post excuse. However, when the uncertainties are evidently large and crucial right from the start, the government can no longer adopt such a stance.

50 *De hype voorbij* [Beyond the hype], p. 42.

51 The WRR report *Onzekere veiligheid* [Uncertain safety] deals extensively with the difference between thinking from the solidarity perspective versus thinking from the vulnerability perspective.

52 See: John Rawls, *A theory of justice*, 1971.

53 From this point of view, risks are well-defined vulnerabilities that have been rendered quantifiable and thus manageable for insurance companies.

At the same time, in such situations involving large, uncertain risks it would be preposterous to claim that it is the responsibility of the government to prevent all possible damage. It goes without saying that the central government will continue to foster the safety and stability of the Netherlands. Yet the central government cannot continue to assert that its policy provides full protection, simply because we cannot know for certain which policy would actually attain that goal.[54] A government that pretends to be able to guarantee absolute safety in such a situation is far from shouldering responsibility. Such a reassurance even holds some danger. It can be conducive to a form of civil idleness; "everything can continue on the same footing, because the government will take care of it".

In addition to substantive responsibilities, the central government also has a systemic responsibility, viz. ensuring that all relevant parties –local governments, stakeholders, citizens – are capable of assessing their own safety, in order to be able to take "private" action if need be, or attempt to convince the government to take additional measures.[55] In the event of climate change, this necessitates that all parties start thinking in terms of uncertainties and start operating on the basis of an awareness of vulnerability. Such a transition will have real consequences. Municipal authorities that are found to have anticipated climate change to the best of their ability in choosing locations and designing new housing estates, yet nonetheless incur damage, may presumably still count on the solidarity of the central government. It remains to be seen, however, whether ignoring known vulnerabilities might curtail that solidarity. For example: may a municipality or project developer that still employs conventional construction methods in a deep polder lay claim to solidarity if those houses are damaged by pluvial flooding? The central government must provide clarity as to the responsibilities it will or will not accept in such situations, and how it is exploring ways, together with citizens, businesses, and lower governments, to take responsibility in such an uncertain, high-risk situation.[56]

When it comes to large, uncertain risks, the new normative guideline should be an awareness of vulnerability, rather than unconditional solidarity, the WRR states. The council makes a case for acknowledging the vulnerability of people, social systems, and eco systems – and for perceiving such acknowledgement as a moral appeal to protect vulnerable organisms and systems that are incapable of adapting themselves at a sufficiently rapid rate. *Au fond* everyone should be aware of this vulnerability – and act upon it. Such a frame of mind is difficult to bring about if the central government, prompted by solidarity principles, always steps in as soon as damage is incurred. Such a priori solidarity hampers the learning ability, whilst this a situation in which everyone's learning ability is needed.

Precaution

Whereas prevention is an administrative virtue that chimes with classical risk-based thinking, precaution is the administrative virtue associated with thinking from the perspective of uncertainty. The WRR refers to precaution as "the designation for the awareness that uncertainties must be taken seriously, and therefore

54 Under the new flood risk management policy, by no later than 2050 the minimum protection level of each Dutch citizen living behind the dykes and dunes will be 10-5 (reducing the probability of individual mortality as a result of flooding to no more than 1:100,000 per annum). A higher protection level is provided at locations that may involve: large groups of casualties, and/or major economic loss, and/or serious damage due to the failure of vital and vulnerable infrastructure of national significance.

55 Insofar as the reports consulted venture an opinion on the matter, they are unanimous: the government should inform citizens and private parties about the expected climate changes, including any relevant uncertainties. This is the only way for them to prepare themselves and take their responsibility. According to the experts, the government is responsible for initiating a social learning process on the consequences of climate change.

56 In this respect, exactly which responsibilities the government may vest with citizens and businesses clearly constitutes a normative, politically charged question. The Veerman Committee states that everyone now starting to build outside the dykes will have to foot the bill for any flood damage themselves. In this case, the responsibility of the government is limited to informing, advising, alerting, and evacuating, according to the Committee. According to the VROM-raad, however, the government cannot expect citizens and businesses to keep track of all the risks involved in an issue as knowledge-intensive as climate change. "It is, therefore, irresponsible to simply pass the risk assessment of living in an area outside the dykes or deep polder onto citizens of businesses", the council states. The Ruimtelijk Planbureau [Spatial Planning Agency] (2007) opts for a form of social engineering here: it recommends that the government consider the option for introducing water insurance. Such insurance will automatically enhance water awareness, the planning agency believes.

that the approach to uncertainties calls for explicit organisation".[57] The precaution principle already is a standing policy in the European Community; scientific uncertainty must not be a reason for postponing measures that are intended to preclude serious or irreversible damage to the environment.[58]

As long as classical risk-based thinking continues to underpin our reasoning, this precaution principle will tend to manifest itself as a call for *radical* prevention. However, within a paradigm of vulnerability, a call for precaution does not imply that action is prohibited if there is but the faintest probability that this action could lead to damage – or, when looking from the other pole, that action is imperative until every possible risk has been precluded. Such an interpretation of the precaution principle that is wedded to the concepts of "risk" and "preventing damage" could have a paralysing effect or lead to excessive cost. It would be better to interpret the precaution principle as the acknowledgement that administrators may – and sometimes even must – act in situations of uncertainty.[59] Properly understood, precaution abandons the idea of prevention as the focus of risk management policy in favour of manoeuvring in an alert yet cautious manner, fully aware of our vulnerability.

The hybrid truth

In its administrative practice, the government appears to pay full tribute to the principle of solidarity – including in its climate change adaptation policy.[60] And with good reason. For example, the elevated parts of the Netherlands are expected to show solidarity with the low-lying parts of the country. The government also feels responsible for solidarity among generations. Investing in climate adaptation now means that future generations will not be put to unnecessarily high expense. Furthermore, the government realises that private parties will be hesitant to fund the required adaptations to climate change, because it will take too long to recover their investments. Businesses work with investment and return models (for example, for real estate) that look ahead years, but not decades.[61] The interests of future generations cannot be left to the market, because those interests are not yet reflected in the economic models at the time investments must be made. Only the government "hears" the future generations.

In short, there are good reasons for cherishing classical risk-based thinking, and the associated values of prevention and solidarity – in appropriate situations. Policy-makers are faced with the challenge of determining and arguing in which high-risk situations prevention and solidarity may remain directive values, and in which situations those values – especially interpreted in an absolute sense – impede the learning ability of society as a whole. In that case, it might be better to have "precaution" and "vulnerability" serve as a moral compass.

57 To quote the WRR: "Viewed from the perspective of the new risk-based approach, the precaution principle entails that society commits itself to taking uncertainties seriously, and create the conditions that enable a range of actors – politicians and scientists, the government as well as private parties – to meet this obligation."*Onzekere veiligheid* [Uncertain safety], p. 18.

58 Provided these measures are cost-effective. This word holds the political sting. Investments must be proportionate to the probable damage, which leaves room for normative clashes. See *Omgaan met onzekerheid in beleid* [Dealing with uncertainty in policy], p. 14.

59 *Onzekere veiligheid* [Uncertain safety], p. 134.

60 In particular in *Samen werken met water* [Working together with water], the advisory report of the Veerman Committee, but, e.g., also in Verantwoord generatiebewust beleid [Responsible generation-conscious policy], a memorandum of the Ministry of Finance.

61 A comment from *De hype voorbij* [Beyond the hype] by the VROM-raad.

The above can be summarised as follows:

First we believed..	Then we found..	Now we believe..
The classical definition of "risk = probability x effect" is a proper and well-tried method for making risks manageable from a policy point of view. This definition renders risks quantifiable and thus manageable. Administrative intervention is needed if in a specific generation calculated risks appear to exceed the pre-determined, generic standards.	Situations surrounded by great uncertainties do not justify the use of the classical definition of risk. After all: it is actually impossible to determine the probability leg of the equation in a reliable manner. In those circumstances, administrators cannot use the classical definition to determine whether the risks are acceptable or not. They can, however, use the definition of risk for an inter-comparison of measures in terms of cost-effectiveness and risk reduction.	In situations involving highly uncertain risks it would be better to make uncertainties the explicit point of departure
Solidarity and prevention are good moral guidelines for a policy aimed at controlling risks.	In uncertain situations, absolute promises of prevention can only be upheld at extremely high cost. Full applicability of the solidarity principle may undermine the required learning ability of society.	The precaution principle and a broadly supported sensitivity to vulnerabilities are dominant virtues in situations of uncertain risks.

Thinking in terms of uncertainties calls for:

- A change of outlook;
- A government that, based on its systemic responsibility, questions the automatism with which costs arising from a non-climate-proof design of an area are refunded;
- A sharp analysis of the concrete situation for which policy is set down: does it call for an approach adopting risks as method of analysis, and solidarity as its leading value, or are the uncertainties so great that our awareness of vulnerability dictates that we had better go by the precaution principle?
- More intertwining of water management decisions and spatial design decisions;
- A system to keep local alertness up to par.

Recommendation 2: Maximise the no-regret zone

The mental space associated with the classical definition of risk features qualities such as calculability, manageability, and manipulability. It is good to realise that unilateral dependence on these qualities, in the event of high-risk uncertainties, will almost automatically result in radical prevention. A style of governance that takes these qualities as its guideline will predominantly invite "robust" measures, i.e., measures that are effective in every situation that could possibly arise. For example, raising sea dykes to a height of one hundred metres constitutes a robust measure, because a hundred metre high cordon along the coast will protect the Netherlands from a sea level rise in any scientifically conceivable future world.

An example as absurd as the above immediately shows that taking robust measures is not always the *optimum* administrative approach. Rather the opposite is the case: an attempt to render an uncertain situation "sufficiently certain" in every scenario possible will virtually always require draconian measures that are difficult to justify in political terms. Moreover, in all probability the future will reveal that much more modest coastal protection could also have sufficiently protected the country from the sea. In short: a robust measure is not necessarily the best nor the optimum measure.[62]

What we are looking for now are no-regret measures. Measures may stave off regret for two logically different reasons. The first possible reason is that they are worthwhile anyhow, even if the least serious climate change scenario should become a reality; here, no-regret measures are measures that are useful and effective within any scenario and in any realistically conceivable future world. Such a measure guarantees, as it were, that time, money, and efforts are well spent. The second possible reason is that, alongside climate change, there are *other* reasons for implementing the measure – for example, because it would boost the local economy (it would create a recreational area, it would enhance the quality of the living environment), or because the measure would be conducive to the realisation of goals relating to the environment or Nature.[63]

No-regret measures, therefore, are measures that are the common denominator of policy the government would want to pursue for every conceivable future. Whatever happens – whatever future will crop up, and whatever policy the government would want to respond with – the no-regret measure is always part of the deal.

No-regret measures are a blessing to the country. As they can, by definition, be justified satisfactorily, they are also a blessing to administrators. However, our above sketch of the scope of the problem already demonstrates that in actual practice administrators cannot confine themselves merely to no-regret measures. In all probability, due to the great, uncertain risks ensuing from the changing climate, no-regret measures will not suffice. Responsible administrators will also have to venture into the uncertain zone beyond the no-regret level, simply because the risks are too great, whilst the presumably required measures call for too much preparation to let the situation run its course now. In our next recommendation we will deal with the question of how administrators can best proceed in that uncertain zone. We would like to

62 Measures that aim to counteract threats to the Dutch economy make this easier to see than measures aimed at protecting the lives of Dutch citizens. In the first case, the benefits of (for example) making the country's infrastructure more robust can be balanced against the cost involved. This constitutes a calculation within the same – economic – domain. Rendering the sea dykes robust puts pressure on the economy, but is intended to save human lives (among other goals). Weighing up money and lives would, obviously, pose a much greater problem, from both a practical and a moral point of view. Other policy domains cannot quite evade this balancing either. The healthcare sector, for example, is using so-called *qualys* (quality-adjusted life years) in an attempt to establish a standard for assessing whether "investing" in an individual's medical treatment would be justifiable from a social perspective.

63 Whereas the first form of "no-regret measure" is by definition absolute in nature (the measure is beneficial in every conceivable future), the second form is more pragmatic in nature (the measure may not be quite optimum in terms of climate adaptation, but it does pay and will so in other fields as well, which all in all makes it very defensible). So the first type of measure precludes risks, whilst the second type spreads risks. The first type of measure sounds ideal, but exists mainly in theory. The second type is more realistic, but, in the spirit of this essay, does give rise to the question of whether one can be *certain* that the measure will pay elsewhere; furthermore, the possibility will have to be considered that this same measure might perhaps have adverse consequences in other fields. A consolation: this type of situation is *business as usual* for administrators and politicians.

point out in this context that the no-regret zone is not a static given. There are ways to expand this zone, and we will explore some of those ways below. A responsible administrator will capitalise on these opportunities.

Local action and local networking

Climate change is a global phenomenon that can turn out in a host of different ways at the local level. Whereas the one region will presumably be facing more pluvial flooding, another region might perhaps need to prepare for periodic droughts. For that reason, generic substantive guidelines for adapting "the country" to climate change are neither desirable nor feasible. As a rule, administration will need to be customised. Local action is an important way to expand the no-regret zone. Frequently, potential consequences are better identified at the local level. This enables the impending problems to be concretised, which expands the zone of no-regret measures.[64]

A local outlook does not just expand the no-regret zone because it enables "loading" the models with concrete physical data. Operating locally also creates room for more concrete, more subtle politico-administrative coordination. Especially in situations of uncertainty, it is wise to refrain from "boarding up" policy, and rather to afford local parties the opportunity to substantiate general goals and guidelines in a manner befitting the local situation. Virtually all the reports that deal with climate change adaptation policy point out the importance of involving relevant businesses, organisations, or individuals – so-called stakeholders – in the policy process.

A proper stakeholder's process is important for various reasons. Stakeholders possess (local or sectoral) know-how that policy-makers might tend to overlook, whilst that know-how may be crucial to reducing (some of) the uncertainties in the policy field.[65] For example, local farmers probably know best when salinisation reaches a value which is critical to them. Reducing cognitive uncertainties is the royal road to expanding the no-regret zone. After all, a proper assessment of the situation provides more clarity regarding the measures that will never result in regret. However, specific politico-normative know-how may also expand the no-regret zone. Local politicians will know which measures are likely to encounter a lot of resistance on account of their sensitive history. And last but not least: policy that has been developed locally will find more ready acceptance; local action, therefore, reduces uncertainties surrounding the implementation. Parties that know they have been heard will be more likely to commit themselves, and less inclined to dispute measures up to the Council of State.

A process in which the parties jointly look for relevant facts (*joint fact finding*)[66], and in which they jointly determine which values are significant (*joint value finding*) provides the greatest chance of developing successful policy – or, policy that will not result in regret. Such an approach capitalises on local know-how, and accommodates local interests and sensitivities. This will allow actors greater freedom to act and thus give them greater individual responsibility for the manner in which they attain a goal.[67]

64 For example, the often large margins in predictions regarding, e.g., changes in the amount of precipitation may, in part, be circumvented by means of the "turning point approach". This involves determining on the basis of the local characteristics of an area (for example, the degree of paving and the dimensions of the drainage system) how much precipitation can increase before, for example, the inner city becomes inundated. This provides insight into the specific vulnerabilities of an area. On the basis of climate scenarios we can subsequently determine approximately how much time we will have before that critical precipitation limit could be exceeded. This would allow us to schedule the measures in a well-considered manner. By taking action at the local level, administrators may thus expand the no-regret zone.

65 Especially in uncertain situations, in which blueprints will not work, it is important that the knowledge and facts supply channels remain open. Cf. Recommendation 4.

66 Such a joint fact finding process is already a basic rule in the Delta Programme.

67 Such a call on shared responsibilities puts "vulnerability" into practice as a normative point of departure (recommendation 1).

Linkage

A great many issues pertaining to climate change are inter-related. As a result, an intervention in a system that is changing on account of climate shifts will tend to have a simultaneous impact on multiple fronts. To administrators, this is both a complication and an opportunity. For example, policy aimed at protecting the landscape may, under certain circumstances, also be conducive to agriculture; interventions intended to protect against pluvial flooding may possibly contribute to enhancing ecological or spatial quality (e.g., by incorporating more green and blue into public spaces). One of the best ways to spot such interventions is putting less obvious parties in touch with one another, and creatively linking local interests. This may generate interesting local solutions that could never have come up at a more general administrative level.

This "linkage" – also referred to as pursuing integrated policy – has been given a great deal of attention in recent reports. Linkage is a way of being able to continue working within the no-regret zone for a longer period of time. A measure that kills many birds with one stone will still attain a desired result even if one of the intended goals could not or not entirely be reached.[68] In retrospect, tackling the dyke may appear to have been a case of over-reacting, but the local community is nonetheless pleased with the beautiful residential area that has been created along the way. There are no feelings of regret at the local level.

Climate change is a complex phenomenon surrounded by a host of uncertainties. In a certain sense, however, the complexity of the issues is an advantage: it enables adaptation policy to tackle various problems at the same time. An alert administrator will see and utilise linkage opportunities. Such action expands the scope for policy that will not result in regret.

The above can be summarised as follows:

First we believed..	Then we found..	Now we believe..
Administrators act responsibly by taking robust measures, i.e., measures that will be effective in any possible future	The spectrum of possible futures that may come about as a result of climate change is quite wide. This is also due to the fact that people tend to look far ahead when climate issues are at stake. If the spectrum of possible futures is quite wide, robust measures will seldom be optimum, as they will quickly result in high social cost. Moreover, the measures will focus on counteracting problems resulting from climate change. The impact of these measures on other policy fields is left out of the equation, because the authorities tend to look less far ahead in those fields.	The following three rules of thumb must be observed in making the Netherlands climate-proof: Determine which measures will be effective in each likely climate scenario, and implement them. Wherever possible, tie in with current trends in the usage of space and water management, and try to influence these trends in such a manner as to gradually render the physical system more climate-proof. Combine ambitions aimed at climate-proofing the environment wherever possible with ambitions in other fields ("linkage").

68 Consequently, the linkage practice is an attempt to arrive at the second, pragmatic variant of a no-regret measure, referred to in Note 63.

Expanding the no-regret zone calls for:

- Describing and promoting cognitive and normative consensus on the basis of which “no-regret” measures can be formulated
- An open ear to local know-how, in order to capitalise on local opportunities (which may be wider than generic opportunities)
- Involving (local) stakeholders in policy, in order to increase the options for customisation and enhance commitment
- Being alert to linkage opportunities: creative solutions that serve multiple purposes at the same time

Recommendation 3: Pursue flexible policy beyond the no-regret zone

As stated above, the point of departure for responsible adaptation policy is *acknowledging* multifarious and large-scale uncertainties. The next step is examining which measures would be worthwhile anyhow ("no-regret"). The broad message, however, is that policy-makers will not be able to limit themselves to such "no-regret measures". Considering the presumably large impact of changes in the climate, and the extensive and time-consuming efforts required to counteract the adverse effects, they cannot indulge in the luxury of waiting for undisputed "no-regret measures" to crop up. In part, they will need to move beyond this comfort zone. How can they best proceed there? The answer that emerges from the reports we have studied is: by developing flexible policy.[69]

Flexible policy is aimed at a distinct ultimate goal, yet the manner in which this goal is attained is, in principle, open to change. In addition, flexible policy is not paralysed by uncertainty, but accepts administrative responsibility amidst uncertainties. Flexible policy-makers thus flesh out the call for precaution. Flexible policy-makers acknowledge that they need to implement policy even before all the profound uncertainties have been resolved, and opt for a combination of phased decision-making, strategies that can be accelerated or decelerated relatively simply, and measures that keep open the possibility of implementing additional interventions in the long run. Obviously, an acute threat requires immediate action, but in other cases it is wise to focus systematically on the minimum measures necessary, whilst alertly monitoring the developments, as these actual developments narrow the bandwidth within which the remaining uncertainties arise. Flexible policy thus attempts to organise the policy process in a manner that leaves room for acting on new insights.[70]

Playing with the pace

The direction in which the climate is developing is clear: the earth is warming. Uncertainties lurk in the explanations for this warming (appropriate data is especially relevant to mitigation policy), in the predictions of the exact (local) impact, and in the predictions of the pace at which these changes will come about. The latter two issues are of particular relevance to designers of adaptation policy.

Thus, the key question that makers of flexible adaptation policy are faced with is how they can play with the pace. This can be achieved in two ways. First of all, policy-makers may "buy time" by postponing final decisions on large-scale infrastructural projects whose necessity is determined by the (as yet uncertain) pace at which the climate is changing. Instead, they can actively focus on promoting technological innovations, further research into climate change, and its impact on the functioning of the water system. Meanwhile, the government might confine itself to smaller, temporary solutions that sufficiently mitigate local issues. Postponing irreversible major decisions for as long as justifiably possible prevents the government from wasting money on Large Projects that, in retrospect, turn out to be unnecessary. In the meantime, the (central) government will need to monitor its scope for action by imposing restrictions on infrastructural and spatial developments.

Playing with speed can also be achieved by retaining the room to base a decision regarding the optimum moment for taking a certain measure on the latest information. Suppose, for example, that consensus has been reached regarding sand replenishment along the coast; the relevant parties agree that this would be a sensible measure. Even then, the optimum moment for spraying the sand could be in five years' time, rather than in three or ten years' time – for example, because the funding conditions would be more favourable then, or because scientific data will be available then that specify *how much* sand can best be

69 As a matter of fact, flexible policy is not entirely new. In its 1994 report *Duurzame risico's* [Sustainable risks], the WRR already refers to an action perspective that does not apply "for once and for all", but rather is adjusted time and again in a "continuous assessment process", "based on new information that becomes available".

70 Flexible policy has already outgrown the idea stage: in its report *Randstad 2040* [Randstad conurbation 2040], the Council of Ministers expressly states its intention to leave room for the application of new insights and innovations in the substantiation of policy choices.

sprayed *where*. So, even if a particular measure has been decided upon, it might make sense to retain the freedom to time the implementation of the measure in more specific terms.

In our sketch of the problem scope, at the beginning of this essay, we have already stated that in the event of uncertain risks it would not attest to administrative wisdom to draft a blueprint of the future and subsequently engage in "back-casting". After all, the probability that such a blueprint is wide of the mark would be much too great. It is, however, possible to articulate a target scenario. A target scenario is slightly looser; it indicates which situation we deem desirable or even necessary at a certain date, but leaves aside the exact manner in which we intend to attain such a situation. Take, for example, the coastal town of Katwijk. The obvious target scenario is that by 2100 its inhabitants will be adequately protected from the sea, in accordance with the statutory standards. However, the manner in which the government will attain this goal – by sand replenishment, by dyke improvement, by other construction methods – is still open. Target scenarios make visions operational. Whereas a target scenario induces policy preparers actively to look for particular types of information and technical options for realising that picture, a vision pertains to values. A vision, therefore, is the domain of politicians. It is incumbent upon politicians to specify which values should prevail – and subsequently to garner support for that vision. A clear vision provides a certain calm, and enables particular target scenarios to be drawn up. Other possible target scenarios will drop out because they do not chime with the vision.

Rigid planning is no longer the motto under flexible policy. On the contrary: the policy process must retain the freedom to accelerate or decelerate according to the circumstances. Flexible policy-makers have incorporated interim amendments to policy decisions into the process, as it were. In this approach, policy amendments fall within the line of expectations, and are welcomed as the result of new insights that have actively been sought. This means that they are not regarded as somewhat awkward ad hoc amendments by policy-makers forced to admit that they were wrong. Within a flexible policy frame of mind, amendments do not appear as whimsical, because unforeseen, but rather as wise – because actually anticipated.

Monitoring and buffering

Flexible policy-makers thus use the time available to the full. They do so by actively looking for new information and new insights. By deciding on a specific course of action *just in time*, they take maximum advantage of any new insights gained. In addition to an open attitude and a continuous willingness to adopt a new point of view when new facts crop up, such an approach also calls for a proper monitoring system for the changing climate and the impact thereof, and of the effects of the policy implemented. After all, the possibility for amending and adjusting policy is dependent on the organisation of relevant "feedback" regarding that policy: are our assumptions still correct, do we see measured values that deviate from our expectations, are we booking the right results, and are we booking them fast enough? This process may be structured by establishing beforehand which variables must in any case be monitored at regular intervals. If relevant, threshold values may be set down in advance, which must not be exceeded. In other words: the alarm system must be in order.

