

Guidance

On the Questionnaire of the Twin2Go Case Study Review Workshops

About this document

This document serves as guidance on the questionnaire used during the Twin2Go Case Study Review Workshops. It provides information on the various indicators, scores and potential data sources.

Note for Twin2Go members

- It is advisable to fill parts of the questionnaire prior to the workshops, especially those indicators that are based on indices. Furthermore, you can send the questionnaire to the experts in advance and ask them to start filling in data.

Note for case experts, who fill the questionnaire

- If not specified differently, the indicators refer to the national part of the basin of interest. It is not necessary to consider all countries of the basin.
- In general, you should check the GWP toolbox for papers, reports, etc. as data sources of your region, especially with regard to the water governance regime.
- In the case of index-based indicators (e.g. Corruption Perception Index), please record the category (e.g. “B”) and also the index value (e.g. “6.8”)
- If you think that the indicators below do not address important issues in your case study, please insert additional indicators in the questionnaire and explain them at the end of that document. In this way, we can get a better understanding of particular issues in your case study, whereas the existing default indicators allow us to compare your study with other case studies.

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A) Water governance regime

I) Characteristics of environmental governance regimes

a) Water policy, Institutional & legal framework (formal and informal)

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
1.	Domestic¹ water legislation (laws, by-laws, etc.) in place?	Formal legal and regulatory framework within a country that explicitly deals with the water sector, at least for one administrative level (national, provincial, local)	Presence of a legal and regulatory framework improves the performance of a regime with regard to good governance principles "accountability, transparency, responsiveness, effectiveness & efficiency, following the rules of law".	<ul style="list-style-type: none"> - A - B - C - D - E 	<p>(A) Domestic water legislation in place that has been implemented for at least 10 years</p> <p>(B) Domestic water legislation in place that has been implemented for less than 10 years</p> <p>(C) Domestic water legislation exists, but has not been implemented</p> <p>(D) Domestic water legislation is under formation</p> <p>(E) No domestic water legislation</p>	<p>http://waterlex.fao.org/waterlex/srv/en/home FAO/WHO Water Law and Standards Database: existence of water laws in general, including the year on in-force-coming, differentiated in water legislation, administration, water management and pollution control with further sub-categories, no information regarding the implementation status, however under Water Management one can see whether there are at least formal "Monitoring and enforcement provisions"</p> <p>http://www.ecolex.org/start.php database, free text search, ECOLEX is operated jointly by FAO, IUCN and UNEP</p> <p>http://www.oas.org/dsd/EnvironmentLaw/WaterLaw/home.htm database of Water Law and regulations in Latin America and the Caribbean</p>

¹ Domestic (instead of national part(s)): within a state

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
2.	Domestic Water Law: Public character of water and legal status of water use rights	The domestic water law recognises the public character of water, but provides adequate provisions for the protection of user rights, as to create a climate favourable for both investment and economic development as well as ecological sustainability	Water laws should clearly state that water belongs to the public domain of the State; water laws should determine specifically that water use rights, when granted under conditions of, or which aim at, effective and beneficial use and that do not cause environmental damage, are protected by private property clauses in the Constitution. According to Solanes & Jouravlev (2006), this is a basic legal element present in the systems that have successfully promoted private investment in the development and conservation of water resources. The former thus contributes to improved performance of a regime with regard to effective water governance	<ul style="list-style-type: none"> - A - B - C - D 	<p>(A) Water is recognised in the Domestic Water Law as being a public good; adequate provisions are foreseen to protect private water use rights; the law allows for the exercise of these provisions to be generally regulated as needed for ecological and social sustainability, and in the public interest</p> <p>(B) Water is recognised in the Domestic Water Law as being a public good; adequate provisions are foreseen to protect private water use rights; the law does not allow for the exercise of these provisions to be generally regulated as needed for ecological and social sustainability, and in the public interest</p> <p>(C) Water is recognised in the Domestic Water Law as being a public good; no adequate provisions are foreseen to protect private water use rights</p> <p>(D) Adequate provisions are foreseen to protect private water use rights; water is not explicitly recognised as being a public good and the law does not provide for regulations as needed to guarantee ecological and social sustainability, in the public interest</p>	Check domestic water law/consult domestic expert

