Perspectives on sediments: adaptation and dealing with complexity

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Summary
When dealing with water management it is often difficult to attain sustainable water management that is able to balance economical, social and ecological aspects. One of the most important aspects of this challenge is how to use an abstract notion such as sustainability on an actor-level, in the case of water management. In this paper we have used the concept of perspectives or frames to get more insight in this matter. In this paper two cases of sediment management in the Netherlands: the Western Scheldt Estuary and Rijnland, a polder network in the west of the Netherlands, were studied to see if perspectives on an actor level could be found and what this would mean for the approach towards water(soil) management. First the, rhetorical, perspectives were constructed, based on interviews and the analysis of policy documents. Then the perspectives were tested by the use of a survey. Although different perspectives were recognised in the cases, some methodological improvements should be made in future research. Based on the results the authors come to the three following conclusions. First of all project management should be aware that the goal of their project might seem very legitimate from one perspective, but it can actually go against another. Secondly the fact that the perspectives and visions of the stakeholders can not be known beforehand means that the project management should focus less on finishing every planned 'step' in the project. The third important impact could be the way that plans to meet project goals are designed.

Key-words: The Netherlands, complexity, case-studies, water management, perspectives, stakeholders.

1 Introduction

The management of rivers has not always been a matter of ecological development. For long, the economic perspective dominated the way actors looked at rivers (Van Ast, 2000). It was not until halfway the 1980's that the (international) environment became more prominent on the agenda in Europe, following the Bruntland report in 1987 (Clark and Dickson, 2003) and when diplomatic resources spent on the proliferation of weaponry was partly shifted towards ecological issues (Mitchel 2003). The management of rivers has been framed within the sustainable development paradigm since that time. At least in theory. As Van Ast (2000) points out: many of these ideas rank high on participation but very low on impact.

The general idea is that current decisions regarding rivers should not diminish the option-basin for future generations. This means that decisions need to balance between the economical, social and ecological dimension. However actual practices of sustainable development learn that there are some difficulties in realising sustainability in water management. Basically, these difficulties can be observed at two levels. One is the system level, the other the actor level. The system level encompasses the physical water systems level, e.g. water quantity, water quality, groundwater and sediments, and the social system, e.g. populations, institutions, economics etc. The actor level focuses on the people (actors) that are actually, potentially, influenced in their daily life by the water system or are influencing the physical system as a user or political decision-maker. Examples are: farmers who use water for their land, or residents that are enjoying the view over a scenic river. This paper focuses on the actor level.

To attain sustainable water management, one has to find a way to make the sustainable paradigm operational when dealing with the actor level in actual cases (Otten, 2000). That means incorporation of the long term in the short term and the identification of competing claims on the water body, such as navigation versus ecological development. Once the competing claims are identified one can attempt to find a possible synergy or at least to balance these claims against each other in decisions regarding the water body. The transformation of abstract notions about sustainability and the need to view the management and development of rivers from multiple perspectives to the concrete actor level, the level at which the actual negotiations must be carried out and decisions must be taken, proves troublesome (Otten, 2000). Often, it is difficult to

translate these abstract notions into concrete measures, and often actors have difficulties relating these (theoretical notions) to the daily practises.

This paper is about what the difficulties are when attempting to identify and balance the competing claims at the actor level, and how this affects the attempts to incorporate long-term perspectives in policy processes in actual cases. To gather information two cases were analysed. The first case is the deepening of the Western Scheldt estuary, an operation to improve the navigational possibilities of the harbour of Antwerp. The Western Scheldt crosses the borders of both Flanders (Belgium) and the Netherlands. This case constitutes an international water body characterised by a highly dynamic physical system and laborious international negotiations. The second case is a sediment management project in the polder water network of the waterboard Rijnland, in the west of the Netherlands. This case is on a local scale – as opposed to the Westerschelde case. Although this system shows much less dynamics, emotions on the actor level are sometimes surfacing, due to the fact that dredging has been neglected for a long time – in some areas up to fifty years. The distribution of these physical and social characteristics allows comparison of two rather different cases. The cases are part of a project stimulating stakeholder participation and the development of long-term perspectives on water and sediment management in the Netherlands.

The theoretical background and methodology of this research are explained in section 2. Section 3 features a further introduction of the cases section 4 covers the results. The final section 5 deals with the findings and discusses the implications for the sustainable development of rivers at the actor level.