From the above, it follows that flexible policy-makers will need to master the art of choosing the right moment to invest. Climate change involves a complication in this respect: these changes evolve slowly, and are partially still invisible. Furthermore, the parties now bearing the costs do not necessarily coincide with the parties that will, often in the long run, reap the benefits of the investments. A basic rule frequently quoted is that postponing customisation will save costs in such cases. But especially when it comes to climate adaptation, it may be economically advantageous to already take certain measures, because postponing now will result in higher costs at a later date. Gradually improving sea dykes now, before we get our feet wet, may prove more cost-effective than expensive, (near) ad hoc measures; adjustments in the design phase are nearly always cheaper than implementing ex post modifications in projects that have already been completed. Such "gaps" in time must be stopped properly, for example, by building up financial buffers: money earmarked to be spent right away if need be. It goes without saying that this money must be made available once new data shows that push has come to shove, necessitating immediate and

considerable expenditure, but it may also be drawn on if – less dramatically – investing now will yield optimum returns.[71]

All in all, adaptation to climate change is pre-eminently suited to pursuing flexible policy. Some consequences of climate change will not lead to major problems until several decades from now; in such cases, there is time to postpone the actual realisation of sets of measures for a while, in anticipation of interim evaluations, or even in the hope of new insights. This is a luxury in which administrators confronted with an acute outbreak of avian influenza cannot indulge. Policy intended to effect adaptations to the climate can, therefore, be *adaptive* policy *par excellence* – flexible adaptation policy.

The above can be summarised as follows:

First we believed..	Then we found..	Now we believe..
Working back from a fixed objective ("back-casting") is a taut and sound form of governance. It enables us to work in a systematic fashion, and allocate responsibilities transparently. Furthermore, back-casting ensures continuity and reduces the risk of under	Large-scale uncertainties regarding the impact of climate change actually render back-casting impossible. Large-scale uncertainties imply that the risk of under-investing cannot be precluded. However, large-scale uncertainties involve an additional risk: that of over-investing.	Drawing up an unequivocal target scenario is pointless if a domain comprises too many degrees of freedom. This is the case with respect to the climate issue. In such situations, it would be better to initiate a policy process that does justice to these large-scale uncertainties, and aims to render the Netherlands more climate-proof step by step, in an exploratory manner. In this respect, it is important to strictly monitor a limited number of preconditi-ons, such as compliance with the statutory minimum safety standards. Within those preconditions, the process must be designed as flexibly as possible, i.e., measures can simply be accelerated or decelerated if new insights so occasion. This flexibility is essential in the quest for the proper balance between the risk of under-investing and the risk of over-investing.

71 We realise that this is easier said than done. In actual practice, the political justification of the required buffers and investments may be difficult; after all, the political reality will frequently prompt politicians to answer the question of what is "the best moment" differently than economists and climate scientists.

Flexible policy calls for:

- An open attitude that considers many possible futures
- Proper feedback on the policy pursued to date
- A proper monitoring system
- Decision-makers who are sensitive to the issues, and prepared to implement accelerations and decelerations if a situation so demands

Recommendation 4: Proceed in a transparent manner

A policy-maker developing flexible policy is well aware of the profound uncertainties in his or her policy field. He or she also knows that the know-how and technologies available to future policy-makers might generate fundamentally different views on measures to be taken compared to what we now deem wise based on our current insights. In such a situation, therefore, setting down concrete implementation targets would be less relevant than designing and completing an open and transparent policy process.

In a situation that calls for flexible policy, it is even more important than usual for all parties involved to be clear as to the information on the basis of which decisions are taken or postponed for the time being. Only then will they be able to have faith in this flexible method of operation. Ergo, flexible policy must be transparent policy. In this context, the term transparency refers both to transparent *decisions* (i.e., decisions that ensue from the available information in a clear and insightful manner) and to transparent *decision-making* (a clear, insightful, and justifiable way to arrive at decisions based on the best available yet incomplete information).

New relationships

Climate change calls for different ways of thinking, presenting, and communicating – ways in which uncertainties are not covered up, but rather occupy centre stage in the discussions with various parties involved. By providing clear information, including about the risks, uncertainties, and differences in normative views, and by showing which steps the government is taking to develop better policy, the government enhances insight among its citizens and organisations. Developing and adjusting policy in an open and transparent manner has the effect of a continuous justification of the policy pursued.

Paradoxically, insight into their vulnerabilities expands the sphere of action among citizens, businesses and civic society organisations. They will feel the need for a more pro-active pursuit of information, and that information can empower them. The State, in its turn, may consider adopting a more active and concrete approach in informing citizens, businesses, and civic society organisations about the possible impact of climate change and the risks this entails. In addition, the government must continue to devise, communicate, and practise a clear disaster protocol. Such a protocol considerably reduces the probability of damage, and at the same time raises the awareness of vulnerability.[72]

Thinking in terms of uncertainties not only changes the way in which the government informs social parties, but also the way in which it seeks information. In the previous paragraph, we already stated that local know-how can be highly conducive to reducing uncertainties. However, this does require the government to be receptive to that know-how. But also, the relationship with traditional suppliers of know-how, science, is in need of change. In a situation in which knowledge is fundamentally uncertain, it is of paramount importance for scientists to paint a clear picture of the "profound" uncertainties involved in the information they supply, in order to enable policy-makers and politicians to subsequently think through the social implications of those uncertainties. A responsible administrator will, in his or her turn, actively ask for information about the uncertainties.

Normative uncertainties complicate the relationship between the government and its knowledge suppliers even further. As already stated, in such cases the uncertainty does not (only) pertain to the know-how; there is (also) a lack of clarity or a difference of opinion regarding the standards and values that should prevail. Normative uncertainty in fact calls for an "early" involvement of politicians in an issue, because the presentation of the research question and the manner in which it is interpreted and elaborated already implies a normative direction here. To scientists active in normatively charged fields, such as climate

72 The Burmese government saw the 2008 hurricane coming way in advance, but did not have a contingency plan in place, which is why the number of casualties was high nonetheless. Following previous floods, the government of Mozambique devised a contingency plan, and ensured that the population knew what to do in the event of another flood. A subsequent flood caused substantially fewer casualties, although in itself it was no less of a natural disaster.

studies, this either means that they need to be extremely clear as to the standards they themselves support, or that they need to make an effort to provide a clear and comprehensive overview of the manner in which various standards and values have been incorporated into possible policy choices.[73]

Climate change, as an untamed[74] problem *par excellence*, anyhow calls for a clear interpretation of roles among scientists, policy preparers, and politicians. In the worst case, politicians wish to come across as "strong" and not be associated with uncertainty, policy-makers trust experts blindly, and experts believe they need to present "hard" figures – even if the uncertainties are great. In fact, this results in irresponsible behaviour among all the parties. It would be better for scientists to confidently state that clear information on uncertainty also constitutes a worthwhile form of knowledge.[75] Policy preparers may actively seek and cherish such scientists. Politicians, finally, would need to be given – and take – the space to deal with uncertainty. A lack of certainty regarding the proper way to proceed results in a particular need for vision and leadership. If the facts are "soft", "hard values" may provide direction and offer a form of (social) certainty.

Vision gives calm

It is crucial for flexible policy to be transparent. Only then will it be possible to keep tabs and provide feedback on policy that pre-eminently relies on fresh data and new insights. On the other hand, transparency must not lead to a situation in which those involved are constantly deluged with new information; neither must flexibility undermine the reliability of the public administration. A profusion of information is bothersome to administrators; entrepreneurs must be able to rely on the fact that the conditions under which they invest are fairly stable. This means that there is a certain tension between transparency and flexibility on the one hand, and a profusion of information and administrative stability on the other. Decision-makers will need to develop a feeling for the difference between information that must immediately be reflected in policy, and information that can best be put on hold for a while with a view to administrative calm.

Politicians can be of great help in reducing that tension. In situations in which profound uncertainties prevail, it is no use making a blueprint of the future. This would require far more crucial data. However, politicians themselves hold the key to one crucial datum: their vision of the values that continue to be of importance in the future. A vision contributes to "making" the future, and in that sense removes uncertainty; future A would be acceptable, but future B would not, and we can already gear policy to that. Such a vision of values is particularly relevant to flexible policy.[76] If the vision is clear – in other words: if the story has been outlined and the framework sketched – the optimum substantiation of that vision may take place little by little, step by step, on the relative sidelines.[77]

73 In the words of the American climate adaptation scientist Roger Pielke Jr, scientists may assume the role of "issue advocate" or "honest broker" in such cases. An "issue advocate" publicly champions a particular political view, and supplies his or her "club" with facts that further this political agenda. Therefore, scientists serve a political purpose here. According to Pielke, this is not necessarily wrong, as long as such scientists are extremely clear about their agenda. An "honest broker" gives policy-makers relevant information on profound uncertainties of both an epistemological and a normative nature, and offers a plethora of alternatives to facilitate the taking of decisions. The "honest broker" indicates which values are directive with respect to each of the alternatives. Ergo, here scientists organise the field in a manner that aims to be relevant to policy questions. However, they refrain from implicitly directing the conceivable political choices by the unilateral selection and presentation of scientific information. Pielke regards the role of 'honest broker' ideal for scientists with respect to issues that are uncertain and morally charged. Calculating and thinking through a range of alternatives is virtually impossible for individual scientists. However, scientific organisations such as planning agencies, knowledge institutes, and research groups could launch into supplying such a plethora of alternative visions. See Pielke´s *The Honest Broker: Making Sense of Science in Policy and Politics*, Cambridge, Cambridge UP, 2007.

74 An untamed problem involves cognitive and/or normative uncertainty.

75 For an extensive clarification of this topic, see *Omgaan met onzekerheid in beleid* [Dealing with uncertainty in policy].

76 "Looking far ahead is crucial but must not be translated into an ultimate image nailed to the distant horizon" (NWP 2009-2015, p. 263). Cf. the paragraph on blueprint, target scenario, and vision in the body text of this section of the essay.

77 Cf. the parallel with know-how: in recommendation 3 we stated that adaptive policy is feasible because we know what the general trend is: the earth is warming. That is the cognitive framework. The uncertainties pertain to the pace at which the earth is warming and its local impact. Clarity regarding the direction of the development (warming) enables the "tinkering" of a succession of justifiable, customised policy steps. In parallel, a clear, normative course reduces uncertainty and provides a similar freedom to look pragmatically for each next sensible step.

Reaching decisions, dividing responsibilities
The more uncertain an issue, the more effort legitimising a policy takes. As already stated, a clear, appealing vision is crucial in this respect, as is the timely involvement of the appropriate stakeholders in the decision-making. A proper stakeholder process is not just a way to expand the no-regret zone (see recommendation 2), but also a way to render decisions more transparent. Involving the appropriate parties in the articulation of the demand for knowledge, normative questions, and decision-making may not just generate meaningful know-how and solutions, but will also enhance the legitimacy and the acceptance of measures. This produces social robustness, as it were. Especially in situations of normative opposites – i.e., situations involving clashing views – organising a broad-based debate is imperative. After all, a stakeholder process makes it easier to develop a common picture of a reasonable division of responsibilities. This is relevant because the uncertainties surrounding climate change prompt a revision of the responsibilities of the various parties involved (see step 1).

Policy aimed at facing up to climate change is pursued at many administrative levels. Considering the complexity and uncertainty of the phenomenon, it is not strange – it rather makes sense – that mitigation policy and adaptation policy, top-down and bottom-up approaches, flexible policy and perfectly fitting measures, local and generic approaches exist alongside one another. However, this may lead to administrative pressure and a host of administrative styles. This may give rise to "organised irresponsibility"[78]: a situation in which many parties bear a little responsibility, yet accountability or systemic responsibility are not clearly vested with anyone in particular. As a result, no-one "feels the monkey on their shoulders". It may happen that, especially with respect to major, trans-domain or cross-sector issues – i.e., especially when sorely needed – little concrete responsibility is taken. In view of the complexity of climate change, this policy issue would be a likely candidate for organised irresponsibility. For example, the VROM-raad concluded in 2007 that the division of responsibilities vis-à-vis many water-related topics is unclear.[79]

Flexible policy expects a great deal from administrators at the various levels and in the various sub-domains, in terms of both expertise and state of mind. These administrators in their turn may expect to be provided with clear frameworks within which to operate. Especially in complex, uncertain situations, stringent control is crucial. The appointment of the Delta Programme Commissioner meets this need.

Dissidents
In situations of uncertainty, it is imperative that room is created for multiple ways of thinking – precisely because the familiar mode of thought does not provide a sufficient grip on the problem. The government would be wise to consider how it can organise the decision-making process in such a way as to create room for both *early warners* and *early listeners*. Those *early listeners* are important too, because in retrospect it frequently appears[80] that critical notes have been sounded, but insufficiently heard by the parties responsible. Particularly in the event of many normative uncertainties, involving clashing opinions, the powers that be tend to dismiss dissidents as political opponents, paying little heed to their arguments. We are not advocating that all dissidents must be given a free rein every time. This would presumably end in irresponsibly delayed decision-making, because a particular type of dissident will make an effort to block for as long as possible any decision that does not correspond to the decision he or she would take. In uncertain situations, nothing is easier than questioning the knowledge basis of the intended decision. The tragedy of the situation is that at times we are forced to act on the basis of incomplete insight. This type of dissident apparently does not consider him/herself the owner of the problem we are jointly facing: how can we act responsibly in a situation in which we know we are vulnerable? We suggest that it would be wise for

78 A term originating from the German sociologist Ulrich Beck, who also coined the term "risk society" in the 1980s.

79 The Delta Committee has pointed this out and calls for institutional frameworks within which necessary decisions may be taken on time and at the proper level. The appointment of the Delta Director meets this wish; within the Delta Programme, the Delta Director monitors the interconnectivity, consistency, and transparency of the policy pursued.

80 Recently, for example, in the credit crisis.

the government actively to get in touch with scientists or civic society organisations, whether dissident or not, that exhibit a feeling for the over-arching problem: how to act responsibly in uncertainty? As long as they display such feeling, listening to them will be useful – regardless of whether they voice a dominant or even an extremely divergent view. If, however, persons or groups are found to actively close their eyes to the position of administrators forced to decide in uncertainty, the message must be that this is sidelining them from a social perspective.

The above can be summarised as follows:

First we believed..	Then we found..	Now we believe..
Once the solution to a policy problem has been formulated, professionals can set to work in a fairly autonomous manner. Politicians are held to account at regular intervals.	In policy fields featuring uncertain risks, policy problems cannot, by definition, be fixed. The nature of the problem is, in principle, open to re-formulation, as are the most appropriate phasing and approach.	In the event of uncertain risks, it would be wise for politicians, administrators, policy-makers, and policy implementers to remain involved in policy problems and the solutions formulated, keeping an open mind to new information. Should that information lead to policy adjustments, the background must be explained clearly, and the adjustment made transparent. Such "sharing" of concerns and reasoning helps keep scientific knowledge development up to par, and acquire crucial information from stakeholders. Furthermore, dissidents will be more inclined to make constructive contributions. All relevant parties may commit to a learning process. Justification of policy adjustments is not subject to any particular rhythm, but takes place on a continuous basis.

A transparent working method presupposes:

- Clear information on uncertain risks
- Directive visions and well-articulated values
- Public acknowledgement of the limited options for reducing uncertainty regarding risks, and the willingness to continually enter into debate on this
- Parties that are sufficiently receptive to participate in an exploration and adaptation process
- An adequate filter that ensures that parties are well informed, without being deluged with information
- Clear interpretation of roles among scientists, policy preparers, and politicians
- Alert authorities that explicitly recognise and assume their own responsibilities
- A clear direction that actively avoids organised irresponsibility
- Involving the appropriate stakeholders in the decision-making
- A willingness to hear certain dissident voices

Now that we have explored the train of thought underpinning adaptive delta management, we will focus on the third and last core value of the Delta Programme: solidarity.

Part 3: Solidarity as a core value

Sustainability introduces the factor of "planet", which fundamentally changes the playing field, as we have attempted to show. We have presented adaptive delta management as a working method that follows naturally from the long time lines and linkage of domains to which sustainability exhorts.

Meanwhile, man remains the measure of all things to policy-makers. Ultimately, it is we who determine whether the people-planet-profit system can be maintained sufficiently stable for a prolonged period of time. Not just because people influence that balance (intentionally or unintentionally), but also because it is people who determine whether a situation at any given moment actually still deserves to be regarded as "balanced" – or that we are now really bearing down dangerously close on a crisis. Hence in Part I we referred to the social domain as the hub of the system. This is where political dynamism originates.

Solidarity, the core value we are focusing on now, is a concept that pre-eminently falls under the domain of *people*. In a certain sense, all societal debates can be translated into the question of "Which people need to show solidarity with which other people, to what extent, and why?" Political views on this matter differ fundamentally from one another, and will continue to do so. However, the Delta Programme has made a stand by roughly answering that question as follows: all Dutch citizens are expected to show solidarity with fellow countrymen who seriously have to contend with water issues.[81]

We will specify that statement below. There is reason to do so, because climate change has induced us to reconsider the substantiation of such solidarity, as we have already established in Part 2 (about flexibility as a core value). Solidarity is becoming more conditional. Not just because the large-scale uncertainties surrounding the climate keep the government from being able to fully guarantee flood risk management and a secure freshwater supply for all Dutch citizens, whatever the circumstances; under uncertain conditions, that substantiation of solidarity is not feasible – an illusion. Furthermore, it is undesirable, because such promises undermine the learning ability of society. And in an uncertain situation, in which we know we are vulnerable, we are particularly dependent on that learning ability.

Solidarity is still an undisputed principle in Dutch water policy – designating "solidarity" as a core value underlines that fact. We are, however, facing the question of how we can substantiate and define solidarity as a core value in a situation of climate change. What would be fair to expect from citizens wishing to call on the uncurtailed solidarity of their fellow countrymen?

81 In actual practice, the funding of Dutch water projects shows a fair amount of solidarity. The State bears 50 percent of the costs, while the joint district water boards fund 40 percent. Local communities pay the remaining 10 percent. This means that the inhabitants of areas prone to many and/or large-scale water issues are protected with money largely originating from other areas.

I Solidarity in the Delta Programme

Solidarity is one of the three core values of the Delta Programme. This means that "solidarity" is deemed to play a directive role in the assessment and selection of projects claiming money from the Delta Fund. Consequently, all those involved in such projects are under an obligation to reflect on the question as to how this money will contribute to a more solidary organisation and management of the physical living environment.

Now "solidarity" is an abstract concept that can assume different shapes according to the situation, which hampers the assessment of projects in terms of their solidarity content. Resorting to (moral) philosophy will not provide a final solution, because the history of ideas has yielded various contradictory moral views (for the aficionados: see the appendices).[82] The actual meaning of solidarity is not waiting to be discovered, but will rise from the sub-practices we ourselves are engaged in.[83] That is why we will now quickly turn to that actual practice.

The *National Water Plan 2009-2015*, the official state plan for national water policy, demonstrates that "the Netherlands" is the level within which the requested solidarity would have to be found. In other words: Dutch citizens, businesses, and administrative bodies are expected to show solidarity with one another.

The Delta Programme further specifies the value around the term "shifting". Solidarity entails that a party strives to avoid shifting the cost (adverse consequences) of an intervention to future generations or other domains. Should an intervention (e.g., widening of a river dyke) nonetheless put another administrative domain to expense, then that expense ought to be taken into account as the cost of the intervention itself. The region whose river dyke is widened must factor in possible adverse consequences in other regions to the best of its ability, and work out together with the aggrieved areas what can be done to prevent or compensate for such consequences.

The idea is for the choices made to result in a solidary "distribution" of the *benefits* of interventions implemented within the Delta Programme (better protection from flooding, better freshwater supply). In principle, each and every Dutch citizen must, therefore, profit by the programme. Moreover, the Delta Programme encourages the parties involved to be alert to opportunities for "linking" benefits, i.e., decisions that not only improve water management in the Netherlands, but, for example, also beautify the landscape. However, not every decision will only yield winners. In such cases, solidarity involves the prevention or compensation of the adverse *side effects* of an essential intervention.

In addition, the National Water Plan clearly states that the *national* optimum is ultimately normative. Ergo: the solutions ultimately chosen with respect to the national taskings in the fields of flood risk management and freshwater supply may perhaps not chime with *all* the regional interests to the same extent.[84] The Delta Programme regards the flood risk management and freshwater supply of our country as a collective good; the regions are expected to take this into account in their relevant decisions.

So the National Water Plan already provides an initial substantiation of how "solidarity" may be interpreted in the context of the Delta Programme: policy shows solidarity if it distributes benefits fairly, avoids shifting

82 In other words: there are various ways morally to open up a concrete case. For that reason, philosophy cannot provide an indisputable moral course of action (in the sense of: "this is the only correct, solidary conduct"). The hope that philosophy can *wind up* a discussion is, therefore, vain.

83 Adapted from Richard Rorty, "Solidarity has to be constructed out of little pieces, rather than found already waiting." (*Contingency, Irony, Solidarity*, Cambridge, 1989, p. 94).

84 That is: although the Delta Programme funds projects that contribute to regional flood risk management and freshwater supply, the set of measures decided upon cannot be "a sum of regional wishes" (NWP1, p. 263).

burdens wherever possible, and gives preference to the national optimum in the event of conflicting interests. However, these guidelines still leave a great deal open. Below we will attempt to provide a greater grip on the solidarity issues that may arise in practice in the water world.

Exceptional time span determines policy context

The most distinctive feature of the water world is the exceptional time span that administrators are faced with; whereas fellow administrators consider decisions spanning ten years as long term, and investors tend to write off their goods within a maximum of twenty years, water administrators are sometimes asked to look ahead by more than a century. One could say that time has an additional impact on this administrative field.

Long-term developments thus leave their mark on policy. To our mind, the water world is facing three such crucial developments. The first: climate change. Whereas up to a few decades ago we believed we could safely assume a future situation that would be virtually identical to the current one in physical terms (in any case, with respect to the climate), today's water administrators can no longer regard the climate as a fixed datum. Here we can make a significant distinction between trend and variability. By now, we may accept as a fact that the climate is changing because the earth is warming. We do not yet know much about the pace and exact causes of climate change, nor about our options for influencing these changes. Yet the physical trend is manifest. We also know that the weather is becoming more changeable as a result of climate change; extreme weather conditions will occur more frequently. "Exceptional" weather will become more common. Therefore, the variability involved in a trend that in itself is already surrounded by uncertainties is increasing. To water administrators, this is quite a difficult theme. All in all, the context within which they make decisions has grown far more uncertain over the past few decades – something administrators are well aware of.

At the same time, our knowledge of the effects of climate change is growing. Whereas we increasingly realise that the overall (climate) system is not quite as stable as we used to think, we amass more information on the consequences and possible impact. This information is still far from complete – and without a doubt far more deficient than administrators would like to see. Yet the certainty that real risks are involved is rising.

This makes us realise that we will need to find other ways of dealing with water.[85] We will need to learn to work with our vulnerability. Fortunately, our knowledge of, and experience with the options we have to adapt to the said climate change is growing: we regard this as the second development. We are gaining increasingly more insight into which adaptation strategies and adaptation technologies are the most effective in a certain situation. This clarifies our action perspective. Thus, we are gradually getting greater grip on an uncertain situation. Not because the future is becoming easier to predict, but because we are devising construction and organisation methods that lead to acceptable outcomes even in uncertain conditions. For example, dykes that can withstand overtopping, houses or boulevards constructed to withstand short, shallow flooding, or designs accommodating adaptations based on new insights. We know we are right in focusing on these types of innovations.

Not yet everyone is convinced of the "use and necessity" of adaptations; the action perspective is still not always used to take concrete measures. We regard the fact that the willingness to take action will increase as the third development.

