



**NeWater**

## **Governance, institutions and participation**

**A comparative assessment of current conditions in selected countries in the Rhine, Amu Darya and Orange basins**

**Report of the NeWater project -  
New Approaches to Adaptive Water Management under Uncertainty**

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## Executive Summary

This report contains an assessment of the current water management regimes in five countries (Switzerland, Germany, the Netherlands, Uzbekistan and South Africa), particularly focusing on three river basins (Rhine, Amu Darya, and Orange).

Attention was paid to several elements believed to comprise a management regime:

1. The government system and policies;
2. Property rights, markets and cost recovery;
3. Stakeholder and citizen participation;
4. Information management;
5. Networks;
6. The scale dimension.

A calibrated approach (shared checklist and common discussion and reinterpretation of outcomes) was used to compare the state of affairs in water management in the selected countries and basins. The assessment reveals that the three Rhine countries have roughly developed in a similar direction when it comes to managing the Rhine. The adoption of strategies for managing water by means of more flexible infrastructures is core in the water management regime of these three countries. Uzbekistan and South Africa are very different in much respect, although South Africa has overhauled its water law drastically and many changes are being made. At the end of the report, we move from a more descriptive to a more normative perspective, tentatively assessing the degree to which water management in the five selected countries can actually be labelled 'adaptive'. This analysis suggests that the Rhine countries, especially Switzerland, have implemented important components of what could be called adaptive water management, with South Africa and Uzbekistan lagging behind.



## 1. Introduction

This report is the first deliverable of workpackage 1.2 (D 1.2.1) in the NEWATER project. It contains a baseline assessment of water management regimes in five countries, addressing matters of governance, institutions and public participation.

The term baseline assessment here refers to two things. The first is the fact that the assessment is of the current situation in water management, as the starting point of analysis in the rest of this workpackage. It is also a baseline assessment in the sense that it is descriptive and empirical rather than normative and theoretical. The central concept in NEWATER is that of adaptive water management, and for this workpackage it is adaptive governance. At the time of writing of this report, the research team was still in the phase of discussing the definition of the word adaptive management, which is to serve as a guiding device for the potential future direction of water management regimes.

The researchers in workpackage 1.2 have collectively decided to focus their efforts on a small set of basins, notably the Rhine, the Amu Darya and the Orange. Work-package (wp) 1.2 is closely related to workpackage 1.3, but the two work packages differ in their focus: wp 1.3 has its focus on the international dimension of the governance of these basins, whereas wp 1.2 restricts itself to the national level and below. For the purpose of the current deliverable, five underlying reports have been written:

- Case study Orange – South Africa and Lesotho by Nicole Kranz, Eduard Interwies and Antje Vorwerk (Ecologic);
- Case study Amu Darya – Uzbekistan country report by Resul Yalcin (University of Bonn);
- Case study Rhine – Country report Switzerland by Gert Becker (Vrije Universiteit Amsterdam);
- Case study Rhine – Country report Germany by Gert Becker (Vrije Universiteit Amsterdam);
- Case study Rhine – Netherlands country report by Tom Raadgever and Erik Mostert (Delft University).

All of these reports contain descriptions of the physical characteristics of the basins, current issues relating to water quality and quantity, and often also a description of the general government system in said countries. The present report limits itself to the specific characteristics of the water management regime only. The interested reader can request these reports from the authors<sup>1</sup>.

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<sup>1</sup> Please find address details at [www.newater.org](http://www.newater.org). The reader is warned that the background reports contain slightly different data from what is presented here. The most important element of the country reports for the purpose of D 1.2.1 was the scores they contained. The scoring was discussed in a wp 1.2 meeting, then calibrated and new scores were given to the authors of this report, without changing the scores in the background reports. The new scores have been used here. As a consequence, they may differ slightly from the scores in the background reports. Where that is the case, the scores in this report are the final ones.

As stated, the goal of the NEWATER project is to generate ideas about adaptive governance. Although we are currently at the beginning of thought formation in this matter, we have a general awareness of the matters that may be of relevance for adaptive management in the sense that these are the elements of any governance regime and thus also of an adaptive regime.

These matters have been laid down in a checklist that all authors of country reports have used for their assessment<sup>2</sup>. The checklist paid attention to the following matters:

- The government system and government policies, specifically the degree to which these are centrally led and based on rigid and large-scale infrastructure;
- Property rights, markets and cost recovery, especially the division of responsibilities for handling water problems over the public and private sector;
- Stakeholder and citizen participation, especially the timing in the policy process and degree to which policies are co-produced;
- Information management, specifically whether information on all aspects of the DPSIR framework is collected and shared or not;
- Networks, specifically the relations between experts and politicians and secondly the relation between the water management sector and other policy sectors;
- The scale dimension, specifically whether or not there is a fit between the scale of natural problems and the regime's response.

Worth mentioning is the fact that the comparison that is made in the rest of this report is with limited pretence in the sense that very little inferences can be drawn. This is because the comparison is not theoretically informed, so there are no rigorous hypotheses to test. The hypotheses stated served as working hypotheses to guide the baseline assessments. Furthermore, the countries involved have not been chosen with a perspective of systematic case study selection (e.g. maximum difference of regime, or minimum difference of regime per case). In the present report, this has implied an over-representation of countries in the Rhine basin. The reader is also warned that 'country scores' given in this report are specifically for the basins that are being studied for NEWATER and may look different for other basins in these countries. In situations where there was even more variation (e.g. in Germany, where the Laender have different sets of policies for the Rhine), the basis for the scoring in this report is reported separately and the reader must keep in mind that the picture may be different for other jurisdictions. The authors of the background reports have used the commonly developed checklist, which asked them to score the situation in the five countries on a five-point scale. The wp 1.2 team concluded during a workshop in September 2005 that (1) the questions had not been interpreted consistently by the various authors, and (2) that giving scores on a five point scale suggested a level of precision that cannot be achieved by this type of analysis. A calibration process was started, which essentially implied a discussion process on scoring between the authors of the background reports to come to a common understanding. Secondly, it was decided that the final (this) version of D 1.2.1

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<sup>2</sup> Developed by Dave Huitema, Tom Raadgever and Erik Mostert.

would not present scores on a five-point scale<sup>3</sup>. Instead, scores are here presented on a three-step scale, with the scores denoting Low-Medium-High levels of progress.

Despite the limitations just sketched certain patterns that seem to exist will be pointed out and these patterns may be reassessed when the full baseline assessment for all basins in the NEWATER project becomes available.

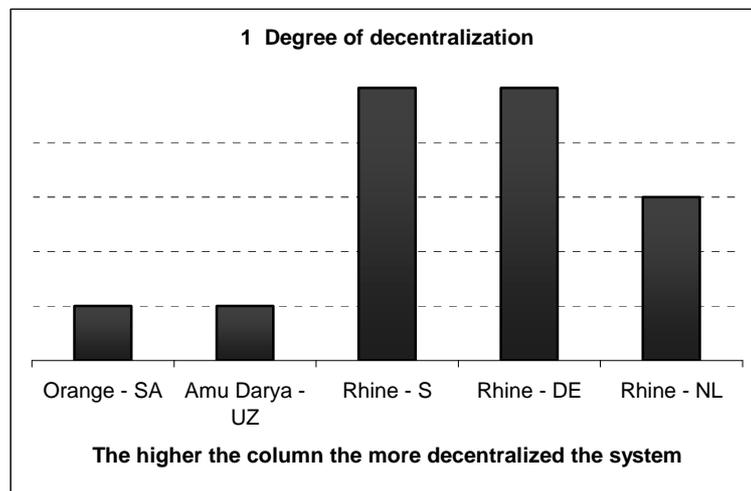
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<sup>3</sup> The scores in this report are derived from the calibrated scores from the background reports. Essentially scores 1 and 2 have been translated into 'Low', 3 into 'Medium' and 4 and 5 into 'High' stage of progress.



