Perspectives on water bodies

Dynamics and adaptation as a requisite for dealing with the complexity of multiple perspectives in water management

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Summary
In the quest for sustainable water management, it is often difficult to balance economical, social and ecological demands. This paper addresses this issue by discussing the difficulties that arise in attempting to identify competing claims at the actor level, and by asking how these competing claims affect the process of incorporating long-term perspectives into actual policy processes. The authors have used the concept of perspectives or frames to address the above questions, within the context of two Dutch water management projects : the first in the Western Scheldt Estuary and the second in Rijnland, a polder network in the west of the Netherlands. Actor level perspectives were sought and an analysis was carried out to find out what this would mean for the water management approaches adopted in each of these regions. From the results of this study, the authors come to the following three conclusions. First, actors involved in water management projects should be aware that while the goal of their project might seem very legitimate from one perspective, it can go against the priorities of actors holding another perspective and this clash can have significant impact on the processes and outcomes of the project. Secondly, the fact that the perspectives and visions of the stakeholders can not be known beforehand means that the process manager should show a high level of flexibility and adapt to the dynamic process. . Thirdly, the way that plans to meet project goals are designed have important impact on the outcome of efforts to reach a mutual decision and stakeholders should have ample opportunity to give their input during this process.

Key-words: water management, perspectives, stakeholders, sediments, framing, complexity, subjectivism

1   Introduction
The management of rivers has not always been a matter of ecological concern. For centuries, purely economic perspectives dominated the way actors looked at rivers (Van Ast, 2000). It was not until the mid-1980's following the Bruntland report (Clark and Dickson, 2003) that the (international) environment gained prominence in Europe and diplomatic attention and resources previously spent on the proliferation of weaponry shifted partially towards ecological issues (Mitchel 2003). At least in theory, the management of rivers has since been framed under the paradigm of sustainable development. But as Van Ast (2000) and Gerrits and Edelenbos (2004) point out, many of these ideas have seen high levels of subscription but very low levels of impact.

The general idea that has developed within the sustainable development paradigm is that river-related decisions taken today should not diminish the option-basin for future generations. Ideally, these decisions should balance economical, social and ecological dimensions. However, those involved in the actual practice of sustainable development learn very quickly the difficulty of realising this aim. These difficulties can be observed at two broad levels, first at the system level, second at actor level. The system level encompasses aspects of the physical water system such as water quantity, water quality, quality, depth of the groundwater and the quality and distribution of sediments; as well as the social system which is made up of populations, institutions, economics and other such factors. At the actor level, the attention is focused on the people who are either influencing or influenced by the water system. This could occur through their status as users of the system such as farmers who use water to irrigate their land and residents who enjoy the river view, or through their status as political decision-makers and authorities who govern the use of water bodies. In this paper, we focus our attention on the individual actors, i.e. decision makers and stakeholders.

To make sustainable water management possible in practice, one has to find a way to make the sustainable paradigm operational at the actor level (Otten, 2000). This requires the incorporation of long term perspectives into other-wise short term decisions. It also requires the identification of a number of competing claims over the water body such as navigation and ecological development, and safety versus flood. It is only when such competing claims have been identified that one can attempt to find a balance between them in the decision making process. However, at the concrete actor level where actual negotiations are carried out and far reaching decisions must be made (ibid.), transforming the abstract notions of sustainability into

operational actions proves to be a challenge as does the incorporation of multiple perspectives. It is often difficult to translate these abstract notions into concrete measures, and actors have difficulty relating these theoretical notions to daily practice.

This paper is an empirical report of two cases of water management. We attempted to identify the different perspectives on the future of the water bodies, and registered the difficulties that arise with such an identification process. These difficulties add much complexity to the long-term policy development process.

The first case pertained to the deepening of the Western Scheldt estuary, an operation carried out primarily to improve the navigational accessibility of the harbour of Antwerp. The Western Scheldt crosses both the borders of Flanders (Belgium) and the Netherlands, and the international nature of the project triggered laborious negotiations. The second case is a sediment management project undertaken in the polder water network of the Rijnland waterboard, located in the western region of the Netherlands. This second case is of primarily local concern, and is therefore somewhat less complex in its dynamics. However, in some areas, dredging has not been done in up to fifty years, and the neglect has resulted in the demonstration of strong emotions amongst the different stakeholders involved. The varying physical and social characteristics of the two projects triggers a number of interesting comparisons. An analysis of both will contribute richly to the effort to promote greater stakeholder participation and the development of long-term perspectives on water and sediment management in the Netherlands.