This means that the water world is subject to three simultaneous[86] movements:

- The climate system is changing, and the weather is becoming more changeable. There is increasing certainty that climate change entails real risks. Ironically, this certainty makes us rather more uncertain

85 In terms of this essay and for the experts: mitigation demands *global solidarity*; this is the only way to attain effective climate adaptation policy (to be propagated and implemented loyally at the national level). At the national and regional levels, an adaptation strategy will be the appropriate way to withstand the impact of climate change.

86 Yet at a different rate.

regarding our current protection against extremes;
- Our knowledge about the consequences and possible impact of climate change is growing, as is our action repertoire; we are gaining more experience with suitable adaptation strategies and adaptation technologies. We have increasingly more options to prevent undesired side effects;
- Some parties take action, others do not; adaptation is a gradual yet imbalanced process.

A matrix

How can one focus on solidary processes and results in this field of force? That is the question we ask ourselves here. We have rendered this question manageable by analytically subdividing the field of force into different situations, identifying three axes: certainty (knowledge about the current and future situations, and the risks involved), opportunities (ability to intervene, exert influence; action perspective), and willingness to take action (extent to which concrete measures are actually taken).

The more *certainty* exists regarding one's current and future situations, the better one's idea of what is in store. But knowing where one stands does not imply that one also has opportunities to exert influence on the situation. And even if those opportunities did exist, that would not imply that they are utilised; opportunities may or may not lead to action.

Below we have schematised the possible combinations of low/high certainty, low/high opportunities, and low/high action:

Situation:	Knowledge of risks	Opportunities for adaptation	Willingness to adapt
1	High	High	High
2	High	High	Low
3	High	Low	High
4	High	Low	Low
5	Low	High	High
6	Low	High	Low
7	Low	Low	High
8	Low	Low	Low

Not every combination is significant. If there is little knowledge about risks, there will also be few rational opportunities for adaptation. And if there are no *opportunities* for adaptation, *willingness* to adapt will be of little practical value. These relationships can be schematised as follows:

Situation:	Knowledge of risks	Opportunities for adaptation	Willingness to adapt
1	High	High	High
2	High	High	Low
3	High	Low	N.A.
4	High	Low	N.A.
5	Low	N.A.	N.A.
6	Low	N.A.	N.A.
7	Low	N.A.	N.A.
8	Low	N.A.	N.A.

Each of these situations has been given a title:

Situation 1 will be referred to as **Manipulable**
Situation 2 will be referred to as **Taking Risks**
Situations 3 and 4 will be combined into a single situation: **Running Risks**
Situations 5, 6, 7 and 8 will also be combined into a single situation: **Fate**

The combination of the three factors has thus yielded four fields with which we may describe the water world. They are set out in the simplified diagram below:[87]

MANIPULABLE Great deal of certainty, many opportunities, great deal of adaptation	**RUNNING RISKS** Great deal of certainty, few opportunities
TAKING RISKS Great deal of certainty, many opportunities, little adaptation	**FATE** Little certainty, few opportunities

Below we will further elaborate each of these four ideal-typical situations for the water world, indicating which form "solidarity" tends to take under these conditions. Wherever such would clarify matters, we will draw analogies with other sectors, in particular healthcare.[88] We will do so based on the assumption that this information is particularly relevant to determine policy – and therefore to determine *solidary* policy. We will conclude this section with a brief discussion of the findings in light of the three developments the water world is facing.

Solidarity among generations is another explicit point for attention in the Delta Programme. However, the dynamics involved in this "generational solidarity" are quite different to the dynamics of solidarity among (groups of) Dutch citizens currently living in our territory. For that reason, we will discuss solidarity among generations in a separate paragraph – which will be considerably shorter, because the analysis produces a fairly univocal guideline to solidary action.

We will conclude our exploration of solidarity as a core value with some remarks on solidary water management; in fact, we will reiterate some previously gained insights from other perspectives.

87 The design of this model will remind many people of the "scenarios" or "possible worlds" that are popular among strategic managers. The difference is that these fields do not describe any possible developments or even target scenarios, but provide an analytical model to classify situations that have already arisen. Furthermore, it features both the strength and the weakness of any analytical instrument: it brings certain relevant characteristics into sharper focus, but also misrepresents reality because no situation would actually ever crop up as clearly as it may be typified. More than that: situations tend to merge seamlessly into one another.

88 A comparison between water management and public health tends to fall short. Water management is perceived as a typical government task; citizens can leave it to its own devices. With respect to public health, the government plays quite a different role; here, the government sets down frameworks for transactions that take place primarily between citizens, insurance companies, and health professionals – i.e., in the private sphere. This results in highly different dynamics. Nonetheless, looking at public health would be informative, because within this field a great deal of thought has been devoted to solidarity. The issue is urgent here.

II Solidarity among today's population

A. Four types of situations

Situation 1: Manipulable

A great deal of certainty, many opportunities, a great deal of adaptation
The first type of situation described here is fairly comfortable. There is a great deal of certainty regarding the nature of the situation, and there is a lot of grip on the situation. Therefore, we have sufficiently reliable knowledge at our disposal, we have the opportunity to act according to that knowledge, and we are actually converting these opportunities into concrete action.

Picture
This type of situation is quite common in our country. Across the globe, the Netherlands is known as the country that understands water. We are familiar with our natural system, and hydraulic engineers use that knowledge to design dykes, locks, sluices, and dams. Dredging companies play with tidal movements by dredging estuaries or spraying "sand engines" along the coast. Well-placed groynes prevent major rivers from silting up. Wide flood plains are used as temporary water storage. Our vast technological know-how enables us to flourish beneath the sea level. Administrators have many centuries of experience in managing dykes and freshwater reservoirs. The population is used to water as well. We know we can never have full control of the water, but all in all, we are getting amazingly far.

Position of the government
Slightly exaggerating, one could say that the Dutch government has evolved from the perceived need to jointly manage the water. The district water boards set up in the provinces of Zeeland, Holland and Brabant in the twelfth century were our first administrative bodies. They assumed responsibility for the water management of an entire region, including the construction and maintenance of dykes, dams, locks, and sluices. Each landlord was required to pay a dyke fee to this end. Collaboration was established on the basis of enlightened self-interest, and under pressure of a common "outside enemy": the "water wolf".[89]

Since then, responsibility for flood risk management and freshwater supply is an undisputed task of the government. The government manages the water system, keeps its eye on the overall picture, and determines where and when investments are most advisable. Subsequently, it mainly acts as principal. Engineering offices, contractors, and dredging companies tender for well-defined jobs. These contractors are deemed to know their business; as experts they should be familiar with the current and possible future situations, and with methods to translate their knowledge into the dimensioning and design of a project. The government may conclude clear performance agreements with these professionals, and hold them to account if their work is sub-standard.

Tricky issues
This situation features few fundamental problems. Any clashes among societal groups with respect to water management have been "resolved" over the course of the centuries; the situation has consolidated, society has adapted to the crystallised manner of water management. Our ancestors have, to paraphrase the political philosopher Hannah Arendt, "committed to a shared future through promises", and this has created "little islands of predictability amidst a sea of uncertainty". An achievement to be proud of!

From a societal perspective, we know what we want: upholding and possibly improving the current system. In technical terms, we are quite capable – so much so that Dutch water management methods are a golden export product. The government acts primarily as a technocrat here, and can fulfil that role quite well in this situation.

89 Derived from Cordula Rooyendijk's *Waterwolven* [Water wolves], a fine historiography of Dutch water management.

Solidarity
This situation is rather stable and does not require a great deal of discussion about solidarity. After all, solidarity has penetrated to the very capillaries of the national economy. The Dutch population once joined forces with a view to a common interest: let us manage the water together, because together we will achieve more than on our own. They formed a type of cooperative, transferring individual liberties and moneys in order for all of them to ultimately benefit. This form of solidarity, individuals joining forces out of enlightened self-interest, will here be referred to as *cooperative solidarity*.[90]

In the Netherlands, cooperative solidarity regarding water management has become such a matter of course that it has attained a statutory status. The Water Act has legally anchored solidarity – and thus rendered it enforceable, if need be. Such "juridified cooperative solidarity"[91] renders a debate on solidarity largely superfluous. After all, solidarity has been arranged and secured.

Challenges to solidary policy
Well-arranged positions of solidarity entail the growing danger that a sense of urgency will go amiss. Now that solidarity has been "organised away" the population may weaken its commitment. To Dutch people, it is a matter of course that there is no need to be alert to the danger of flooding, because the government is taking due care of their water affairs. The availability of freshwater is perceived as a right, perhaps too much so; citizens and entrepreneurs may have the impression that they can make endless use of fresh water as long as they keep paying. Perhaps the performance of water managers is taken for granted. One could also say that Dutch people do not get the opportunity to actively opt for solidarity with respect to water. That solidarity is forced upon them: for countless good reasons, but the danger is that citizens feel less of a bond with the issue. After all, solidarity that is solidified in legislation is less alive.

Whereas water management used to be so urgent that it prompted people to solidarity, it is now regulated to such a sophisticated extent that people hardly perceive a need for solidarity. As a result, the individual disadvantages of (forced) solidarity may elbow aside the reasonableness of the arrangement. Something similar is currently taking place in the public health domain, with respect to vaccination. Now that the collective memory of serious contagious diseases is fading, more emphasis is placed on the side effects that individuals may experience following inoculation. In addition, an array of ideological objections is gaining ground; some perceive government policy as too much of an invasion of their personal space here. Nowadays, vaccination is seldom regarded as a contribution to a collective effort to keep diseases at bay.

At present, little or no dynamism of this kind is noticeable with respect to the requested solidarity as regards water management. Perhaps the threat of the "water wolf" has settled too deeply in the collective memory. Or the issue simply is of less interest: after all, a vaccination notice generates more commotion in private homes than does handing over abstract tax money that is spent on water management. Nonetheless, there is a danger of solidarity with respect to water management gradually crumbling away, whilst complaints on mandatory payments will increase; after all, the Netherlands has not seen any fatal floods for decades.[92]

In such situations, administrators may especially safeguard the proven effective anchoring of solidarity in water management by pointing out the reasons for a solidary stance; for example, by keeping accounts of flood disasters and visionary efforts alive. Behind the technocratic practice lies a true and compelling story of human suffering and heroism that could permanently feed the requested solidarity.

90 Following Eckart Voland, see his article 'Die Natur der Solidarität' in *Solidarität: Begriff und Problem*. Kurt Bayertz (ed.), Suhrkampf, 1998. pp. 297-318.

91 Another term coined by Voland, see Note 90. The Nuffield Council, a British think tank in the field of public health care issues, would dub this "contractual solidarity". The Council distinguishes three tiers of solidarity, of which contractual solidarity constitutes the third. The tiers ascend in degree of abstraction. The first tier refers to solidarity among individuals who know one another, the second to solidarity among groups of people who are in the same situation.

92 In its report "Water Governance in the Netherlands: Fit for the Future?" (2014), the Organisation for Economic Co-operation and Development (OECD) also points out the risks of a lack of water awareness among Dutch residents.

Based on the above, we can supplement the matrix as follows:

MANIPULABLE **Great deal of certainty, many opportunities, great deal of adaptation** › Solidarity has been juridified, and is hardly under discussion • Characterisation: juridified cooperative solidarity • Danger: loss of perceived urgency • Strategy: keeping urgency alive through appealing accounts	**RUNNING RISKS** Great deal of certainty, few opportunities
TAKING RISKS Great deal of certainty, many opportunities, little adaptation	**FATE** Little certainty, few opportunities

Situation 2: Running Risks

Great deal of certainty, few opportunities
From time immemorial, the water world has had a great deal of reliable information at its disposal. Statistical techniques enable the analysis of historical data sets, and assess, for example, the extent of the maximum river discharge that – from a statistical perspective – occurs once every 10,000 years. The associated premise is that the system itself is stable; i.e., the historical data sets are deemed to describe the same system as the one in place in the year 2100. However, climate researchers demonstrate that the system has never really been stable, and only appears to become increasingly unstable. Therefore, the analyses turn out less reliable than assumed. This generates a feeling of entering a "terra incognita". We have a strong impression that we are running risks, but as yet we do not have a full picture of what those risks could entail. This type of situation poses great challenges to water administrators.

Picture
The climate is changing. And even though our own activities have, in all probability, contributed to that climate change, we are overrun by its impact. After all, we have not properly anticipated, let alone intended this impact.

As yet, fortunately, some consequences of climate change are not making themselves felt that strongly. The sea level is rising relatively slowly, and can be monitored very well. For that reason, we are quite justified in claiming that we are still in a "manipulable" situation in this respect. We are aware of the trend, we have the time to find out how we can best protect our coast from flooding, and we have the time to implement these plans in a phased and flexible manner. All in all, we are quite capable of preventing the negative effects of the rising sea level. Although scientists would probably characterise this situation as (cognitively) uncertain, from an administrative perspective it is a relatively "certain", manipulable situation.

However, other consequences of climate change are already leading to (physical and therefore administrative) problems. The buffer function of snow and glaciers is diminishing, and winter precipitation is increasing, causing major rivers to overflow more frequently. Periods of drought occur more often in spring and summer, which may cause temporary freshwater shortages for agriculture and industry, and weaken dykes. Farmland will undergo more rapid salinification, because in dry summers less freshwater will be available to flush polders, and on account of the sea water that is encroaching ever further inland via,

e.g., the Nieuwe Waterweg. The Netherlands will be subject to more heatwaves, which will cause particular nuisance in densely built-up cities. Our infrastructure (roads, but also, e.g., the power grid) is susceptible to the downpours that are already occurring more frequently. But we do not yet have a full picture of all the risks, and there is still a lot of discussion about the use and necessity of measures.

Position of the government
The government has a well-defined task here. It has been assigned a directive role in the fields in which the above problems will arise (flood risk management, freshwater supply, spatial planning, and infrastructure). For that reason, it will be aiming to put the problems ensuing from climate change clearly on the map. In many cases, flood protection turns out not to be guaranteed. Citizens, organisations, and entrepreneurs must become aware of the burdens and dangers of climate change, and know which measures they themselves can (or perhaps need to) take. The government may underpin this with an account that calls on solidarity. After all, we are in this together; climate change entails that we are running risks.

Tricky issues
We can see the *consequences* of climate change coming, but we cannot guarantee that we can prevent all its adverse *effects*. However, Dutch society can make an effort to minimise those effects, by adapting to the consequences of climate change. In other words: the government may take adaptation measures, and encourage citizens, organisations, and businesses to follow suit. In doing so, it runs up against two – rather general – problems. First, not everyone accepts the analysis that current climate change is exceptional and problematic. Whereas a scientific diagnosis usually puts politicians on fairly firm ground, in this case the scientific diagnosis itself has unfortunately become politicised. This undermines the administrative clout of those who sincerely believe that adaptation measures are called for. Furthermore, issues pertaining to the water world often attract less societal attention than do acute "wrongs" in, e.g., healthcare or education. Amidst this dismay, the story about the need for adaptation measures is not really easy to promote.

In expert circles, by contrast, it is not as difficult. Designers and engineers think up a host of interesting adaptation solutions, such as green roofs that absorb excess rainwater and prevent urban "heat islands", river dykes that can withstand overtopping without too many problems, houses built in a concrete tray that transforms them into a type of houseboat at high water, *et cetera*. However, our history has solidified in inert rock. In retrospect, building a village in a deep polder might not be such a good idea, and if we could re-design the Netherlands, we would probably drain polders to a slightly lesser depth, and perhaps move the Randstad conurbation a tad eastward. But the fact is that many Dutch citizens are attached to locations that meanwhile have become prone to water issues – and have invested great sums in those spots. By far the bulk of the population lives in densely populated cities or old villages, where adaptation measures will need to be fitted into the existing buildings in dribs and drabs. Our historical roots and attachment to achievements tend to keep us from relocating. The costs are too high, and we would have to leave behind too much of what we hold dear.

There is a tragic side to this situation: we would like to continue on the same footing, but the world around us is changing. And there is a certain arbitrariness to this tragedy. In all probability, farmers on sandy ground will be facing periods of drought more frequently, which might force them to convert to growing other crops. Their peers along the major rivers will be faced with more frequent inundation of the floodplains. Businesses may encounter a shortage of cooling water in summer; historic towns may see their cityscape change due to an essential raising of the dykes. However, there might also be winners. A changing climate may play into the hands of existing entrepreneurs, and provide opportunities for newcomers. Campsite managers, for example, may profit from wider river beds, and sea lavender growers may benefit from the salinisation of coastal regions. In other words: climate change will result in new winners and new losers.

Solidarity
The given that current inhabitants and entrepreneurs more or less have to wait and see how climate change will affect them (and what impact it will have on them), demands a specific form of solidarity. The local impact of climate change can be assessed increasingly more accurately, which also increases its predictability in specific local situations. We will then see that the pain is not "distributed evenly"; some group members run more risks than others. These people will have to relocate their companies, or adapt their methods in order to be able to live a good life in their familiar surroundings.[93]

As a result, a particular segment of the population will stand to lose a great deal more than other Dutch citizens due to pluvial flooding or water shortage. And this whilst they are not to blame for such "losses": it is simply their bad luck to be living in a location where they are vulnerable to those changes, or to have started a company that is highly dependent on stable water management. Solidarity with these "losers of climate change" can be typified as *altruistic solidarity*.[94] The solidarity is not based on a calculable "enlightened self-interest". On the contrary: if group members would take a calculating stance, a substantial proportion of them would recognise that they are neither running the same risks as these "losers", nor will they do so in the future. This would remove the reason for showing a calculating form of solidarity ("cooperative solidarity").

Challenges to solidary policy
Altruistic solidarity ensues from a feeling that these people must be aided "as a matter of course" – because they belong to us; because the same thing could have happened to us, being members of the same risk group, without the person giving aid expecting anything in return. Altruistic solidarity exists, and is perhaps not quite as exceptional or peculiar as it would seem within the dominant economic portrayal of man.[95] Coming to the aid of peers in distress is a human inclination. This is evident when (flood) disasters occur, and it is also manifested by the casualness with which elevated parts of the Netherlands contribute to the protection of low-lying parts. However, a government that relies on altruistic solidarity within the group is taking a risk.[96] Building policy on a moral appeal, whilst a range of studies indicate that confidence in society is diminishing, is an unreliable strategy. A government that truly wishes to direct will want to minimise its dependence on altruistic solidarity, which always tends to be a bit tottery. For that reason, the fact that even *within* the Netherlands, climate change will generate ever more manifest winners and losers is not conducive to embedding solidarity in water management.

On the other hand, assuming that there is *insufficient* good will within the group, and "safely" relying on everyone's enlightened self-interest may also entail a risk. Especially now that insight into the local impact of climate change is growing, rendering the "veil of ignorance"[97] increasingly more transparent, people will be better able to calculate the approximate risk they are running. Policy-makers within the healthcare sectors are already concerned about the consequences of an expansion of this type of knowledge, because of the dynamics that will ensue. For example, young people as a group actually run less of a risk of becoming ill than do older people. For this reason, some healthcare insurers are considering designing special policies for young people (carrying a lower premium and a higher policy

93 Our community traditionally features great solidarity with people who are aware of the risks they are running yet themselves can exert little influence on their situation. Cf. the situation of people who know they suffer from a hereditary disease that will inevitably disable them in the course of their life, such as muscular dystrophy. There is considerable compassion for such people and a considerable willingness to use collective resources to assist them – whereas most people do not suffer from a similar hereditary disease, and thus will never be explicitly "compensated" for their solidarity. The empathy is such a matter of course and so direct that the thought of compensation never occurs.

94 Another characterisation of Voland's, see Note 90.

95 For years and years, the Dutch have been donating their blood to the blood bank in exchange for a sandwich and a thank-you.

96 Altruistic solidarity is more vulnerable than cooperative solidarity, because it does not meet premise 4 in Appendix I, Solidarity A: reciprocity. Reciprocity states: "I am helping you now, because I am convinced that you would help me if I were in the same situation". In the long term, the knowledge that one would, in all probability, never end up in the same situation might undermine one's complaisance.

97 The term "Veil of ignorance" has been coined by John Rawls, see Appendix I, Solidarity B.

excess). Such a policy would be financially advantageous for both parties, but disrupt the solidarity principle of the insurance system.[98]

The government gets the citizens it cultivates. If calculating back and forth becomes the norm again, behaviour motivated by common interests will have less of a chance. American political philosopher Michael Sandel describes how in the 1990s the Swiss government was at a loss what to do about nuclear waste. For a number of reasons, Wolfenschiessen, a small mountain village, was the best location for storing that waste. A survey among the villagers showed that a narrow majority would be willing to accept the waste – in spite of the known risks. When the researchers suggested that the village be offered financial compensation for the storage, the willingness *dropped*; half of the initial advocates dropped out. They had consented out of a sense of public responsibility, and refused to be "bribed".[99] So apparently good will can evaporate if people are called to account on their self-interest. A government propagating solidary policy would, therefore, be wise to leave room for altruistic behaviour by not addressing citizens as individuals whose sole aim is to profit.

It would be alright for the government to assume that altruistic solidarity with the "losers" will be fairly large. After all, everyone can imagine how annoying frequent pluvial flooding will be for people living along the River Meuse, or how painful it will be for a family of farmers to have their age-old business switch to entirely different methods. We are quite willing to aid these fellow countrymen. But as time goes by, and knowledge about the (local) impact of climate change grows, we will want to see changes in behaviour. Solidarity also demands something from those who are aided: they should make a visible effort to minimise their dependence on the group's assistance.[100] [101] Solidarity with people who continue to act as victims will diminish. That is only reasonable. After lending people a helping hand to encourage them to take certain adaptation measures, one may expect them to learn to adapt their way of life to the circumstances. After all, the risks they are running are becoming less and less unforeseen. Solidary water policy ensures that assistance rendered is reciprocated with effort. Only under this condition can the required altruistic solidarity be sustainable.

98 The Don Committee is explicitly concerned about the consequences of risk selection and the ensuing "target group approach" for solidarity, see the report "*Evaluatie risicoverevening zorgverzekeringswet*" [Evaluation of risk equalisation in the Health Insurance Act], June 2012, pp. 26/27.

99 See Michael Sandel, *What Money Can't Buy; the Moral Limits of Markets*, pp. 114-117.

100 Number 5 of the principles of solidarity, see Appendix I, Solidarity A. The coalition agreement of the Rutte II Cabinet endorses this principle, witness this passage from the introduction: "Support must go hand in hand with proven effort". The Cabinet implements this maxim on a broad scale: with respect to social benefits, but also with respect to its support to Greece.

101 Open question: suppose an entrepreneur is able to make a greater profit without any additional effort on his part, for example, because the rising temperature extends the harvest season. Would it be fair to claim some of his extra profit for a "solidarity fund"?

This allows us to complement the matrix as follows:

MANIPULABLE **Great deal of certainty, many opportunities, great deal of adaptation** › Solidarity has been juridified, and is hardly under discussion • Characterisation: juridified cooperative solidarity • Danger: loss of perceived urgency • Strategy: keeping urgency alive through appealing accounts	**RUNNING RISKS** **Great deal of certainty, few opportunities** › Spontaneously felt solidarity with people who are out of luck through no fault of their own • Characterisation: altruistic solidarity • Danger: growing knowledge may lead to calculating behaviour, which undermines altruistic solidarity • Strategy: helping "losers" take adaptation measures
TAKING RISKS Great deal of certainty, many opportunities, little adaptation	**FATE** Little certainty, few opportunities

Situation 3: Taking Risks

Great deal of certainty, many opportunities, little adaptation
Water obviously poses more of a threat to some parts of the Netherlands than to others. There is not much we can do about that difference. Coastal areas and the banks of major rivers are naturally more vulnerable to flooding than more elevated parts of the Netherlands. Sandy soil is more sensitive to drought than clay soil. A downpour will inconvenience a compact, densely built-up city worse than a ribbon village. And even though we are uncertain about the exact risks that will occur locally, we realise that climate change will only inflate those differences.