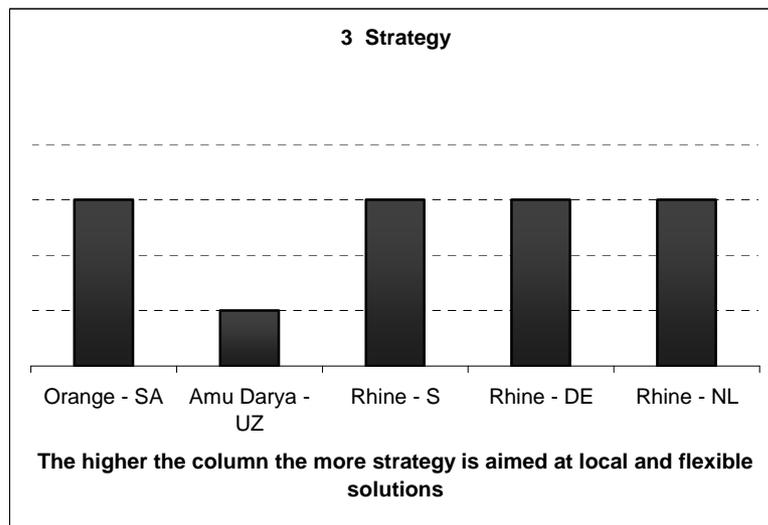
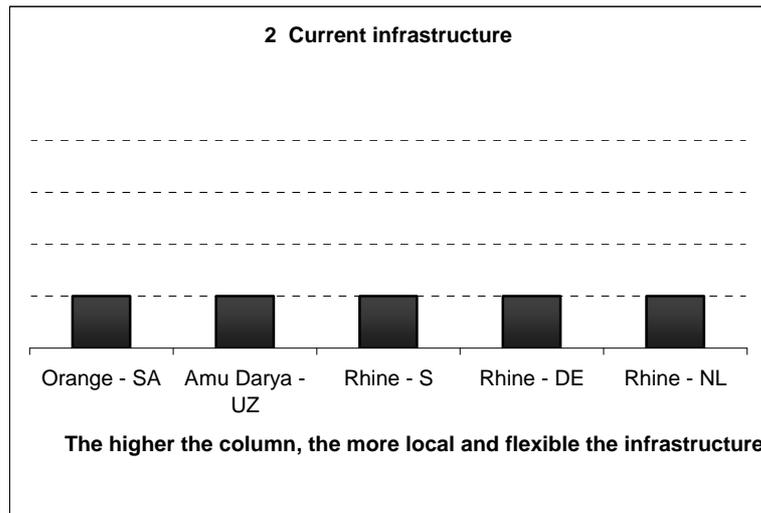
## 2. Government and government strategies

The first aspect that the authors of the country reports scored on was the degree to which the government's efforts in water management are centralized. Background of this question was the idea embedded in the NEWATER project proposal that a decentral approach to water management issues is potentially better from an adaptiveness point of view. Figure 1 shows that Switzerland and Germany do quite well in this respect, as a consequence of the large role that lower level authorities play in policy making in these countries. The Netherlands has a relatively stronger influence from national government actors, notably two ministries that are responsible for water management in this country. Although there are differences between South Africa and Uzbekistan (in Uzbekistan practically all government offices are a derivate from the central level), both countries have a low level of decentralization.

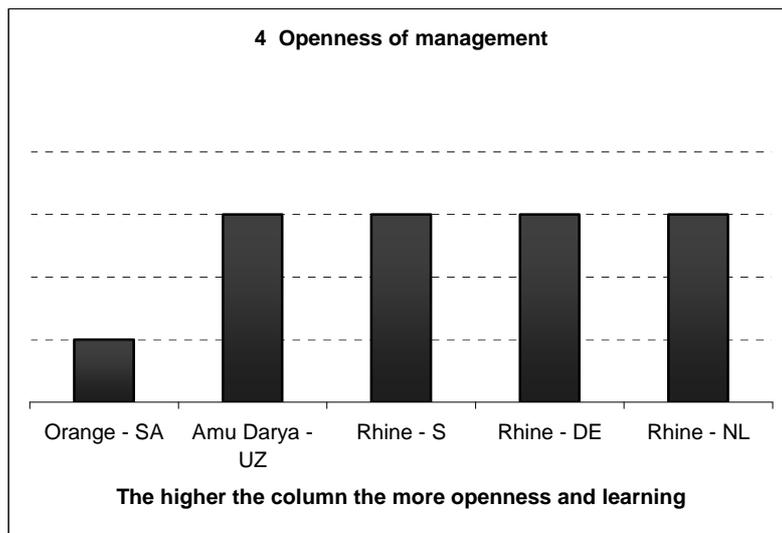


One interesting hypothesis to ponder in the NEWATER project is the relation between the degree of centralization of government and the degree to which there is a large scale and rigid infrastructure in place to control water problems. We can see in Figure 2 that all five countries of interest here are, in terms of their existing water control infrastructure, rather on the side of large and rigid elements, with the authors of the background reports noting differences between Uzbekistan and the other countries. Uzbekistan relies on the infrastructure from its Soviet Union past and in South Africa, much of the infrastructure was developed in the Apartheid era. In the Rhine countries, the change in strategy (see below) is beginning to show in water management strategy but not yet enough to score as medium progress.

In three countries, Switzerland, Germany and Netherlands, the trend is away from investment in large-scale water infrastructure. Figure 3 gives a certain indication of these shifts in strategy, making clear that the three mentioned countries and South Africa are targeting a larger share of local and flexible solutions in water management than they currently have. The strategy in Uzbekistan is in line with the currently present infrastructure.



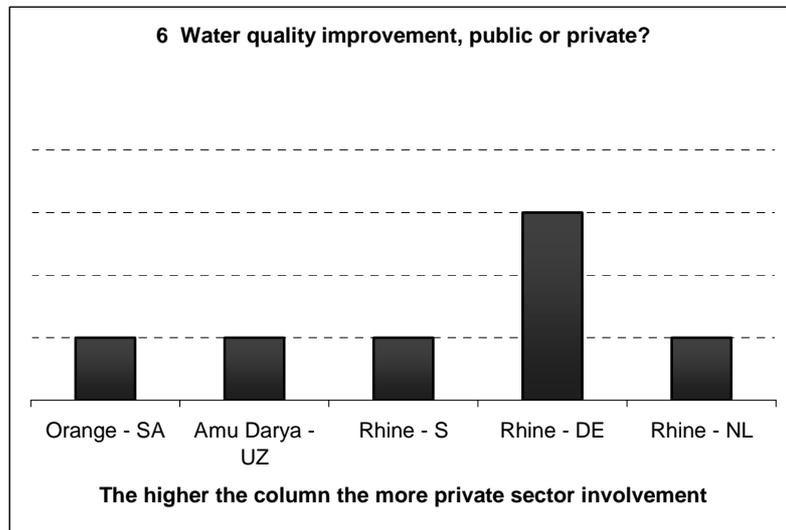
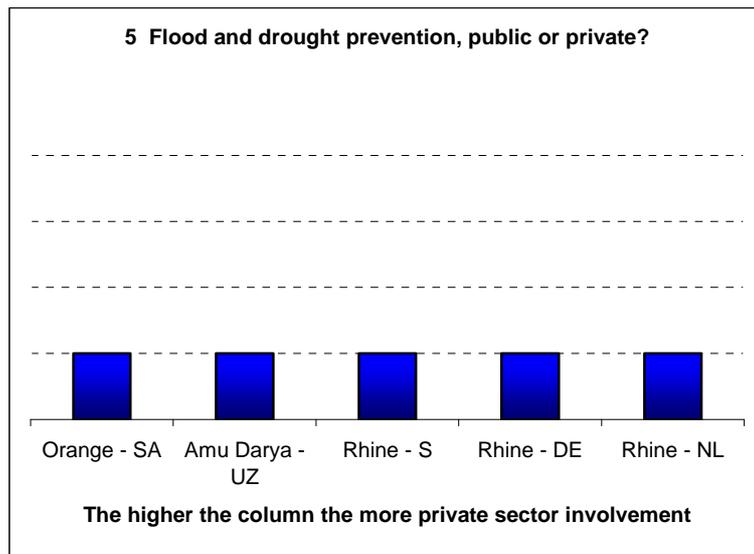
Given the just sketched similarities and differences, the outcome of the comparison of the countries on the aspect of openness of the regime to change delivers a surprising result. This in the sense that the country reports indicate roughly a similar degree of openness for four countries. Especially the score of Uzbekistan is surprising given the fact that the country does not seem to have undergone a transition away from the large and rigid infrastructure, so no change has yet occurred. South Africa is least open to change of the five countries involved here. In the background report the reader can find the story of the intrinsic relations between the injustices in South African society and the set up of water management. Water management was one instrument of the former regime to favour the white and wealthy farmers, and the country is slowly changing course. The relatively low score reflects this.