2 Theoretical background and methodology

2.1 Reconstructing perspectives

Dealing with multiple dimensions of water management, means dealing with actors' perspectives on water bodies. It is therefore necessary to understand which perspectives apply to a certain case. The idea that different actors have different perspectives on issues has been elaborately discussed by the scientific community; witness the objectivism versus constructivism debate (Fischer, 1998 among many others). Objectivism departs from the idea that a fact-value dichotomy applies to reality and the way researchers investigate that reality. It supporters assume that actors within this reality are also able to make such a distinction. This classical approach towards science has prevailed many years, but critical notes towards this approach and its limitations have been raised more recently (Gibbons, 1994; Hajer; 1995, 2002; Tukker, 1998). According to a growing group of scientists, fact-finding is a phenomenon that takes place within a social context, which makes it impossible for anyone to place oneself outside this context. From this point of view no factual description of a situation, which is completely independent of the social conditions in which it was observed, can be made. Ergo: science measures an interpretation of the research object instead of the object itself. This points out that when interpreting facts it is better to speak of possible interpretations or possible explanations instead of 'absolute truth' (Fischer, 1998) – hence subjectivism.

Departing from this idea means that one cannot establish an item objectively outside the respondents' interpretations. 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. After all, there is no objective way of establishing his or hers perspectives. Interpretations of research, ideas, proposals an decisions regarding water management are subjective rather than objective. For example, the idea that the facts such as change of water level speak for themselves in terms of solutions does 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. The authors point out that different social actors put a certain problem in a different perspective, or frame. "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). In the case of policy-making and decision-making, this 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. But it is exactly the frame of reference that social actors build through the years on the basis of what they deem important which determines their vision on reality.

It is possible to conduct research into frames? The first step is by trying to reconstruct the frames. Rein and Schön describe this as the 'construction' of perspectives. This means that on the basis of 'some proof' expectations, meaning and implications, as seen by the social actors based on a certain situation, can be interpreted in such a way that perspectives or frames can be constructed. The 'proof' mentioned here could be delivered in two different ways. The first way is on the basis of statements made by actors, for example during interviews and meetings, or written in policy documents and reports. These are called rhetorical-perspectives. The second approach is on the basis of observations of actual actions performed by the social actors. In these so-called action perspectives both the actual action or 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 within the cases, the reason for this is that actual actions are very difficult to observe in the cases presented here, due to the large number of actors and the small number of researchers.

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: perspectives are part of the natural world, it goes without saying that researchers are also biased by frames which they are not conscious of as such, but do influence their thoughts, actions and beliefs. Secondly: the same pattern of actions can be consistent from multiple perspectives. Put in another way: from the actual actions of a social actor it is hard to determine which 'frame' drives these actions. Thirdly, it is difficult to make a difference between real and potential shifts between frames. Sometimes it seems as if a social actor is shifting towards a new frame, but this might only be a minor change of accent in the current frame.

Obviously, given these disadvantages, one will not be able to determine the 'real' perspectives. Intersubjective robustness by triangulation within the same case, however is obtainable. In this research using both qualitative interviews and quantitative research and discussing the perspectives with the respondents after the first two steps were conducted does this. Secondly, it is not necessary to know the 'real' perspective in operational practices of decision-making regarding water bodies. If actors themselves agree that a certain perspective represents them correctly one may use that in the process as a point of departure in the policy process.

2.2 Methods

As stated in the previous section: this research used qualitative interviews, quantitative surveys and collective feedback sessions in order to establish the perspectives that were then used in, the analysis of, the actual policy process.

For the first part of the research the method of semi-structured interviews was chosen. This approach allows room for exploring the different perspectives. Policy documents regarding the cases were used to get a first idea about the possible perspectives. These were then used as the basic assumptions on which the respondents were invited to reflect.

The next step was to use the results from the interviews to construct a number of perspectives. These perspectives were then tested in a survey among all actors involved with the ProSes project. This created the possibility to test the constructed perspectives on a larger group than the original respondents, and to analyse the results statistically. This is basically a first verification within the same case.

The third step was to discuss the perspectives during a group session in which all respondents were asked to reflect on the findings from both the interviews and the survey. They were asked

whether they would agree on the perspectives and whether they would like to amend any of the perspectives, or if they missed any.

