

Basin Report:

Questionnaire + Addendum

To review case study basins with regard to their water
governance regime, context and performance

Rhine Basin

With focus on the Dutch part

Case Study Review Workshop for the NeWater project

Berlin, 05. – 07.05.2010

The questionnaire was post-processed after the workshop.

About this questionnaire

This questionnaire was developed within the scope of the Twin2Go project. It serves to record case study data about a river basin's water governance regime, its context and its performance. An explanation of the indicators, pre-defined scores and potential data sources is provided in the guidance on this questionnaire (Twin2Go, Guidance on the Questionnaire of the Twin2Go Case Study Review Workshops. 13/03/10).

Scores to each of the indicators are assigned according the suggested score scheme proposed in the guidance. In the case of numerical indicators like indices, the numerical values are added in brackets after the score, e.g. "B (0.178)" or "C (12,534)". For a better understanding of the recorded issue, additional information is added in the "comments" column.

If not specified differently, the indicators refer to the national part of the basin of interest, i.e. the Dutch part of the Rhine basin.

A few weeks before the Case Study Review Workshop in Berlin (May 5-7 2010), the questionnaire was sent to the invited Rhine experts. So they had enough time to prepare themselves by studying the questionnaire intensively. The experts pre-filled a lot of answers and marked ambiguities and misunderstandings related to several indicators.

As the participants were well prepared, the Rhine questionnaire was completely answered in the scheduled time during the workshop. Difficulties concerning indicators were discussed in the plenum. Difficulties as well as general comments and suggestions are documented in the Rhine questionnaire.

Based on the preliminary synthesis results and discussion during the Twin2Go synthesis workshop (Stockholm, September 1-2 2010) an addendum was made with some additional parameters.

The resulting data will be post-processed and added to the Twin2Go database. Should you feel these scores do not reflect the situation of the basin accurately, or want to contest any of the information included, you may contact the project organisers. Contact information as well as additional information regarding the project and the results can be found on www.twin2go.eu.

Names of participating experts have been removed for confidentiality purposes.

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A) Water governance regime

No.	Indicator	Score	Comments
I) Characteristics of environmental governance regimes			
a) Water policy, institutional & legal framework (formal and informal)			
1.	Domestic water legislation (laws, by-laws, etc.) in place?	A	Recently renewed “integrated water law” [<i>waterwet</i> , 1 Jan 2010]. (excluding drinking water)
2.	Domestic Water Law: Public character of water and legal status of water use rights	A	Public good: no private ownership over water. Users need permits.
3.	Domestic Water Law: Explicit recognition of traditional and indigenous water uses	D	Not sure what traditional water use means. In changing the water law, traditional rights were respected (at least for a transition period). No indigenous water use.
4.	Domestic Water Law: On flow availability, third party rights and ecological requirements	A	Priority scheme for use in dry season (<i>verdringingsreeks</i>). No allocation of water rights
5.	Integration of domestic water legislation	A	Recently renewed “integrated water law” [<i>waterwet</i> , 1 Jan 2010]. (excluding drinking water)
6.	Multilevel structure of domestic water legislation and subsidiarity	A	National government, provinces, water boards, municipalities. [more recent discussions on co-funding of integral measures]
7.	Existence of formal domestic administrative structure for water governance	A	Ministry (develop). Rijkswaterstaat and Water boards (mostly implementation). Water boards have some legislative responsibilities as well (tax, permits).
8.	National basin organisation or comparable arrangement	D	Rijkswaterstaat is responsible for the national part of the major waterways. Major rivers have their own committee / board within rijkswaterstaat
9.	Formalised transboundary coordination organisation	A	Rhine committee. Meuse, Schelde, Eems-Dollard + communication on regional waters (kleine grenswater commissies)