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
3.	Domestic Water Law: Explicit recognition of traditional and indigenous water uses	The domestic water law explicitly foresees for the protection of traditional and indigenous water uses, while protecting the common public interest	In the case of water rights and uses that were in existence prior to the establishment of the legislation (or legislative change), including traditional and indigenous uses, these should be recognised in accordance with their effective and beneficial, historical and current use, without this affecting the possibility of imposing appropriate regulations (Solanes & Jouravlev, 2006). Accomplishment of the former contributes to improved performance of a regime with regard to effective and inclusive water governance	<ul style="list-style-type: none"> - A - B - C - D 	(A) Provisions are foreseen to protect traditional and indigenous water uses, while maintaining the possibility of imposing appropriate regulations (B) Provisions are foreseen to protect traditional and indigenous water uses, but these affect the possibility of imposing appropriate regulations in the general public interest (C) No provisions are foreseen to protect traditional and indigenous water uses (D) Other (please specify)	Check domestic water law/consult domestic knowledge
4.	Domestic Water Law: On flow availability, third party rights and ecological requirements	The domestic water law explicitly foresees that in the allocation of water rights, information on water availability and considerations regarding third-party rights and ecological sustainability are duly taken into consideration	For achieving socio-economic and ecological sustainability, water rights should only be allocated when there is enough available water flow, when third party rights and ecological requirements are not affected, and when, in accordance with the opinion of water administration, the request (for water rights) is in the public interest regarding water use (Solanes & Jouravlev, 2006). Accomplishment of the former contributes to improved performance of a regime with regard to effective and inclusive water governance	<ul style="list-style-type: none"> - A - B - C - D - E 	(A) In the allocation of water rights, due consideration is given to: the availability of the resource, the interests of existing third party rights, the protection of the aquatic ecosystems' ecological integrity (B) In the allocation of water rights, due consideration is given to: the availability of the resource and the interests of existing third party rights (C) In the allocation of water rights, due consideration is given to the availability of the resource (D) In the allocation of water rights, due consideration is given to interests of existing third party rights (E) Other (please specify)	Check domestic water law/consult domestic knowledge

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
5.	Integration of domestic water legislation	Water-related regulatory framework (see above) is coordinated/integrated under one single piece of legislation (i.e. national water act)	Coordination/integration of water-related regulatory framework under one single piece of legislation improves the performance of water governance.	<ul style="list-style-type: none"> - A - B - C 	<p>(A) One single piece of legislation exists to coordinate/integrate the water-related framework</p> <p>(B) A single piece of legislation does not exist, but is under formation</p> <p>(C) A single piece of legislation does not exist</p>	<p>http://waterlex.fao.org/waterlex/srv/en/home</p> <p>http://www.ecolex.org/start.php database, free text search, but a bit confusing, ECOLEX is operated jointly by FAO, IUCN and UNEP</p> <p>http://www.oas.org/dsd/EnvironmentLaw/WaterLaw/home.htm database of Water Law and regulations in Latin America and the Caribbean</p>
6.	Multilevel structure of domestic water legislation and subsidiarity	Allocation of responsibilities and dependencies across levels	More distributed and legally institutionalised functions, responsibilities and power improve performance.	<ul style="list-style-type: none"> - A - B - C 	<p>(A) Functions, responsibilities and authority are allocated to various levels</p> <p>(B) Functions and responsibilities are distributed, but no authority</p> <p>(C) Legislation only at one level, no distribution at all</p>	<p>http://waterlex.fao.org/waterlex/srv/en/home see: Administration (differentiated in decentralisation, federal countries, RBM, water user's associations, local administration; FAO/WHO Water Law and Standards Database)</p>
7.	Existence of formal domestic administrative structure for water governance	Autonomous administration to develop and/or implement domestic water legislation and programmes	The existence of an autonomous administrative structure for water legislation improves performance.	<ul style="list-style-type: none"> - A - B - C 	<p>(A) Autonomous administration existing for development and/or implementation</p> <p>(B) Autonomous administration existing for development and/or implementation is planned</p> <p>(C) No autonomous administration in place</p>	<p>http://waterlex.fao.org/waterlex/srv/en/home see: Administration (differentiated in decentralisation, federal countries, RBM, water user's associations, local administration; FAO/WHO Water Law and Standards Database)</p>

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
8.	National basin organisation or comparable arrangement	Formal authority that is responsible for water management in the domestic part of the basin.	The existence of one national basin organisation enhances performance.	<ul style="list-style-type: none"> - A - B - C - D 	(A) One formal organisation responsible for management of the national part of the basin, equipped with sufficient capacity and financing mechanisms (B) One formal organisation responsible for management of the national part of the basin, no significant financing mechanisms (C) One formal organisation is currently in the planning stage (D) No formal authority explicitly existing for the national part of the basin	The international network of basin organisations can help as a first check: http://www.riob.org/spip.php?article44 But: only member of the INBO are named.
9.	Formalised transboundary coordination organisation <i>Only relevant for transboundary rivers (so indicate if not relevant rather than score as D)</i>	Organisation that is responsible for the coordination of water management in a transboundary basin.	The existence of a formalised transboundary coordination organisation enhances performance.	<ul style="list-style-type: none"> - A - B - C - D 	(A) Transboundary coordination organisation and regular cooperation among countries existing (B) Transboundary coordination organisation existing without sufficient support (C) Transboundary coordination organisation currently in the planning stage (D) No transboundary coordination organisation existing	http://faolex.fao.org/watertreaties/ ² (Database with International agreements on international water sources), treaties only – no direct information about the existence of an organisation The international network of basin organisations can help as a first check: http://www.riob.org/spip.php?article44 But: only member of the INBO are named. GWSP atlas, map on harmonisation of freshwater law, indicators to engage in transboundary cooperation: http://atlas.gwsp.org/index.php

² Carries the full text of treaties and agreements, bi-lateral and multi-lateral, concluded by sovereign countries in regard to the development and management of rivers and lakes, and/or of groundwater resources, which form an international boundary line or which are bisected by such boundary line. Country and river/lake/basin/aquifer coverage does not purport to be exhaustive. It covers a time span from 1909 to-date.