### 3. Property rights, markets and cost recovery

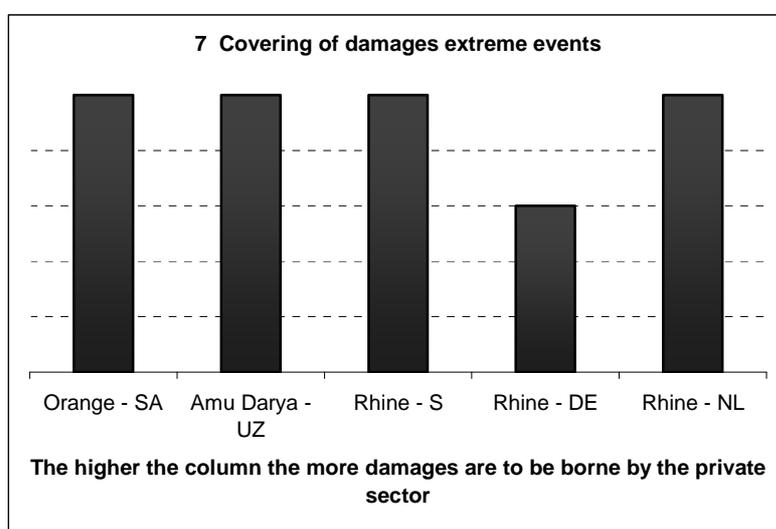
Interesting as it may be, the interpretation of data on water managers in the government can only be complete if we know their relative importance as compared to water managers in the private sector. This was assessed by asking the writers of the country reports to ascertain whether water quantity and water quality management are public or private tasks. Figures 5 and 6 give an indication of this.



It becomes clear that in all countries the government is still quite dominant in the provision of safety from flooding and droughts (quantity), with the Rhine countries and South Africa allowing slightly more private involvement than Uzbekistan. The pattern is slightly different for water quality management, which -according to the background reports- has a higher degree of private sector involvement than quantity management in

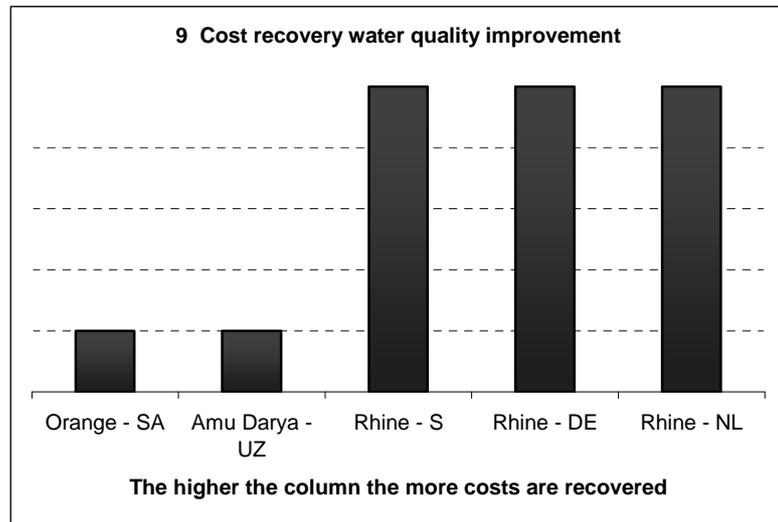
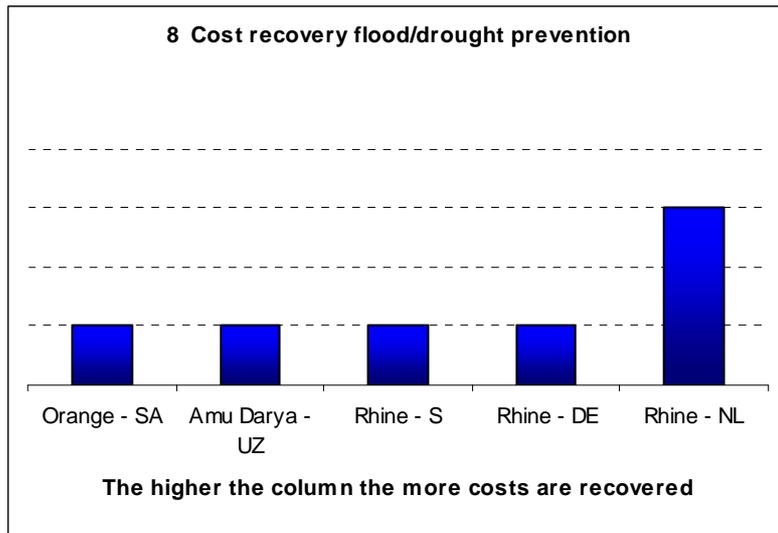
all countries except Uzbekistan. These differences are however not visible (except for Switzerland) in the figures due to the application of the three point scale. The (small) difference in scores for water quantity and water quality may have to do with perceptions of the nature of safety and water quality: safety from flooding is probably perceived as a collective good, and water quality as a good with private elements and where a market can develop.

Given the pattern just sketched, it is somewhat surprising that the damages incurred by extreme weather events are to be mainly borne by the private sector in all the countries. Apparently the damages of such events are considered to be in the realm of the risks associated with private entrepreneurship and ownership even though prevention is seen as a public task. This could imply in certain situations that the private sector needs to pay for mismanagement in the public sector (if present).



Needless to say that preventative measures against damages need to be taken. A relevant matter is then whether the costs of such measures are actually borne by the sectors for which they are taken. Complete cost recovery of preventative measures against floods and droughts is a fiction, with Uzbekistan showing none, the lowest degree of costs recovery and the Netherlands showing a medium score, which is related to the application of taxes/levies applied by the waterboards.

For water quality improvement, the degrees of cost recovery are high in the Rhine countries, but low in South Africa and Uzbekistan. In the case of Switzerland and Germany the costs are almost fully recovered according to the background reports. In all the Rhine countries, the high score is connected to the existence of water emission fees, which are an internationally well-known and well functioning way of stimulating wastewater treatment capacity. Where cost recovery is not complete, this tends to be associated with diffuse pollution sources. For such sources it is more difficult to impose levies as measurement of pollution loads is demanding. Secondly, diffuse sources are in part related to agriculture and this sector tends to have a special position in policy-making processes.

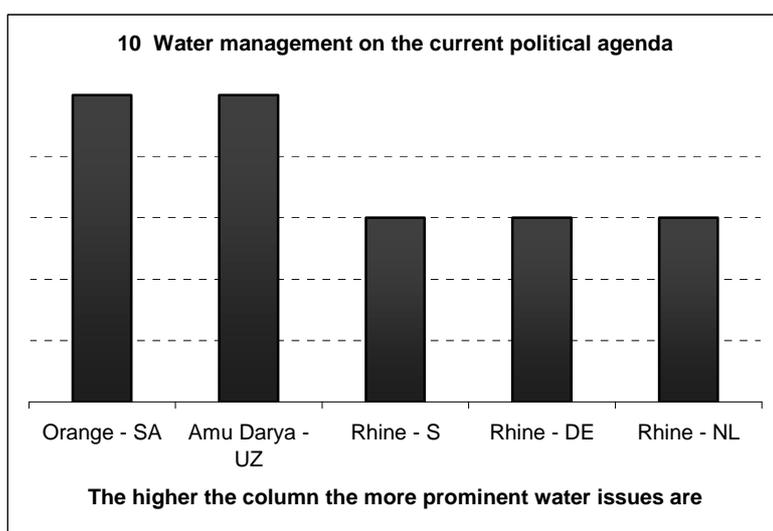




## 4. Stakeholder and public participation

An important element of any governance regime is the way public actors deal with other parties that have a stake in their management decisions. Some of these other actors are organized interest groups (agriculture, tourism, etc.); here we call them stakeholders and their participation *stakeholder participation*. The involvement of unorganized citizens is called *public participation* here. There are various relevant indicators, which start from the demand side for participation and end with the general ‘policy style’ of water managers.