No.	Indicator	Score	Comments
10.	Formal institution (legislation) that prescribes the basin management principle	A	WfD. National water plan with chapters on the main basins. Water boards arranged according to watersheds (reorganisation in 1984 hydrological borders are guiding principle). Enshrined in the law of the water boards (1990s)
11.	Water (basin) strategies, programmes and plans	A	
12.	Financing mechanisms: Degree of investment from private sector/ public/ other sources (e.g. international)	B	No private investment
13.	Economic instruments Is water for irrigation priced?	C	In general no price. General water board tax (farmers, etc). Tax is paid for groundwater abstraction (national and province). For discussion as part of the national delta program in relation to larger infrastructure
14.	Economic instruments Is water for households priced in urban areas?	A	Depends on city. Most cities are metered. Some flat rate for the connection (e.g. old houses in Amsterdam).
15.	Economic instruments Is water for industry priced?	A *	Surface water abstraction for free. Groundwater taxed (paid to province and national). Drinking water paid
16.	Tradable permits related to water abstraction/use	C	
17.	Polluter pays principle (related to water)	A	Depends on pollution. True for point sources. Diffuse sources difficult to price
18.	Environmental subsidies (related to water)	A	Played an important role in the past for point sources.
19.	Payment for ecosystem services (related to water)	B	Agro environmental schemes, e.g. management of field borders (blue services / <i>blauwe diensten</i>). <u>Post-processing comment:</u> The score was changed from "A/B" to "B". According to the comment, ecosystem services are taken into for agriculture use, but this is not comprehensive enough to justify an "A" score.
20.	Tradable permits (related to water quality, maximum, allowable loads etc.)	C	

No.	Indicator	Score	Comments
21.	Environmental tax (related to water)	A	Water quality: Water boards charge all that discharge. Money used for purification. For groundwater: B, just used for income for the state, not labelled
22.	Presence of substituting informal institutions for management of water	A	<u>Post-processing comment:</u> The score was changed from "C" to "A"
23.	Presence of complementary informal institutions for water management	A	Example: in the debate on industrial use/discharge, industries were allowed to report on progress and organise emission reductions (worked well until European reporting was required)
23.a	<i>Case-specific indicator(s)...</i>		
			Independent inspectorate (since about 7 years)
b) Formalisation of IWRM principles & Millennium Development Goals			
24.	Formalised IWRM principles	A-	Sectors are recognised, not necessarily planned for equally. IWRM as a process. Participatory approach implemented. Economic value recognised <u>Post-processing comment:</u> The score was changed from "A/B" to "A-". According to the comment, basic IWRM principles are incorporated in planning, even if sectors are not necessarily planned for equally.
25.	State of implementation of IWRM principles	A	
26.	Capacity to implement IWRM	A	<u>Post-processing comment:</u> The score was changed from "A + B" to "A". According to the original scores, sufficient IWRM capacities and efforts are made to increase the capacity. This justifies score "A".
27.	Is universal and non-discriminatory access to safe drinking water and sanitation a goal?	A	Goal realised
28.	Integration of wetlands in IWRM and IRBM*	A	
28.a	<i>Case-specific indicator(s)...</i>		

No.	Indicator	Score	Comments
c) Decision making regarding uncertainties			
29.	General practices for dealing with uncertainties	A	Various sources are explored. Long-term safety explored, scenarios are used. Yet, more advanced methods could be used. Using risk based regulation is discussed to replace norm based regulation
30.	Dealing with uncertainties: Reversible and flexible options	B	Increasingly explored, sometimes favoured.
31.	Dealing with uncertainties: Safety margins	A	Very much accepted
32.	Are scenarios used for decision making?	B+	Scenarios are explored. Water management still dominantly tailored to perform under a particular discharge <u>Post-processing comment:</u> The score was changed from “A/B/ to “B+”, because although exploring scenarios, water management prefers relying on particular discharges.
33.	Climate risks: Climate variability and change	A	Since the 1990s explicitly. Delta program latest step in coping with climate change
33.a	<i>Case-specific indicator(s)...</i>		
II) Actor networks with emphasis on the role and interactions of state and non-state actors and power relationships			
a) Cooperation and coordination structures			
34.	Vertical coordination (governmental)	A	e.g.: coordination activities for water framework or delta program
35.	Horizontal coordination (governmental)	B	More cooperation. For the delta program larger regions are defined where provinces work together
36.	Role of local governments	A	Municipalities involved in Delta program. Cooperation between water boards and municipalities <u>Post-processing comment:</u> The score was changed from “A/B” to “A” because according to the comment, municipalities are actually involved at higher levels, not just consulted.
36.a	<i>Case-specific indicator(s)...</i>		
			This part weak on non-state actors (NGO's, interest groups, citizens) & public - private interaction.