The theoretical background and methodology of the study conducted here is explained in Section 2. Section 3 focuses specifically on the Westerschelde case, while Section 4 provides details of the Rijnland case. The final section, Section 5 provides an analysis of the findings with regard to water-management related decision making processes the implications these processes have on actual sustainability.

2.1   *Reconstructing perspectives*

Dealing with multiple dimensions of water management involves dealing with a number of individual perspectives on the nature and use of water bodies. It is therefore necessary to understand which perspectives apply in each case. The idea that different actors have different perspectives on issues has been extensively discussed by the scientific community and the objectivism versus constructivism debate provides clear indication of this (Fischer, 1998 among many others). Objectivism departs from the idea that a fact-value dichotomy applies both in reality and in the way researchers investigate that reality. Its supporters assume that actors within this reality are able to make such a distinction. This classical approach towards social science has prevailed many years, but the limitations of this approach have been raised of late, and some rather harsh criticisms have been made (Gibbons, 1994; Hajer; 1995, 2002; Tukker, 1998). Fact-finding is now increasingly being seen to take place within a social context, making it almost impossible for anyone to place themselves outside of the broad context. From this point of view no factual description of a situation can be made which is completely independent of the social conditions in which it is observed. Proponents of this view conclude that science measures an interpretation of the research object instead of the object itself. When discussing facts, it is better to speak of possible interpretations or possible explanations instead of 'absolute truths'– hence subjectivism (Fischer, 1998).

Carrying this idea of subjective rather than objective reality forward, one cannot establish an item objectively outside one's own interpretation or the interpretation of one's respondents. In the case of water management, it is therefore necessary to refer to the actors' interpretations and normative stances regarding the water body in order to determine which perspectives he or she applies to this particular water body. Research efforts, ideas, proposals and decisions regarding water management are all subjective, meaning for example, that facts such as change of water level, do not simply speak for themselves. Solutions that imply certain logical conclusions do not apply in this kind of thinking.

According to Rein and Schön, an individual acts on the basis of culture, emotions and social and economical background. These authors also point out that different social actors view a given problem under differing frames. "Framing is a way of selecting, organizing, interpreting, and making sense of a complex reality to provide guideposts for knowing, analyzing, persuading,

and acting. A frame is a perspective from which an amorphous, ill-defined, problematic situation can be made sense of and acted upon" (Rein and Schön 1993: 146). The impact of framing in the business of policy and decision-making has been addressed by, among others, Hajer (1995) and Klijn (2000). Klijn emphasises that there is no direct relationship between fact and perceptions because if this were the case, all social actors would have the same perception of reality. It is instead, the frame of reference that social actors build through the years on the basis of what they deem important which determines their vision in reality.

It is possible to research frames? The first step in any such effort is to reconstruct the frames. According to Rein and Schön, this implies that the expectations, meanings and implications viewed by social actors in a certain situation can be interpreted on the basis of 'some proof'. The 'proof' mentioned here could be delivered in two different ways. The first is on the basis of statements made by actors, for example during interviews and meetings or in written policy documents and reports. These are called rhetorical-perspectives. The second is on the basis of observations of actual actions the social actors perform. In these so-called action perspectives both the actual action and the institutionalisation of future actions (for example in a law) can be used as input (Rhein en Schön, 1996). This paper focuses on the rhetorical perspectives simply because of the large number of actors involved in the two cases. The fact that only researchers are involved in this study makes each of their actions impossible to observe.

But how can one determine which frames exist and whether the researchers' interpretations are actually correct? According to Rein and Schön, there are three complications when studying frames. First of all, it goes without saying that researchers are also biased by frames which they are not conscious of. These no doubt influence their thoughts, actions and beliefs. Secondly: the same pattern of actions can be consistent from multiple perspectives. Simply judging from the actual actions of a social actor, it is hard to determine which 'frame' drives his or her actions. Thirdly, it is difficult to distinguish between real and potential shifts between frames. Sometimes it seems as if a social actor is shifting towards a new frame, when there might have only been a minor change of accent in the current frame.