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
						?option=com_wrapper&Itemid=53&id_desc=80&Itemid_desc=63&id_ds=128&Itemid_ds=52&header=Harmonisation%20of%20Freshwater%20Law&site=harm1_0 PhD thesis of Ines Dombrowski (UFZ) – analyse 58 international treaties and organisations. Published as book by Elgar and several journal articles. She might have also a data base and give advice if consulted.
10.	Formal institution (legislation) that prescribes the basin management principle	Formal Institution (legislation) determining that water management must be organised according to the hydrologic principle Could be at national or supra-national (e.g. EU WFD) level	A formal Institution (legislation) prescribing the hydrologic principle as basis for water management enhances performance.	- A - B - C - D	(A) Hydrologic principle is prescribed by formal institution (legislation) and implemented (B) Hydrologic principle is prescribed by formal institution (legislation), but not implemented (C) It is planned to include the hydrologic principle in legislation (D) Formal institution (legislation) does not prescribe the hydrologic principle	http://waterlex.fao.org/waterlex/srv/en/home see: Administration – River Basin Management, however: no information about the up-to-dateness of the database
11.	Water (basin) strategies, programmes and plans	Water strategies, programmes, plans that contain clear targets and phases for measures implementation	Water strategies, programmes, plans at various levels with clear targets and implementation phases improve performance	- A - B - C	(A) Existence and implementation of water strategies in programmes and plans (B) Water strategies exist, but are poorly implemented (C) Water strategies do not exist	http://waterlex.fao.org/waterlex/srv/en/home see: Administration – River Basin Management, however: no information about the up-to-dateness of the database
12.	Financing mechanisms: Degree of investment from private sector/ public/ other sources (e.g. international)	Main funding source for investment in water management National level most meaningful.	Balanced contribution of diverse funding sources increases performance	- A - B	(A) Balanced sources (each < 2/3) (B) Dominance (2/3) of either public, private or other source (e.g. international aid) – please specify the dominant source	Expert judgement

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
13.	Economic instruments Is water for irrigation priced?	A price is charged for water use for irrigation in agriculture.	A price that allows full cost recovery leads to more effective water use.	- A - B - C	(A) A price is charged and corresponds to real costs/value of water (B) A price is charged too low or too high (C) No price is charged	http://waterlex.fao.org/waterlex/srv/en/home FAO/WHO Water Law and Standards Database: differentiation in <ul style="list-style-type: none"> Water ownership Land tenure requirements Licensing exemptions Granting criteria Recording of licences Terms and conditions Administrative measures Transfer of permits Transitional provisions and vested rights Water charges Only refers to that legislation that was reviewed.
14.	Economic instruments Is water for households priced in urban areas?	A price is charged for household water use.	A price that allows full cost recovery leads to more effective water use.	- A - B - C	(A) A price is charged and corresponds to real costs/value of water (B) A price is charged too low or too high (C) No price is charged	"
15.	Economic instruments Is water for industry priced?	A price is charged for industrial water use.	A price that allows full cost recovery leads to more effective water use.	- A - B - C	(A) A price is charged and corresponds to real costs/value of water (B) A price is charged too low or too high (C) No price is charged	"
16.	Tradable permits related to water abstraction/use	Permits related to water abstraction/use can be traded	Tradable permits improve environmental and economic performance.	- A - B - C	(A) Tradable permits are used and generating additional investments in the water sector (B) Tradable permits are used, but the general income is used for other purposes (C) No tradable permits	Expert judgement

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
17.	Polluter pays principle (related to water)	The one who is responsible for pollution must pay the full costs for the damage	The application of the polluter pays principle (PPP) improves both environmental and economic performance	- A - B - C	(A) PPP is applied and gives incentives for environment-friendly behaviour (B) PPP is applied, but low incentives to adjust behaviour (C) PPP is not applied	Expert judgement
18.	Environmental subsidies (related to water)	Environmental subsidies are applied to encourage environment-friendly behaviour	Environmental subsidies improve environmental performance	- A - B - C	(A) Environmental subsidies exist and are applied (B) Environmental subsidies exists, but remain unused (C) No environmental subsidies	Expert judgement
19.	Payment for ecosystem services (related to water)	Ecosystem services are identified and priced	Payment for ecosystem services improves environmental performance	- A - B - C	(A) Wide range of ecosystem services is priced (B) Only some provisioning ecosystem services ³ are priced, others are neglected (C) No pricing of ecosystem services	<i>World Data Centre for Biodiversity and Ecology: Data, Reports, academic paper etc. about ES/payments</i> http://wdc.nbi.gov/portal/serve_r.pt
20.	Tradable permits (related to water quality, maximum, allowable loads etc.)	Rights for pollution can be traded	Tradable permits improve environmental and economic performance	- A - B - C	(A) Tradable permits are used and generating additional investments in the water sector (B) Tradable permits are used, but the general income is used for other purposes (C) No tradable permits	http://waterlex.fao.org/waterlex/srv/en/home FAO/WHO Water Law and Standards Database: differentiation in <ul style="list-style-type: none"> Water ownership Land tenure requirements Licensing exemptions Granting criteria Recording of licences Terms and conditions Administrative measures Transfer of permits Transitional provisions and vested rights Water charges Only refers to the legislation that was reviewed.