This (slightly paradoxical) knowledge about uncertainties typifies both situation 2 (Running Risks) and situation 3 (Taking Risks). The difference between the situations is not to be found in physical conditions but rather in the extent to which citizens and entrepreneurs actually utilise the action perspective available to them. Whereas in situation 2 people know themselves "thrown into" a situation, for example, because they have been born in a particular area, they more or less bring down situation 3 upon themselves of their own accord; either by refraining from taking any adaptation measures, even after a period of time, or by deliberately migrating to a particular "high-risk" area. Their own action (or negligence) makes them run risks that can, in principle, be avoided. This alters the "colour" of their behaviour: they are *taking* risks. In that sense, they can exert influence on their situation.

Picture
A project developer currently building a new residential area in a deep polder knows that this location is relatively prone to pluvial flooding. If the developer makes allowances for the surroundings by building in an adaptive manner, there need not be a problem. But if he were indiscriminately to erect the same type of houses in the lowest part of the Zuidplas polder as in – for example – a town such as Emmen, located in an elevated region, he is consciously taking risks. By analogy, a farmer intending to grow potatoes near the Zuid-Holland village of Nieuwe Tonge is also taking a risk; the farmland in that region is threatened by salinisation and potatoes do not grow well in saline soil. Starting a farm that is highly dependent on a continuous supply of lots of good quality water, in an area not connected to the main water system, entails more of a risk because the probability of dry spells is increasing. And someone who has a house built on a flood plain of the river Waal in order to enjoy the beautiful view knows that this house stands a good chance of regularly being flooded.

Position of the government
In this situation, the government will want to provide clear and transparent information, in order to enable citizens and entrepreneurs to acquaint themselves with the risks they are taking. It will be able to support and encourage businesses and organisations experimenting with innovative solutions for adapting their activities to the riskier circumstances. On the other hand, it will be reluctant to continue to compensate entrepreneurs who stubbornly continue along the same lines while they know that their business has become riskier under the current circumstances. The government will look for (legal) ways to avoid costs ensuing from risks wittingly taken by entrepreneurs being paid from collective funds. Neither will it want to foot the bill for the flood damage of a private individual's new house on the flood plains. It is not inconceivable even that the government will be recovering any evacuation costs from these people in the future.[102]

Tricky issues
Providing sound information and only assisting parties to a minimum extent if they run into trouble on account of dangers about which they have been warned – it sounds rational and firm. The big advantage of this approach is that it blocks the path of profiteers; people who speculate that a solidary system will compensate them for losses they have deliberately risked. This approach thus prevents people who are apparently already inclined to gamble from taking a chance on solidarity.

Yet this approach also entails two difficulties. First, this policy assumes that people can, and will, keep themselves well-informed– and subsequently can and will act on this information. Policy virtually cannot avoid taking such active citizens as its point of departure. The reality is, however, that by no means all Dutch residents are capable of doing so. Some lack the ability to take a view of long-term complex risks. A larger group perhaps lacks the means to act on the information; they are too poor to invest in adaptation measures. Both cases concern vulnerable groups, which especially calls for solidarity on the part of the community.[103]

In addition, society also benefits from those enterprising members who are not afraid to take risks. Often it is they who come up with innovations. If concrete experiments are curbed too much, innovative solutions will presumably not get off the ground either. Enterprising spirits engaged in interesting experiments may expect more from the government than a pedantic "you have been warned" when they meet with adversity. At the same time, in pre-agreed "safety net constructions" it would be obvious to set down agreements on sharing profits if the experiments do yield the intended results. Are we dealing with profiteers or with people needing help? With constructive or reckless risk seekers? In theory, the difference is clear, but in actual practice the distinction is not always easy to make.[104]

Solidarity
We seem to come across a reflex here: as individual group members consciously take more risks, the group's solidarity with their setbacks, if any, gives way. We show solidarity with people who find themselves in dire straits owing to circumstances beyond their control.[105] But if you are in a position to act, you should acquaint yourself with the risks you are running – and that knowledge should influence your behaviour. If you fail to do so, we hold you responsible for the consequences, and those consequences will then come out of your own pocket.

102 Cf. the fact that Alp countries are considering charging evacuation costs to mountain tourists who take great risks.

103 Or is this, strictly speaking, not a group with which we should show *solidarity* but rather a group we should take *care* of, because it is dependent on us? Cf. Note 133.

104 This difference has (consequently?) also been politicised; opinion on the Left holds a prejudice with respect to this issue which is different to prejudices which come with opinion on the Right.

105 The crucial distinction; these people find themselves in situation 1 (Running Risks).

This reflex is a form of group protection; in the long run, solidarity would become untenable if the group refrains from setting limits to the behaviour of those who call on solidarity. Displaying risky behaviour is a fair criterion for distinguishing between those who justifiably call on our solidarity and those who may not count on it.

Challenges to solidary policy

The challenges to solidary policy here ensue from the already identified difficulty of actually setting the aforementioned limits in practice. When can someone reasonably be held to account for his behaviour? When did someone have sufficient leeway to move freely, so that we do not need to show solidarity with the adverse consequences of his actions?

The debate on so-called "lifestyle diseases" shows how difficult this issue is in actual practice. For decades we have known for a fact that smoking, excessive use of alcohol and little exercise is bad for our health. Dutch people are well aware of this; there is no lack of information. Yet a considerable group of Dutch residents behave in an "unhealthy" manner. As a result, another segment of the population is starting to grumble: this group sees the mandatory healthcare insurance grow increasingly more expensive, and refuses to foot the bill for the medical expenses of those who have become ill "avoidably and culpably". The solidarity of the system is under pressure, because people "consciously" taking a risk may also file a claim.[106] The crucial question is whether this description of the claimants is correct. Many of them would describe themselves as addicts rather than rational weighers of choice. Add to this the uncomfortable fact that lifestyle diseases predominantly occur among socio-economically weaker groups, and it is clear that assessing who is and who is not worthy of our solidarity is not a simple matter.

In the water world, the problem is less sharply defined. There is, however, a parallel. Climate change forces us to adapt to a new situation, and this requires a certain innovative attitude. Not everyone adopts a flexible and mobile position in this. Sometimes, this will be out of laxity. Sometimes out of inability – the chronically ill and very old, for example, are not quite as mobile, whilst a low income severely restricts someone's options.[107] Are such people consciously taking risks if they refrain from implementing adaptive measures?

Newcomers who consciously venture into a risky situation may count on considerably less solidarity than people who have been born into what eventually turns out to be a risky situation – and rightly so, as we stated earlier. But here too in practice, most cases are actually tinted more grey than the black or white situations theoreticians like to depict. How reprehensible is a family moving into a new house in a deep polder? Sure, the probability of water damage is greater, but how much of a choice do they have if they are employed in the vicinity and cannot afford anywhere else to live? And conversely: for how long do old-timers doggedly pursuing their businesses along the same lines despite the changing circumstances reckon they can keep counting on our solidarity in the face of adversity?

In actual practice, it will be difficult to make a clear distinction between people running risks and people taking risks. *Ipso facto* it will be difficult to distinguish between people who can reasonably lay claim to the group's solidarity, and people who have forfeited such a claim. The government will not always be able to make such a distinction either. It will, however, have to (be willing to) enter into debate about the matter,

106 People are concerned about this, as is evident from the recent report *Leefstijldifferentiatie in de zorgverzekering, een overzicht van de ethische argumenten* [Life style differentiation in health insurance, an overview of the ethical arguments] published by the Centrum voor Ethiek en Gezondheid [Centre for Ethics and Health] in March 2013. The CEG (a governmental advisory council) here explores whether it would be acceptable to raise the basic premium for smokers, or –conversely – to lower the policy excess for people who eat sensibly or get sufficient exercise. http://www.ceg.nl/uploads/publicaties/Leefstijldifferentiatie_in_de_zorgverzekering.pdf
Another governmental advisory council, the Raad voor Volksgezondheid en Zorg [Council for Public Health and Care], recently published a report on solidarity in health care: *Het belang van wederkerigheid … solidariteit gaat niet vanzelf!* [The importance of reciprocity … solidarity is not a matter of course] (March 2013). http://www.rvz.net/uploads/docs/Advies_Het_belang_van_wederkerigheid.pdf.

107 These are some vulnerable groups according to the British Joseph Rowntree Foundation. The Foundation has examined how the pluses and minuses of adaptation policy affect societal groups; see its report *Socially Just Adaptation to Climate Change*, July 2012.

based on the fundamental difference in responsibility borne by people running risks and people taking risks. A government that shirks from such a debate will watch solidarity being undermined from within as the knowledge of avoidable risks grows.

This results in the following matrix:

MANIPULABLE **Great deal of certainty, many opportunities, great deal of adaptation** › Solidarity has been juridified, and is hardly under discussion • Characterisation: juridified cooperative solidarity • Danger: loss of perceived urgency • Strategy: keeping urgency alive through appealing accounts	**RUNNING RISKS** **Great deal of certainty, few opportunities** › Spontaneously felt solidarity with people who are out of luck through no fault of their own • Characterisation: altruistic solidarity • Danger: growing knowledge may lead to calculating behaviour, which undermines altruistic solidarity • Strategy: helping "losers" take adaptation measures
TAKING RISKS **Great deal of certainty, many opportunities, little adaptation** › Solidarity diminishes as knowledge of avoidable risks grows • Characterisation: no solidarity with setback ensuing from risky behaviour • Danger: in actual practice, a clear characterisation of behaviour is difficult • Strategy: protecting solidarity with those who run rather than take risks, by openly discussing demarcation issues	**FATE** **Little certainty, few opportunities**

Situation 4: Fate

Little certainty, few opportunities

No matter how our knowledge grows, unexpected events will always continue to take place. After all, the models we use to draft predictions are nothing more (or less) than our best attempts to approach reality. This always leaves open the possibility that a crucial datum falls outside our field of vision.[108] And even if we have a proper picture of a trend, we will always have to reckon with occasional ups and downs; events ensuing from rogue, previously unknown, feedback mechanisms leading to situations that fall far beyond the bandwidth of what is normal. Because we cannot, by definition, predict such events, we have little grip on the circumstances. This puts us in the situation that we are aware of the threats, but see few options for

108 What Donald Rumsfeld dubbed the "unknown unknowns": unknown variables about which you did not even know that you did not know them?. These are the most dangerous variables, in the sense that they can blow up an entire model of thought. Nassim Nicholas Taleb's bestseller *Black Swans* warns of something similar: we are inclined to look for confirmation of our models, whilst really trailblazing changes are brought about by "highly improbable" events – events we have not predicted because they did not chime with our assumptions and routines. In the subsequent *Antifragile* he makes a case for designing systems in such a manner that they demand protection, yet benefit from stress, coincidence, and uncertainty.

exerting any influence on them. A situation in which we will have to reconcile ourselves to what Fate brings us.[109]

Picture

Decades of measuring have taught us the average summer and winter temperatures. We also know the approximate variability, i.e., the margins within which the temperatures fluctuate. Yet a period of time can turn out extremely hot or extremely cold. In such cases, the weather conditions fall far beyond the normal distribution. Crops and cultivation methods are not geared to such abnormal situations; Dutch houses are not built to withstand extreme snowfall or frequent heatwaves. Such weather conditions are difficult to predict – and if they occur, we cannot influence them. Nonetheless they may have serious consequences: crop failures, roofs collapsing, increased mortality in nursing homes.

As a result of climate change, such extremes will occur more frequently in our country; heavy downpours, storms, periods of extreme drought, exceptionally high water in the rivers – all of these are in the line of expectations. Ironically, this means that we are now more certain that we have less control of the situation than we used to think. We are going to feel hit by Fate more frequently.

Task of the government

Society may expect citizens to prepare for setbacks – yet within a reasonable bandwidth. No individual or company can sufficiently prepare for extreme blows; either because this is downright impossible, or because it is manifestly not cost-efficient. Such people are hit by Fate. They have bad luck.

The first task of the government obviously is to lend assistance to citizens in the event of a (major or minor) disaster. This means that the government ensures that emergency services are operational and that emergency scenarios are ready – up to and including evacuation schedules.

The quintessence of a collective is for many to assist group members in dire straits. A modern collective usually does so by establishing funds to which a great many people all contribute small amounts, and use such funds to compensate the participants with bad luck for their loss. The power of numbers makes such an "insurance" cost-efficient.

In principle, the government only needs to intervene here if a particular insurance is deemed essential to the extent that its importance supersedes individual freedom of choice. For example, health insurance is mandatory for every Dutch resident. And with a bit of terminological liberty, land draining rates can also be regarded as a mandatory collective insurance against flood risk and freshwater issues. In some cases, the government will want to stand surety for "uninsurable risks", risks that private insurance companies avoid because they are unable to design a workable – i.e., cost-efficient – market model for them.[110]

109 Even within this field, Fate, displacements will occur. In the most undiluted form, in the primitive society of caricature, the group does not realise that it is ignorant of many things – the group perceives itself merely as the plaything of primaeval forces or deities. As knowledge (insight into a pattern) increases and the group gets a greater grip on the matter, the group may, ironically, start to realise that it is ignorant of many things. Socrates would say that the group is getting wiser. In contemporary vocabulary: the group becomes aware of uncertainties; not just of the variability of the phenomena (ontological uncertainty), but also of the possibility that the group does not yet have a picture of relevant variables (epistemological uncertainty). The degree of uncertainty determines whether a situation may still be characterised as Fate; as knowledge grows, the situation will tend more towards either Running Risks (if knowledge has not yet given rise to a meaningful action perspective), or Manipulable (if such an action perspective has evolved). For a clear overview of types of uncertainties, see the article by Arthur Petersen in *Omgaan met onzekerheid in beleid* [Dealing with uncertainty in policy], MNP, 2007, http://www.rivm.nl/bibliotheek/rapporten/550032003.pdf

110 For example, the government funds the development of so-called "orphan medicines"; medication for rare diseases whose development costs pharmaceutical companies fear never to recover because the number of potential users is, naturally, very small.

Tricky issues

As a matter of fact, such a type of situation features fairly few tricky administrative issues pertaining to solidarity. The willingness to help people we have had bad luck is large and goes without saying. And there is little discussion about the assumption that in certain cases the government will be the most obvious body to organise that solidarity. Definition issues and demarcation lines are likely to cause the most societal tension. For example, debates may be anticipated as regards what can be deemed "real bad luck", and the collective might break up over the question as to what extent group members should be compensated for "bad luck" that does not actually jeopardise their normal functioning.[111]

Solidarity

In this type of situation, solidarity is high and quite stable. Individual behaviour could not have prevented the misfortune, so the victims themselves are not liable for the damage. And moreover, we all could have been in the victims' shoes. Fate has struck blindly; next time, it could be your turn. If this is the perception of the situation, assistance is rendered as a matter of course. Solidarity can be typified here as *cooperative solidarity*[112], and worked out, if so desired, as "enlightened self-interest". However, as long as the members of the collective actually believe that each member has approximately the same chance of bad luck as any other member, such calculations are seldom necessary. Solidarity will feel "natural" and be shown "spontaneously".[113]

Challenges to solidary policy

Cooperative solidarity is the most stable form of solidarity. Furthermore, bad luck usually generates a great deal of interest; reasoning from a policy-making perspective, this is an advantage of this situation vis-à-vis situations in which the importance of water issues may be ousted by other, more high-profile societal issues. In this situation, therefore, the government does not need to go to great lengths to 'sell' solidary policy. The greatest impediments to be expected will ensue from definition issues and demarcation cases.[114]

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111 Cf. the discussions in the Netherlands on the AWBZ. The Dutch *Algemene Wet Bijzondere Ziektekosten* (Exceptional Medical Expenses Act, AWBZ) exacts solidarity through taxes and was originally intended to cover "uninsurable risks". The AWBZ currently accounts for a substantial and rather uncontrollable proportion of the overall healthcare budget. The rising costs clearly put this form of solidarity under pressure. This is reflected in discussions about definitions and demarcation lines. Typical arguments are: "Ageing cannot be called a risk, so make everyone save for the healthcare expenses they will most probably incur in their old age." And "Why should individual A pay for his moped, whilst individual B is reimbursed for his rollator?"

112 As in situation 1. Because this form of solidarity feels so "natural", it is likely to be juridified fairly rapidly.

113 Cf. this enlightening quote from Professor of labour relations Paul de Beer, from "*Kennis bedreigt solidariteit*" [Knowledge threatens solidarity]: "If you share a risk with people who are running a similar risk, there is no reason for you to assume *beforehand* that you will pay more insurance premiums than the compensation you will receive in exchange. If it *subsequently* appears that you have been ill quite a bit less than average, you have shown solidarity with others who have been ill more. However, this constituted solidarity out of self-interest – after all, things could have turned out differently – and there is definitely no reason to regret the insurance. This does no longer go without saying if it is certain *beforehand* that some insured run a much higher risk of falling ill or having an accident than others." (p. 46).
De Beer makes an interesting distinction between "probability" and "risk": probabilities are distributed blindly, risks follow a certain pattern, which enables you to assess whether you are running more or less of a risk than other group members. "Probability solidarity, therefore, demands less of citizens than does risk solidarity", De Beer concludes (p. 49). In our terms: probabilities lead to cooperative solidarity, whilst risks incite (more vulnerable) altruistic solidarity. Although the difference between probability and risk is quite elucidating, we have not adopted the distinction here because especially in the water world, "probability" and "risk" have a specific connotation on account of the universally used definition "risk = probability x effect".

114 As identified under the heading of "***Tricky issues***" in this paragraph.

We can now complete the matrix as follows:

MANIPULABLE **Great deal of certainty, many opportunities, great deal of adaptation** › Solidarity has been juridified, and is hardly under discussion • Characterisation: juridified cooperative solidarity • Danger: loss of perceived urgency • Strategy: keeping urgency alive through appealing accounts	**RUNNING RISKS** **Great deal of certainty, few opportunities** › Spontaneously felt solidarity with people who are out of luck through no fault of their own • Characterisation: altruistic solidarity • Danger: growing knowledge may lead to calculating behaviour, which undermines altruistic solidarity • Strategy: helping "losers" take adaptation measures
TAKING RISKS **Great deal of certainty, many opportunities, little adaptation** › Solidarity diminishes as knowledge of avoidable risks grows • Characterisation: no solidarity with setback ensuing from risky behaviour • Danger: in actual practice, a clear characterisation of behaviour is difficult • Strategy: protecting solidarity with those who run rather than take risks, by openly discussing demarcation issues	**FATE** **Little certainty, few opportunities** › Solidarity is stable and a matter of course • Characterisation: cooperative solidarity based on enlightened self-interest • Danger: little; problems, if any, will be centred around demarcation lines • Strategy: optimising emergency relief, and ensuring well-defined rules regarding claims to solidarity

B. Three developments and their impact

In the introduction, we described three developments the water world needs to take account of.
To recapitulate:
- our *physical* environment is changing: the earth is warming, the weather is becoming more changeable;
- our *knowledge* of the effects of climate change is growing;
- we are gaining *experience* with adaptation strategies.

We shall now briefly explore how these three developments impact the water world situations we have outlined.

Whichever way we look at it, climate change has rendered our situation less certain. Research has raised our awareness of the risks; the certainty is increasing that we are faced with a real threat. Climate change is devaluing the significance of carefully monitored measuring data and procedures that have justified themselves in actual practice. This is threatening to push us out of the relatively comfortable, "manipulable" situation 1, in which we can combine reliable knowledge with a tried and tested action repertoire.

At the same time, our insight into the consequences and possible effects of climate change is gradually increasing. Due to this "countermovement", in (administrative) practice we will largely remain in this "manipulable" situation 1 with respect to gradual, trend-based consequences such as the rise in sea level. Although the rising sea level does necessitate large-scale investments in sand replenishment or sea dyke improvement, in principle there is sufficient time to properly carry out such hydraulic projects. As for this particular component of the flood risk management domain, the familiar system which relies on (partly juridified) cooperative solidarity can, therefore, continue to function.

Matters are different when it comes to the more erratic consequences of climate change, such as peak river discharges, periods of drought, and torrents. Climate change has an unpredictable and volatile impact here. If we refrain from taking measures, rivers will overflow more frequently, cities will have to deal with increasing pluvial flooding and extreme temperatures, and agriculture will suffer more frequent losses as a result of extreme weather. Some of these effects are already being felt. Yet the picture is still out of focus; the extent of the risks is still under discussion, as is the best way to deal with those risks. Consequently, the previously "manipulable" situation is starting to look more like situation 2, *Running Risks* (if the risks have not been distributed evenly across the group members), or situation 4, *Fate* (if there is no pattern to be observed in the distribution of the risks across group members, i.e., if the risks are distributed randomly). Solidarity is particularly urgently needed in situations 2 and 4, whilst society has not yet come to terms about the forms solidarity could take in actual practice. A strategy that focuses on the sound provision of information, and facilitates solidarity in administrative terms is most appropriate here.[115]

As the options for adaptation are expanding, we will gain more control over our environment; not so much by being able to manipulate our physical surroundings, but because our perspective on action is growing. This also changes the dynamics of solidarity, because the possibility of actively improving one's own situation comes with a growing responsibility for one's own situation.

People who – after a reasonable adjustment period – refuse to implement adaptation measures will be regarded as people who are consciously taking risks (situation 3). Such high-risk behaviour on the part of a fellow group member reduces the group's moral obligation to show solidarity. The government would be wise to propagate that taking available adaptation measures is a prerequisite for being able to lay uncurtailed claim to solidarity. Setting firm boundaries protects the willingness to show solidarity in situations that call for it.

If there are sufficient options for adaptation and if these are actually being utilised, we will tend back to situation 1, Manipulable.

115 *In abstracto* it is clear that situation 2, *Running Risks*, calls for altruistic solidarity, and situation 4, *Fate*, for cooperative solidarity. That still does not say how solidarity will pan out in concrete cases – nor does it bear any general statement to that effect. What solidarity entails in a concrete situation will become evident once the right parties conduct the right type of discussions.

III Solidarity among generations

A special situation

So far, we have examined issues pertaining to the solidarity among (groups of) people currently living in the Netherlands. However, the National Water Plan explicitly urges us to show solidarity with our descendants as well: the Dutch residents who will inhabit this delta in the future. According to the National Water Plan, solidarity with generations to come entails expending our best efforts to avoid shifting any costs and problems onto them. The National Water Plan calls on us to implement interventions that protect future Dutch residents from flooding and provide them with sufficient freshwater – preferably at (considerably) lower cost than what they would need to spend if they were to attain those goals themselves later on. Once we have a picture of such effective and cost-efficient strategies, the adage is clear: go ahead!

In many cases, however, the situation will not be as unequivocal. We are then faced with the question of what solidarity with the next generations requires of us. For example, should we spend money now on dykes that will certainly protect them from the water, or should we use that money to reduce the national debt, in order to provide our descendants with a sufficient budget to make their own investments?

Solidarity with future Dutch residents requires us to take decisions now that will safeguard flood risk management and the freshwater supply in the (distant) future. Time plays a crucial role in this issue: first of all because the future – and especially the distant future – is difficult to predict. In time, we will be facing problems of a different nature. This can be an advantage. For example, we may expect our climate models to improve and our predictions to become more accurate over time. This will allow us to determine more accurately how high and strong a safe dyke must be in the year 2100. Allowing time for big decisions will reduce the danger of inordinate investments. Furthermore, there is a real possibility that we will achieve technological innovations that will lead to better results than we have been able to attain with our current technology. Time can also effect a change in our "water goals". Socio-economic and cultural developments that are as yet undefined may result in quite different preferences later on. Will our descendants like to live in a city or will they prefer the countryside? Will they value wide floodplains, or not? We cannot foresee such things.

The dynamics of solidarity

Striving for solidarity with future generations evokes dynamics other than solidarity among the regions: first of all, because we can find out a great deal more about the regions than we can about the future. But also because solidarity ideally crystallises in a discussion among group members – and it is impossible to organise a discussion with Dutch residents who do not yet exist.[116]

Solidarity presupposes mutual identification among group members, as we stated earlier.[117] For us to identify with future Dutch residents requires that we approach them the way we would like to be treated ourselves, that is as citizens who are able and willing to design their own environment through a democratic process. Obviously, we cannot ask future generations for an opinion. It is clear that our good intentions will not necessarily make them happy. By boarding up the future, we are behaving like despots towards them.