The first two elements that the country researchers have looked at is the general place of water issues on the current political and public agenda. If water issues occupy a low place on that agenda, then this means that water issues are not of great concern to official decision makers and neither to the general public. This would be an indication that the desire for stakeholder and public participation is probably low.

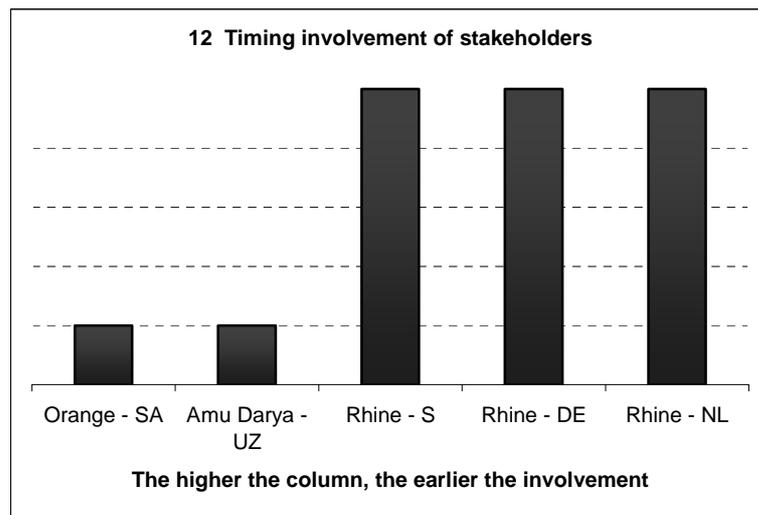
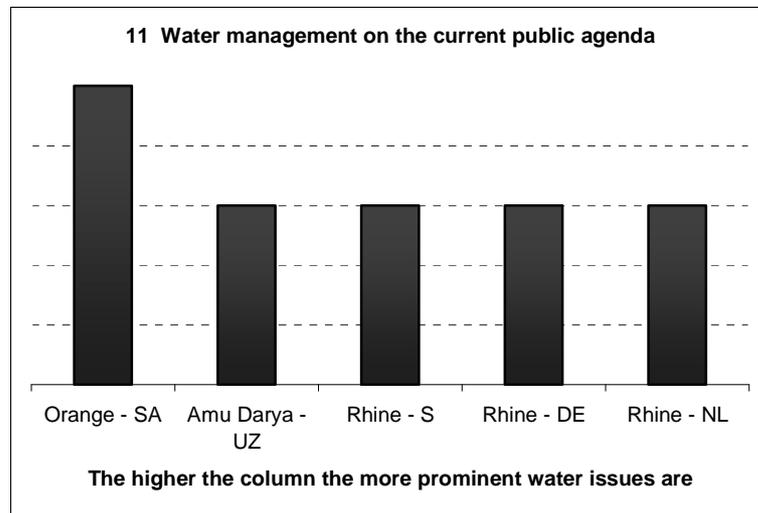


It is interesting to note that the place of water issues on the political agenda in the Rhine countries, according to the writers of the country reports, is somewhat lower than the place of these issues in Uzbekistan and South Africa. What can be read in the background reports is that incidents such as flooding have an impact on the place that water issues occupy on the agenda. In addition, in South Africa, water management issues are a key ingredient in the effort to reshape the country in a more equitable manner. Because water management and land ownership issues are intrinsically connected in South Africa, the political saliency is high.

It appears that the place of water issues on the public agenda in Uzbekistan is somewhat lower than the place on the political agenda. In the Rhine countries and South Africa there is no difference between political and public agenda.

The timing of stakeholder and citizen participation is considered an issue of importance by scientists and practitioners alike. This is because early on in the policy process, the

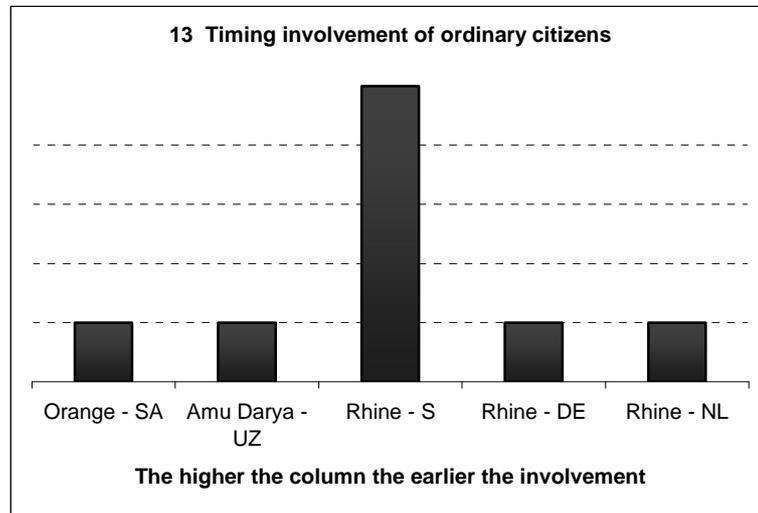
issue is the way problems become defined and solutions discussed later on tend to be based on such definitions<sup>4</sup>. As the reader can see in Figure 12, Germany, Switzerland, and the Netherlands have early stakeholder involvement. Stakeholder participation in South Africa and Uzbekistan and takes place at a late stage.



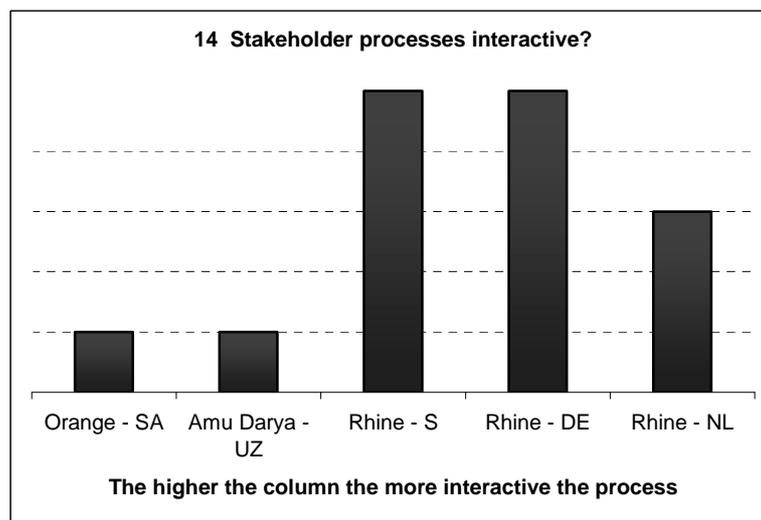
There tends to be a difference between the timing of the involvement of organized interests and ordinary citizens, with ordinary citizens getting involved later, e.g. at the time when measures thought out by the policy makers and stakeholders have been prepared and start being implemented. This tendency of involving ordinary citizens later

<sup>4</sup> Although the existence of a policy cycle does not hold much currency amongst policy analysts these days, the policy cycle is an attractive analytical device. Here we used the stages of the policy process for determining how 'early' or 'late' stakeholders and ordinary citizens are involved in the policy process. The earliest possible stage for such involvement is in the stage of defining water problems, the latest possible stage is at the policy evaluation stage.

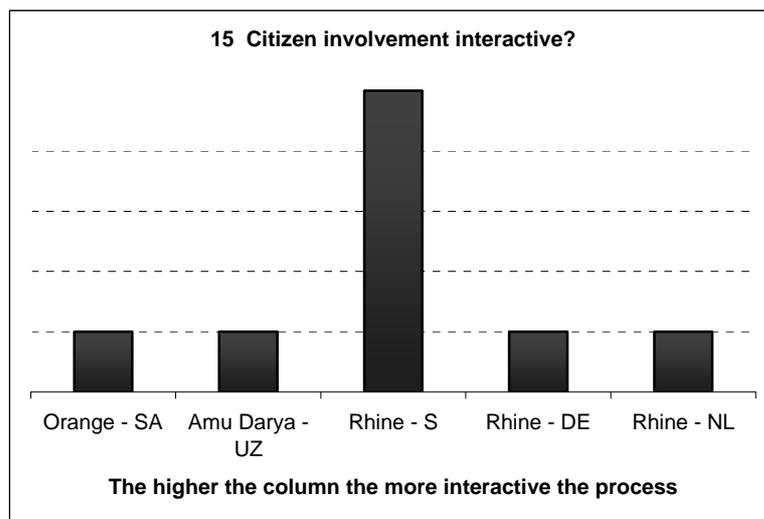
than stakeholders is visible in all four countries, except Switzerland. The exceptional status of Switzerland is probably thanks to its political system, which emphasizes the involvement of citizens by means of direct democracy.