³ Provisioning services are products provided by ecosystems, e.g. food, fresh water and fuel (Millennium Ecosystem Assessment: Ecosystems and their Services, p. 56f.)

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
21.	Environmental tax (related to water)	Taxes that are charged for water-related activities	The presence of environmental taxes improves environmental performance	- A - B - C	(A) Environmental taxes are used and generating additional investments in the water sector (B) Environmental taxes are used, but the general income is used for other purposes (C) No environmental taxes exist.	OECD/EEA database on instruments used for environmental policy and natural resources management http://www2.oecd.org/ecoinst/queries/index.htm
22.	Presence of substituting informal institutions for management of water	Rules that do not build on legal laws and that have substituting goals to the legal law	Substituting informal institutions, (such as patronage networks at national, basin, regional level) decrease performance with regard to good-governance principles	- A - B - C	(A) Substituting informal institutions do not play a significant role (B) Substituting informal institutions compete with formal ones, but do not dominate them (C) Substituting informal institutions dominate water management and replace rules of legal law	Main sources for each country can be individual scientific analyses. Furthermore analyses of corruption in the water sector: e.g. by Transparency International 2008 Report on Corruption in Water Sector: http://www.transparency.org/publications/gcr/gcr_2008#1
23.	Presence of complementary informal institutions for water management	Rules that do not build on formal legal provisions but which complement these	Complementing informal institutions (such as traditional, local arrangements) increase performance with regard to good governance principles	- A - B - C	(A) Complementary informal institutions play a dominant role (B) Complementary informal institutions exist, but do not dominate (C) Complementary informal institutions are unimportant	Main sources for each country can be individual scientific analyses.

b) Formalisation of IWRM principles and Millennium Development Goals

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
24.	Formalised IWRM principles	Principles for IWRM (as defined by GWP ⁴) are officially included in legislation and planning. National level	The incorporation of IWRM principles in legislation and planning improves performance	- A - B - C	(A) Most IWRM principles are incorporated in legislation and planning (B) Most IWRM principles are incorporated in legislation, but not in planning (C) Most IWRM principles are not incorporated in legislation or planning	For EU Countries RBMP can be checked (as far as we consider the WFD to follow the IWRM principles)

⁴ See e.g. http://www.unwater.org/downloads/UNW_ROADMAPPING_IWRM.pdf

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
25.	State of implementation of IWRM principles	The state of the implementation is reflected by the presence of IWRM plans for river basins. National level	The more IWRM is implemented in practice, the better the performance	- A - B - C	(A) River basin management plans based on IWRM exist and have been implemented (B) River basin management plans based on IWRM exist/are currently created, but have not been implemented (C) River basin management plans based on IWRM do not exist	For EU Countries RBMP can be checked (as far as we consider the WFD to follow the IWRM principles)
26.	Capacity to implement IWRM	Human resources and financing to implement IWRM are available National level	Lack of capacity is decreasing performance.	- A - B - C	(A) Sufficient IWRM capacities are available (B) Efforts are made to increase the IWRM capacity (C) There is a lack of IWRM capacity	Expert judgement
27.	Is universal and non-discriminatory access to safe drinking water and sanitation a goal?	Goal = a strategy is given in some formulated form that aims at achieving safe access to drinking water in good quality and sufficient quantity as well as sanitation for the total population	Formalisation of universal and non-discriminatory access to safe drinking water and sanitation as a goal improves performance.	- A - B - C	(A) Yes, formalised goal within a given framework (B) Yes, but not formalised (C) No	Expert judgement
28.	Integration of wetlands in IWRM and IRBM⁵	Is specific consideration given in IWRM and IRBM to the particular functions and services that wetlands provide, and to their protection as relevant ecosystem types?	Explicit integration of wetlands and IWRM/IRBM may contribute to the performance of the governance regime with regard to the Millennium Development Goals	- A - B	(A) Wetlands are explicitly considered as valuable elements, and wetlands are explicitly integrated in IWRM/IRBM (B) Wetlands are considered as valuable elements in the context of IWRM, but no explicit integration of wetland and river basin management is practiced	Expert judgement

⁵ This indicator is of special interest to the WETwin project (EC FP7). Collaboration in identifying this indicator for the Twin2Go case studies is kindly requested from the workshop participants.