No.	Indicator	Score	Comments
b) Information sharing via formal rules, dependency relationships etc.			
37.	Kinds of knowledge included => Role of experts/ science, local/traditional knowledge	B+	Tacit knowledge of people working in water board taken into account. Depends on what 'taken into account' means. Strong role in operational water management. At strategic level good connections between water management related people. Participation of other stakeholders increasing.
38.	Access to information => about expert knowledge and management plans	B+	Depends on the information. During policy planning less active dissemination or at the level of flyers & brochures. Consultations are common. Information about water quality etc all readily available. <u>Post-processing-comment:</u> The score was changed from "A/B" to "B+", because active knowledge dissemination is not common during the whole planning cycle.
<i>38.a</i>	<i>Case-specific indicator(s)...</i>		
III) Multi-level interactions across administrative boundaries and vertical integration across levels and horizontal integration across sectors			
a) Centralisation			
39.	One level one actor?	A-	Disputable whether other actors participate significantly. Discussion on the hypothesis that a shared responsibility is 'better'. E.g. in water purification a more centralised approach might well be more efficient. Efficiency and adaptiveness different requirements?
40.	Degree of centralisation	B	
41.	Technical capacity and economies of scale	A	Discussion on bigger water boards to make use of economies of scale
42.	Legal obligations and responsibility	A	
<i>42.a</i>	<i>Case-specific indicator(s)...</i>		

B) Context

No.	Indicator	Score	Comments
I) Societal dimension			
43.	Proportion of the population living in rural areas	NL: 19.8% D: 26.6% L: 17.2% F: 23.3% CH: 26.7%	Source: United Nations Population Division (2008): World Urbanization Prospects: The 2007 Revision Population Database, http://esa.un.org/unup/ Values for 2005
44.	State of societal development	NL: A (0.964) D: A (0.947) L: A (0.960) F: A (0.961) CH: A (0.960)	Human Development Index Source: UNDP: Human Development Report, online at http://hdr.undp.org/en/statistics/ Values for 2007
45.	Social sustainability (Gini Index)	NL: 30.9 (B) D: 28.3 (A) L: 30.8 (B) F: 32.7 (B) CH: 33.7 (B)	Gini Index Source: UNDP: Human Development Report 2009, http://hdr.undp.org/en/media/HDR_2009_EN_Complete.pdf - Values were calculated based on data by World Bank (2009d)
46.	Economic sustainability (e.g. GDP)	NL: A (34,724 \$) D: A (30,496 \$) L: A (70,014 \$) F: A (29,644 \$) CH: A (35,520 \$)	GDP per capita (US-\$, PPP-corrected) Source: World Bank, http://siteresources.worldbank.org/ICPINT/Resources/icp-final-tables.pdf Values for 2005

No.	Indicator	Score	Comments
47.	Effectiveness of formal institutions	NL: A (8.9) D: A (8.0) L: A (8.2) F: B (6.9) CH: A (9.0)	Corruption Perception Index Source: Transparency International, http://www.transparency.org/policy_research/surveys_indices/cpi/2009/cpi_2009_table Values for 2009
48.	Trustworthiness of economic institutional setting - degree of risk for foreign direct investment	NL: A (AAA) D: A (AAA) L: A (AAA) F: A (AAA) CH: A (AAA)	Rating by the rating agency "Standards & Poor Source: The Guardian (article from 22.05.2009), http://www.guardian.co.uk/business/2009/may/22/recession-government-borrowing#zoomed-picture
49.	Presence of avenues of dissent – press freedom, freedom of speech	NL: A (1.00) D: A (3.50) L: A (4.00) F: B (10.67) CH: A (1.00)	Press Freedom Index Source: Reporters without Borders, http://en.rsf.org/press-freedom-index-2009,1001.html Values for 2009
49.a	<i>Case-specific indicator(s)...</i>		
II) Good Governance Principles at the national level – legal basis at the national level			
50.	Participatory regarding decision making in the water sector	A	Consultations formally established, WfD
51.	Transparency regarding water allocation	A	<i>Wet openbaarheid bestuur</i>
52.	Effectiveness and efficiency regarding decision making in the water sector	A	[strange definition of question. Would expect 'control mechanism' rather than regarding decision making]
53.	Equitable and inclusive	A	