116 As a matter of fact, this makes solidarity with future generations, by definition, altruistic: after all, we cannot count on future generations 'doing something in return'. Therefore, a government that aims to encourage solidarity with future generations will need to come up with arguments that will meet with approval among those sporting an attitude of 'après nous le déluge'. To this end, the government may capitalise on the given fact that in the Netherlands we owe a great deal to the efforts expended by our ancestors, particularly in the field of water management, and on the fact that people tend to be willing to give a great deal for their descendants. Once the idea takes root that the Netherlands of the future will be inhabited and governed by people who bear no (blood) relationship to us, it will be more difficult to engineer altruistic behaviour.

117 See premises 2 and 3 in Appendix I, Solidarity Aa.

These considerations lead to distinct guidelines for solidarity projects, i.e., projects involving sensible investments in future safety, and leaving as many options as possible open for future generations.[118] From a technocratic perspective, this affords them the room to act on new know-how and technology, which would render policy more cost-efficient. In politico-philosophical terms, such a course of action shows solidarity, because it demonstrates our identification with the democratic and innovative potential of future generations. From a practical point of view, it means that in the event of surveyable risks, saddling our descendants with a residual tasking would be preferable to burdening them with disproportionate debt, in order for them to spend "our" money-of-the-present based on the insights of the future.

Tricky issues

Solidary water management, therefore, means keeping open as many options as possible for the next generations – but without putting them in an irresponsibly risky situation. If we can foresee with some measure of certainty that *refraining* from taking action now will lead to bigger problems or much higher costs later on, it is evident that we should take action. Fortunately, the trend that poses the greatest threat to our country, viz. the rising sea levels and the increasing peak discharges of the major rivers, is establishing itself fairly slowly. This enables us to take our time in making preparations – yet with a great deal of zip: for example, by reinforcing the bases of dykes in a manner that allows us to further improve and raise the dyke itself quite easily if the river discharge rises more sharply than predicted in current scenarios. This constitutes a solidary strategy, because robust dyke bases are important in any situation, and spending money on dyke bases now will involve far less cost for future generations than eventually having to take emergency measures in great haste.[119]

In actual practice, it will often prove quite difficult to determine what investment would be most cost-efficient in the long run, while keeping open as many options as possible. It is even quite conceivable that in some cases these two requirements – cost-efficiency and scope for action for future generations – appear to be at odds with one another. Then how are we going to find a balance? *In abstracto*, it is hard to say anything meaningful about that. We do know that a solidary strategy requires us, in every concrete casus, to conduct a discussion on the optimum balance between cost-efficiency and scope for action.

118 It is here that the core values of "solidarity" and "flexibility" clearly meet; operating flexibly is a good way to show solidarity with future residents of the Netherlands.

119 One difficulty is that calculations determining the yield of a euro spent now vis-à-vis the yield of a euro to be spent by future generations almost always work out to the advantage of postponing measures. When taking the discount rate into consideration over such an extremely long period of time (compared to the usual calculation models), it almost always appears more rational to keep money liquid. When 'calculated back' the long-term benefits are virtually worthless in the present. Therefore these models do not do justice to the strong intuition that in some situations, water managers need to spend money now in order to save more money in the future.

IV Concluding remarks

The Delta Programme is intended to ensure the inter-coordination of Dutch flood risk management and freshwater management projects. Projects to be funded must not only be effective and cost-efficient, but also propagate a certain state of mind. For example, water projects to be implemented under the Delta Programme must show solidarity with other regions and other generations.

Cooperative and altruistic solidarity

This essay argues that solidarity with future generations is given shape by "bringing and keeping the current system up to standard", with plausible futures in mind, and with a view to allowing future residents as much leeway as possible to take their own decisions regarding the accommodation of any impact of climate change. At times, it will evidently be appropriate to take measures now in order to preclude major problems later on. Yet in the event of surveyable risks, saddling our descendants with residual tasking would be preferable to burdening them with disproportionate debt, in order to afford them the opportunity to set their own preconditions and seek appropriate solutions.

Establishing a strategy that imports solidarity among the various groups now co-habiting on Dutch territory presents more of a problem. By nature, administrators seek to bend their surroundings to their will. If they were to succeed in achieving complete control, there would not be any reason for a debate on solidarity, because then we would find ourselves in a purely manipulable situation, i.e., a situation in which solidarity is not such a pressing topic, as this essay shows.

However, climate change is leading to new uncertainties. We appear to have less control over our water management than we thought. Changeable weather conditions will cause trouble more frequently than before. This tends to reduce the manipulability of the surrounding area. On the contrary: we feel stricken by Fate more often than we used to. Such a situation calls for solidarity, and fortunately the inclination to show solidarity is fairly great and self-evident: not just out of sympathy, but also because every group member realises that he might just as likely be struck by Fate – in which case he himself might not be able to manage without help from the group. Here, therefore, solidarity can be regarded as a tacit societal agreement founded on enlightened self-interest. In this essay, this is referred to as "cooperative solidarity".

An increasing knowledge of specific risks changes matters. Both scientists and administrators do their utmost to gather such knowledge – and with good reason, because this knowledge is the only way to regain a grip on our surroundings. The result is, however, that we will find out that Fate does not strike entirely blindly: it will turn out that some fellow group members run greater risks than others. If the chance of bad luck is not the same for everyone, solidarity ceases to be a matter of enlightened self-interest – at least, as far as the (relative) winners are concerned. This changes their motives for adopting a solidary attitude. Solidarity will tend to come under pressure.[120] And if they do show solidarity, they will rather do so from a sense of altruism.

Altruistic solidarity is certainly possible, but requires more in terms of identification with the group than cooperative solidarity – and identification with fellow countrymen is not a matter of course. With respect to a solidary strategy, therefore, it is an uncomfortable given fact that climate change will result in ever more distinct winners and losers within the Netherlands. It is for good reasons that administrators strive to gain more insight into the specific consequences of climate change, as that knowledge enables them to do a

120 Solidarity is put under particular pressure if one group is found to contribute systematically (considerably) more to and *at the same time* "profit" less from a solidarity scheme than another group, or so it appears from the forecast set down by the Centraal Planbureau [CPB, Netherlands Bureau for Economic Policy Analysis] in its report *De prijs van gelijke zorg* [The price of equal care], January 2013. In this report, the CPB concludes that richer people pay more for healthcare but "consume" less care than poorer people. According to the CPB, in such situations solidarity can only be safeguarded by reducing the bandwidth of the field within which fellow group members are expected to show solidarity with one another (the CPB suggests cutting down basic healthcare insurance).

better job. However, it is precisely that knowledge that will put solidarity under pressure sooner or later. In such a situation, an insistent call on enlightened self-interest will rather tend to backfire. For that reason, the government would be wise to provide a language that reflects the altruistic aspect of solidarity as a logical and admirable quality: first of all by not shirking from a reference to solidarity in government circles, and in discussions with citizens and businesses. With its district water board structure, the Netherlands commands an age-old history of local solidarity in water management. This tradition merits being kept alive; the continued social acceptability of solidarity will be of benefit to the Netherlands.

Avoidable and unavoidable risks

Dutch residents who are at risk from climate change may hope for the altruistic solidarity of fellow group members who have ceased to be partners in misfortune. Yet they themselves must also expend efforts to adapt to changing circumstances. If they refrain from doing so – and remain passive in situations in which actual perspectives for action are starting to arise – then their moral right to claim assistance from the group will decrease. This applies even more to those who consciously run risks presupposing that the group will come to their aid in case of need. Water administrators would be wise to propagate that taking available adaptation measures is a precondition for being able to lay claim to solidarity. Setting firm boundaries protects the willingness to show solidarity wherever it is duly called for.

The atmosphere of solidarity will be most powerful if the group is convinced that group members only call on other group members as a final resort. For that reason, the government may safeguard solidarity by focusing on a strategy that identifies and expands each individual's opportunities for coping – including with uncertain situations. This may be interpreted as a straightforward plea for promoting and developing adaptive strategies.

Furthermore, in order to preserve solidarity, water administrators will need to make clear that, in their view, the difference between avoidable and unavoidable risks carries great moral significance. People who run unavoidable risks may count on solidarity. However, people who run avoidable risks are sidelining themselves as far as solidarity is concerned.[121] In actual practice, it will be difficult to draw a clear distinction between people who are running risks and people who are taking risks. Yet the government will need to enter into debate on this, based on the fundamental difference in responsibility borne. Administrators who shun this debate will have to watch the growing knowledge about risks undermine solidarity.

The government as a partner

From another perspective, "debate" is also a key. In the relative comfort of a manipulable situation, water managers can view and present themselves as defenders of public life. We are then faced with an "old-fashioned", modernist government that shapes society and arrogates responsibilities on the basis of expert knowledge and a fixed moral compass. As regards climate change, however, the government is the plaything of climatic circumstances, just as much as individual citizens and businesses. It operates in the same situation as citizens and businesses – a situation directed by no-one. The government is aware of its vulnerability in this respect.

This is not without consequences. In the classic manipulability setting, the government is inclined to compensate parties who are adversely affected by government measures that are, in themselves, sensible. Within the concept of manipulability, repairing such damage constitutes no more than fair governance. Things may perhaps be different in situations in which our country is running risks or even struck by Fate. Obviously, in such situations the government ought to make an effort to ensure the safety of its citizens. However, it will cease to view or present itself as the party rolling out its good works across the country. On the contrary: the government is attempting, for better or worse, to limit the damage resulting from climate change.

121 See Appendix I, Solidarity C, for a diagram explaining the relationship between solidarity on the one hand, and avoidable and unavoidable risks on the other.

It has neither planned nor desired this situation, any more than citizens and businesses have, and it is well aware of the fact that it is unable fully to control the situation. The responsibility has remained the same, but now tends to be translated into an obligation to make best efforts rather than an obligation to achieve results. Its culpability in the event of things going wrong has diminished.

To us, what this means in terms of government accountability is an interesting yet open question. Having to make decisions in uncertainty will become increasingly normal in the water world. In other words: the government will often wittingly intervene without having an overall view of the situation – because inaction appears even more undesirable. If such an intervention is underpinned by the best available knowledge, and brought about following an open decision-making process, to what extent then can the government be blamed for the adverse effects of such an intervention? Another question is what shape such reproach will take. In such cases, may the government expect claims from aggrieved citizens or businesses? The term "claim" fits within a legal discourse, involving complainants and defendants. But who is actually the actor in this case? Has the government failed these private parties, or is "the climate" to blame?[122] If government action could lead to unforeseen claims, it might be inclined to sit back and tend to refrain from expending sufficient effort. In our opinion, this would certainly not be to the advantage of society, especially when it comes to water issues.

We suspect that climate change will open an administrative field in which the usual compensatory mechanisms cannot apply unabated. This suggestion will undoubtedly lead to a substantial legal conundrum, the consequences of which we cannot predict. The suggestion is most certainly not intended as an argument to leave people who are impeded by adaptation measures out in the cold. We do wish to point out that Fate opens up a context other than the law. The legal context features words like "manipulability" and "compensation". The connotation with Fate features words such as "expending one's best efforts" and "solidarity". Solidarity cannot be exacted, but one can reasonably hope for it.

Solidarity: a concept in motion

It is difficult to pin down what exactly solidarity implies. "Solidarity" is a term used to denote a certain balance achieved by fellow group members in a certain timeframe, based on the bond they feel with one another. We can certainly say something about the *process* within which solidarity ought to be given shape. Solidarity calls for an open discussion among the appropriate parties.[123] However, what a solidary *outcome* of such a process would be cannot be determined beforehand. The fact is that political movements differ fundamentally in their views of what "real solidarity" is and presupposes. For example, what does solidarity entail first and foremost? That we do not begrudge fellow group members opportunities, or that we relieve their distress? That we empower them, or that we take care of them?

The ideological differences in this regard are large, and it is an illusion to assume that abstract reasoning will overcome these differences. We would do better to rely on the ability of fellow group members to find an acceptable modus vivendi for the manner in which they wish to flesh out solidarity here and now – for example, with respect to concrete measures in the water domain. We should not interpret these measures as endorsing a particular solidarity theory that will be written in stone from now on, and from which a range of guidelines could be deduced for other measures.

122 This remark is not intended to dismiss human responsibility for climate change. What we mean to say here is that the consequences of climate change are now, at the national level, presenting themselves to us as Fate, even though we ourselves have presumably contributed to them.

123 And that usually means: not just the trusted people from the network of (semi-) professionals. The Joseph Rowntree Foundation in particular is hammering away at this point, see Note 107. From the perspective of solidarity, therefore, it is always advisable to afford as many relevant stakeholders as possible as much space as possible to submit their views and interests – preferably on a stage where they can actually have a say in determining exactly which factors are deemed relevant in a concrete project.

Although scientists and philosophers may identify characteristics of solidarity, they cannot determine what people in actual practice *perceive* as a solidary project. Thinkers could obviously "nail their political colours to the mast" by making out a case for a particular interpretation of solidarity. That in itself is legitimate, but it is not the role that befits us as the authors of this essay. Consequently, we cannot provide a "solidarity checklist". Instead, we have analysed the dynamics of solidarity within the water world, and pointed out several consequences thereof. This based on the idea that an awareness of the tricky issues intrinsic to solidarity in a particular setting will enable administrators to ensure that the proper issues come up in the decision-making process.

In conclusion: the relationship between the core values

In the above, we have explored the normative concepts that the *National Water Plan 2009-2015 (NWP)* so explicitly formulates as "the three core values of the Delta Programme", and have studied each one in depth. We conclude this essay with a few short remarks on the interconnectivity between these values. In doing so, we aim to keep in mind that the Delta Programme quartermaster's team and the drafters of the *NWP* have opted for these values after a series of interviews with stakeholders from the field. They noticed that these values could be particularly directive, yet at the time did not feel the need to think through the conceptual interconnectivity between these values. Entirely in the spirit of the Delta Programme, they chose to substantiate these terms as they went, in interaction with the field.

Flexibility as a method to foster sustainability

This essay has aimed to outline the function and significance that values have acquired (often implicitly), as a basis for further thought. It is not our intention to pull the system of core values into a rigid conceptual framework after the event. Nor would that be quite possible. For example, the actual practice of the Delta Programme shows a strong interconnectivity between the values of "flexibility" and "sustainability". We have defined sustainability as sustaining a long-term balance in a system comprising the three domains of *people-planet-profit*. We have described adaptive delta management as the manner in which this call for sustainability has been substantiated in the actual practice of the Delta Programme. Flexibility and integrality are the defining features of adaptive delta management. For each preferential strategy within the Delta Programme, actual adaptation paths have been developed that outline which measures may be implemented at an accelerated or decelerated pace, if at any time this would seem a better way to attain the intended national goals (flood risk management and proper freshwater management). This approach has therefore been incorporated into the programme.

"Flexibility" features here as (a component of) an *approach* which substantiates sustainable policy. From a strictly conceptual perspective, this makes flexibility a (practical) aspect of sustainability, rather than a value in itself. One could say that the Delta Programme quartermaster's team and the drafters of the *NWP* have sensed that flexibility ought to be part of a manner of substantiating sustainability in the context of the fundamental uncertainty with which climate change confronts us. By continuing to operate flexibly, administrators will allow their policy to "breathe", which will also put them in a better position to prevent crises in the long run. To put it differently: flexible policy increases the chance that the balance in the three domains system (*people, planet, profit*), which in itself is quite movable, will consistently steer clear of the problem zones.

In retrospect, it would perhaps have been more accurate from a conceptual point of view to present flexibility as a sub-value of sustainability. However, the fact that this has not come to pass does not constitute a fatal critique of a programme that predominantly wishes to provide guidelines for managers who need to take practical action. From a political perspective, there is a case for designating flexibility as a separate core value. After all, it is vitally important that those who have devised and are implementing the Delta Programme, of all people, feel very strongly about flexibility.

The core values as a "perspective"

This pragmatic approach crops up at several other locations. At the operational level, the core values have been elaborated into the so-called "Evaluation System".[124] In this system, they are referred to as a perspective. The *Evaluation System* implicitly shows that these values are not separate, independent criteria, but rather form some kind of formula for clustering some of the criteria already set down as a sub-set – with the aim of examining a measure or strategy from a particular point of view. A core value aggregates information from the (long and technical) list of criteria observed by managers, which makes it easier to verify how coherent and ambitious the plan submitted actually is in terms of sustainability, flexibility, and solidarity.

In actual practice, the *Evaluation System* sets out in advance which criteria correspond with which core value. In our opinion, this essay shows that, upon closer consideration, there is a certain arbitrariness to this arrangement. An example: in the actual practice of the Delta Programme, involving stakeholders in decision-making is scored under solidarity. Subsuming this criterion under the flexibility "perspective" would also be quite justifiable. After all, linking interests is an explicit element of flexible management; it renders a decision more robust. And is not involving stakeholders in decision-making a wonderful feat of sustainability in practice? Considering that it involves a discussion among representatives of the domains of *people* (groups of residents), *planet* (nature organisations), and *profit* (entrepreneurs).

Perhaps systematists may not like the phenomenon that a criterion might just as well be ranged under another perspective. But one could also claim that it is the "fluidity" of the criteria that points to practical cross-connections between the core values, which give the plans coherence.

Solidarity as a coordinate value

We have already seen that, from a conceptual perspective, flexibility is in fact a sub-value and actually an operationalisation of sustainability, which is crucial to the Delta Programme. Solidarity is slightly more difficult to place. In the above[125] we referred to "solidarity" as a directive value within the domain of people, and we designated that domain as the hub of the 3 P system that ensues from the term ''sustainability". Sustainability states that the overall system must be sufficiently stable. However, it is people who perceive stability (or, as the case may be, a crisis). And we only have (a measure of) control over the influence people exert over that overall system. So it is there, in the social domain, that action takes place. It is the locus of action, of responsibility, of vision, of politics.

Sustainability is a call for balance, for stability – nothing more, nothing less. Flexibility is a way to heed that call. Solidarity is co-determinative for what we actually wish to *name* an acceptable balance. In that sense, solidarity is the most political of the three values. In a democracy, we keep finding out what exactly this balance entails and requires of us. "Sustainability" is not a determining factor in this respect – it is decided by *us*, in mutual debate, in the public domain.[126] And in that public domain solidarity is a crucial, directive value. Under that heading, we determine who is expected to assist whom, if the 3 P system is off balance or threatens to become unstable. Ergo, solidarity is not subordinate to sustainability (or an aspect of a method

124 The *Evaluation System* is a set of criteria used as a basis for discussing a strategy within the Delta Programme. See Appendix IV for more details.

125 Viz., upon the introduction of the *people-planet-profit* model, see the first paragraph of the chapter on sustainability.

126 Or what the figure in the sub-essay on sustainability as a value refers to as the *social* sphere.

for achieving sustainability, such as flexibility), but rather coordinate to it. It is truly a different perspective from which to elucidate (water) plans.[127]

A future-based orientation as the main quality

All the same, sustainability, being the value that pertains to the *overall* system, does place solidarity as a value in a new light. This is mainly due to the long-term perspective that is so emphatically introduced by the sustainability value. This long timeline, and its attendant manifold uncertainties, (also) change our outlook on solidarity. Solidarity becomes dependent on factors that are shifting from a generic-fundamental to a conditional nature. The administration is entitled to ask the residents of our country to take (future) uncertainties into account if they wish to continue to lay claim to our solidarity. In concrete terms: if parties could have known they would get in a fix and nonetheless stubbornly continue to ignore that risk, then it is quite justifiable (and, in our opinion, inevitable in the long run) that we show less solidarity with them than we would with people who are suddenly struck by Fate. Time, knowledge, and options for action thus become factors that co-determine the nature and extent of solidarity. In the chapter on solidarity we have also demonstrated that situations change, and over time can swing back into another situation – with all the socio-political consequences this might entail. Compared to customary reflections on solidarity, future developments therefore play an important part in our analysis of solidarity.

All in all, working with a view to the (sometimes distant) future constitutes the most distinctive feature of the Delta Programme. For that reason, it will hardly come as a surprise that sustainability, flexibility, and solidarity as core values reinforce one another the most in the consideration of future generations. After all: sustainability means that we leave our environment behind in a state that allows those who follow us to live good lives as well, as the authoritative Brundtland report stated as early as in 1987, on the eve of the global sustainability philosophy. The link between sustainability and future generations is, therefore, quite strong from the outset. The Delta Programme explicitly urges us to show "solidarity" with future generations. And the implementation of the Delta Programme has clearly shown that this solidarity is best substantiated by bringing and maintaining the system up to standard, whilst making every effort to avoid "cutting off" paths that might be useful in the future. This is another way of stating that policy must be as "flexible" as possible. In order to enable the Dutch residents of the future to adapt the country to their own wishes and options. There is a lot more to say about the three core values and their (current and potential) interactions – but the time has come for us to put a stop to this essay. We hope to leave you with the conviction that the three core values have contributed to plotting a stable course amidst the profound and multifarious uncertainties with which climate change is facing the water domain.

Marjan Slob, Pieter Bloemen
September 2014

127 In other words: even apart from the profit and planet domains, solidarity *could* be a directive value that could serve as a basis for the assessment of (water) practices. Unlike flexibility, solidarity has been such a value since the beginning of our times. Flexibility could perhaps be a value, apart from sustainability, but actually is not. Furthermore, the arguments in favour of flexible management strongly ensue from the sustainability philosophy. This is not the case with the arguments for a solidary society (although these arguments are perfectly compatible with – and can even be underpinned by – the philosophy of sustainability).

Appendices

Appendix I: Solidarity

A. Philosophy of solidarity

A forgotten concept

"Solidarity" is an important and frequently employed word in the political arena. Remarkably, its use is far less widespread in philosophical circles: philosophers have not particularly contemplated or discussed the concept of "solidarity" at great length. In part, this can be explained by the relatively short history of the term. True, the Romans already observed the "obligatio in solidum", but this was solely within the context of (family) law.[128] The concept of solidarity did not find wider application until the end of the eighteenth century, as a way of bringing up mutual moral obligations between individuals in a society. This was a direct consequence of the French Revolution; in the course of the nineteenth century, the term "fraternity" in the battle cry "liberty, equality, fraternity" was increasingly understood as a call for "solidarity".

By that time, however, the philosophy of ethics had already bifurcated into two main movements: deontology and utilitarianism (see Appendix II). Although their rationales are quite different, these two theories share the starting point in their analyses: the autonomous individual, who purely on the basis of his humanity is deemed to command universal, inalienable rights. This leads to the following politico-philosophical key question: based on what arguments would an individual actually devolve part of his autonomy to the State? This line of thought does not quite align with the concept of solidarity, whose point of departure is, after all, "the group".[129] This is why solidarity is sometimes referred to as "the forgotten concept of the Age of Reason".

To scholars of the Enlightenment, solidarity constituted a problematic concept for two reasons. Firstly: the philosophers of western modernity were looking for maxims that would apply anytime and anywhere, i.e., irrespective of time and place. However, solidarity does not emanate a universal appeal; a person will (and is allowed to) feel less solidary with individuals who do not belong to his group.[130] This undermines the abstract ideal of equal treatment. Secondly: thinkers for whom the autonomy of the individual occupies centre stage tend to feel threatened by the idea that a group may claim the commitment of an individual by appealing to his solidarity. Their rather instinctive reaction is: "I cannot and must not be forced to do what others tell me to." That response precludes them from any serious exploration of the circumstances in which solidarity can thrive.

Solidarity: premises

Despite its meagre embedding in philosophy, the concept of "solidarity" has guided – and is still guiding – many people's actions in actual practice. Contemporary philosophers have acknowledged this and meanwhile have introduced some analytical structure into the concept. For example, they claim that "solidarity" is based on the following premises:[131]

128 It referred to the duty to foot the bill for the debts of relatives.

129 Cf. Richard Rorty: "(..) our sense of solidarity is strongest when those with whom solidarity is expressed are thought of as 'one of us', where 'us' means something smaller and more local than the human race." (191).