The interviews were conducted among a selected group of respondents. The selection criterion was whether they were considered core-members of the policy arena regarding the water body. The survey was conducted among all actors involved – ranging from political decision-makers to stakeholders living along the water body. The survey allowed verifying the perspectives in a controllable way among a larger sample. For example, questions could be rephrased and posed again throughout the survey to test the consistency of the stated preferences.
The survey consisted of three clusters of questions. For an example of the questions posed in these clusters see Box 1 on the following page. The first cluster contained statements using a 5-point Likert-scale. In first cluster it is possible to answer in a way that would still not reveal the intentions of the respondent. Because of this the second cluster was composed in such a way that by agreeing with a statement the respondent would automatically disagree with another. These statements were composed in such a way that they entailed the main points of dispute between the different perspectives. The same 5-point Likertscale as in the first cluster was used. In the third, and last, cluster of statements the respondents were asked to rank three statements, in which each statement represented one perspective. In other words the respondents were asked which perspective they preferred over the other. The methodological motivation for this approach was that, similar to the second cluster, the respondents are forced to choose a preferred perspective, but also to point out a secondary perspective and thus giving insight in their relative preferences for the perspectives. The survey was constructed in such a way that it forced the respondents to show their preferences in a more consistent way. The question that was kept in mind while designing the survey was: will the respondents keep on answering in a consistent fashion, also if they have to balance different perspectives between each other? However, because of practical reasons the Rijnland survey was shortened and the second and the third cluster omitted.
The outcomes of this survey were discussed during workshops. All respondents were invited to reflect on the findings and to discuss whether they recognised the perspectives or whether further adjustment was 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 and flows 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 at the same time it provides maritime access to the port of Antwerp, one of Europe's largest ports. The Western Scheldt has a dynamic riverbed and the ecological value is largely attributed to that. It also requires regular dredging and periodically deepening as the size of the ships bound for the port of Antwerp continues to increase. As such, one can see two competing claims. The port authorities regularly request further deepening of the navigation channel, but since the estuary is situated on Dutch territory, they can't act at their own discretion and depend on Dutch willingness to cooperate. Added to that is the dimension of safety. People in the Dutch province of Zeeland and in the Flanders lowlands are hesitant to accept risks regarding floods.

In order to deal with another request, by the port of Antwerp authorities, to deepen the Western Scheldt a project organisation was established in 2001. 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. Its task was to develop a concrete outline for the Western Scheldt for the year 2010, based on the long term vision 2030, and to do so in close international cooperation and through stakeholder participation. This outline should answer two questions: is it possible to deepen the Western Scheldt once again? And if so: how can the deepening be calibrated against the other dimensions of the Western Scheldt, namely the development of the ecological state and the promotion of safety?

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

3.2 Data collection case Western Scheldt

Superficially and given the mission of ProSes, one can therefore distinct between three normative perspectives: ecology, economy and safety. But these perspectives are formal ones and as such detached from the individual actors involved with this process. Twelve actors distributed over the ProSes organisation, the research group and the 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', 'Using' and 'Balance'.

The first perspective 'adaptation' uses argumentation that shows a view that actual deepening of the Western Scheldt can 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 'using' is based on arguments that the Western Scheldt is a navigation channel and should be used as such. The reasoning is such that: as the water is a given fact it should be utilised. Considerations that deepening the estuary might damage the natural system (or may not) are of lesser importance in the decision-making. The third, and final, perspective 'balance' is based on the argumentation that the Western Scheldt is on the verge of degeneration from a vital estuary into an ecologically dead water body. From this perspective every deepening or any other human-induced change of the natural system is full of risks and possibly disastrous and should be avoided. These perspectives were then tested through a survey.

To structure the survey the statements were formulated around different theme's that were discerned during the interviews. These were: vulnerability of the natural system, (water) management of the estuary, knowledge and knowledge utilisation during the policy process and information. Statements covered both the future and the past.

3.3 Results

The survey was distributed among 45 potential respondents. The response was N=16 (36%), next to another 11 respondents (27%) who answered that they did not want or could not participate.

From the analysis it appears that every perspective has a certain amount of support. None of these perspectives are rejected, because in most cases there is a (large) difference between the minimum and maximum score and the scores are not clustered around value zero. An exception on this is the minimum score of perspective 'using' in the third cluster of questions the survey. It appears that mainly the perspectives 'moving' and 'balancing' are found in this cluster. The support for both perspectives is almost equal, however the perspective 'balancing' seems to be the perspective that has most support, although the standard deviation for the perspective 'moving' is the lowest.