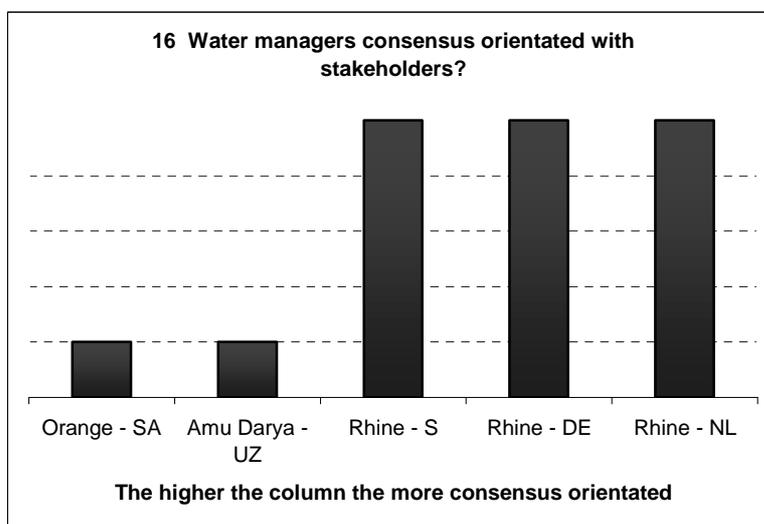
Obviously participation can take place in various forms, some of which may not at all be interactive. Although such exercises may not be very deserving of the word participation, there are processes where the role of citizens and stakeholders involves nothing more than an invitation to come and listen to an explanation. Figure 14 indicates that this is especially the case in South Africa and in Uzbekistan, and that Switzerland and Germany approach the ideal of a two way communication process.



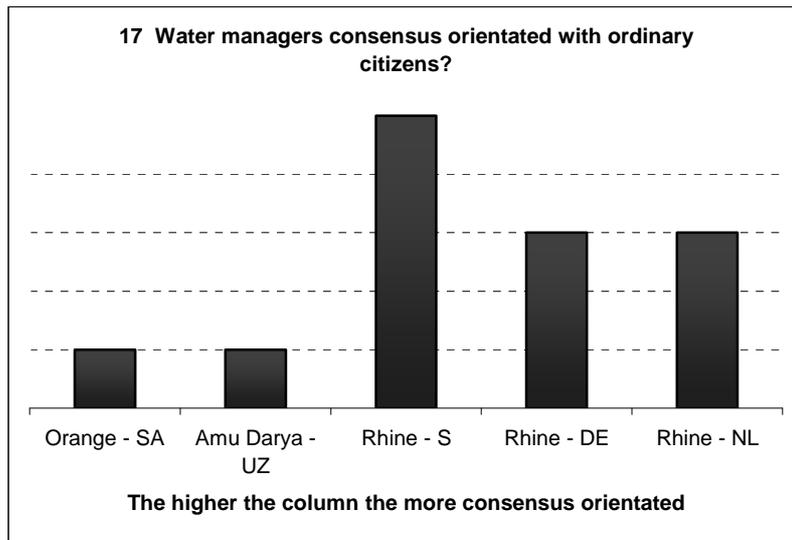
Citizen involvement is less interactive if we look at the scores given by the writers of the country reports. All countries for which we have data are either on or close to the score of a one-way process from government to public, signifying low or no interactivity at all. The exception is Switzerland again, where water managers approach the ideal of a two-way interaction with the ordinary public.



The last issue raised under stakeholder and public participation is the policy style of water managers. Such a style is supposed to vary across two dimensions, one being the degree to which decisions are taken after consensus with target groups, the second being forward looking nature of a certain sector. It is the first dimension that has been scored by the writers of our country reports as below (the second dimension will return later – under scale).



In the Rhine countries, the water managers seem to operate in a highly consensus orientated way vis-à-vis stakeholders. Switzerland is equally consensus orientated towards ordinary citizens, but this is not the case in Germany and the Netherlands. It is no surprise in view of the political history that Uzbekistan and South Africa operate in a rather imposing fashion, although slightly more so towards citizens than stakeholders according to the background reports.

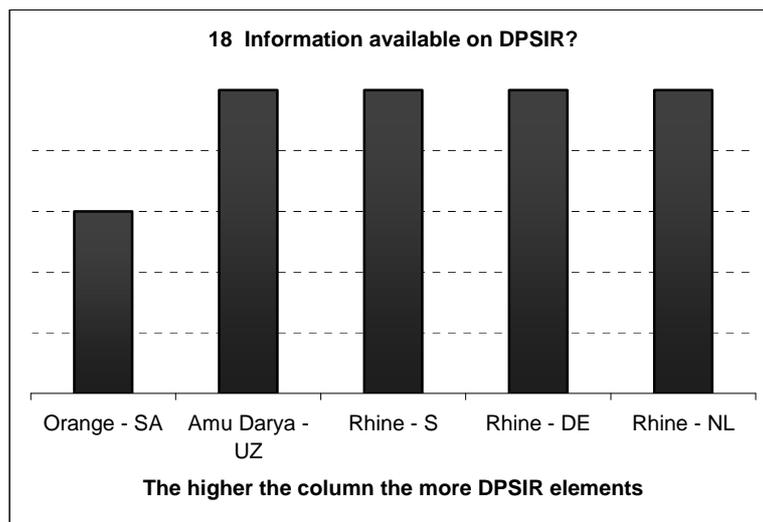




## 5. Information management

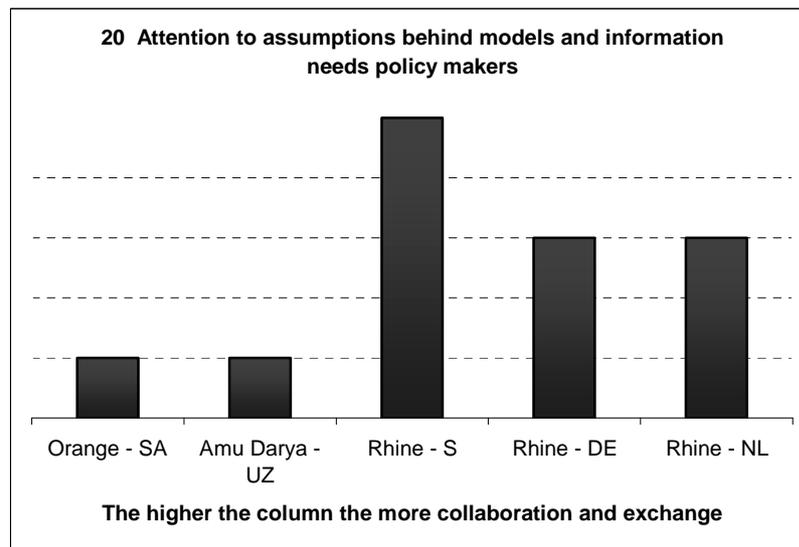
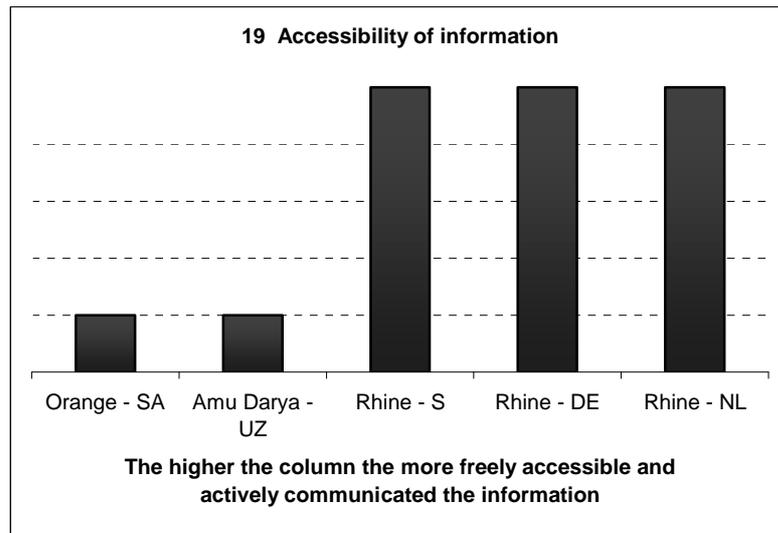
Information management is expected to play a crucial role in adaptive management. The topic covers various items, including the breadth and depth of current information collection systems in the countries involved, but also the accessibility of this information to anyone who is interested, the reflexive nature of information and a healthy relation between scientific experts and decision makers, which implies that none of these life worlds dominates the other.