c) Decision making regarding uncertainties

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
29.	General practices for dealing with uncertainties	The way how uncertainties are addressed in the problem identification and responses how to deal with the problem.	Performance is increased if uncertainties are taken into account and addressed in an appropriate way.	- A - B - C	(A) Different kinds of uncertainties are taken into account in the full water management cycle (also responses by human actors, different perspectives etc.) (B) Only uncertainties that can be quantified are taken into account (e.g. variability in hydrologic parameters) (C) Uncertainties are ignored	Uncertainty addressed in regulatory frameworks. Uncertainty addressed in guidance documents (e.g. CIS of the EU WFD). Expert judgement from water management practice. Preferably to be derived from available analyses. Conducting document analyses and interviews is time consuming.
30.	Dealing with uncertainties: Reversible and flexible options	The level of reversibility and flexibility of response options in the light of uncertainties: How easily can implemented measures be revised or adjusted if changed boundary conditions require this?	Performance under uncertainty is enhanced by favouring reversible and flexible options	- A - B - C	(A) Reversible and flexible options usually favoured (B) Sometimes favoured (C) Not favoured	Expert judgement
31.	Dealing with uncertainties: Safety margins	Additional actions taken or design specifications to be able to cope with uncertainty	Performance under uncertainty is enhanced by invoking safety margins to reduce vulnerabilities	- A - B - C	(A) Low cost design enhancements for wider safety margins usually adopted (B) Sometimes adopted (C) Never adopted	Expert judgement
32.	Are scenarios used for decision making?	Scenarios are used for planning, providing a long-term perspective on potential future developments and showing more than one option.	The use of scenarios increases performance and adaptation to climate change.	- A - B - C	(A) Scenarios are used as an important contribution to decision-making. (B) Scenarios are used, but have little impact on decision-making. (C) Scenarios are not used.	Please specify the spatial level. If possible, specify, which scenarios are used

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
33.	Climate risks: Climate variability and change	Regarding climate-related risks: are both climate variability and climate change taken into consideration?	Considering both climate variability and change in water-related planning and decision-making enables more adaptive water governance	<ul style="list-style-type: none"> - A - B - C 	(A) Both climate variability and change are taken into consideration in current planning and decision-making (B) Only current and historic climate variability is taken into consideration in current planning and decision-making (C) Only limited attention is given to climate variability in current planning and decision-making	Expert judgement

II) Actor networks with emphasis on the role and interactions of state and non-state actors and power relationships

a) Cooperation and coordination structures

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
34.	Vertical coordination (governmental)	Formal provisions to support coordination in water sector among governmental organisations across administrative levels	Clear and distinctive allocation of tasks and functions avoiding overlaps and coordination increases performance	<ul style="list-style-type: none"> - A - B - C - D - E 	(A) Cooperation and clear allocation of tasks (B) Clear allocation of tasks, and coordination ⁶ (C) Task overlap, but coordination (D) Clear allocation of tasks, but no coordination (E) No coordination, much overlap	Expert judgement
35.	Horizontal coordination (governmental)	Formal provisions to support coordination in water sector among governmental organisations across sectoral or provincial borders	Clear and distinctive allocation of tasks and functions avoiding overlaps and coordination increases performance	<ul style="list-style-type: none"> - A - B - C - D - E 	(A) Cooperation and clear allocation of tasks (B) Clear allocation of tasks, and coordination (C) Task overlap, but coordination (D) Clear allocation of tasks, but no coordination (E) No coordination, much overlap	Expert judgement

⁶ Indicators “Vertical Integration” and “Horizontal Integration”: Cooperation means joint elaboration of strategies, plans etc.. By contrast, coordination means that different actors (organisations) develop strategies, plans etc. separately, but take into account the work and interests of other relevant actors, e.g. by consulting them.

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
36.	Role of local governments	Involvement of local governments in the creation of water-related institutions at higher levels, if the institutions affect the local level	Involvement of local governments at higher levels improves the performance of water governance	<ul style="list-style-type: none"> - A - B - C 	<p>(A) Local governments are involved in the creation of institutions at higher levels and participate in decision-making, if they will be affected by these institutions</p> <p>(B) Local governments are consulted in the creation of institutions at higher levels, if they will be affected by these institutions</p> <p>(C) The role of local governments is basically restricted to the implementation of institutions from higher levels</p>	Expert judgement

b) Information sharing via formal rules, dependency relationships etc.