The perspective 'using' is the least supported in the sample. There is no high score for this perspective to be found and in cluster two the support for the argumentation of perspective 2 is even negative. The standard deviation is the largest for this perspective in the third and second cluster. A conclusion that could be drawn from this is that the argumentation for the 'using' perspective is the most controversial if it is compared to the other two perspectives: both support for argumentation as rejection of the argumentation can be concluded most clearly from the results of the survey. This is not really unexpected because exclusively 'using' the Western Scheldt as a waterway, without looking at the other aspects of the estuary does not fit in the current paradigm of sustainability – or at least the actors' interpretation of sustainability – that is important in this case. The results of this survey can be found in tables 2 - 5.

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

Table 2: 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 ‘using’	16	-100	38	-17,13	40,965
Perspective ‘balancing’	16	-38	100	19,56	38,349
Valid N (listwise)	16				

Table 3: 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 ‘using’	15	0	67	28,20	20,778
Perspective ‘balancing’	15	33	92	65,80	15,354
Valid N (listwise)	15				

Tabel 4: Preferences in cluster 3 – Western Scheldt case.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Perspective ‘moving’	3	18,8	18,8	18,8
	Perspective ‘using’	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	

Tabel 5: Primarily preferred perspectives ‘moving’, ‘using’ or ‘balancing’ and not identified (when a respondent chose a different perspective in every cluster) over three clusters – Western Scheldt case.

The amount of support varies strongly between the perspectives. This brings up the question whether the respondents did respond consistently over the three clusters. In all the clusters many respondents show a relatively clear preference for one of the argumentation of one or two of the perspectives and a lesser preference or disapproval for one of the other perspectives. This is shown in table 6 were ‘high’ stands for high consistency and ‘low’ for little consistency. Over 30% chooses the same perspective in every cluster. Fifty percent of the respondents choose the same perspective in two out of three clusters with the same perspective. Nineteen percent of the respondents show that they prefer a different kind of argumentation in every cluster. Respondents that are completely consistent and choose the same argumentation in every cluster appeared to prefer the perspective ‘’balancing’.

		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 6: Consistency among respondents over three clusters – Western Scheldt case.

These results were presented during a workshop but an very low turn-out means that no additional data could be obtained. To sum up this case: the perspectives found in the first round of interviews can count on a certain degree of support from the respondents because most

respondents switch between two perspectives. However, there is no strong consistency in the respondents' support. The outcome of the workshop could not be used to give meaning to these findings. Another case may shed more light on this phenomenon.

4.1 Rijnland water network

The water network of the waterboard Rijnland (Hoogheemraadschap Rijnland) consists of waterways in which sediments have accumulated over a long time span. These need to be removed for various reasons such as quantitative and qualitative watermanagment and the improvement of the ecological state of the waterways. Dredging hasn't been done for decades and the riverbed almost touches the surface of the water in some areas of the watersystem. Influx of sediments is through rain or supplying water bodies, such as rivers, outside the physical system for which Rijnland is responsible.

The maintenance of the water network is the responsibility of the water board Rijnland. Facing the enormous backlog, associated costs, and societal dissatisfaction, the organisation decided to take on a different approach and engaged in a participatory process in which stakeholders could exchange ideas about the future of the network. These visions were then translated into concrete measures for the actual project. This way, Rijnland hopes to increase public support for the operation, and hopes to achieve a policy that is sustainable in order to avoid such backlogs in the future. This process was started in January 2006 and is still in progress at the time of writing. A research design similar to the one used in the Western Scheldt case was applied to this case.

4.2 Data collection case Rijnland

Ahead of the stakeholder process, a number of interviews were conducted among the main actors in order to identify the main perspectives on the water network of Rijnland. Analysis of the interviews revealed three perspectives. These are labelled 'utilisation', 'control' and 'protection'. In contrast to the Western Scheldt case it was decided not to use three clusters of statements but rather one cluster. This contains statements using a 5-point Likert-scale. Three clusters proved to be too demanding for the respondents. The reason for that was of a practical nature. The respondents were asked to fill out the survey during a workshop, and it would take took too much time for the respondents to state their preferences and they could also experience duplication of the statements which could make them feel answering 'again' was of no use.