No.	Indicator	Score	Comments
54.	Predictability – with regard to IWRM and climate change	A	What is difference between A&B?
54.a	<i>Case-specific indicator(s)...</i>		
III) Environmental dimension			
55.	Köppen-Geiger climate classification (river basin)	Cfb (almost entire basin) ET and Dfc (source area)	Source: Kottek, M., J. Grieser, C. Beck, B. Rudolf, and F. Rubel (2006), http://koeppen-geiger.vu-wien.ac.at/present.htm#maps For period from 1951 to 2000
56.	Climate Moisture Index	h, humid (upstream) Sh, sub-humid (midstream) h (downstream)	Source: GWSP Digital Water Atlas (2008), GWSP Digital Water Atlas (2008), http://atlas.gwsp.org/index.php?option=com_wrapper&Itemid=53&id_desc=98&itemId_desc=63&id_ds=146&itemId_ds=52&header=Climate%20Moisture%20Index&site=b1_cmi_anWSAG1_0
57.	Climate Moisture Index Coefficient of Variation	A, low (upstream) B, moderate (midstream) A, low (downstream)	Source: GWSP atlas (2008), http://atlas.gwsp.org/index.php?option=com_wrapper&Itemid=53&id_desc=126&itemId_desc=63&id_ds=171&itemId_ds=52&header=Coefficient%20of%20Variation%20for%20Climate%20Moisture%20Index&site=b2_cmi_annual_cv Reported are the dominant values in the Rhine basin
58.	Per Capita Equivalent of TARWA	NL: C (5,610 m ³ /yr) D: D (1,870 m ³ /yr) L: C (6,750) F: D (3,370 m ³ /yr) CH: C (7,470 m ³ /yr)	Source: UNESCO, UN World Water Development Report, http://www.greenfacts.org/en/water-resources/figtableboxes/3.htm Values for 2005
59.	Average water availability at the river basin level (1995)	A (400-1,000 mm/yr)	Source: University of Kassel, WaterGAP 2.0, http://www.env-edu.gr/Documents/World%20Water%20in%202025.pdf

No.	Indicator	Score	Comments
60.	Annual renewable water supply per person by river basin (1995)	C (1,000-1,700 m ³ /yr)	Source: World Resources Institute, EarthTrends 2001, http://earthtrends.wri.org/pdf_library/maps/2-4_m_WaterSupply1995.pdf
61.	Projected annual renewable water supply per person by river basin (2025)	C (1,000-1,700 m ³ /yr)	Source: World Resources Institute, EarthTrends 2001, http://earthtrends.wri.org/pdf_library/maps/2-4_m_WaterSupply2025.pdf
62.	Relative Water Stress Index	B (low) with patches of E (very high) in downstream area	Source: UNESCO, World Water Development Report II, http://wwdrii.sr.unh.edu/download.html The illustration (I4) has bad quality. Please check if the judgement is appropriate.
63.	Climate Vulnerability Index	NL: C (medium) D: B (medium low) L: n/a F: B (medium low) CH: A (low)	Source: Oxford Centre for Water Research (OCWR), 2008-2010, http://ocwr.ouce.ox.ac.uk/research/wmpg/cvi/cvi_leaflet.pdf
64.	Degree to which water quality status restricts usability of users' types	B	Drinking and swimming water.
65.	Extent of flow and channel modification	C	
66.	Impact of land-use changes on hydrological processes	C	Not sure about negative impact on ecosystem services. Negative impact on regulating service of floodplains
67.	Uncertainty associated to climate change predictions regarding precipitation for the basin	C (0.2-0.4)	Source: Illustration from MAGICC-SCENGEN tool at the end of the guidance document. Better to look at KNMI scenarios.
67.a	<i>Case-specific indicator(s)...</i>		Note: some of the hypotheses associated with indices are strange. Especially the low performance hypotheses. little interest for salt intrusion / salinization