Given these complications, it is not always possible to determine the one 'real' perspective. However, a process of triangulation can be used to help determine the robustness of a perspective by comparing intersubjective accounts within the same case. This method is attempted in this study using three data sources. Qualitative interviews and a quantitative survey was carried out, following which respondents were invited to a discussion where they expounded on the results of the survey. It is important to note that the objective of these efforts was not to identify the 'real' perspective behind operational decision making practices. If the actors themselves agree that a certain perspective represents them correctly, that in itself can be used as a point of departure in the policy process.

2.2   Methods

The method of semi-structured interviews was chosen for the first part of the study and the interviews were conducted among core-members of the policy making body. Policy documents regarding the cases were used to get an initial idea of possible perspectives and the respondents were invited to reflect upon these perspectives as a starting point to the discussion.

The results of the interviews were then compiled and narrowed down. The perspectives selected were then tested in a survey among all actors involved with the ProSes project, from the political decision-makers to the individual residents who lived along the water body. The survey allowed the constructed perspectives to be tested statistically on a much larger group than that afforded in the interviews. It also allowed the perspectives to be verified in a controlled way amongst a much larger sample group. To ensure accurate reflections and to test the consistency of stated preferences, multiple variations of each question was included in the questionnaire with alternate phrasing.

The survey was divided into three clusters. For an example of the questions posed in these clusters, see Box 1 on the following page. The first cluster contained statements that had to be answered using a 5-point Likert-scale. In first cluster it is possible for a respondent to answer questions in a way that would not reveal his or her intentions. The second cluster was composed in such a way that agreeing with one statement would automatically mean the respondent

disagreed with another. These statements were structured to reflect the main points of dispute between actors holding different perspectives. Again, a 5-point Likertscale was used. In the third, and last, cluster, the respondents were asked to rank three statements, each of which represented one perspective. The Rijnland survey was shortened however, and the second and the third cluster had to be omitted for practical reasons.

[BS4] The outcomes of the survey and the initial interviews were discussed during workshops. All respondents were invited to reflect on the findings and to discuss whether they recognised the perspectives or whether further adjustments were needed.

Box 1: Examples of statements in case Western Scheldt

An example of a statement as given in the *first cluster*:

"The analysis of past changes in the estuary has been done in a too statistical approach."

This statement is typical for the discourse in perspective of 'adaptation'. A high score on this statement means support for this perspective.

An example of a statement given in the *second cluster*:

"The Western Scheldt is a unique ecosystem and human-induced impacts should be avoided."

The argumentation of this statement coincides with the 'balance' perspective. Thus a high score indicates a way of thinking of a respondent that follows the discourse of this perspective. A low score, however, means a different kind of reasoning that is typical for the discourse of the 'using' perspective.

As an example of the statements of the *third cluster* is question 31 of the survey is shown below, between brackets are the perspective that use a similar argumentation as is shown in the statement:

a) The Western Scheldt is a waterway ['using'].
b) The Western Scheldt is a precious ecosystem ['balance'].
c) When the Western Scheldt is concerned, safety is priority number one ['adaptation']

3.1 Western Scheldt estuary

The Western Scheldt estuary runs from the city of Antwerp in Belgium through the Dutch province of Zeeland before flowing into the North Sea near the cities of Vlissingen and Breskens, in the south west of the Netherlands. The estuary is famed for its ecological functions, but it provides, at the same time, important maritime access to the port of Antwerp, one of Europe's largest ports. The Western Scheldt has a dynamic riverbed and its ecological value is largely attributed to that riverbed. The morphology of the river however requires that it is regularly dredged and periodically deepened to accommodate the increasing size of the ships bound for the port of Antwerp. Immediately, two competing claims come to light, namely, ecological value versus economic utilisation. The port authorities regularly request that the navigation channel be further deepened, but the fact that the estuary is situated on Dutch territory makes it impossible for them to act at their own discretion. Adding to the question of the Dutch willingness to cooperate is the dimension of safety. People in the Dutch province of Zeeland and in the Flanders lowlands are hesitant to accept the inherent flood risk involved in such a process.