The first perspective, 'utilisation' is very similar to the perspective 'using' in the case of the Western Scheldt. The discourse in this perspective is to regard the water network as a utility that needs to be utilised. Decisions regarding the water body should be framed in terms of utilisation. That means that maintenance of the riverbed is important once it distorts the utilisation capacity of the water body. It also means that the operation should be of benefit, e.g. using dredged material to build dykes etc. The perspective 'control' encompasses the discourse that promotes a type of management and development that is primarily aimed at controlling. This means that operations can only be carried out once all consequences are known and are deemed acceptable. Risks regarding the future development of the water body must be avoided and this perspective values laws, rules and regulatory frameworks highly. The third perspective, 'protection', has a strong ecological orientation. From this perspective, the Rijnland network is primarily an ecological system that requires protection or redevelopment in case its ecological state had deteriorated. The operation from this perspective was primarily a restoration of the ecological values of the water network.

These perspectives where then checked by means of a survey. Again, to structure this survey the statements were clustered around three themes, namely law and regulation, risks, sediment use, nature. Statements also covered both the future and the past.

4.3 Results

The survey was distributed among 31 potential respondents. The response was N=29 or 96%. Two potential respondents did not want to cooperate because they felt that – given their position as an employee of the Rijnland water board – they may criticise the water board unintentionally.
Analysis of the survey results showed an unclear picture. When looking at the first cluster, 'control' seems to get the most support. But, although fifteen respondents choose this perspective as the primary perspective, there are fourteen that choose 'utilising'. 'Protection' is never chosen as a preferred perspective but it seems that respondents choosing 'control' as their first preference often opt for 'protection' as their secondary preference. If one looks at the distribution of support over the three perspectives per respondent, one sees that most respondents have a more or less equal support for all perspectives. Preferences for a certain perspective are therefore rather relative: respondents' preferences change with (almost) each statement.

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

Table 7: Primary preferences in one cluster - case Rijnland

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Utilising	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 8: Secondarily preferences in one cluster - case Rijnland

It was not possible to check respondents' consistency in answering over various clusters as in the Western Scheldt survey for reasons stated before. Therefore, it was decided to analyse whether the three perspectives were mutually discriminating. If the scores for the perspectives are clustered around zero, the perspectives are (apparently) not complementary but rather similar. If the scores are widely distributed, the perspectives are (apparently) complementary. Analysis shows that the standard deviation is approximately similar for every perspective. This indicates that the perspectives are not very complementary. The perspective 'control' seems to be the most controversial with a highest standard deviation. Scores range from 20 to 40 so that means that opinions about this perspective are divided: those who support it, support it fully, those respondents who don't, fully reject it. But still the standard deviation is not that high and outliers are probably due to a small number of respondents choosing an extreme view.

	N	Minimum	Maximum	Mean	Std. Deviation
Score: Utilising	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 9: Scores per perspective and standard deviation – case Rijnland.

The survey results therefore indicate that the perspectives are only partly complementary and to a large degree overlapping. The way out of this puzzle could be offered by the workshop session.

The workshop was attended by most respondents. The perspectives were explained to them and it didn't take much discussion for all respondents to agree with the findings. That is: they recognised that all three perspectives were relevant for the case Rijnland and most of the respondents – bar two – confirmed that they felt they were categorised under the right perspective. To summarise: the survey showed an unclear result but the respondents were nevertheless convinced that the three perspectives were complementary. How to go from here?

5 Conclusions and reflection

5.1 The existence of perspectives and the adaptive capacity of the social actors

Although the methodology, and thus the scientific reliability and validity of the findings, can be improved, see section 5.2, some interesting observations can be derived from the results.

First of all the perspectives are a representation of the perspectives as these exist among the respondents. In the case of Rijnland this was most clearly approved by the respondents themselves, when they were confronted with the different perspectives.