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
37.	Kinds of knowledge included => Role of experts/ science, local/traditional knowledge	Use of knowledge from different sources about the water systems and impacts on society	Performance is increased if both expert and local knowledge is taken into account.	<ul style="list-style-type: none"> - A - B - C - D 	<p>(A) Both scientific expert knowledge and local/traditional knowledge are taken into account</p> <p>(B) Scientific expert knowledge is taken into account</p> <p>(C) Only local/traditional knowledge is taken into account</p> <p>(D) Decision-making is not based on relevant knowledge about the water system</p>	Expert judgement

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
38.	Access to information => about expert knowledge and management plans	Ability to (legally and technically) unrestricted access to information	The higher the access to information, the higher the performance	<ul style="list-style-type: none"> - A - B - C - D - E 	(A) Information is processed and disseminated actively and/or free of cost to make it accessible to all groups (B) Access to information is open to everyone (C) Access to information is restricted to certain groups and/or certain documents (D) Information are not publicly accessible (E) Biased information is disseminated ⁷ .	Expert judgement

III) Multi-level interactions across administrative boundaries and vertical integration across levels and horizontal integration across sectors

a) Centralisation

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
39.	One level one actor?	Each administrative level/area has a dominant actor with full decision power in water management issues.	The performance of water management is higher, if decision power is shared and there is no actor, who fully controls an administrative level/area.	<ul style="list-style-type: none"> - A - B - C 	(A) No administrative level has a dominant actor with full decision power. Further actors are involved at each level and participate significantly in decision-making. (B) At least one administrative level has a dominant actor with full decision power. (C) Each administrative level has a dominant actor with full decision power.	Expert judgement

⁷ i.e. wrong or incomplete information is knowingly disseminated with the intention to deceive the addressees

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
40.	Degree of centralisation	Centralisation implies that one authority has all responsibilities and power to enforce decisions across many administrative levels ("command and control approach")	Centralised regimes lead to compliance and implementation problems and are quite rigid (decreased performance)	- A - B - C	(A) Not centralised system (B) Policy development is centralised, but implementation is decentralised (C) Both policy development and implementation are controlled by one central actor	Expert judgement
41.	Technical capacity and economies of scale	Is the existing level of decentralisation in accordance with the available technical capacity and are economies of scale taken into consideration?	Available technical capacity and economies of scale need to be taken into consideration for decentralised governance regimes to be successful and sustainable in time	- A - B	(A) Yes (B) No	Expert judgement
42.	Legal obligations and responsibility	Are the legal obligations and responsibilities of the decentralised system clearly established?	Clear establishment of obligations and responsibilities is key to the decentralisations' contributions to improved adaptive water governance	- A - B	(A) Yes (B) No	Expert judgement

B) Context

I) Societal dimension

All context variables are determined and are more easily available at the national level. One may consider further additions for transboundary basins, in particular to show the variability in countries sharing a basin.

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
43.	Proportion of the population living in rural areas	Percentage of "[d]e facto population living in areas classified as rural" (United Nations Population Division, 2008).	Rural countries tend to have a lower performance of the water governance regime. This indicator serves to judge the Millennium Development Goals with regard to rural population (see performance section).	Percentage number Without categories	Proportion of the population living in rural areas in the national part of the basin. If no data are available for the basin and expert estimations are impossible, please refer to the entire national level.	National level: United Nations Population Division (2008): World Urbanization Prospects: The 2007 Revision Population Database, http://esa.un.org/unup/ => Choose value for 2005

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
44.	State of societal development	A society's state of development, considering life-expectancy, literacy, educational attainment and GDP per capita etc	A high state of development has a positive influence on the performance of the water governance regime.	HDI and categories - A - B - C - D	Human Development Index for all major countries in a river basin in transboundary basins (A) Very high HDI: 0.900 – 1.000 (B) High HDI: 0.800 – 0.899 (C) Medium HDI: 0.500 - 0.799 (D) Low HDI: 0.000 – 0.499	UNDP: Human Development Report, online at http://hdr.undp.org/en/statistics/
45.	Social sustainability (Gini Index)	Extent of inequality of basic assets Some arguments have been raised against using the Gini coefficient as a measure of income inequality (e.g. difference in what income means ignored by using one metric and its distribution; index sensitive to differences across regions with major differences in absolute income. Hence large and heterogeneous countries have a higher index which may be smaller if income was corrected by power purchasing parity. For our purposes no real problem since both kinds of differences may be relevant for basin management).	A more balanced distribution of assets has a positive influence on the performance of the water governance regime. From a normative point of view neither entirely equal distribution nor extreme inequality (less than 10% own more than 90% of assets) are desirable. Some inequality may derive from different skills and efforts; extreme inequality is a sign for imbalance of power and dominance.	Gini coefficient and categories - A - B - C - D - E	Gini coefficient (A) < 0.30 (B) 0.30 – 0.39 (C) 0.40 – 0.49 (D) 0.50 – 0.59 (E) >= 0.60 (Numbers may be multiplied by 100)	UNDP: Human Development Report 2009: http://hdr.undp.org/en/media/HDR_2009_EN_Complete.pdf - see annex, table M (p. 195) Values were calculated based on data by World Bank (2009d)
46.	Economic sustainability (GDP)	Economic wealth of the system as indicator of state of economic development Gross domestic product, corrected by purchasing power parity to make the data more comparable	A higher GDP has a positive influence on the performance of the water governance regime – may level off	GDP per capita (PPP corrected) and categories - A - B - C - D - E	GDP per capita, (\$ PPP corrected) (A) Very high: >= 24,000 (B) High: 15,000 – <24,000 (C) Medium: 6,000 – < 15,000 (D) Low: 1,200 – < 6,000 (E) Very Low: < 1,200 More appropriate categories might be defined at a later stage.	World Bank: Estimates for GDP per capita (US-\$, PPP-corrected) for 2005 http://siteresources.worldbank.org/ICPINT/Resources/icp-final-tables.pdf - see left data column (PPP)