A project organisation was established in 2001 in order to deal with the latest request by authorities of the port of Antwerp to deepen the Western Scheldt. This organisation was baptised ProSes - an acronym for Projectdirectie Ontwikkelingsschets Schelde-estuarium, or Project directorate (for the) development (of a) development outline (for the) Scheldt estuary. As is clear from the name, its task was to develop a concrete outline for the Western Scheldt for the year 2010, based on a longer term vision for the year 2030. The effort is to involve close international cooperation and stakeholder participation and should answer the following critical questions: Is it

possible to deepen the Western Scheldt once again? And if so, how can the deepening be calibrated against other priorities with regards to the Western Scheldt, namely the development of the ecological state and the promotion of safety?

The actors in ProSes developed two pathways through which to answer the main questions. The first is a research process where several researchers from different institutes attempt to understand the estuary and derive indications about its management and development. The second is the policy pathway in which various actors (stakeholders) are brought together in the so-called Overleg Adviserende Partijen (Advisory Board Stakeholders) or OAP. This board advices political decision-makers on the results generated in the research pathway.

3.2   Data collection case Western Scheldt

Given the mission of ProSes, one can superficially distinguish between three normative perspectives: ecology, economy and safety. But these perspectives are formal ones and are as such (at least partly) detached from the individual actors involved with this process. Twelve actors distributed over the ProSes organisation's research group and advisory board were selected for the explorative interviews. Three different perspectives on the deepening of the Western Scheldt were found during this phase. These were labelled: 'Adaptation', 'Utility' and 'Balance'.

The first perspective 'adaptation' argues that the actual deepening of the Western Scheldt will change the state of the estuary, but that the ecological system is robust enough to balance out the consequences of these changes. The second perspective 'utility' is based on the argument that the Western Scheldt is a navigation channel and should be used as such. Considerations that deepening the estuary might damage the natural system take lesser importance from this perspective. The third, and final, perspective 'balance' argues that the Western Scheldt is on the verge of degeneration. From a vital estuary, it is fast deteriorating into an ecologically dead water body. From this perspective, any human-induced changes, including that of deepening the river along would catastrophically risk the natural system and should be avoided at all costs.

3.3   Results

The survey was distributed among 45 potential respondents. 16 (36%) of those approached responded positively, 11 said they would or could not participate (27%) and the rest simply did not respond.

The results of this survey can be found in tables 2 - 5. From the tables, it appears that every perspective has a certain degree of support. None of the perspectives were rejected and in most cases, there was a (large) difference between the minimum and maximum score. No responses had scores clustering around zero, except in relation to statements made from the perspective of 'utility' in the third cluster. The support for the 'moving' and 'balancing' perspectives is almost equal, with the perspective 'balancing' having insignificantly more support, although the standard deviation for the perspective 'moving' is the lowest.

The 'utility' perspective is the least supported in the sample. In cluster two, support for this perspective is even negative. The standard deviation is the largest for this perspective in the third and second cluster. We conclude from this that the "utility" perspective is the most controversial of the three as it saw high levels of support and equally high levels of rejection. [BS5]This result is not quite unexpected as the blatant 'utility' of the Western Scheldt as a waterway at the expense of other goals does not fit in the current paradigm of sustainability.

Cluster 1	N	Minimum	Maximum	Mean	Std. Deviation
Perspective 'moving'	16	-40	60	17,50	29,326
Perspective 'utility'	16	-50	75	5,50	33,158
Perspective 'balancing'	16	-64	86	10,31	45,303
Valid N (listwise)	16				

Table 1: Preferences in cluster 1 – Western Scheldt case.

Cluster 2	N	Minimum	Maximum	Mean	Std. Deviation
Perspective 'moving'	16	-25	38	-1,50	19,920
Perspective 'utility'	16	-100	38	-17,13	40,965
Perspective 'balancing'	16	-38	100	19,56	38,349
Valid N (listwise)	16				

Table 2: Preferences in cluster 2 – Western Scheldt case.

Cluster 3	N	Minimum	Maximum	Mean	Std. Deviation
Perspective 'moving'	15	33	75	57,33	13,356
Perspective 'utility'	15	0	67	28,20	20,778
Perspective 'balancing'	15	33	92	65,80	15,354
Valid N (listwise)	15				

Table 3: Preferences in cluster 3 – Western Scheldt case.