130 British philosopher Richard Hare justifies this as follows: suppose mothers would tend to concern themselves in equal measure with all the children in the world, then the children of the world would ultimately be far less well off than they are now. Ergo: obligations one does not feel at a universal level but only towards a limited group may add up to a better outcome for all, because they will result in a better overall level of care. However, this does not alter the fact that, according to the majority of philosophers, everyone has certain basic obligations towards any fellow human being, regardless of where and when.

131 This overview has been compiled on the basis of the work of the contemporary German philosopher Kurt Bayertz, see *Solidarität*.

1. A "solidary" group is inter-connected in an empirically demonstrable manner (e.g., through a shared history).
2. The interconnectivity between the members of a group is not just an objective fact, it is also perceived by the group members. In other words: they identify with the group.
3. This interconnectivity projects a normative charge; on the basis of this interconnectivity, the members of the group are allowed to expect solidary behaviour from one another.[132]
4. Members of the group are willing to help one another, and in their turn expect help if they are in trouble.[133]
5. An individual or sub-group may have bad luck and experience adversity, but will always attempt seriously and to the best of their ability to improve their own situation – i.e., refrain from transferring their responsibilities to other group members.

Please note that this is not a description of actual practice, but rather a description of the conditions under which solidarity can function. Solidarity can only exist if by far the majority of the group share and act upon these points of departure.

Enlightened self-interest

A term that frequently crops up in contemporary discussions on solidarity is "enlightened self-interest". Solidarity is interpreted here within a type of cooperative model: the group members join forces out of their conviction that they will then be better off than if they were to attempt to attain their goal as individuals. Collective insurances are based on this principle, and the first dykes that were built in the late Middle Ages are often regarded as a fine example of enlightened self-interest; the flood defences were too large, too difficult, and too expensive to be carried out by individual citizens, whereupon individuals joined forces with other stakeholders in the expectation that they would all be better off.

Regarded purely from the perspective of the cooperative model, "solidarity" presents itself as something conditional: participation and collaboration are useful, but once membership ceases to be in one's best interest, leaving the group would make more sense. However, the concept of "solidarity" entails more than the mere notion of "enlightened self-interest"; in addition, there is always an altruistic component to solidarity.[134] Based thereon, members of a group simply feel morally obliged to help people or parties that, for one reason or another, lose out. Calculation and the idea of compensation do not play a part. One helps because one feels part of a community. This community thus is not (or not just) an instrument for utility maximisation, but also has an intrinsic value to its members.[135] History makes it abundantly clear that altruistic behaviour is within people´s scope of action. At the same time, political movements clearly diverge with regard to the extent to which they dare or want to adopt altruistic behaviour as a point of departure. Will altruistic behaviour remain an exception, or will it turn out to be the rule if one manages to organise society in a certain way?

132 The nineteenth century French philosopher Ernest Renan states that solidarity is based on the sacrifices a group has made and will yet make. These sacrifices reinforce the group feeling, and in their turn render new sacrifices among group members more self-evident. A shared "history of sacrifices" can thus act as a flywheel to solidarity. The Dutch "battle against the water" fits in nicely with this model.

133 In principle, the help is reciprocal, and parties are equal – even though in actual practice the help provided by strong parties will be far greater and far more frequent than the help they receive. However, the inconceivability of a group member or sub-group ever being in a position to do something for another group member would, strictly speaking, constitute a dependency relation. In such cases, it would be more appropriate not to speak of solidarity, but rather of charity or care, for those in need. However, this distinction tends to be ignored in actual practice.

134 If that altruistic component is lacking, an appeal to solidarity will, strictly speaking, be superfluous. In such cases, a much more down-to-earth tone will suffice: informing and working out.

135 The distinction between cooperative and altruistic solidarity is derived from Eckart Voland (see *Solidarität*, p. 298). This distinction is intended in a purely analytical sense; in actual practice, these aspects of solidarity will co-exist.

Philosophical questions on solidarity

This essay serves a pragmatic objective: it aims to further reflections on solidarity within the Delta Programme. This does not call for overly theoretical exercises. Yet we would like to touch on some fundamental questions that may be asked about solidarity, because in times of scarcity these questions will often manifest themselves as political problems.

- Identification with a group is crucial to solidarity. This opens questions about the definition of the group. How elastic is this group? Who belong to the group and why?
- A group member's acknowledgement of a fellow group member's appeal to solidarity does not yet entail a specification of its practical ramifications. How far should he take his solidarity? To phrase it differently: when has he shown sufficient solidarity?
- Solidarity often occurs spontaneously in a *Gemeinschaft*; a comparatively small, well-organised group whose members know one another. In a *Gesellschaft*, i.e., a larger, more anonymous community, help is often not provided by acquaintances but rather by bureaucracy.[136] If organising solidarity becomes an official duty, the risk of the support for solidarity becoming undermined will grow. A considerable number of members of the community will perhaps not consent to the provision of help of their own free will and out of a perceived bond, but rather have the feeling that they are being forced to help out.
- In north-western Europe, certain solidary behaviour has become anchored in law.[137] To a certain extent, solidarity has thus been juridified, whilst the concept of solidarity has arisen, and functions in quite a different context. Although this has made solidary behaviour, in part, enforceable by law, speaking of a right to solidarity is not in the spirit of the concept. In the long run, juridifying solidarity may undermine the societal practice of solidarity, because it alienates citizens from a practice they perceive as enforced.

This is not the place to pursue these questions in greater depth. What these questions immediately make clear is that maintaining "solidarity" as a living and shared concept within a society requires attention, effort, and consultation.

136 The distinction between *Gemeinschaft* and *Gesellschaft*, and the comment that solidarity is in danger of becoming bureaucratised in a *Gesellschaft*, originates from Emile Durkheim, the founding father of sociology.

137 Examples include compulsory health insurance and the Water Act.

B. Movements in ethics

The philosophy of ethics is, in fact, a duality. In modern times, two modes of thought that still dominate moral debates have taken root: deontology and utilitarianism.

Deontology

Deontology ("the theory of moral obligation") is based on moral duties. An action is good if it ensues from the right principles and points of departure. The negative of this definition is actually more provocative: actions that do *not* ensue from the right points of departure are, by definition, bad – i.e., even if the outcome of those actions would be favourable. The "golden rule" of deontology reads: let all your actions be guided by codes of conduct you could want everyone to observe.

Immanuel Kant is the philosophic giant of deontology. In the twentieth century, the American Neo-Kantian John Rawls proposed an influential thought experiment in his wake. Rawls asks you to imagine that you are in the "original position": you are part of a society, yet unaware of the position you occupy within that society (i.e., you do not know your descent, gender, intelligence, state of health, *et cetera*). From behind this "veil of ignorance" you need to decide on the rules that will apply to your society. Because no-one knows how he could favour himself, these rules will be just. According to Rawls, we should always reason as if we were in the original position.

When applying this principle to flood risk management and freshwater supply, a deontologist will place strong emphasis on "equal treatment", i.e., an equal level of protection for everyone. Presumably, he or she will immediately want to raise the protection level for residents of sparsely populated dyke rings to the level of densely populated dyke rings.

Utilitarianism

According to a utilitarian, the action that yields the greatest well-being for everyone is the best action from a moral perspective. Unlike deontology, that takes its departure from intentions, utilitarianism therefore focuses on results. Utilitarians aim for the outcome that is conducive to the well-being of as many people as possible. The philosophical standard bearer of utilitarianism is John Stuart Mill.

With respect to flood risk management and freshwater supply, a utilitarian will opt for the investment yielding the optimum result. Although this does not hold any practical interpretation of "optimum", (can a highly cost-efficient solution in which one party will, unfortunately, sustain great loss be regarded as an optimum decision?), it is clear that not all the parties concerned may count on equal treatment here. Some members of the group will benefit more from an investment than others. However, public funds are spent efficiently, which is in everyone's best interest.

Note the highly utilitarian component to the formula that is well-known within the water world, "risk = probability x effect". As a matter of fact, the formula focuses on outcomes that actually protect residents of densely populated areas better than their peers in sparsely populated areas (after all, the *effect* of a flood or water shortage will be more serious in a densely populated area, which raises the risk, and which in its turn necessitates more stringent measures under the current policy practice).

Post-modern ethics

In response to deontology and utilitarianism which are the main movements in *modern* ethics, twentieth-century philosophers have devised *post-modern* ethics. The common denominator of post-modern ethics schools is that they have incorporated the influence of globalisation and emancipation movements. In the course of the twentieth century, the diversity and sometimes even opposition of the values and interests of various social groups and peoples could no longer be ignored.

Whereas theories of modern ethics take the "universal man" as the starting point for their reasoning and wish to disregard local circumstances, post-modern philosophers point out that this leaves the most urgent societal and political issues aside. This comes at a cost: post-modern philosophers can no longer pretend to formulate universal standards, i.e., guidelines for action that apply anywhere and anytime. Incidentally, this is good news for reflections on solidarity. After all, within post-modern ethics it is both acceptable and relevant to reflect on the proper course of action within a certain (historically and geographically limited) *group*.

Post-modern philosophers (Charles Taylor, Amitai Etzioni, Carol Gilligan, Richard Rorty) consider it a matter of course, and justifiable from an ethical perspective, that one feels more moral obligations towards a fellow group member than one does towards a stranger. The proper point of departure for moral action is of less concern to them. It is not about being able to provide good reasons for showing solidarity. It is about being sensitive enough to see where solidarity is called for. Someone who perceives such a need does not require any further reasons; that someone will be solidary and his actions will so demonstrate.

As regards the water world, this means a call to avoid getting bogged down in fundamental debates on solidarity. Post-modernists will always want to explore pragmatically what a good, solidary solution would be in each given case, in so doing expressly offering room for the various values and interests of group members.

C. Solidarity in diagram

The more we learn about uncertainties, the more we learn about the types of risks that groups or group members run. Can the risks be avoided or mitigated by taking action, or will damage be inevitable? To a substantial extent, the answer to this question determines which type of solidarity is proper and appropriate. Below we will give a brief overview of the dynamics of solidarity over time:

- *The members of a group are overtaken by a disaster no-one had foreseen. They spontaneously hasten to help one another.*

  Situation: Fate. Appropriate form of solidarity: (ad-hoc) altruistic solidarity.

- *Group members are at risk, but no-one knows where the risks will hit, nor how they can defend themselves. The group is aware of its vulnerability.*

  Situation: Fate after the initial stage. Appropriate form of solidarity: cooperative solidarity.

- *A pattern starts to emerge: some group members run more of a risk than others, without any options for the extra vulnerable group members to (already) offer resistance.*

  Situation: running risks. Appropriate form of solidarity: (systematic) altruistic solidarity.

- *The knowledge about risks increases. The chances of fortune or misfortune are distributed unevenly across the group members. The options for adaptation increase.*

  Situation: gradually changing from running risks to manipulable. Appropriate form of solidarity: from (systematic) altruistic solidarity to juridified solidarity. The aid also gradually changes in nature: emergency relief changes into empowering (the group helps its vulnerable members realise options for adaptation).

- *The knowledge about risks increases; group members are unevenly affected by the risks. Some group members who run relatively great risk nonetheless refrain from action. For example, they continue their business year after year in a high-risk sector, or continue to live in a high-risk location.*

  Situation: gradually changing from running risks to taking risks. The appropriate form of solidarity also changes: the initial (systematic) altruistic solidarity gradually diminishes, until solidarity ultimately ceases.

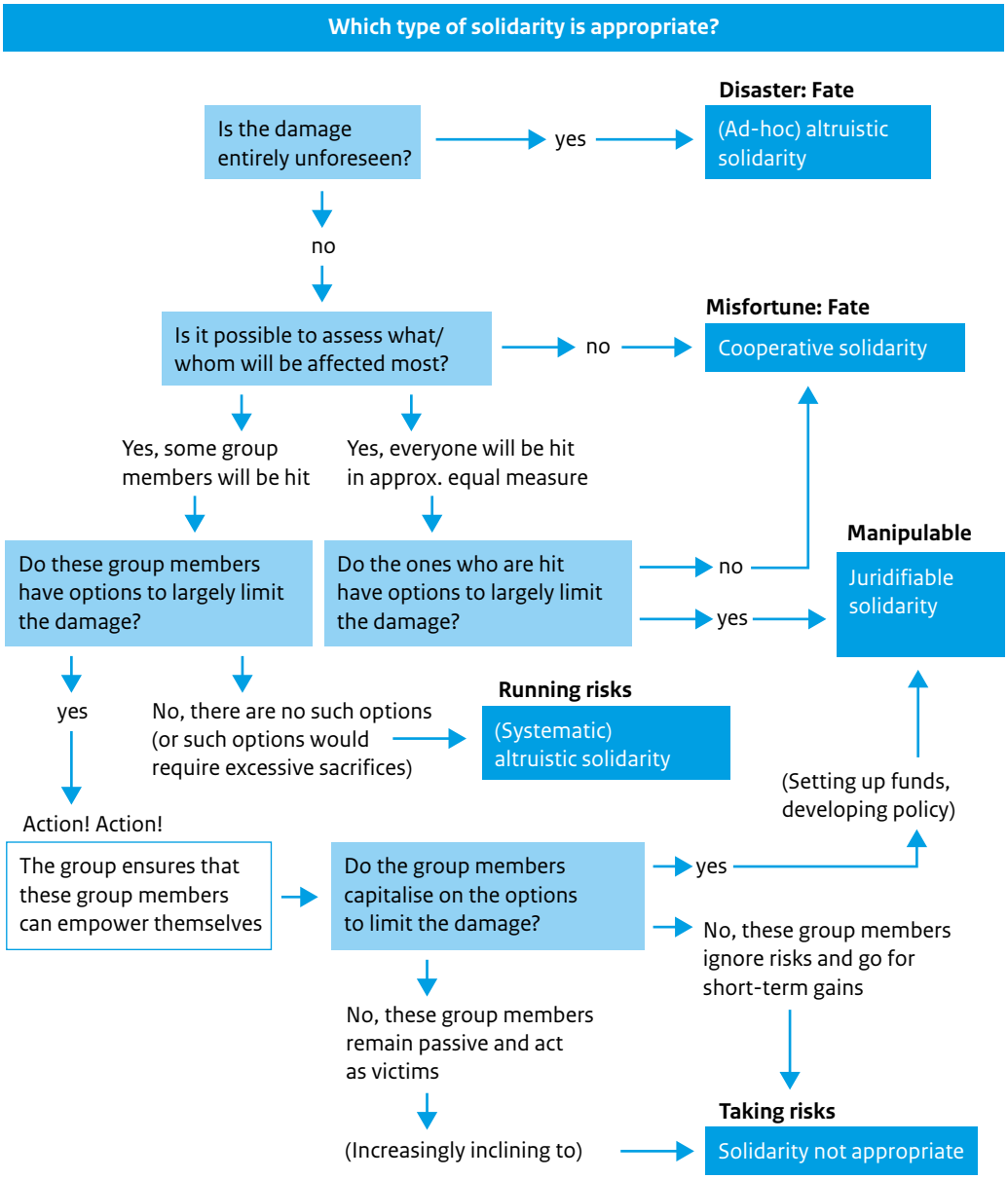
- *The knowledge about risks increases. Some group members take action that wittingly renders them extra vulnerable to certain risks.*

  Situation: taking risks. Appropriate form of solidarity: none. These group members sponge off a system of solidarity; if the group shows solidarity with these group members, the system will erode.

- *The knowledge about risks increases. The chances of fortune or misfortune are distributed fairly evenly across the group members. The options for adaptation increase.*

  Situation: gradually changing from Fate to manipulable. Appropriate form of solidarity: from altruistic solidarity to juridified solidarity. The help gradually changes in nature: emergency relief changes to empowerment. Group members who do not avail themselves of this "help to help oneself" forfeit their claim to solidarity.

- *There is a great deal of knowledge about the risks. The chances of fortune or misfortune are (perceived to be) distributed fairly evenly across the group members. There are considerable options for adaptation.*
  Situation: manipulable. Appropriate form of solidarity: juridified solidarity (solidarity that has been formalised into procedures, contracts, and laws; non-observance of the agreements carries a penalty).



Appendix II: Flexibility

Terminology

Complexity

A complex issue involves multiple factors that, additionally, may also interact. Complexity is unrelated to uncertainty: a highly complex sum may have a fixed, particular, certain outcome.

Risk

Risk means that there is a chance of an undesirable outcome. Risks too are unrelated to uncertainties: jumping from a roof is quite risky. The chances of a particular, undesirable outcome can frequently yet not always be quantified.

Uncertainty

Uncertainty refers to a form of abeyance. Risks do not need to be uncertain, nor do uncertainties necessarily entail risk (the number of galaxies in the Milky Way is uncertain, but this does not constitute a dangerous lack of knowledge). Scientific literature features finely meshed distinctions between forms of abeyance; their terminology is not yet unequivocal.[138] An initial, rough division is the one between technical uncertainties (measuring errors, uncertainty regarding the degree of accuracy, statistical uncertainty) and "profound" uncertainties. Profound uncertainties may ensue from a lack of insight into reality (there is doubt as to the scientific models), but also from reality itself (it involves chaotic processes that are fundamentally unpredictable).

A separate category is normative uncertainty. In this case, there is no consensus on the proper weighing of the values, interests, desirabilities, and undesirabilities at stake. This creates uncertainty about what is to be deemed "proper" policy – even if the description of the problem for which policy needs to be developed is perfectly lucid, and even if the result of a particular policy can be fully predicted.

A policy field may comprise multiple forms of uncertainties at the same time. Climate issues involve many types of uncertainties, including normative ones. The nature and scope of the uncertainties differ from one sub-field to the next. For example, although there is considerable technical and profound uncertainty regarding the degree to which the sea level will rise, there is no normative uncertainty regarding the premise that the population must be protected from dyke failures. The degree to which rivers need to be given more room involves more normative uncertainty (i.e.,: differences of opinion).

Policy issues relating to climate change are frequently complex, risky, and uncertain all at once. The great challenge facing policy preparers and politicians is to develop policy that properly accommodates such complex, uncertain risks.

Adaptation

In this context, adaptation means: gearing the Netherlands to the consequences of climate change. Whereas mitigation policy attempts to temper climate change, adaptation policy accepts the consequences of climate change as a *fait accompli*. It subsequently focuses on the policy question of what measures the Netherlands needs to take in order to prepare for climate changes. Such measures may be physical (building houses that will float and rise along with the water level; allowing rivers room for overflowing periodically), but also administrative (compiling strict contingency plans, assigning responsibilities to parties wishing to construct in deep polders). Adaptation policy in itself does not say anything about the administrative style; this may be highly directive and "top-down", or contrarily, may set great store by looking for support among

138 Theory about types of uncertainties features particularly in two of the reports studied for this essay, viz. *Uncertainty and Climate Change Adaptation* (see, for example, the table on p. 60, relating policy strategies to types of uncertainties) and *Omgaan met onzekerheid in beleid* [Dealing with uncertainty in policy] (p. 17 features an "uncertainty matrix").

a host of societal actors. In this article, *adaptive* policy refers to the flexible policy by which administrators attempt to attain "adaptation" as a policy objective.

Flexible policy / adaptive policy

Pursuing flexible policy is an answer to the paradoxical situation that climate change necessitates looking (far) ahead, yet at the same time renders impossible nailing down that ultimate image on account of the great uncertainties regarding the expected developments and the associated risks. Flexible policy involves clearly setting down the ultimate goal in terms of preconditions for the desired situation with respect to flood risk management and the freshwater supply, while the course to be taken basically remains open to adjustment. This enables policy-makers to continually respond to changing insights, new developments, technical innovations, and shifting social relations.
Adaptive policy is flexible, and consciously creates room for gradually incorporating new information and new insights. Such policy is yet experimental, but perceived to hold great promise in situations involving uncertain risks.

Robust

A system is robust if it is not easily disrupted. A robust measure is a measure that holds out in all conceivable future scenarios. However, robust measures are not necessarily optimal.

Resilience

Resilience is a key characteristic of climate-proof spaces. It features three components or stages: *resistance* (against change, commensurable with robustness), *restorative resilience* (approximates to elasticity: after a change in circumstances, a system quickly switches back to normal operation), and *adaptive resilience*, a system's ability to re-organise itself, whereby the system continues to operate the same way but may change in physical terms. The latter ability reduces the system's susceptibility to long-term changes, and thus provides a much more dynamic understanding of the situation.[139]

No-regret measure

A "no-regret measure" forms part of desirable policy in any conceivable future situation. Therefore, such a measure is always appropriate. Presumably, however, there are no policy fields in which merely "no-regret measures" will suffice. Administrators who attempt to adapt the country to climate change will definitely need to venture beyond the no-regret zone.

139 Cf. Gersonius: "Managing resilience is about how to keep changing so as to keep functioning in the same way – it is not about staying the same." *An assessment of flood resilience using a model to build and value managed adaptive responses to changes in flood risk*, p. 3.

Appendix III: Passage about core values in the National Water Plan 2009-2015

(From: National Water Plan 2009-2015, p. 16)

Core values and premises

Solidarity, flexibility and sustainability are core values that are pursued, in broad terms, in water policy. These values govern the manner of organisation and collaboration in water management. Solidarity is reflected in the manner of funding and the prevention of responsibilities being shifted. Flexibility is required in order to be able to move along with, i.a., developments in spatial planning and climate change. The final core value is sustainability. This is substantiated by seeking considerable local commitment to and improvement of the quality of the living environment in the selection and elaboration of all goals and measures ("people"), improving the quality of eco systems ("planet"), and creating opportunities for the business community ("profit"). Rendering these values explicit is of particular importance with respect to the development of the Delta Programme. The core values indicate how the organisations involved in the Delta Programme intend to proceed in their substantive elaboration of their goals. In addition to the core values, water policy features a number of premises that are given additional impetus with the introduction of the Delta Programme. These premises involve interconnectivity, consistency, and transparency. They enable control at the programme level. By defining and safeguarding unequivocal points of departure, the aggregate activities are forged into a logical whole, which fosters the efficiency and recognisability of the Delta Programme. Appendix I contains a brief description of the core values and premises. These will be elaborated further and rendered operational during the planning period.

(From National Water Plan 2009-2015, pp. 263-266)

Core values and premises of the Delta Programme

Core values

The core values are the "shared values" of the organisations involved in the Delta Programme: values that mutually bind the parties, values whose importance is beyond dispute – but that are not automatically reflected in the implementation phase of projects. They may serve as a beacon for the many choices that need to be made when going through the process from an initial exploration to the realisation of major works.

How is the reflection of the core values safeguarded?

In order to monitor the extent to which the core values are reflected in the various phases – and wherever necessary demand attention for potential adjustments – the final reports on the exploration and plan elaboration phases will be assessed in this regard, as will plans for the large-scale Delta projects commissioned by the Minister responsible. The assessment will be carried out prior to awarding the contract (for the planning, elaboration, and realisation phases), and prior to funding decrees. The assessment will tie in with "regular assessments" wherever possible. Example: in the event of explorations with a framework vision status, a significant part of the assessment could take place on the basis of the Environmental Impact Assessment required for framework visions.

Solidarity

Within the context of the Delta Programme, "solidarity" as a core value has been substantiated as follows:

- minimum shifting of responsibilities to the future (solidarity with future generations),
- minimum shifting of responsibilities to the surrounding area (solidarity with contiguous areas),
- prioritising measures based on the national optimum (solidarity among parts of the Netherlands),
- national funding of measures of national importance (safety as a collective good, solidarity among elevated and low-lying parts of the country).

The choice for (this substantiation of) solidarity as a core value implies:
- that external costs are mapped out systematically and subsequently internalised; this applies to spatial developments such as the construction of houses and industrial estates, but also to interventions in the fields of flood risk management and freshwater supply;
- that the unanimity which the Delta Programme requires of all the regions in tackling major water taskings does not mean that in terms of content the programme can be the sum of regional wishes; the regions are asked to be sympathetic towards situations in which national interests demand prioritising or delay;
- that the aim is, on the one hand, for each area and each generation to resolve its own issues (minimum shifting), and, on the other hand, that support is provided wherever this ambition turns out not to be feasible.