C) Performance

No.	Indicator	Score	Comments
I) Progress towards stated Goals			
68.	Progress towards sustainable access to safe drinking water (MDG drinking water target)	NL: A D: A L: A F: A CH: A	Source: WHO & UNICEF (2008), Progress on Drinking Water and Sanitation: Special Focus on Sanitation, http://www.wssinfo.org/en/40_MDG2008.html Values for 2006
69.	Proportion of population with access to improved drinking water	NL: A (100%) D: A (100%) L: A (100%) F: A (100%) CH: A (100%)	Source: UN statistics of MDG progress, http://mdgs.un.org/unsd/mdg/Data.aspx Values for 2006
70.	Proportion of rural population with access to improved drinking water	NL: A (100%) D: A (100%) L: A (100%) F: A (100%) CH: A (100%)	Source: UN statistics of MDG progress, http://mdgs.un.org/unsd/mdg/Data.aspx Values for 2006
71.	Progress towards sustainable access to basic sanitation (MDG sanitation target)	NL: A D: A L: A F: n/a CH: A	Source: WHO & UNICEF (2008), Progress on Drinking Water and Sanitation: Special Focus on Sanitation, http://www.wssinfo.org/en/40_MDG2008.html Values for 2006

No.	Indicator	Score	Comments
72.	Proportion of population with access to improved sanitation facilities	NL: A (100%) D: A (100%) L: A (100%) F: n/a CH: A (100%)	Source: UN statistics of MDG progress, http://mdgs.un.org/unsd/mdg/Data.aspx Values for 2006
73.	Proportion of rural population with access to improved sanitation facilities	NL: A (100%) D: A (100%) L: A (100%) F: n/a CH: A (100%)	Source: UN statistics of MDG progress, http://mdgs.un.org/unsd/mdg/Data.aspx Values for 2006
73.a	<i>Case-specific indicator(s)...</i>		
II) Good governance principles as indicators for the process dimension			
74.	Participatory regarding decision making in the water sector	B	Experiments with co-decision making. Decision mandate with elected government
75.	Transparency regarding water allocation	A	
76.	Effectiveness and efficiency regarding decision making in the water sector	A	Opinions differ on efficiency of national government. Plans for budget cuts. No clear waste of resources
77.	Equitable and inclusive	A	In general true in the Netherlands
78.	Predictability – with regard to IWRM and climate change	A	
78.a	<i>Case-specific indicator(s)...</i>		
III) Stakeholder participation			

No.	Indicator	Score	Comments
79.	Deliberative engagement opportunities	B	Lower level to which influences decision (some window dressing). Information about deliberative arenas & active invitation limited. For delta program more active involvement is sought for. Challenge to find appropriate representation of citizens & to get citizens interested
80.	Inclusiveness of stakeholder participation	A	At national level: OWN bodies
80.a	<i>Case-specific indicator(s)...</i>		
IV) Response to climate change			
81.	Strategy for adaptation to climate change in the water sector	A	
82.	Availability of specific knowledge enabling adaptation	A	Activites A-D are taken <u>Post-processing comment:</u> The score was changed from “A-D” to “A”, because if all four kinds of knowledge are available, the highest level should be chosen as score.
83.	Awareness of water managers regarding adaptation to climate change	A	Shared vision among water managers about urgency. The options are contested.
84.	Coordinated implementation process regarding adaptation to climate change: Program / Plan of activities and measures	A	Implementation and new design
85.	Operational activities (measures)	A	
86.	Ways to deal with climate variability (floods and droughts)	A	<i>Drie lagen benadering (infrastructure, spatial planning & calamities)</i>
86.a	<i>Case-specific indicator(s)...</i>		

Additional case-specific indicators

Please briefly define all case-specific indicators, which you have added, in the following table.