		Frequency	Percent.	Valid Percent.	Cumulative Perc.
Valid	Perspective 'moving'	3	18,8	18,8	18,8
	Perspective 'utility'	3	18,8	18,8	37,5
	Perspective 'balancing'	7	43,8	43,8	81,3
	Not identified	3	18,8	18,8	100,0
	Total	16	100,0	100,0	

Table 4: Primarily preferred perspectives 'moving', 'utility' or 'balancing' of the respondents over three clusters in the Western Scheldt case. "Not identified" was the listed category when a respondent chose a different perspective in every cluster.

The amount of support varied strongly between the perspectives, raising the question of whether the respondents responded consistently over the three clusters. In each cluster, many respondents showed a relatively clear preference for one argument that is consistent with one or two of the perspectives and a lesser preference for a third. This is shown in table 6 where 'high' stands for high consistency and 'low' for little consistency. Over 30% of the participants chose the same perspective in every cluster, 50% chose the same perspective in two out of three clusters with the same perspective and 19% demonstrated a varying preference in every cluster. Respondents who were completely consistent and who appeared to choose the same argument in every cluster preferred the "balancing" perspective.

		Frequency	Percent	Valid Percent	Cumulative Percent
Consistency	Low	3	18,8	18,8	18,8
	Medium	8	50,0	50,0	68,8
	High	5	31,3	31,3	100,0
	Total	16	100,0	100,0	

Table 5: Consistency of the responses over three clusters – Western Scheldt case.

These results were presented for discussion during a workshop, but a low turn-out meant that no additional data could be obtained. To sum up the findings, it can be said that the perspectives isolated in the first round of interviews held a degree of support from the respondents. Most respondents appeared to switch between the two, however showing no strong consistency in the support for one perspective over another. Unfortunately, the workshop could not be used as a platform to give meaning to these findings. However, the second case outlined below may be able to shed more light on these findings.

4.1   Rijnland water network

The Rijnland water board (Hoogheemraadschap Rijnland) consists of waterways in which sediments have accumulated for centuries. The influx of sediments can be attributed to the rain and rivers from which the Rijnland receives its water supply. Dredging has not been carried out for decades and in some areas, the riverbed almost touches the surface of the water. The authorities are of the opinion, therefore, that the sediments are in urgent need of removal for the sake of water quality, volume and the general ecological state of the waterway.

The maintenance of the water network is the responsibility of the Rijnland water board. Faced with an enormous backlog, sky-rocketing costs and high levels of societal dissatisfaction, the organisation decided to engage stakeholders in a participatory process in which they could exchange ideas about the future of the network. By doing so, the Rijnland water board hopes to increase public support for the operation, and to achieve a sustainable policy by which they can avoid such backlogs in the future. This process was started in January of 2006 and was still in progress at the time of writing.

4.2   Rijnland data collection

Ahead of the stakeholder involvement process, a number of interviews were conducted with main actors in order to identify the main perspectives. An analysis of the interviews revealed three main perspectives. These are labelled 'utility', 'control' and 'protection'. While the Western Scheldt case involved three statement clusters, a decision was made in this case to retain just one cluster as respondents who filled in the questionnaire for the earlier case felt it was too demanding to fill all three. The process of filling out the questionnaire took too much time, and many saw through the verifying questions and felt they were needlessly repetitious.

The first perspective, 'utility' is very similar to that raised in the Western Scheldt case. Under this perspective, the water network is seen as a resource to be maximised. Decisions regarding the water body are framed in terms of utility, implying for example that the maintenance of the riverbed is important only when the utilisation capacity of the water body is compromised. It also means that the operation should trigger other economic benefits or savings, for example that which is brought about by using the dredged material to build dykes and other such infrastructure.

The 'control' perspective promotes a type of management and development under which laws, rules and regulatory frameworks are highly valued. Operations can only be carried out once all consequences are known and deemed acceptable and risks to the future development of the water body must be avoided.

The third perspective, 'protection', has a strong ecological orientation. From this perspective, the Rijnland network is primarily an ecological system that requires protection, restoration and nurturing. From this perspective, any action taken must have the explicit purpose of restoring the ecological value of the water network.

The salience of these perspectives was checked by means of a survey. Again, the statements were clustered around three themes, namely law and regulation, risks, sediment use and nature.