Regarding the first matter, the completeness of information gathering. The information position of water managers generally appears to be excellent, being high in the Rhine countries and Uzbekistan, implying that relevant information on most aspects of the Drivers, Pressure, State, Impact and Results (DPSIR) formula is indeed connected. South Africa scores somewhat lower, which is probably related to the relatively recent character of modern South African water legislation and nascent stage of its new water management system.

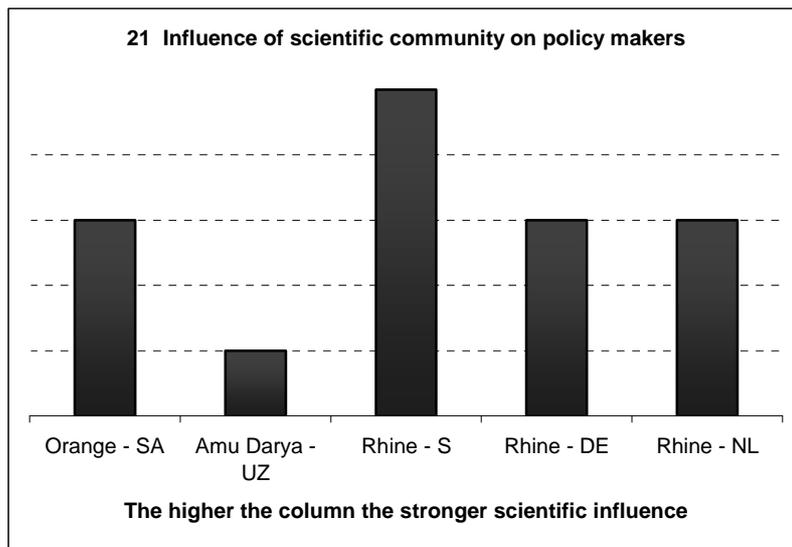


There is much information available in Uzbekistan but this information is not widely shared, which is also the case in South Africa. The Rhine countries score higher because they offer free access and actively communicate information.

Obviously, water managers use models to predict water flows and water quality at certain times. We asked the writers of the country reports to assess the degree to which policy makers were actively involved in model building and application and are thereby or in any other way become aware of some of the assumptions in these models. Awareness of models could be crucial to interpret the outcomes and may also lead to models that have a higher relevance to policy makers. Attention to such assumptions is high in Switzerland, moderately present in Germany and the Netherlands, and scant in South Africa and Uzbekistan.



A healthy relation between scientists and policy makers is a term that is hard to define. The two extremes in this relationship that are not healthy however are technocracy and political ad hoc policy. In the first relationship, scientists determine policy, which is questionable from a democratic perspective, in the second case it is likely that many irrational decisions are taken because of sheer political opportunities, which may prevent the solution of problems. The risk of political ad hoc decisions is the greatest in Uzbekistan according to the country report writers, and smallest in Switzerland. Indeed, the influence of the expert community in this country looms large. The Netherlands, Germany and South Africa take the - perhaps most healthy- intermediate positions.

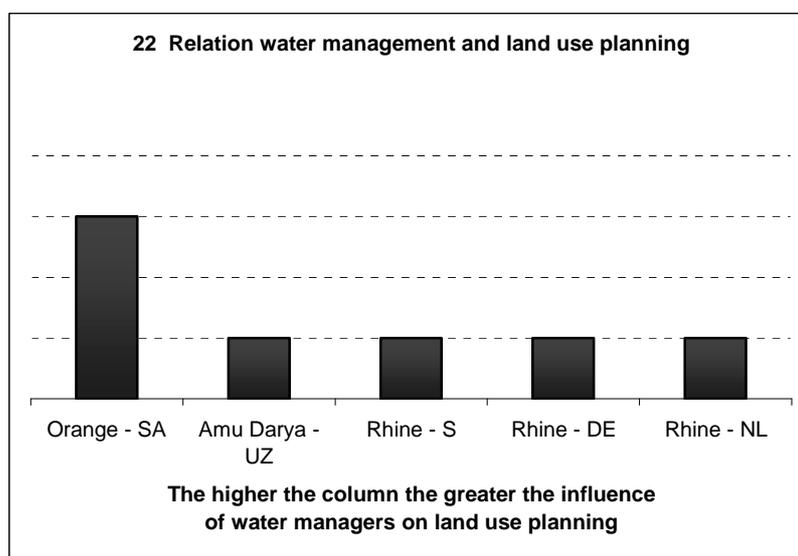




## 6. Networks

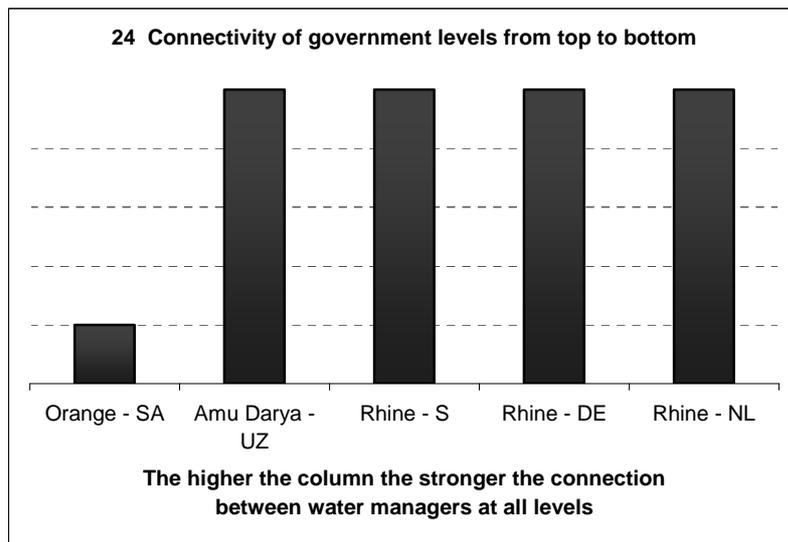
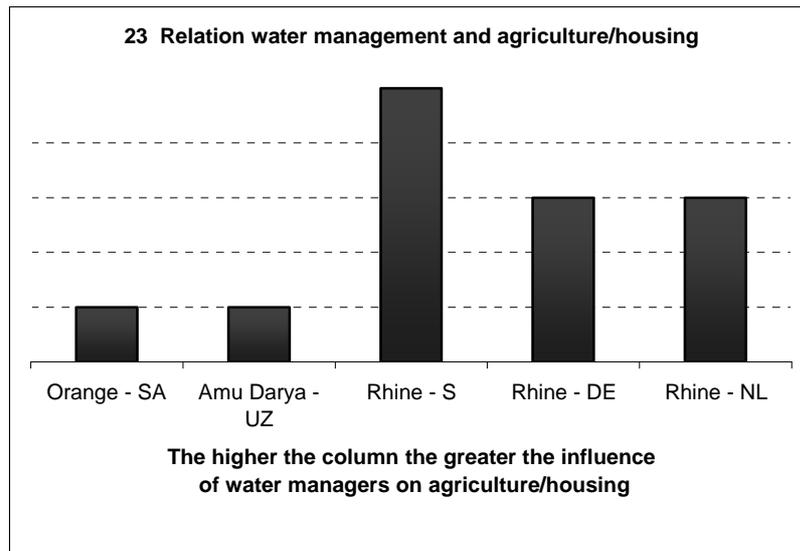
Networks are crucial in today's society. For our checklist we have focused mainly on government networks, gauging the emphasis in the relationship between water management and other policy sectors and the connectivity of the government network top to bottom. These texts should be interpreted in close connection to Chapter 4 on stakeholder and public participation, where the role of other actors is brought into focus.