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. which indicators/ on which basis are scores allocated)	Comment on data source
	<i>Case-specific indicator 1</i>	Number of ministries involved, maybe through a ministerial steering group?		- A	(A)	
	<i>Case-specific indicator 2</i>	Salt intrusion related indicators		- A	(A)	
	<i>Case-specific indicator 3</i>	Privatisation		- A	(A)	
	<i>Case-specific Indicator 4</i>			- A	(A)	
	<i>Case-specific Indicator 5</i>			- A	(A)	

General notes / comments / experience:

- Goals set for water management (development, norms / risks, integration & weighing sectoral interests)
- Recognition of long term / future interest
- Explicitly planning for ecosystem services, especially regulating services (of landscapes etc)
- (pays attention to / restores) mutual dependency
- missing: monitoring body required
- hypotheses strange in relation to indicators (especially environmental dimension)
- be aware of self fulfilling prophecy in performance indicators
- covering the issue of privatisation

- attention for / cooperation with non-state actors (now questionnaire is mostly about government actors) (from planning to public private partnerships & monitoring)
- dynamic norm setting versus rigid norms
- open for experiments & pilots
- encouraging exchange and learning
- some simple 'quantitative indicators' (e.g. number of CoPs established, number of people at public hearings & consultations)
- attention for: (number of) people with directly water quality and quantity dependent jobs / livelihood (consider: how affected is society to variation of water quality)
- dependency between indicators or trade-offs
- conflict resolution mechanisms / mediation in place
-

Addendum - Context

No.	Indicator	Score	Comments
I) Basin Characteristics			
67a	Sub-Basin Size	28,273 km ²	Source: Van Leussen, W., van Slobbe, E., and G. Meiners (2007): Transboundary Governance and the Problem of Scale for the Implementation of the European Water Framework Directive at the Dutch-German Border. [online] URL: http://www.newater.uos.de/caiwa/data/papers%20session/D4/VanLeussen-paper%20CAIWA%202007.pdf (= CAIWA conference paper of session D4)
67b	Transboundary	Yes	The Rhine basin, which covers an area of about 185,000 km ² , is shared by 9 countries: The Netherlands, Germany, Belgium, Luxembourg, France, Switzerland Austria, Liechtenstein and Italy. Source: Buiteveld, H. (2006): Research Action Plan Rhine. [online] URL: http://www.newater.uos.de/deliverables/D321%20-%20D322%20-%20D323%20-%20Rap_rhine_2005.pdf (= Deliverable 3.2.1-3 of the NeWater project)

Addendum - Performance

Notes:

Information on several indicators were extracted from the current water management plan for the Deltarijn. The Deltarijn catchment covers the total Dutch part of the Rhine basin. About 10% of the Deltarijn area are located in Germany.

- Ministerie van Verkeer en Waterstaat, Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, Ministerie van Landbouw, Natuur en Voedselkwaliteit, Ministerium für Umwelt und Naturschutz, Landwirtschaft und Verbraucherschutz des Landes Nordrhein-Westfalen and Niedersächsisches Ministerium für Umwelt und Klimaschutz (2009): Internationaler Bewirtschaftungsplan. Bearbeitungsgebiet Deltarhein. 2009 - 2015. [online] URL: http://www.helpdeskwater.nl/publish/pages/24004/bwp_deltarhein_2009-2015_nl_nrw_ni_duitstalig.pdf

Other information sources used were an ICPR report about biodiversity in the Rhine and the International Warning- and Alarm Plan Rhine' published by ICPR.