4.3   Results

The survey was distributed to 31 potential respondents. 29 or 96% of these returned completed responses. The remaining two potential respondents chose not to cooperate for dear of criticising their employers at the Rijnland water board. The high return rate demonstrated that the decision to reduce the length of the original survey was a prudent one. Still, an analysis of the survey results revealed a somewhat unclear picture. 'Control' appeared to get the most support with fifteen respondents choosing this as the primary perspective. Fourteen chose 'utility' as their primary perspective. 'Protection' was never chosen as a preferred perspective, but respondents who chose 'control' as their first preference often opted for 'protection' as their secondary preference. Looking at each individual's pattern of support of the three perspectives, it appears that each was held at almost equal value. Preferences for a certain perspective in this case are rather relative and change (almost) with each statement.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Utility	15	51,7	51,7	51,7
	Control	14	48,3	48,3	100,0
	Total	29	100,0	100,0	

Table 6: Primary preferences in one cluster - case Rijnland

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Utility	8	27,6	27,6	27,6
	Control	12	41,4	41,4	69,0
	Protection	9	31,0	31,0	100,0
	Total	29	100,0	100,0	

Table 7: Secondarily preferences in one cluster - case Rijnland

For reasons stated before, it was not possible to check the consistency of the respondents' responses over various clusters as in the Western Scheldt survey. It was decided instead to analyse whether the three perspectives were mutually discriminating. If the scores for the perspectives are clustered around zero, the perspectives would appear not to be rather similar. If the scores are widely distributed instead, the perspectives would appear to be complementary. Analysis shows that the standard deviation is similar for each perspective, indicating that they are not quite complementary. The perspective 'control' seems to be the most controversial with the highest standard deviation. Scores range from 20 to 40, demonstrating tha t opinions on this perspective are sharply divided – those who support it, support it fully while those who don't support it reject it fully. However, while the standard deviation for this preference was highest of the three, the absolute number is not very high and outliers could be attributed to a small number of respondents choosing an extreme view.

	N	Minimum	Maximum	Mean	Std. Deviation
Score: Utility	29	22	39	30,14	3,989
Score: Control	29	20	40	30,34	4,624
Score: Protection	29	17	35	25,69	3,992
Valid N (listwise)	29				

Table 8: Scores per perspective and standard deviation – case Rijnland.

The survey results indicate therefore that the perspectives are only partly complementary and that they overlap to a large degree. The workshop that was held in this case was well-attended. Once the perspectives were thoroughly explained, it wasn't long before respondents expressed agreement with the findings. They recognised that all three perspectives were relevant for the Rijnland case and most of the respondents, bar two, conferred with the preference category in which they had been placed. To summarise: the survey showed an unclear result but the respondents were nevertheless convinced that the three perspectives were complementary.

5.1   Conclusions: The existence of perspectives and the adaptive capacity of social actors
This article began with the question of what the difficulties are in attempting to identify competing claims at the actor level, and how this question affects the process of incorporating long-term perspectives into short-term policy processes in actual water management cases. To start, the identification of claims on the actor level was approached from the concept of perspectives. Although the methodology, scientific reliability and validity of the findings, can be improved, section 5.2 revealed some interesting results. Firstly, different perspectives on water management can be discerned in the cases. Secondly, these perspectives are differentiated on the actor level. Thirdly, shifts between perspectives can occur at the actor level, meaning that the

perspectives of an actor are fluid rather than static. Fourthly, actors seem capable of recognising the line of reasoning, and the arguments involved in perspectives other than their own.

Two conclusions can be drawn from these observations. Firstly, perspectives on water management do exist and they have a signficant impact on the process of water management. Secondly, perspectives are fluid or dynamic and difficult to relate to a specific actor. These conclusion have an impact on both the methodology and analysis of this kind of research and the practice of managing water projects.

5.2   Reflections on analysis.

As described above, the researchers were confronted with results that were sometimes difficult to explain. This can be partly attributed to a lack of scientific rigour. The fact that the survey showed results that were dissimilar to that of the explorative interviews may be attributed to the fact that respondents in the two samples had different perspectives altogether. Also, the shift from a qualitative method to a quantitative one and back again can also be criticised. Given the conclusion that it is difficult to attribute a single perspective to any one person. It may have been wiser then, to use only a qualitative approach as such approaches are more suited to the exploration of the subtleties of dynamic perspectives. Quantitative methods, on the other hand, are more suitable for taking "snap-shots" of perspectives. The major disadvantage of this method is that the resulting snap-shots don't show anything about the shifts that occur in individual choices. From the cases, it appears that such a static approach doesn't suit the dynamics of the perspectives. Also, presenting the results of the interviews to the respondents immediately excludes their focus from other possible perspectives, and forces them to limit their attention to what is presented. This is a difficult methodological choice to make and mistakes such as this are hard to avoid.