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
47.	Effectiveness of formal institutions	<p>Effectiveness of formal institutions refers to the strength of formal institutions (formal regulations, laws) and thus the likelihood that they are implemented and executed rather than existing only on paper.</p> <p>The effectiveness of formal institutions is measured by the <i>Corruption Perception Index</i>. The higher the index, the lower the corruption and the more effective are formal institutions. The CPI can range between 0 and 10. For 2009 values from 1.1 to 9.4.</p>	A high effectiveness of formal institutions has a positive influence on the performance of the water governance regime	<p>Corruption Perception Index and Categories:</p> <ul style="list-style-type: none"> - A - B - C - D - E 	<p>Corruption Perception Index (the higher the value, the less corruption)</p> <p>(A) ≥ 7.9 (B) 6.2 – 7.8 (C) 4.5 – 6.1 (D) 2.7 – 4.4 (E) < 2.7</p>	<p>Released every year from Transparency International 2009: http://www.transparency.org/policy_research/surveys_indices/cpi/2009/cpi_2009_table</p>
48.	Trustworthiness of economic institutional setting - degree of risk for foreign direct investment	Measure of the risks associated with investments in a certain country – measure of the creditworthiness of a country (supplementary to CPI, indicates how trustworthy a country is to get financial support, i.e. by the world bank)	A higher creditworthiness has a positive influence on performance (factors in the index reflect economic performance and effectiveness of investments and easier to have access to credits for investments)	<ul style="list-style-type: none"> - A - B - C - D 	<p>Rating by the rating agency “Standards & Poor</p> <p>(A) AAA (B) A- to AA+ (C) B- to BBB+ (D) C- to CCC+</p>	<p>Guardian article, 2009: http://www.guardian.co.uk/business/2009/may/22/recession-government-borrowing#zoomed-picture</p>
49.	Presence of avenues of dissent – press freedom, freedom of speech	Non-formalised and governmental controlled possibilities accessible to all societal groups to raise their voice on an issue	The presence of avenues of dissent has a positive influence on the performance of the water governance regime.	<p>Press Freedom Index and categories:</p> <ul style="list-style-type: none"> - A - B - C 	<p>Press freedom Index by Reporters without Borders (the lower the value, the more press freedom)</p> <p>(A) Very high press freedom: ≤ 10.00 (B) High press freedom: 10.01 – 15.00 (C) Medium press freedom: 15.01 – 30.00 (D) Low press freedom: 30.01 – 50.00 (E) Very low press freedom: > 50.00</p> <p>More appropriate categories might be defined at a later stage.</p>	<p>Reporters without Borders, For 2009: http://www.rsf.org/en-classement1003-2009.html</p>

II) Good Governance Principles at the national level – legal basis at the national level

This section deals with the way how Good Governance Principles, defined by the UN, are incorporated in law. Here it does not matter if and how these laws are put into practice.

This part refers to policy as such: **national level (how is it said in law)** - national law as information source

No.	Indicator	Definition (according to UN)	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
50.	Participatory regarding decision making in the water sector	All men and women should have a voice in decision-making, either directly or through legitimate intermediate institutions that represent their interests. Such broad participation is built on freedom of association and speech, as well as capacities to participate constructively.	General hypothesis for all principles: good governance principles describe the quality norms for the governance processes and regimes. Respecting them in a country's national legislation implies that the ultimate goal of water governance (to regulate the provision of water related services in an environmentally, socially and economically sustainable way) is more likely to be achieved.	- A - B - C	(A) Laws are in place to establish and maintain the rights of stakeholders, including civil society organisations, and disadvantaged or underrepresented groups to participate in decision-making (B) Laws are in place to establish and maintain the rights of stakeholders until a certain degree (C) No laws are in place in this regard in the water sector	http://www.eclac.org/publicaciones/xml/0/26200/lcl2556e.pdf http://www.oas.org/dsd/Water/waterandgovernanceenglish.pdf
51.	Transparency regarding water allocation	Original def.: Transparency is built on the free flow of information. Processes, institutions and information are directly accessible to those concerned with them, and enough information is provided to understand and monitor them.		- A - B - C	(A) Enforceable and adequate rights of access to free information (including environmental information related to IWRM and climate change) are in place (B) Rights of access to information are in place until a certain degree (C) No right of access information	"
52.	Effectiveness and efficiency regarding decision making in the water sector	Original def.: Processes and institutions <u>produce results</u> that meet needs while making the best use of resources. Effectiveness = (progress towards) achievement of stated water management goals Efficiency = High output is achieved with little input		- A - B - C	(A) Standards, regulations or formal policy (control mechanism) to ensure the achievement of stated water management goals are in place while using resources effectively (B) Weak control mechanism are in law (not defined in detail) (C) No control in this regard	"