Flexibility
The core of the adaptation tasking is anticipation, but changing insights (for example, as regards the pace at which the climate is changing), socio-economic and demographic trends, the advent of innovative methods to overcome problems, and changing societal views on flood risk management and freshwater supply must be able to be accommodated in the course steered by the Delta Programme. In other words: looking far ahead is crucial, but must not be translated into an ultimate image nailed to the distant horizon. The sub-programmes have been designed in such a manner as to allow continuous adjustment of the set-up and scheduling of the Delta projects.

Within the Delta Programme, flexibility as a core value has been elaborated as follows:

Procedural aspects
- The processes that have been or will be initiated in the generic and area-based sub-programmes can quickly and simply be adapted to new circumstances (such as re-prioritising within or among sub-programmes), insights (such as new climate scenarios), or opportunities (such as linkage with other spatial developments or policy ambitions);
- The time scheduling of sub-programmes and projects provides scope for the application of innovative methods and technologies;
- The set-up of the area-based sub-programmes factors in an adjustment of measures necessitated by the outcomes of the generic sub-programmes (new safety standards, adapted policy regarding freshwater supply, new insights into the role of climate change in location choices, and the design of urban areas).

Substantive aspects
- In the dimensioning, design, and scheduling of Delta projects, allowances are made for possible future adjustments (adjustments whose necessity cannot yet be positively established, or whose implementation would currently not be cost-effective);
- The substantive points of departure (climate scenarios, SCBA indicators, et cetera) are periodically reviewed (e.g., every six years).

The choice for (this substantiation of) flexibility as a core value implies:
- Confidence in the problem-solving ability of future generations. Wherever possible, we are currently investing in the flood risk management and freshwater supply of the future, yet we are consciously choosing not to work with blueprints we will be committed to for many decades. We are explicitly building in room for adjustments based on expanding insights. Regional agendas, plans of approach et cetera direct the processes, yet refrain from setting down more than is necessary for an adequate implementation of selected measures, and for securing sufficient room for future choices;
- A collaborative has been set up that will be mandated, on the basis of its own research and international peer reviews, to come up with proposals for periodical updates (e.g., every six years) of indicators, methods and guidelines (such as have been set down according to the OEI [Economic Impact on Infrastructure Research Programme] guidelines for dry infrastructure);

- The developments relevant to the Delta Programme are monitored, as are the results attained by the various sub-programmes. The outcomes will be taken into account in the annual review of the Delta Programme;
- The plans of approach for the area-based sub-programmes indicate how the results of the generic sub-programmes – Flood risk management, Freshwater supply, and New urban development & Restructuring – will be translated into adjustment of the ambitions and projects (in terms of content, procedures, and scheduling).

Sustainability
The sub-programmes and Delta projects are designed in a sustainable manner. With respect to the "planet" component of sustainability, this entails that the Delta projects are set up in such a manner as to ensure, both in their implementation (short term), and in their maintenance and management (medium and long term):
- an efficient use of water, energy, and other resources;
- maintenance or improvement of the quality of the living environment and eco systems;
- the use of natural processes wherever possible.

In addition, the sub-programmes are organised (with a view to the "people" component of sustainability) in such a manner as to ensure that:
- local commitment of citizens and civic society organisations to the goals and activities of the Delta Programme is actively pursued, expanded where necessary, and utilised in the design and implementation of the measures;
- unrest in an area is minimised, among other ways by striving to concentrate interventions within a specific period of time.

With a view to the "profit" component, finally:
- opportunities for the local business community are taken into account in the choice and elaboration of measures;
- in the facilitation, promotion, and application of innovation, opportunities for the international profiling of the Netherlands – and the Dutch business community – are taken into account.

The choice for (this substantiation of) sustainability as a core value implies:
- an important role for design, both in terms of the dimensioning and set-up of a Delta project, and in terms of its incorporation into the local environment;
- that insight is provided into how the impact of climate change on the long-term development of management and maintenance costs is accommodated in the design of the Delta project;
- that the contribution of the Delta project to the preservation or improvement of the quality of the living environment and eco systems is outlined *ex ante*;
- that a certain degree of stability is provided in the Delta Programme, in order to avoid regions continuously having to deal with other (plans for) measures resulting from new insights;
- that the design of the innovation aspect of the Delta Programme is coordinated with the (internationally operating) business community.

Premises
The premises enable control at the programme level. By defining and safeguarding unequivocal points of departure, the aggregate activities are forged into a logical whole, which fosters the efficiency and recognisability of the Delta Programme. The premises are particularly directive with respect to the processes within and around the Delta Programme. They are monitored by the Delta Programme Commissioner.

Interconnectivity
The following types of substantive interconnectivity are significant at the programme level:
- Physical interconnectivity: a decision in one area or policy field has physical consequences (for example, through the main water system) for another area or policy field;

- Temporal interconnectivity: a certain measure can only be taken after other measures (for example, in downstream areas) have been taken. From the national level perspective, certain decisions or projects may need to be given priority in time over others;
- Interconnectivity in costs: local or regional interventions may push up the costs of interventions in other parts of the country.

There are various reasons for pursuing interconnectivity in the development and implementation of plans. The following reasons may be used as a checklist for ensuring interconnectivity in terms of procedures when setting up a sub-programme:

- Politico-administrative interconnectivity. Linking activities generates a total package that is acceptable to the various actors. "Package deals" are likely to garner support, which increases the chance of a timely realisation;
- Synergy in policy. Integrated scheduling/implementation may entail greater benefits for society than separate scheduling/implementation. This requires particular attention if plans are at odds with one another;
- Legal interconnectivity. Rules and regulations, such as obligatory compensation, may require additional measures to be taken;
- Financial/economic interconnectivity. Linkage may be useful or necessary because of subsidy constructions, funding constructions, settlements and the like;
- Technical interconnectivity. Combining measures may enhance the cost-effectiveness of the projects and reduce unrest in an area (win-win situation).

Consistency

Two types of consistency are distinguished in the Delta Programme.

- Substantive consistency is achieved by making prior agreements regarding the use of data, calculation methods, and models. For the time being, this would involve the following considerations (list is non-exhaustive):
- Forecasts regarding climate changes deemed likely will be based on scenarios developed by the Royal Netherlands Meteorological Institute KNMI. These will be re-confirmed or adjusted periodically (e.g., every six years);
- Assessments regarding extremes in the rate at which the climate could change in the century ahead will be based on a single method, to be set down jointly;
- A single set of indicators and calculation models, adjusted periodically, will be used for all assessments such as Social Cost-Benefit Analyses;
- Demographic and socio-economic forecasts will be based on the Welfare and Living Environment scenarios of the Netherlands Bureau for Economic Policy Analysis CPB, to be updated periodically;
- The aim is to use a single method and a single set of model instruments as the basis for hydrological calculations involving the main water system underpinning all the measures in all the sub-programmes, with effect from 2015.

Procedural consistency is achieved by opting for a certain univocality in the Delta Programme with respect to the organisation and working methods of the various sub-programmes (process architecture). This involves, for example (list is non-exhaustive):

- For each sub-programme, contracts are awarded by the Minister responsible. There is an administrative organisation in place focused on an effective interaction between the region and the State. Arrangements have been made for proper societal participation. A programme organisation has been set up that initially focuses mainly on explorations and that is preferably composed of representatives from municipalities, district water boards, provinces, and the State;
- The terms of reference and the action plan drawn up for each sub-programme are in line with the design brief set down beforehand;
- With respect to the working methods adopted in the Delta Programme, all the implementation-related activities and construction projects will be based on the MIRT framework. Furthermore, the *Sneller en Beter* [Faster and Better] method (follow-up to the Elverding Committee) will be used across the entire Delta Programme.

Transparency
Maximum transparency is pursued in the Delta Programme, in terms of the structure of the programme (its set-up), the manner in which it is directed (how decisions are made), and its progress (the results that are attained). Elements from the Delta Programme that need to foster transparency are, i.a. (list is non-exhaustive):

- the progress of the various sub-programmes and Delta projects can be followed on the Delta Programme website;
- the Delta Programme uses the joint fact-finding concept as a method for knowledge development, whereby new insights and a common set of methods, guidelines, and standards are jointly developed in a manner transparent to all the parties involved;
- insight into the extent to which Delta projects contribute to achieving the programme goals is provided in a manner comprehensible and accessible to everyone.

Appendix IV: Operationalisation of the core values within the Delta Programme

1 General

The core values of solidarity, flexibility, and sustainability are the "shared values" of the organisations involved in the Delta Programme, as stipulated by the *National Water Plan 2009-2015*. These values serve as a beacon in the choices the parties will have to face. However, the *National Water Plan* already anticipates that their reflection in the implementation phase is not simply a matter of course.

In fact, these core values have become increasingly calibrated over the years: how can they be used to arrive at a well-considered manner of water management and spatial planning that integrally interconnects the short term and the long term? Although the core values have suggested a path, a direction, their specific meaning had not been established beforehand. Our comprehension of these values is gradually expanding.

In that sense, too, the Delta Programme is not a blueprint but rather an opening to an iterative process: step by step, we are gaining more insight into what the realisation of the vision entails. Concrete plans may be adjusted, if there is a case to be made for the adjusted plan actually chiming better with the original vision. Such a review is not regarded as failure or a setback. On the contrary: being receptive to the "feedback of reality" and learning from it for the benefit of the Delta Programme is deemed a virtue. This receptiveness to clarification and deepening also extends to the calibration of the core values. Therefore the fact that their calibration is fairly loose and their meaning fluctuates does not necessarily constitute a weakness. It rather indicates that the participants in the Delta Programme realise that they form part of a search process.

Reflection at two levels
The reflection of the core values has been secured at the overall level of the Delta Programme, in its structure and in its decision-making process, and at the strategic level in the manner in which the strategies are developed, outlined, and selected.

In the context of the Delta Programme, a strategy comprises a goal, measures, and a timeline. In many cases, the inherent degree of solidarity, flexibility, and sustainability of a measure cannot be determined in unequivocal terms. The same applies to the system whose nature is affected by that measure, and to the process in which all consecutive interventions have been embedded. The implementation of the core values primarily requires an obligation to make best efforts – the values may play a particularly directive role in the designing of strategies and options for Delta Decisions. Periodic reflections – both during the strategy track and during the development of the cohesive proposal for the five Delta Decisions – have kept the core values alive and allowed a joint exploration of meaningful substantiations.

DP 2015 outlines the proposals for the Delta Decisions and the associated preferential strategies. Their underpinning has been explained in the Synthesis documents drawn up by the managers of the Delta Programme sub-programmes. These documents have been published as Appendices to *DP 2015*.

2 Reflection of the core values at the overall level of the Delta Programme

A. Solidarity at the overall level of the Delta Programme

In the context of the Delta Programme, "solidarity" is understood to mean (*NWP 2009-2015*):

- minimum shifting of responsibilities to the future (solidarity with future generations);
- minimum shifting of responsibilities to the surrounding area (solidarity with contiguous areas);
- prioritising measures based on the national optimum (solidarity among parts of the Netherlands);
- national funding of measures of national importance (safety as a collective good, solidarity among elevated and low-lying parts of the country).

These four aspects are reflected in various ways in the overall set-up of the Delta Programme, and in the manner in which decisions are prepared.

At the programme level, the structure and working methods of the Delta Programme contribute to the substantiation of solidarity as a core value, in the sense that all the parties involved jointly develop and select strategies, and formulate a proposal for the five Delta Decisions. All the parties are heard and have access to decision-making. Focusing in on the four aspects identified in the *NWP* generates the following picture.

Minimum shifting of responsibilities to the future (solidarity with future generations)
The Delta Programme is investing now in order to preclude problems in the future, and to create opportunities in the fields of flood risk management and freshwater management. On the basis of the knowledge available at present, the current generation anticipates climatological and socio-economic developments to the best of its ability, by making targeted investments and pursuing well-considered policy. Solidarity with future generations is thus implicit at the heart of the Delta Programme.

Minimum shifting of responsibilities to the surrounding area (solidarity with contiguous areas)
At the scale level of the overall Delta Programme, the "contiguous areas" are Germany and Belgium. At this level, shifting of responsibilities is not an issue on account of the downstream location of the Netherlands.

Prioritising measures based on the national optimum (solidarity among parts of the Netherlands)
The unanimity which the Delta Programme requires of all the regions in tackling major water taskings does not mean that in terms of content the programme can be the sum of regional wishes. The regions are asked to be sympathetic towards situations in which national interests demand prioritising or delay. Wherever possible and cost-efficient, major differences in the spread of pluses and minuses will be mitigated or compensated. The cost and benefits of sweeping measures involving the main water system (such as any changes in the discharge distribution) will be portrayed by means of a cost-effectiveness analysis or a cost-benefit analysis.

National funding of measures of national importance (safety as a collective good, solidarity among elevated and low-lying parts of the country)
Under the Water Act, funding the improvement of primary flood defences is incumbent upon the State and the district water boards. The State carries out this task through the Delta Fund, the financial foundation of the Delta Programme. Part of the budget is earmarked for the flood protection measures implemented by the district water boards. In accordance with the National Administrative Agreement on Water, the district water boards bear the other half of these costs. The experiment clause has been incorporated into the Delta Act for the purpose of realising integrated solutions under the Delta Act. Wherever taskings related to flood risk management and freshwater supply tie in with area developments, part of the cost is borne by the provinces (e.g., Ooijen-Wanssum, IJssel Delta-South, WaalWeelde). Civic society organisations may also contribute to the cost (e.g., Oesterdam).

As outlined above, the latter two aspects, "prioritising measures based on the national optimum" and "national funding of measures of national importance" have been secured at the Delta Programme level. As they do not constitute distinctive features of individual strategies developed by sub-programmes, they are not reflected at that level.

B. Flexibility at the overall level of the Delta Programme

"Looking far ahead is crucial but must not be translated into an ultimate image nailed to the distant horizon" (*NWP 2009-2015*). In other words, new insights and current developments must be able to be accommodated in the course steered by the Delta Programme.

At the overall level of the Delta Programme, this core value is substantiated by the implementation of adaptive delta management in formulating possible solutions: phased decision-making, making explicit and transparent allowances for uncertain long-term developments. Adaptive delta management fosters an integrated approach to taskings, and reduces the risk of over-investing or under-investing in future flood risk management and freshwater supply. Key premises in adaptive delta management are (*DP 2013*):

- linking short-term decisions in the broad spatial and water domain to long-term taskings in the fields of flood risk management and freshwater supply;
- working with multiple strategies that allow moving from one strategy to another (adaptation paths);
- incorporating flexibility into possible solutions (where effective);
- interlinking various investment agendas.

This presupposes confidence in the problem-solving ability of future generations. Wherever necessary, the Delta Programme is currently investing in the flood risk management and freshwater supply of the future, but it is consciously choosing not to work with blueprints it will be committed to for many decades. Room for adjustments based on expanding insights is explicitly built in. Regional agendas, plans of approach *et cetera* direct the processes, yet refrain from setting down more than is necessary for an adequate and energetic implementation of selected measures, and for securing sufficient room for future choices.

In addition, flexibility is substantiated at the overall level of the Delta Programme by making allowances for possible future adjustments in the dimensioning, design, and scheduling of measures (implementation projects or policy choices) – adjustments whose necessity cannot yet be positively established, or whose implementation would currently not be cost-effective.

Finally, the substantive points of departure (such as scenarios for socio-economic development and climate change) are periodically reviewed, whilst developments relevant to the course of the Delta Programme are monitored, as are the effects of the implemented measures.

C. Sustainability at the overall level of the Delta Programme

With its attention to the long-term and integrated approach, the Delta Programme can be regarded as an investment in a sustainable water and spatial planning system.

At the overall level of the Delta Programme, sustainability recurs in a range of ways – in terms of both processes and content.

The inter-administrative nature of the Delta Programme entails that all tiers of the government are actively involved in the development and selection of strategies and options for Delta Decisions. Civic society organisations are also structurally included in the decision-making process – at the national level (e.g., through consultative bodies for Infrastructure and the Environment) and at the individual sub-programme level. This precludes "monomaniac" reasoning and decision-making; each consideration takes account of all the interests – in the light of *people, planet, and profit*.

Sustainability plays a key role in terms of content too. The method employed by the Delta Programme in its strategy track, viz. adaptive delta management, has connected ambitions in other policy fields (Nature, shipping, agriculture, recreation) with a systematic place in the strategy development process.

In an indirect sense, the other core values also contribute to possible sustainable solutions. We have already mentioned the connection to solidarity with future generations. Creativity and learning capacity are increasingly regarded as preconditions for the long-term tenability of systems (*De Energieke Samenleving* [The energetic society], PBL 2012). Flexibility as a core value strives to ensure that the preconditions for creativity and learning capacity (viz. the possibility of interim adjustments) are up to par.

Last but not least, an Environmental Impact Assessment plan has been drawn up for the purpose of the *Interim Amendment of the National Water Plan* – in which decisions regarding strategies and the Delta Decisions are set down.

3 Reflection of the core values at the strategies and Delta Decisions level

Three phases and associated instruments

Three phases can be distinguished in the reflection of the core values at the strategy level:

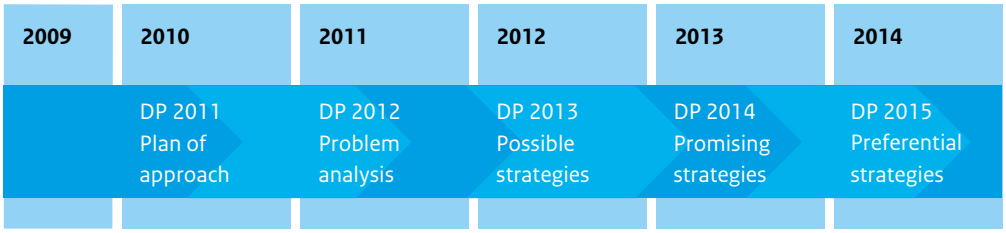
- Developing strategies. The Delta Studio plays a key role in this phase. Delta Studio meetings conduct research in design, and explore how various spatial developments, trends in the use of water, ambitions in other policy fields, and interventions in the water system may be combined.
- Outlining and selecting strategies. The Delta Programme Evaluation System is leading in this regard. It indicates what information is deemed relevant in the discussion of strategies (*inter alia* by means of a list of criteria).
- Deciding on concrete measures (projects or policy adjustments). In addition to the *Evaluation System*, policy instruments such as CBA indicators, CEA, and SCBA also play an important part.

The Evaluation System

On the road to a cohesive proposal for the Delta Decisions and the associated area-based preferential strategies, the managers of the nine sub-programmes[140] wish to give regular account (as does the Delta Programme Commissioner himself). In order to provide them with some structure, and ensure that the sub-programmes work to approximately the same criteria, the premises of the Delta Programme have been elaborated and concretised at an early stage into the so-called "Evaluation System".

The system has been set up to provide optimum substantive support for the convergence process from possible to promising and preferential strategies.

140 The Delta Programme comprises three generic sub-programmes (Safety; Freshwater; New Urban Development and Restructuring), and six area-based sub-programmes (Rhine Estuary-Drechtsteden; Southwest Delta; IJsselmeer Region; Rivers; Coast; Wadden Region). The *Evaluation System* only applies to the area-based sub-programmes.



As its role changes from one phase to the next, the *Evaluation System* itself also evolves. In the possible strategies phase, the *Evaluation System* features as a checklist, in the promising strategies phase it guides the discussions, and in the preferential strategies phase it serves as a founding framework. In parallel, the main assessment criteria are also expanded. The possible strategies phase involves only the first two main criteria (1. scope of flood risk management, and 2. scope of freshwater supply). Subsequently, main criterion 3 (side effects and opportunities) roughly comes into play, where possible followed by main criterion 5 (cost). In the preferential strategies phase, the last remaining main criterion is involved in the process, criterion no. 4 (feasibility); the *Evaluation System* is then implemented across its entire scope.

Version 1 of the *Evaluation System* saw the light in March 2012 (intended for the possible strategies phase).[141] The purpose of the *Evaluation System* is "to ensure that, at any time during the decision-making process, appropriate information is available for making comparative assessments".[142] To that end, the *Evaluation System* "maps out the effects of various possible strategies in a manner enabling a consistent comparison between those strategies".

This should facilitate the combination of (elements of) strategies in actual practice. In the Evaluation System, each criterion is scored with pluses or minuses, along with a brief explanation. In some cases, this is based on quantitative model calculations. The ultimate "scores" are always established via expert meetings.

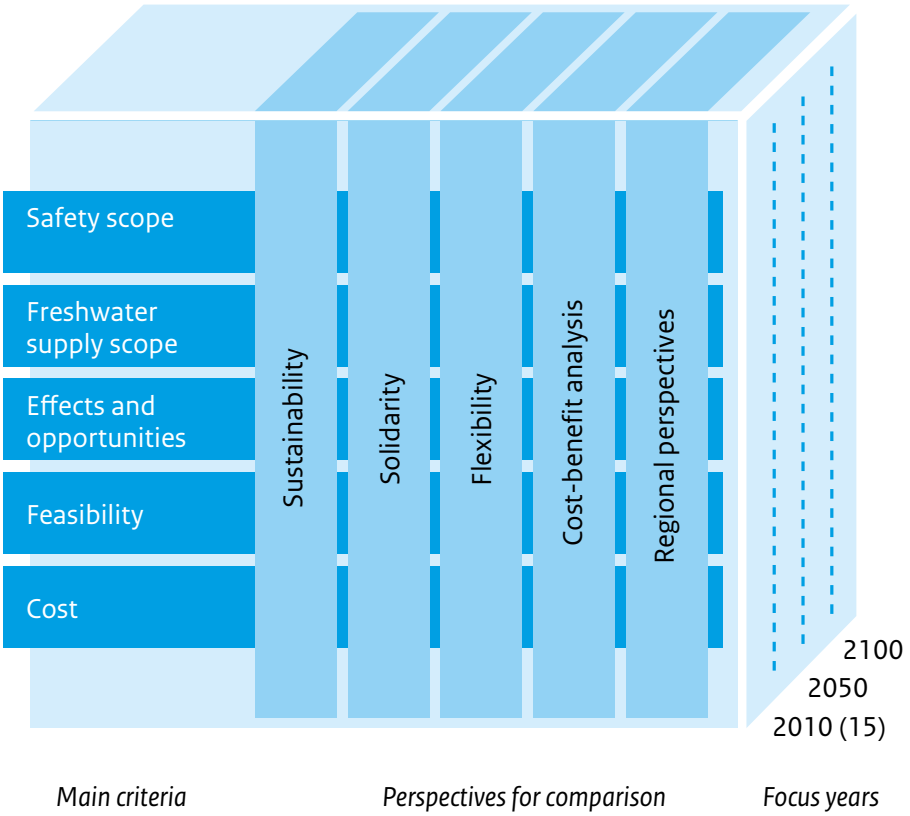
The further assessment of the relative importance of the criteria is (obviously) up to administrators and politicians. The object of the *Evaluation System* is, therefore, to help decision-makers determine the desired balance between the criteria. The structure of the *Evaluation System* can best be described by the three-dimensional figure below.[143]

141 *Vergelijkingssystematiek Deltaprogramma: structuur, inrichting en gebruik, versie 1.0.* [Delta Programme Evaluation System: structure, organisation, and use, Version 1.0], Staff of the Delta Programme Commissioner, 9 March 2012. http://www.royalhaskoningsmc.com/nl-nl/Nieuws/Documents/Vergelijkingssystematiek%20Deltaprogramma%20-%20versie%201%200%20-%2024%20januari%202012.pdf.

142 *Partiële herziening Nationaal Waterplan / Deltaprogramma 2015: concept-notitie reikwijdte en detailniveau milieueffectonderzoek* [Partial revision of National Water Plan / Delta Programme 2015: draft memorandum on scope and level of detail, environmental impact assessment].

143 *Vergelijkingssystematiek Deltaprogramma* [Delta Programme Evaluation System], op.cit. p. iii. A strategy is described as a coherent aggregate of goals, measures, and timeframes. (p. 13).