To improve the quality of the methodology, the authors suggest that a longitudinal research method be used in future. This would makes it possible for researchers to actually 'measure' changes in the actors' perspectives, rather than just identifying the different ones. This helps overcome the problem of the 'snap-shot' approach used in this study. Such a quantitative approach would allow us to look beyond the variables and infer why these shifts took place. The influence of external factors could also be better taken into account, such as accidents that cause contamination and excessive rainfall

5.3   Reflection on possible implications for water management

Although mixed, the findings have several implications for way water projects with a substantial societal impact should be managed. First of all, it is vital for a process manager to have an awareness of different perspectives. They should be aware that the goal of a project might seem very legitimate from one perspective while clashing head on against another. Keeping this in mind when communicating about the project could help the manager improve the quality of the project process significantly. This fluid approach is also worthwhile in relation to the process of gathering knowledge to be used in the decision-making or project process. An approach such as the Joint Fact Finding methodology could give insight into differences between the arguments and facts used by the stakeholders.

Secondly, the fact that the perspectives and visions of the stakeholders can not be known beforehand means that the process manager should be less focused on   following his predetermined plan exactly. He should instead opt for a more adaptive approach. When multiple stakeholders are involved in a process, the process takes on unique dynamics and sometimes becomes difficult to manage. For example, a flexible attitude on the part of the process manager would go far if the participating stakeholders want to discuss the use of water for agricultural purposes when this was not considered a point of discussion beforehand. In allowing ample time for this discussion to take place, he or she could avoid unnecessary opposition later. A process manager should therefore have the flexibility and the skill to let go of their original project description and make use of chances as they appear (Teisman, 2005). Such an approach could give rise to greater cooperation between stakeholders and the project management (problem owners). In a heartening development, one of the Netherlands government departments dealing with sediments is exploring the possibility of leaving the decision making responsibility

completely to the stakeholders. This transfer of control extends even to the setting and use of water management budgets.

The third important impact is in the way project plans are designed. It is often the case that stakeholders in such water management projects are simply presented with a number of plans designed by the decision makers from which to they are asked to make a decision. The process of obtaining a consensus would involve discussion, that could very well lead to a deadlock. Perhaps an effective way to take into account the different perspectives would be to seek ideas from stakeholders in a bottom-up fashion. This would make it possible for both the stakeholders and the decision makers to discuss the goals they would like to reach and to better find a mutual 'fit'. As stated in the introduction of this chapter, many projects have so far scored highly on participation but only lowly on impact. Perhaps what is necessary now is an exploration of other innovative approaches. The goal of any such approach should be to reach and implement a solution that works, rather than to force 'unwanted' solutions through a project process, only to find once the project is completed that it actually does not work.

5.4   Further discussion
An approach worth exploring perhaps is the 'Kaizen' approach used by Japanese companies (most notably Toyota) since the early 1970's to improve their production processes. Kaizen means literally "to take it apart and put back together in a better way". The concept operates under three main principles: the equal importance of both process and results; a preference for systemic, holistic thinking over the narrow view; and non-judgment/blame arising from the belief that blame is wasteful. People of all levels in the organization participate in kaizen; from the CEO on down, including external stakeholders wherever necessary.

Water management may stand to benefit from the implementation of a Kaizen-like approach. It would allow for a more evolutionary process, one in which there is more room for change. If all stakeholders are truly involved, their changing preferences could be consistently absorbed in the policy process. Clearly, at first glance, this idea holds much value and may be worth exploring in future studies.

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[BS1]whose general idea?

[a2]What is it about groundwater and sediments?

[BS3]does that mean the users or the decision makers?

[BS4]So this 3 cluster method was only used for one case study and not the other?

[BS5]Please explain what you mean

[BS6]what does this mean?

[BS7]costs associated with what?