- International Commission for the Protection of the Rhine (ICPR) (2002): Das Makrozoobenthos des Rheins 2000. 68. Plenarsitzung – 2./3. Juli 2002 - Luxemburg. [online URL]: http://www.iksr.org/uploads/media/bericht_nr_128d.pdf

- International Commission for the Protection of the Rhine (ICPR) (2009): International Warning- and Alarm Plan Rhine. State: 01.07.09. [online] URL: http://www.iksr.org/fileadmin/user_upload/Dokumente_en/International_Warning-_and_Alarm_Plan.pdf

No.	Indicator	Score	Comments
I) Environmental sustainability			
a) State of the water resources and the environment			
87	Aquatic biodiversity	B	<p>The score refers primarily to the total Rhine, but the judgement is likely to fit to the Dutch Deltarijn.</p> <p>“Viele charakteristische Flussarten, die im Rhein als ausgestorben oder stark dezimiert galten, gehören heute wieder zum festen Bestandteil der Fauna großer Rheinabschnitte (z. B. <i>Ephoron virgo</i>, <i>Heptagenia sulphurea</i>, <i>Psychomyia pusilla</i>, <i>Aphelocheirus aestivalis</i>, <i>Unio tumidus</i> etc.). [...] Diese Befunde dürfen aber nicht darüber hinwegtäuschen, dass die durchschnittlichen Artenzahlen pro Untersuchungsbereich im Rhein zwischen Basel und Emmerich seit 1995 rückläufig sind, wenn auch im Jahre 2000 wieder eine Zunahme zu verzeichnen ist [...]. Einen Rückgang der Artenzahlen zwischen 1995 und 2000 ist auch am Deltarhein zu erkennen [...]. Die Ursachen der rückläufigen Artendichte sind noch unklar und liegen möglicherweise in der Umstrukturierung der Lebensgemeinschaft durch Neozoen. Auch fehlen viele um die Jahrhundertwende im Rhein belegte Insektenarten noch im Besiedlungsbild des Rheins [...]“ (ICPR, 2002: 24f.).</p>
88	Invasive exotic species	C	<p>No Data found for the Dutch Deltarijn. The score refers primarily to the total Rhine, but is likely to fit to the Dutch Deltarijn.</p> <p>“Auch den Rhein haben in den 90er Jahren zahlreiche Tierarten aus regionalfaunistisch fremden Regionen oft in erheblichen Biomassen besiedelt, die zu einer mehrfachen Umstrukturierung der Lebensgemeinschaft des Rheins geführt haben (ICPR, 2002: 16)“.</p>

No.	Indicator	Score	Comments
89	Surface and groundwater quality	B-	<p><u>Surface water:</u></p> <ul style="list-style-type: none"> - When applying the ‘one out – all out’ principle (one single parameter classified as “bad” => overall status classified as “bad”) to the Dutch part of the Deltarijn area, 80% of all surface water bodies have a good chemical status (Ministerie van Verkeer en Waterstaat et al., 2009: 110). - Depending on the parameter, 20-30% of all surface waters in the Dutch Deltarijn area achieve good biological state when compared to the “good ecological potential”. Most surface water bodies have a “medium” or “dissatisfying” state, only few a “bad” state (ibid.: 113f.). - The majority of the surface water bodies has in the Dutch Deltarijn area has a good state with regard to most physical-chemical parameters (ibid.: 115) - When applying the ‘one out – all out’ principle to assess the overall ecological state (combining the various biological and physical-chemical parameters), only 2% of the surface water bodies in the Dutch Deltarijn area achieve “good” state, and about one third “medium” state (ibid.:117). However, the ‘one out – all out’ principle appears to strict to determine the overall score for this indicator <p><u>Groundwater:</u></p> <p>Three out of eleven groundwater bodies in the Dutch Deltarijn area have a bad “status” (ibid.:123ff.) according to a good/bad classification.</p>
90	Groundwater use	A	All groundwater bodies an the Deltarijn catchment have a good quantitative status (Ministerie van Verkeer en Waterstaat et al., 2009: 89).
91	Water Exploitation Index (WEI)	B (22%)	Score at basin level (national part). Data reported by Netherlands to the EU Commission for the “Scarcity and Drought, 2. Interim report”, 2010.