The first important relation is the one between the water management network and the land use-planning sector. The country report authors have scored the degree to which either of these sectors can be considered leading. Overall, the emphasis appears to be strongly on land use planning, with land use planners being more influential than water managers in Uzbekistan, Germany, Switzerland and the Netherlands, and the balance of power being even in South Africa.



The scores on land use planning are not surprising as land use planning is often considered a very influential policy sector. Figure 23 suggests that water management has a relatively stronger position vis-à-vis housing and agriculture than in relation to land use planning, most dramatically so in Switzerland. Water managers are equally weak vis-à-vis housing and agriculture in Uzbekistan. In South Africa the water managers are actually weaker in their dealings with agriculture/housing than in their dealings with land use planners. This may reflect the high priority that the South African government gives to improvement of housing conditions in that country.

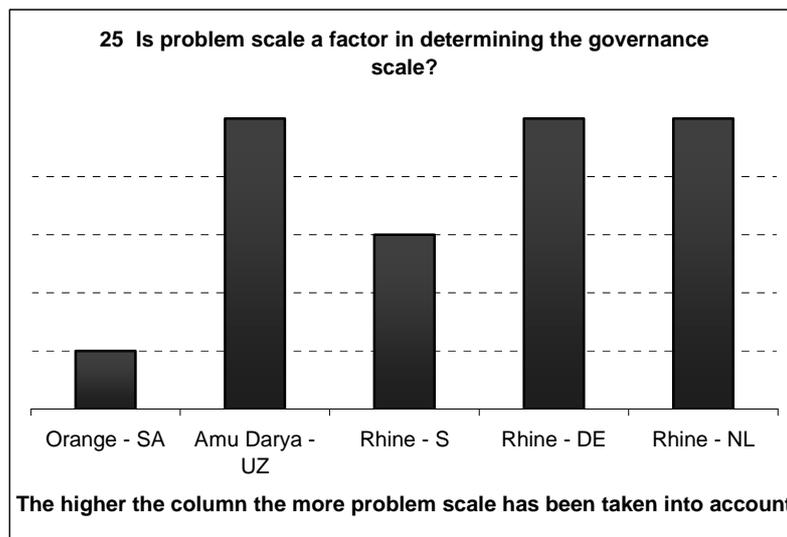
The assessment of the ties between government levels in the countries with the exception of South Africa is about even, with all country report writers indicating a high degree of interconnectedness of water managers at the various government levels (e.g. national, land, province, region, municipality, local area). This would fit the image of water managers as a very well integrated policy sector (policy community) where participants speak more or less the same language and work on one shared project.



## 7. The scale dimension

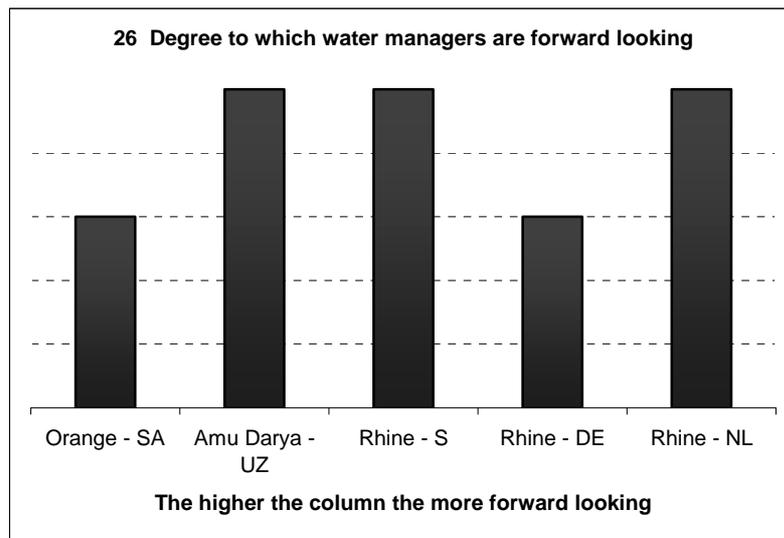
Especially in environmental matters, the scale dimension has gotten a lot of attention with many observers noting that the solution of environmental problems is hindered both by the parochial outlook of policy makers (only thinking about their own constituency) and their lack of long-term perspective (thinking about the short term only). We have asked two questions in our scoring list that seek to assess water management from this perspective. The first question is about the connection between problem scale and the scale of governance institutions created for solving these problems. The second one is about the forward-looking nature of water managers.

Figure 25 suggests that the Dutch and German governance system take the problem scale strongly into account (i.e. by connecting water management to the river basin level). South Africa scores low, despite its new legislation also embodying a river basin philosophy.



A second aspect of scale is the dimension of time. Given the issues that water managers are confronted with, a forward looking and anticipating attitude may be crucial for taking timely measures. However, such an attitude often collides with the more pressing matters that need to be addressed at the short term.

Figure 26 gives the country report writers' assessments of the degree to which water managers in the five countries are forward looking. Water managers tend to be rather forward looking, with Netherlands, Switzerland and Uzbekistan scoring high. The water managers in Germany and South Africa are somewhat less forward looking.



## 8. Adaptiveness

### 8.1 Introduction

Lacking still a fully developed definition of adaptive water governance, the WP 1.2 team took cue from the NEWATER proposal and extended the factors that are mentioned there as constituents of an adaptive regime. Reasoning forward from the proposal and using the aspects that have been treated in the current report, the WP 1.2 team has developed certain hypothesis about adaptive management. In the remainder of this report, these hypotheses are presented, followed by a brief discussion on the scores of the five countries studied here.

All hypotheses would need further theoretical foundation, sharpening and refutation, which will be the topic of another NEWATER report. Here we assume that the hypotheses are correct, which implies that we have yardsticks for measuring the adaptiveness of the water management regimes in the five countries in this report. Such an argumentation allows to derive conclusions on the performance of regimes that will be subject of further empirical investigations.

### 8.2 Government and government strategies

The hypotheses on indicators of adaptiveness by the WP 1.2 team are as follows:

- A water management regime becomes more adaptive as it becomes more decentralized;
- A water management regime is more adaptive when the physical measures it has taken are local and flexible;
- A water management regime becomes more adaptive as the strategies of water management are geared towards local and flexible solutions;
- A water management regime becomes more adaptive as its openness and interest in learning increases.

Assuming that the hypotheses are correct one can derive the following conclusions:

The *South African* regime has changed considerably in the past 11 years towards a higher degree of adaptiveness. One problem is that the regime has made huge investments in large and rigid infrastructure and these imply a certain path dependency. Management is still relatively centralized, with the basin administration system still to take off. Similarly, implementation of new and more adaptive strategies has been slowed down due to a lack of resources. The greatest challenge for the regime would however seem to lie in developing a more open approach as this is the aspect for which South Africa performs worst of all five countries.

The *Uzbekistan* regime is furthest removed from adaptive management, as its infrastructure is large and rigid, its management quite strongly centralized and no changes in strategy are visible. One factor speaking in favour of the regime however is that it is not extremely closed to new insights, even though openness could be greater.

The *Swiss* regime scores well on decentralization, but the scores for other factors are not that impressive. Most problematic for the switch to an adaptive regime would seem to lie in the large investments that have been made in large scale infrastructure, particularly dams for power generation.

The *German* regime seems to have made some strides in the direction of adaptive water management with similar scores as Switzerland. Its infrastructure is still tending towards the large and rigid side. Water management is relatively strongly decentralized and the strategy is towards local and flexible solutions. The Germans score best when it comes to openness and desire for policy learning.

The Dutch regime is a similar scorer in the field of the Rhine countries. Like in the other Rhine countries, it appears that the actual water management infrastructure tends towards the large scale and rigid side, lagging behind a different formal strategy. The regime is moderately centralized, with the freedom of local waterboards curtailed by national institutions. The openness of the water managers is not that great.

### 8.3 Property rights, markets and cost recovery

We start our discussion again by highlighting the hypotheses underlying our work:

- A water management regime becomes more adaptive as more of the responsibility for flood prevention measures rests with the private sector;
- A water management regime becomes more adaptive as more of the responsibility for water quality measures rests with the private sector;
- A water management regime becomes more adaptive as more of the damages incurred by extreme weather events are covered by the private sector;
- A water management regime becomes more adaptive as more of the costs associated with flood and drought prevention are recovered from the private sector;
- A water management regime becomes more adaptive as more of the costs associated with water quality improvement are recovered from the private sector.