Secondly the results do show some interesting images of how respondents – aware or unaware – choose between the different kinds of argumentation. Hereby they can also change their choice for a certain perspective when they have to weigh the underlying argumentation against each other. Although this is not possible to prove in the case of Rijnland, in the case of the Western Scheldt river this can be supported. For example in the case of the Western Scheldt the combination of the perspective 'moving' and the perspective 'balancing' was by far the most occurring combination among the respondents that preferred the argumentation of two perspectives. This could mean that the idea that the estuary is 'robust' enough to sustain actual deepening (argumentation of the perspective 'moving') could go well with the idea that the Western Scheldt is a complex system that should be studied well before actual actions for deepening are taken (argumentation of the perspective 'balancing'). Based on the conclusion that the respondents can clearly view a problem from different perspectives it is not likely that the research that was conducted into the deepening of the Western Scheldt has been reviewed 'neutrally' and that the advise towards the decision makers did not come naturally from the results of the research but is the result of the interpretation of these results from a normative perspective. It appears that the research was coloured by the normative perspectives. On paper the respondents are partly capable to weigh different perspectives (lines of argumentation) against each other and thereby changing perspective if this fits better with their interests. In practice this weighing is coloured by the interests that play an important role. The fact that Flemish respondents choose for the line of argumentation of 'using' more often than the Dutch respondents, can not come as a surprise, taking the vast economical interest that the Flemish region has by deepening the Western Scheldt.

5.2 Methodological analysis.

As was described above the researchers were confronted with results that were difficult to explain. Partly this can be attributed to the lack of scientific rigour. The fact that the survey showed dissimilar results when compared with the explorative interviews may be down to the fact that the two samples have different perspectives altogether. Also, the shift from qualitative methods to quantitative methods and back again to test the same item can be criticised. Furthermore presenting the results to the respondents may exclude their focus from other possible perspectives, hence they agree on what is presented. Furthermore, in the Western Scheldt case was designed based on the expectation that every consecutive cluster of questions would confront the respondents with alternative perspectives and thus 'force' them to become

more consistent in their choices. Based on the results of the survey it cannot be concluded that the second and third cluster are better instruments that the first cluster to get insight in the perspectives that a social actor might have. Because the research was conducted on one moment in time, it is not possible to verify if changes in perspectives occur. Hypothetically speaking it is possible that for example an incident such as a leaking oil-tanker on the Western Scheldt would cause a shift in the perspective 'using' towards the perspective 'balancing'. Also the research process of ProSes itself can cause a change in perspectives. To validate this, a second survey should be conducted. The question is whether this is desirable to use the same methodology again. There is a chance that the respondents, when confronted with another request to fill in the survey try to answer in a similar fashion as they did the first time. With this the research instrument would create a distortion in the data. So for a new survey another research instrument should be designed.

5.2 Reflection on possible implications for water management

Based on these findings, we would like to reflect on what these could mean for the decision-making process, and the way sediment projects with a substantial societal impact are managed.

First of all the awareness of different perspectives on a project means that project goals should be viewed from different perspectives by the project management. Project management should be aware that the goal of their project might seem very legitimate from one perspective, but it can actually go against another. Actually realising this and keeping this in mind when communicating about the project could improve the quality of the project process significantly. This, open eye for diversity, also goes for the knowledge that is used in the decision-making or project process, an approach such as Joint Fact Finding could give insight in the different research or knowledge that is used as argumentation by the stakeholders.

Secondly the fact that the perspectives and visions of the stakeholders can not be known beforehand means that the project management should be less focused on finishing every 'step' in the project that was plan beforehand. Project managers should have the possibility and the skills to let go of their original project description and make use of chances as they appear (Teisman, 2005). Maybe new approaches towards cooperation between stakeholders and project management (problem owners) can be made possible. In the Netherlands, one of the departments dealing with sediments is for example exploring the possibilities to leave the responsibility and the actual assessment to make decisions completely to the stakeholders (including the budget).

The third important impact could be the way that plans to meet the projectgoal are designed. Currently it is often the case that stakeholders will be presented with a number of plans and will be asked to 'choose' amongst these. This will often cause a discussion and some kind of compromises has to be agreed upon. A possibility that uses the different perspectives that exist is to give the stakeholders room for bottom-up ideas. This makes much more use of their skills, creativity and knowledge.

As stated in the introduction of this chapter, many projects have so far scored high on participation and low on impact. Maybe other innovative approaches, where actually reaching a solution that works and also implementing it, in stead of trying to force 'unwanted' solutions through a project process to find that it actually does not work once the project is finished, could be a way out of this. Seeing a project as an R&D lab and going for quality instead of running to the finish line, to see you have developed a project that nobody is going to use.

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