No.	Indicator	Score	Comments
b) Management practices			
92	Water allocated for aquatic ecosystem	C+	<p>The regulation of water levels has negative ecological impacts.</p> <p>“Bei mehr als 90 % der Gräben, Kanäle, Bäche und Seen im niederländischen Teil des Bearbeitungsgebietes Deltarhein werden der Abfluss und der Wasserstand reguliert. Für die großen Flüsse und die Übergangs- und Küstengewässer gilt dies für etwa 15 % der Gewässer. Eine aktive Wasserstandsregulierung mit hohen Sommer- und niedrigen Winterwasserständen hat in allen Gewässertypen eine bedeutende negative ökologische Auswirkung. Dies spielt bei 75 % aller Gewässer eine Rolle. In Kanälen und Seen ist außerdem die Entwässerung eine der Ursachen der hydrologischen Belastung, während in Kanälen und Bächen ein beschleunigter Abfluss aus dem Einzugsgebiet ein bedeutender negativer Faktor ist. (Ministerie van Verkeer en Waterstaat et al., 2009: 149f.)</p>
93	Water pollution incidents	A	<p>The ‘International Warning- and Alarm Plan Rhine’ is the basis for quick and adequate response to pollution incidents in the Rhine basin.</p> <p>“The objective of the Warning and Alarm System is, to pass on reports on sudden pollutions with substances noxious to water in the Rhine watershed, if the amount and concentration may detrimentally impact the Rhine water quality and to warn the authorities in charge of fighting accidents so that</p> <ul style="list-style-type: none"> - Threats may be fought, - Causes may be identified - Polluters may be identified - Measures to clean up pollution may be taken - Measures to avoid and reduce damage may be taken, - Consequential damage may be avoided. (ICPR 2009: 2)”

No.	Indicator	Score	Comments
94	Water quality monitoring	A	<p>Chemical, biological, physical-chemical and hydromorphological parameters are monitored at 51-76 metering points for surveillance monitoring. In addition, 253-561 metering points (depending on the parameter) exist for operative monitoring. (Ministerie van Verkeer en Waterstaat et al., 2009: 89). The monitoring network allows a comprehensive assessment of the state of the surface water in the Deltarijn catchment, which is reflected in the accordant management plan.</p>
95	Hydrometeorological monitoring – levels	A	<p>“Das Messen der hydromorphologischen Parameter in den Niederlanden erfolgt in Wasserkörpern, in denen auch die biologischen und physikalisch-chemischen Parameter gemessen werden [...]. Für die meisten Parameter wird der gesamte Wasserkörper betrachtet. Es handelt sich dabei um das gesamte Paket der hydromorphologischen Parameter: Wasserhaushalt, Durchgängigkeit und Morphologie. Ein Teil der Parameter ist nicht direkt messbar, sondern aus vorhandenen Datenquellen herzuleiten. Dies betrifft in den Niederlanden zum Beispiel Niederschlags- und Verdunstungsdaten des Wetterdienstes, Wasserstands- und Abflussdaten aus dem MWTL-Programm von Rijkswaterstaat (flächendeckender wasserwirtschaftlicher Zustand), topografische Karten, die flächendeckende Karte der Quellaustritte, die Ökotopekartierung von Rijkswaterstaat sowie die digitalen Bewirtschaftungsdaten der Waterschappen (Ministerie van Verkeer en Waterstaat et al., 2009: 97)“.</p> <p>No information found about the age of the hydrometeorological system. Due to the long history of flood protection in the Netherlands, it is assumed that an elaborate hydrometeorological monitoring system has been in place for at least 20 years. The strong regulation of water levels in the Dutch Deltarijn area (see indicator 92) supports the assumption. This justifies score “A”.</p>
96	Level of understanding of groundwater resources	A-	<p>A dense network of monitoring stations delivers data about the quantitative and chemical status of groundwater bodies in the Deltarijn area (Ministerie van Verkeer en Waterstaat et al., 2009: 98ff.). From 2009, the monitoring network will be expanded to allow a better characterisation of influences by surface water bodies on groundwater (ibid.: 100) beyond WFD requirements.</p>