Main structure of the Evaluation System



The Evaluation System contributes to directing the chosen strategies towards the core values, at least where the long run is concerned.[144] This is achieved by scoring the expected effects of a strategy under consideration on the basis of a fixed set of criteria (the dark blue horizontal bars) and perspectives for comparison (the light blue vertical bars). As the figure shows, the core values have been incorporated into the so-called (light blue) "perspectives for comparison" of this system. The other two perspectives for comparison are the regional perspective and the cost-benefit ratio.

A perspective for comparison does not feature any new criteria, but comprises a selection of (dark blue) criteria from a certain point of view. Thus, a perspective for comparison is an "aggregation" of information from the list of criteria pertaining to a particular issue.[145]

The effect of the *Evaluation System* is that all the strategies considered are examined from various angles. To put it bluntly: this Evaluation System forces designers who tend to focus on a cost-effectiveness perspective to also consider the impact of their plan in terms of solidarity; designers who eagerly take on the challenge of a flexible set-up for a project need to consider what this entails for the region, *et cetera*. The perspectives for comparison thus represent "diverse rationalities" that force the parties to "view the issue from various angles, to become aware of other possible perspectives, and perhaps appreciate the considerations of others."[146]

144 *Memo on decisions in DP 2014 and 2015*, 8 November 2012.

145 Ibid, pp. 17, 18.

146 *Handreiking toepassing vergelijkingssystematiek Deltaprogramma* [Guidelines for application of Delta Programme Evaluation System], draft, 27 February 2012, p. 10.

The (light blue) perspectives for comparison are primarily intended to provide insight into systematic shifts in reality induced by policy; shifts that often only become manifest in the long run.[147] For that particular purpose, a third dimension has been introduced in the figure in the form of two 'focus years' (2050 and 2100). These focus years gauge changes vis-à-vis the zero option: continuing current policy. The effects of Delta Decisions and preferential strategies the actual policy pertaining to the organisation of the delta must have been thought through up to focus year 2050. Focus year 2100 forces designers and decision-makers, moreover, to consider which options the decisions and strategies they might perhaps wish to make a case for now will actually leave open (or which options they will close off) for the subsequent fifty years, i.e., between 2050 and 2100.[148] In other words, the Evaluation System attempts to prevent our current policy choices cutting off certain options that could very well prove quite wise and sensible in the second half of the 21st century. The goal is to pass on a fundamentally safe, yet not fully boarded up delta to the people who will reside in the Netherlands after us, in order to enable them to design their country according to their own insights and needs, using the knowledge and technology of their time.

These efforts to pass on a safe delta to future generations, consciously leaving room for additional measures, are unprecedented. The core value of "sustainability" thus filters through in the design of the Evaluation System. After all, the method encourages the pursuit of a *sustainedly* stable living environment, allowing future generations as much space as possible to themselves search for what they (in their time and their situation) wish to regard as a *balance* between people, planet, and profit.

Experiences with application

In many cases, the core values turn out to complement or follow naturally from one another. Sustainability may be regarded as an expression of solidarity with future generations. In some situations, opting for incorporation of the one core value implies a departure from another. Concentrating all the negative effects in a single relatively small area may be sustainable. Such cases, however, feature a considerable shifting of burdens, so the strategy will score poorly with respect to "solidarity" (apart from possible mitigation and compensation aspects).

Furthermore, practical application also shows a major role for the scale on which measures are considered – both the time scale and the spatial scale. An individual measure may score rather poorly for the short term with respect to sustainability, in the sense that its realisation (in the 10 years ahead) requires a great deal of raw materials and energy. But if that measure is a first step towards a more natural water system, its long-term sustainability score (the second half of this century) may be high. And local damage to Nature or agriculture may be acceptable if great gains are made in these same fields on the scale of the entire country.

In addition, differences in perspective within a single core value may also lead to opposite interpretations. Whereas keeping long-term options open ensures flexibility in the water management domain, it could reduce flexibility in the spatial domain – for example, if keeping options open would involve spatial reserves that preclude the temporary use of space; this would reduce the number of locations qualifying for construction.

Although *in abstracto* resolving such issues appears a hard row to hoe, in actual practice it turns out to be less difficult than expected. In a concrete case, expert meetings always managed to reach consensus about the interpretation of a measure, strategy or decision in terms of core values. For the benefit of the Delta Programme Steering Group, the "proposals for provisional directions" submitted on 29 November 2012 at the request of the Delta Programme Commissioner have been roughly evaluated (*ex ante*) with respect to the

147 Ibid, p. 21.

148 *Partiële herziening Nationaal Waterplan / Deltaprogramma 2015: concept-notitie reikwijdte en detailniveau milieueffectonderzoek* [Partial revision of National Water Plan / Delta Programme 2015: draft memorandum on scope and level of detail, environmental impact assessment]. Within the Delta Programme, 2050 is referred to as the "fork", because the fixed strategy does not extend beyond that year and, therefore, various options are open again (tines of the fork, with the chosen strategy being the handle). Although it sounds paradoxical, it could be necessary to take measures in the near future in order to ensure that there is something to choose at all beyond 2050.

core values and with respect to their robustness. In this case, too, the perspectives for comparison turned out to provide sufficient basis for statements regarding the extent to which a decision does justice to the core values.

Systematic reflection on strategies, measures, and decisions
The *Evaluation System* is intended to integrate the design and decision-making processes from the outset. The core values thereby "guide" us towards a "solidary, flexible, and sustainable organisation and management of the water and spatial planning system", as the documents put it.[149] In theory, therefore, the three core values are firmly embedded in this system. In actual practice, it obviously depends on the manner in which these core values are being translated into criteria – and how professionals subsequently incorporate their interpretation thereof in their scores.

This is not always an easy task, as is evident from an amendment to the Evaluation System implemented in 2013. In actual practice, linking the core values directly to sub-sets of concrete criteria (such as "impact on ports", or "prevention of soil settlement and subsidence") appeared to have an undesirable side effect. Because these criteria lend themselves particularly well to short-term substantiation, the result was that the underpinning of a strategy was drawn "unduly to the short term" as well. The third dimension, that of the focus years, in fact did not quite come into its own. After all, the reflection of core values in a strategy only manifests itself in the long run.[150] Too many of these effects remained undiscussed, which reduced the options for inter-comparison of how the strategies contributed to the realisation of the core values. Attempts were made to remedy this by retaining the linkage with the sub-sets of criteria albeit with adopting separate indicators for the long term and the short term, but this turned out to result in a "overly technocratic interpretation, that did not do justice to the nature of the pursuit (the notable line of reasoning connecting the long term to the short term)".[151] In the end, it was decided that preferential strategies must be accompanied by a (qualitative) reflection on a number of topics. These are explained below.

A Solidarity in strategies and proposals for Delta Decisions

Solidarity is substantiated in various ways, such as the inter-administrative development of the Delta Decisions and the directly associated preferential strategies. In each case, the geographical distribution of the pluses and minuses of the various strategies is explicitly made manifest. In accordance with the *National Water Plan*, the point of departure is "minimum shifting of responsibilities" (see box). The reflection distinguishes two aspects:

- Minimum shifting towards future generations
- Minimum shifting towards other areas

Minimum shifting of responsibilities to future generations
The *Evaluation System* has adopted 2015-2020 as its reference situation, and 2050 and 2100 as its focus years. The criteria of the *Evaluation System* are used to determine the effects of the promising strategies for both focus years, and compare them to the effects of the reference strategy in 2050 and 2100.

Each strategy indicates when particular measures are foreseen (the so-called "development path"), which provides insight into the distribution of effects for the current generation and the two future generations (those of 2050 and 2100). The differences in effects between these years generate a picture of the advantages and disadvantages for future generations in situations in which long-term flood risk management and

149 This is how it is formulated in the *Memo Vergelijkingssystematiek 3.0* [Memorandum on the Evaluation System 3.0] of November 2013, Appendix 3, p. 17.

150 As a reminder: the perspectives for comparison (including the three core values) do not introduce new criteria; they involve clustered criteria from a particular point of view. Ergo, a value behind a perspective for comparison is only reflected gradually, once measures within such a cluster start to interact.

151 *Memo Vergelijkingssystematiek 3.0* [Memorandum on the Evaluation System 3.0], Appendix 3, p. 17.

freshwater supply taskings are anticipated in a timely fashion or not. This picture is presented in the reflection.

A second aspect of inter-generational solidarity concerns the safeguarding of sufficient scope for decision-making by future generations. This aspect is addressed by the manner in which strategies are developed: adaptive delta management. This element is discussed in more detail in the section on flexibility as a core value.

Minimum shifting of responsibilities to other areas
In principle, the shifting of responsibilities to other areas may involve various scale levels, for example, between areas within a region (sub-programme), between regions (sub-programmes), between elevated and low-lying sections of the Netherlands, and at the level of cross-border catchment areas. With respect to the promising strategies, the locations at which significant effects are expected to occur are (roughly) identified: in terms of improved flood protection and freshwater availability, and in terms of unintended negative side effects. This serves as the basis for determining whether "pluses and minuses" are distributed fairly. For each key criterion, the reflection outlines the picture this generates.

A separate point of attention in this is the cumulative effect. Sub-programmes assess the effects of their promising strategies. At a higher scale level – for a full overview of promising effects – they additionally need to check for any geographical "overlap" in the effects, i.e., whether they affect the same areas.

Solidarity among sectors is not explicitly illustrated, as the positive and negative effects for various sectors are already scored by means of the Evaluation System. This enables each administrator or sector to verify at a glance for which sectors a strategy works out favourably or less favourably. A separate perspective for comparison has little added value in this respect. A second argument is that it would not be correct in terms of methodology, because strictly speaking it is not a matter of one sector directly shifting responsibilities to another sector (there is no direct causal relationship), whereas there is among generations and areas (an action by this generation results in shifting of responsibilities to other generations, or actions in the one area lead directly to shifting of responsibilities to other areas). The National Water Plan, for that matter, does not identify shifting of responsibilities among sectors as an aspect of solidarity either.

Possibilities for mitigation and compensation
A strategy is "solidary" if it does not make an appeal to solidarity or only does so to a slight extent; if it involves no or little shifting of responsibilities, if pluses and minuses are distributed fairly. Additional measures may sometimes preclude negative effects ("mitigation") or provide a "trade-off'" with positive effects ("compensation"). This will reduce the shifting of responsibilities. A reflection on promising strategies in the light of solidarity roughly outlines, in qualitative terms, whether (and how, if possible) such shifting can be precluded: whether it is easy or not, and which types of measures it would involve.

Targets and timeframe
The first three topics within an area-based sub-programme focus primarily on the effect of the measures contained in the strategies. Each strategy being developed within the framework of the Delta Programme comprises targets, measures, and a timeframe. The fourth topic highlighted in the reflection focuses on the effects of climate change rather than the effects of measures. The extent to which these effects are deemed acceptable co-determines the targets that are set. Solidarity also plays a significant part in this respect. Providing aid to parties who make an effort to adapt to the changing climate seems to be more rational than aiding parties who wittingly refuse to do so. In other words: it depends on the context whether it would make sense to focus a strategy on the target level in order to preclude adverse effects of climate change for certain sectors.

Two factors play a key part: certainty and influence.[152] Certainty refers to the extent of knowledge of the developments to be expected, and the degree of vulnerability. Influence here refers to an awareness of the options for precluding negative effects and the ability to actually capitalise on those options.

In situations involving great certainty and considerable influence ("manipulable"), solidarity is hardly an issue: people know what to do and are quite capable of taking care of themselves. An example: a farmer who adapts his type of crop to the higher frequency of dry summers.

In situations involving little certainty and little influence ("Fate"), solidarity is a matter of course: joint efforts are required to accommodate as much as possible the negative effects that could not be foreseen or precluded. An example: the damage suffered by home owners due to the dyke subsidence at Wilnis in the summer of 2003.

When a great deal of certainty is paired with little influence ("running risks"), incorporating the prevention of adverse effects at the target level into a strategy would be obvious. An example: flood protection of an old city district situated close to a major river.

If there is little certainty regarding developments and vulnerability, yet parties refrain from taking action to preclude adverse effects ("taking risks"), a more detached stance would be justified. People are capable of reducing their own vulnerability, but fail to do so. In such cases, it would not seem reasonable to require a strategy to automatically vest responsibility for the prevention or accommodation of such effects with the government. An example: a horticulturist who fails to adapt his operations to the decreasing water supply in spring and summer, and expects the water manager to supply sufficient freshwater at all times.

Reflection on solidarity thus asks to identify the context in which the strategy is implemented, to distil whether it would be reasonable to focus on solidarity at the target level, and to place the outcome alongside the target set down for the strategy in question.

Finally, there is a relation to the timeframe sketched by the strategy. If a strategy clearly specifies which interventions will take place and when, it would be reasonable to call on the various parties involved (business sectors, citizens, but also other government authorities) to take these into account in their business operations, investment decisions, and policy choices – thus reducing the need for setting down at the target level the prevention of adverse effects as a responsibility of the government. It should be noted in this respect that such a fixed timeframe may be at odds with the core value of flexibility. After all, this core value may induce people to consciously postpone final choices regarding the realisation of projects spanning several decades; in such cases, the rationale would be to keep several options open with a view to cost-effectiveness.

"Solidarity" as a core value in the National Water Plan

The elaboration of the "solidarity" perspective for comparison in the *Evaluation System* ties in with and complements the elaboration in the *National Water Plan*. In the National Water Plan, the core value of "solidarity" has been elaborated into 1) minimum shifting of responsibilities to the future (solidarity with future generations), 2) minimum shifting of responsibilities to the surrounding area (solidarity with contiguous areas), 3) prioritising measures based on the national optimum (solidarity among parts of the Netherlands), and 4) national funding of measures of national importance (safety as a collective good, solidarity among elevated and low-lying parts of the country). The first two aspects are pre-eminently addressed in the strategy track. The latter two have been arranged at the overall level of the Delta Programme. In a general sense, the aim is "on the one hand, for each area and each generation to resolve its own issues (minimum shifting), and on the other hand that support is provided wherever this ambition turns out not to be feasible", according to the *National Water Plan*.

152 A comprehensive, systematic review of the effect of these variables is provided in the chapter on solidarity in this essay.

B. Flexibility in strategies and proposals for Delta Decisions

Flexibility as a core value addresses the tension that is created by our aim to preclude not just under-investments but also over-investments (*Delta Programme 2011*). Our resources for flood risk management and freshwater supply are limited; we cannot afford to over-dimension individual measures.

A strategy is more flexible when its implementation allows more room for implementing the measures at an accelerated or decelerated pace, and/or when it offers more opportunities for eventually switching to another strategy. Flexibility is important to enable adjustment based on advancing insight into developments (e.g., in the field of climate change or in the socio-economic domain), capitalising on technological innovations, and linking up better with other developments in the same area – relating to the usage of space, water management et cetera). Flexibility is an important aspect of adaptive delta management, as elaborated in the *Handreiking Adaptief Deltamanagement* [Guidelines for Adaptive Delta Management] (Stratelligence, final draft, October 2012).

A reflection on promising strategies in the light of flexibility as a core value can be substantiated on the basis of the following three topics:

1. The flexibility of the strategy itself. The *Evaluation System* addresses several elements thereof via the criterion of "adaptability". It would be obvious to use the information generated by applying this criterion in the reflection. This involves:
   - time available until the measures need to be taken (time until the turning point);
   - the irreversibility of measures;
   - the phasability of the realisation of measures into sub-measures over time;
2. the opportunities for switching from one strategy to another, or the extent to which this strategy renders other promising strategies unfeasible (precluding "lock-ins" or "lock-outs").

These two topics primarily reflect the degree of flexibility of a strategy.

3. The third topic addresses the "societal added value" of the flexibility. This refers to the advantages and values generated by increasing flexibility in a strategy. The exact advantages and values may differ from one promising strategy to the next. They involve, for example, opportunities for linking up with management, (major) maintenance, and replacement of structures, or with area developments scheduled for the short or medium term.

By considering strategies from this perspective, flexibility as a core value is rendered operational in a qualitative manner. Other methods assess the added value of flexibility in a quantitative, economic sense (for example, by way of a real option analysis). The Infrastructure and Spatial Economy Knowledge Unit (KIRE) of the CPB Bureau for Economic Policy Analysis further explores the prospects for a more systematic application of this type of technology in social cost-benefits analyses.

"Flexibility" as a core value in the National Water Plan

The elaboration of the "flexibility" perspective for comparison in the *Evaluation System* ties in with the elaboration in the *National Water Plan*. In the *National Water Plan*, flexibility as a core value has been elaborated into procedural and substantive aspects. Many procedural aspects pertain to the coordination between area-based and generic sub-programmes. The substantive aspects pertain to the notion that potential future adjustments are taken into account in the dimensioning, design, and scheduling of measures. The basic idea is that "changing insights must be able to be accommodated in the course steered by the Delta Programme". "We are explicitly building in room for adjustments based on advancing insight into changing circumstances (e.g., in climate change, socio-economic and demographic trends, innovative methods to remedy problems, and changing societal views on flood risk management and freshwater supply)". The *National Water Plan* thus seems to emphasise its aim to only set down and decide what is strictly necessary. In other words: looking far ahead, but without translating the view into an "ultimate image nailed to the distant horizon".

C. Sustainability in strategies and proposals for Delta Decisions

The "sustainability" perspective for comparison is defined as the balance between the impact on "people", "planet", and "profit". This perspective is pre-eminently suited to reinforce the aspects of integrality and connection of the (medium) long term and the short term in the (comparison of) strategies. There are many ways in which and views on how sustainability can be rendered operational.

Three topics are distinguished for the purpose of the reflection. The balance between "people", "planet", and "profit" is the central point of view in each of these topics. The reflection is focused on:

- The extent to which the strategy fosters a more sustainable organisation and management of the water and spatial planning system. The *NWP* particularly refers to the importance of natural processes in this respect;
- The integrality of the strategy itself in terms of taking account of developments and interests beyond the immediate water domain in the design of the strategy and the choice of measures. The explanatory notes to the Delta Act refer to the importance of an integrated approach in the Delta Programme;
- The positive or negative effects of the main measures (projects or policy adjustments). In this respect, the *NWP* refers to a number of concrete criteria that are also addressed by the *Evaluation System*:
  - "Planet" involves the efficient use of water, energy, and resources, as well as the quality of the living environment, eco systems, and natural processes;
  - "People" refers to local commitment among citizens and civic society organisations, and "unrest" (instability) created by implementation measures;
  - "Profit" pertains to the opportunities for the local business community, and to the international profiling and innovation of Dutch trade and industry.

In a general sense, emphasis is placed on how the *design* of measures may foster sustainability, both in the implementation phase and in the management and maintenance phase.
The reflection may be fleshed out on the basis of the information generated by the application of the (main) criteria.

"Sustainability" as a core value in the National Water Plan

The elaboration of the "sustainability" perspective for comparison in the *Evaluation System* ties in with the elaboration in the *National Water Plan*, and is based on the "people", "planet", and "profit" categorisation. The perspective for comparison mainly adds further structure. Supplementary to the *NWP* point of view, which predominantly focuses on measures, the perspective for comparison also examines the higher scale levels: the increasing sustainability of the water and spatial planning system in the long run, and the integrality of the strategy itself.

Summarising overview of topics for reflection on core values

The table below summarises the topics that are considered in the reflection on the promising strategies from the perspective of the various core values.

Perspective for comparison	Topics for the reflection on promising strategies
Solidarity	• Minimum shifting of responsibilities to future generations • Minimum shifting of responsibilities to other areas • Options for mitigation and compensation • Targets and timeframe
Flexibility	• Flexibility of the strategy itself • Options for switching to other strategies • Societal added value of flexibility
Sustainability	• Contribution to more sustainable organisation and management of the water and spatial planning system • Integrality of the strategy itself • Positive and negative effects of measures

Environmental Impact Report and Synthesis Documents

For the purpose of application of the *Evaluation System* – and thus the reflection of the core values – decisions have been categorised in the build-up to the Environmental Impact Report. The Delta Decisions and preferential strategies constitute a coherent set of different types of (proposals for) decisions: fundamental statements, strategic choices, and concrete measures.

- The added value of the environmental impact study lies primarily in the generation of information on the environmental effects to be used as a basis for decision-making on these fundamental statements, strategic choices, and measures *within* the Delta Decisions and preferential strategies: fundamental statements that provide a structure for visions, goals, or approaches, e.g. a new approach to flood risk management or the introduction of supply levels. These types of decisions primarily occur at the level of the coherent set of Delta Decisions;

- Strategic choices that provide a framework for concrete measures, e.g., the choice to combine river widening and dyke improvement in the area around the major rivers, or with respect to freshwater supply, the choice to focus on self-sufficiency in elevated parts of the Netherlands, and on combating further salinisation in the western part of the country - these types of decisions are made at both the Delta Decisions level and the preferential strategies level;

- Proposals for concrete measures, for example, in dyke ring X the dykes will be raised, and at point Y a secondary channel will be constructed, or an innovative "more crop per drop" technology is field-tested in a pilot project - such measures can, therefore, involve both implementation projects and policy adjustments. As a rule, they constitute part of the preferential strategies.

For each of these categories, agreements have been made regarding their substantiation. The reflection of the core values is concentrated at the upper two levels.[153]

153 Programme Directors Consultative Body meeting on substantiation of decisions, 16 May 2013, meeting document p. 3.

Fundamental statements	*For each fundamental statement:* P1. Underpinning of usefulness and necessity principle; reasoning in terms of societal added value P2. Reflection on core values: solidarity, flexibility, and sustainability *Accumulated per Delta Decision:* Interpretation of "aggregate set" of fundamental statements and strategic choices
Strategic choices	*For each strategic choice:* S1. "Explanation of relationship" between strategic choice and fundamental statements S2. Qualitative assessment based on: - perspectives for comparison: core values, "cost-benefit ratio" and "regional perspective" - main criteria: scope of flood risk management and freshwater supply, effects and opportunities, feasibility, and cost *Accumulated per preferential strategy:* Description of convergence process including rejected strategies Assessment of "aggregate set" of strategic choices and proposals for concrete measures
Proposals for concrete measures	*For each proposal for a concrete measure (or realisation sequence of projects):* C1. Qualitative assessment of measure and any alternatives based on the distinctive Evaluation System criteria (selection per decision) C2. Semi-quantitative assessment of measures to be realised prior to 2030 based on distinctive Evaluation System criteria (selection per decision)

The information thus generated has been used to describe the effects of the procedural policy choices and the concrete framework policy choices in the *Milieueffectrapport Ontwerpplan tussentijdse wijziging Nationaal Waterplan* [Environmental Impact Report on the Draft Plan for the interim amendment to the National Water Plan].

In a broader sense, the results of the application of the *Evaluation System* – as a component of the substantive underpinning of the decisions outlined in *DP 2015* – can be found in the *Synthesis Documents* drawn up by the sub-programmes and published as Appendices to *DP 2015*. The Knowledge for Climate research programme has directed a scientific review of the *Synthesis Documents*. Its results are publicly accessible via the website of the Delta Programme Commissioner.

Appendix V Bibliography

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Delta Programme

The Delta Programme is a national programme involving an innovative collaboration between the central government, the provinces, municipalities and district water boards, with input from civic society organisations and the business community. The aim is to protect the current and future generations of the Netherlands against flooding and to ensure a sufficient supply of freshwater.

The Delta Programme Commissioner fosters the development and implementation of the Delta Programme. He submits an annual proposal for the Delta Programme to the Minister of Infrastructure and the Environment, and the Minister of Economic Affairs. The proposal comprises measures and provisions to reduce floods and water shortages. The Delta Programme is presented to the States General every year on Prinsjesdag, the state opening of Parliament in September.

The Delta Programme comprises nine sub-programmes:

- Safety
- Freshwater Supply
- New Urban Developments and Restructuring
- Rhine Estuary-Drechtsteden
- Southwest Delta
- IJsselmeer Region
- Rivers
- Coast
- Wadden Region

www.rijksoverheid.nl/deltaprogramma
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