Admittedly some of these hypotheses could be strongly debated, as the essential line of reasoning appears to be that the private sector performs better than the public sector. This does not necessarily imply a preference for market arrangements but could also mean community based management strategies rather than a statist approach. Within the WP 1.2 team there are preferences for both variants of private initiative and we cannot delve into that discussion here.

For the *South African* regime the scores demonstrate low adaptiveness of the flood and drought prevention part of the regime: this is almost completely a government task. The role of the private sector in water quality issues is low as well, but cost recovery is quite extensive indicating good adaptiveness.

It is clear that the *Uzbekistan* regime is not adaptive in the sense that the public sector resumes all responsibility for both quality and quantity management. Interestingly, the damages caused by extreme events are to be fully borne by the private sector, which is a sign of high adaptiveness (or question of the budget) Such damages are likely to stimulate some degree of private initiative in the sphere of risk assessment (if private money is available).

The *Swiss* regime exhibits a similar pattern, with the government being predominantly responsible for water quantity and quality measures (no difference between the two aspects unlike other countries). Damages of extreme weather events are largely placed with the private sector. The Swiss regime know an extremely high degree of cost recovery for water quality measures, but water quantity measures are hardly recovered at all, which implies a potential for greater adaptiveness in that area.

The *German* and *Dutch* regimes have more or less similar scores, with a dominance of the public sector in water quantity management, and an about even distribution of tasks over the public and private sectors in the sphere of water quality management. There is higher degree of cost recovery for water quantity measures in the Netherlands, and damages of extreme events are predominantly covered by the private sector, although more so in the Netherlands than in Germany.

#### 8.4 Stakeholder and citizen participation

The working hypotheses of the NEWATER project in this area read as follows:

- Water governance becomes more adaptive as the place of water problems on the political agenda becomes higher;
- Water governance becomes more adaptive as the place of water problems on the public agenda becomes higher;
- Water governance becomes more adaptive as stakeholders become involved in the policy process at an earlier stage;
- Water governance becomes more adaptive as ordinary citizens become involved in the policy process at an earlier stage;
- Water governance becomes more adaptive as the interactions between water managers and stakeholders take a two-way rather than a one-way character;
- Water governance becomes more adaptive as the interactions between water managers and ordinary citizens take a two-way rather than a one-way character;
- Water governance becomes more adaptive as water managers become more consensus orientated in their dealings with stakeholders;
- Water governance becomes more adaptive as water managers become more consensus orientated in their dealings with ordinary citizens.

Stressing again that *if* we assume these hypotheses are correct, which may be quite controversial in this case, we can assess the current state of affairs in the five countries as follows.

The *South African* regime enjoys a great level of political and public attention, with water management issues taking a high place on both agendas. It does seem however that the potential for stakeholder and public participation that this implies is not banked, because both stakeholders and ordinary citizens are involved in developing water policies at a very late stage and the participation processes that are there are very much a one way communication from government to the others and water managers are not aiming for consensus with stakeholders. The water managers do better in their approach towards ordinary citizens, they prefer to take measures that are agreed upon by the population.

The *Uzbekistan* regime also profits from a relatively high place of water issues on the political agenda, with the public being more lukewarm about water issues. Involvement of stakeholders is apparently quite early in the policy process, but ordinary citizens are not involved at all. Furthermore, if participation processes take place with stakeholders, they are one sided. In terms of taking measures after reaching consensus, the *Uzbekistan* water managers prefer to take measures that are agreed upon by the stakeholders, whilst attaching less value to consensus with ordinary citizens.

*Switzerland* is in some ways the opposite of the two countries just discussed: there is a lower level of political and public interest, but it is accommodated quite well. *Switzerland* is amongst the countries -in this comparison- where water issues are lowest on the political agenda and the public agenda. Stakeholders and citizens are however involved relatively early and when water managers engage with them, the processes are relatively interactive. There is quite a strong emphasis on reaching consensus too.

*Germany* does not demonstrate a very high place for water issues on the political and public agenda. The Germans score high when it comes to involving stakeholders very early in the policy processes, even at the earliest stage (although it does vary somewhat between the various types of stakeholders). The interactions between water managers and stakeholders are also quite interactive. The same cannot be said for the involvement of ordinary citizens, which takes place only during the implementation stage of the policy process and is strongly tending towards a one-way communication. Consensus with stakeholders is important for German water managers, consensus with ordinary citizens to a lesser degree.

The *Dutch* regime is similar to the German system, with the only difference related to the lower degree of interactiveness of stakeholder involvement process.

## 8.5 Information management

The working hypotheses are as follows:

- Water governance becomes more adaptive as the regime collects information on more elements of the DPSIR framework;
- Water management becomes more adaptive as the accessibility of the information that is collected increases;
- Water management is more adaptive when information collection and modelling are strongly influenced by policy makers (joint modelling and an information system reflecting their information needs);
- Water management is adaptive when scientific information does not completely determine policy nor ignores scientific information completely.

The *South African* regime shows a mixed bag of scores. It seems that the collection of information is lagging behind a lot, and accessibility of the available information is not up to par with the Rhine countries. There is however a nice balance in the relation between scientific experts and politicians.

The *Uzbekistan* regime scores high in terms of completeness of the information that is being collected. However, accessibility for other parties is poor, there is little cooperation between policy makers and experts in modelling or collecting information and most importantly, policy makers tend to neglect scientific information to a large degree.

The Rhine countries (*Switzerland, Germany, Netherlands*) have rather similar scores. The information that is collected is rather openly available, and in Switzerland the information retrieval connects well to the desires of policy makers. In Switzerland experts tend to have a very high degree of influence over policy, in the Netherlands and Germany the situation is more balanced in the sense that politicians are also strongly involved.

## 8.6 Networks

The working hypotheses here are that:

- Water governance becomes more adaptive as water managers more often get their way vis-à-vis land use planners;
- Water governance becomes more adaptive as water managers more often get their way vis-à-vis the agriculture and the housing sectors;
- Water governance becomes more adaptive as the government levels involved in water management become more strongly connected.

The *South African* regime scores best when it comes to influence of water managers on land use planners. However, the score is still not overly impressive, suggesting that water managers still have difficulty getting their way with land use planners. The relation with agriculture and housing is low, but water managers in South Africa have more troubles getting their way with these sectors than with land use planners. The connectivity of government levels is worst of all five countries analyzed.

The *Uzbekistan* water regime is less power full vis-à-vis land use planning than their South African and Rhine country counterparts, but has more power against agricultural and housing interests. The connectivity of government levels is quite strong, which should be no surprise given the large influence of the centre in Uzbekistan.

The Rhine countries (*Switzerland, Germany, Netherlands*) have similar scores, with water managers in all countries struggling to get their way vis-à-vis land use planner (although slightly less so in Switzerland) and experiencing somewhat more power versus housing and agricultural interests. In all countries, the connectivity of water managers at all government levels is quite strong according to the authors of the country reports. The fact that there is no difference here between the Netherlands and the other two countries may come as somewhat of a surprise given the relatively centralized nature of the Dutch government system in general and the decentralized nature of the Swiss and German systems, that might pose more problems for connectivity. Water management in the Netherlands, with its long-standing waterboards may be a decentralized exception to the general pattern however.

## 8.7 The scale dimension

The working hypotheses here are:

- Water governance becomes more adaptive as problem scales become a bigger factor in determining the governance scale;
- Water governance becomes more adaptive as water managers become more forward looking.

In neither of the studied countries the scale of the regime is completely determined by the scale of problems. Germany, the Netherlands and (surprisingly) Uzbekistan come closest, with Switzerland following closely and South Africa lagging behind somewhat. Uzbekistan compensates by having very forward looking water managers, with the South African and German water managers following at a distance.

In conclusion one can state that the comparative analyses largely confirmed prior expectations on the degree of adaptiveness of water management regimes in the Rhine, Orange and Amu Darya basins. Some results are unexpected and some are contradictory. Given the exploratory nature of the analyses one has to be very careful to draw too strong conclusions. But it seems to be evident that situational factors and context (e.g. environmental characteristics, culture, economic conditions) have a very strong influence on the effect of certain characteristics such as stakeholder participation on the adaptiveness of a regime.