No.	Indicator	Definition (according to UN)	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
53.	Equitable and inclusive	<p>All men and women have opportunities to improve or maintain their well-being</p> <p>Equity = do all people (men and women, all ethnic groups, etc.) have equal opportunity of access to water?</p>		<ul style="list-style-type: none"> - A - B - C 	<p>(A) Water prices and rights ensure access to water to each population group by law</p> <p>(B) Water prices or rights exclude parts of the population</p> <p>(C) No water rights and price policy existing</p>	"
54.	Predictability – with regard to IWRM and climate change⁸	<p>According to the Asian Development Bank, “[p]redictability refers to (i) the existence of laws, regulations, and policies to regulate society; and (ii) their fair and consistent application. [...] The rule of law encompasses both well-defined rights and duties, as well as mechanisms for enforcing them, and settling disputes in an impartial manner.”</p> <p>The focus here is on how far IWRM and climate change are fixed in law to allow predictable and consistent policies.</p>		<ul style="list-style-type: none"> - A - B - C 	<p>(A) The law set out clear rights and obligations in relation to IWRM and Climate Change</p> <p>(B) Law requires that some relevant risks are taken into account, e.g. floods, glacial lake outburst flows</p> <p>(C) Climate change or IWRM is not considered in the law</p>	Expert judgement

⁸ Predictability is a core element of Good Governance according to the Asian Development Bank.

III) Environmental dimension

Geographical scale: ideally river basin scale; but if data are not available at least reference to national scale

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
55.	Köppen-Geiger climate classification (river basin)	The Köppen climate classification (1884) is one of the most widely used climate classification systems. Geiger collaborated with Köppen on changes to the system, resulting in the Köppen–Geiger climate classification system.		Köppen-Geiger code	Current climate type (1951-2000) Each particular climate type in this system is represented by a 2 to 4 letter symbol. Log the corresponding official multiple-letter Köppen-Geiger climate classification code for the river basin. If the basin covers more than 1 climate zone, then log all.	Kottek, M., J. Grieser, C. Beck, B. Rudolf, and F. Rubel (2006): http://koeppen-geiger.vu-wien.ac.at/present.htm#maps
56.	Climate Moisture Index	GWSP (2008): “The annual average Climate Moisture Index (CMI) is computed using the ratio of annual precipitation (P) to annual potential evapotranspiration (PET). [...] The CMI indicator ranges from –1 to +1; areas with CMI values exceeding 0 generally represent humid or water abundant areas; Arid regions with very low rainfall show CMI values less than -0.5 where semi-arid regions have CMI values ranging from 0 to -0.5.”	The performance of water governance is lowest in semi-arid basins	CMI and categories - A - SA - SH - H	(A) arid: $-1 < \text{CMI} < -0.6$ (SA) semi-arid: $-0.6 < \text{CMI} < 0$ (SH) sub-humid: $0 < \text{CMI} < 0.25$ (H) humid: $0.25 < \text{CMI} < 1$	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 (Datasets provided by Vörösmarty, C.J.) Chose the value that is dominant in the river basin.

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
57.	Climate Moisture Index Coefficient of Variation	<p>The variability of CMI (see above) over multiple years, critical to determining the reliability of water supplies, is measured by the Coefficient of Variation (CV), defined as the ratio of annual deviation to the long-term annual mean.</p> <p>Increased climate variability indicates larger year-to-year fluctuations, and hence, less predictability in the climate. The variability of CMI over multiple years is critical to determining the reliability of water supplies,</p>	The higher the inter-annual variability in water availability, lower the performance of the water governance regime	<p>CMI CV and categories</p> <ul style="list-style-type: none"> - A - B - C 	<p>CMI CV</p> <p>(A) Low variability: CMI CV < 0,25 (B) Moderate: 0,25 < CMI CV < 0,75 (C) High variability CMI CV > 0,75</p>	<p>http://www.unesco.org/water/wwap/wwdr/wwdr2/pdf/wwdr2_section_4.pdf</p> <p>Datasets also available at http://wwdrii.sr.unh.edu/download.html - Item B2 (UNESCO, UN World Water Development Report)</p> <p>Also as available as Interactive map in GWSP atlas (arid areas have negative values): 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</p> <p>Chose the value that is dominant in the river basin.</p>
58.	Per Capita Equivalent of TARWA	TARWR is an index that reflects the water resources theoretically available for development from all sources within a country. Divided by the nation's population and adjusted to m ³ /yr, it is expressed as a per capita volume more readily allowing a relative evaluation of the maximum resource theoretically available.	Countries and/ or basins which have little water available per capita, have lower performance in the water governance regime (facing bigger challenges in water management)	<p>Per Capita Equivalent of TARWA and categories</p> <ul style="list-style-type: none"> - A - B - C - D - E 	<p>Per Capita Equivalent of TARWA</p> <p>(A) Very high: $\geq 25,000$ (B) High: 10,000 – 24.999.9 (C) Medium: 5.000 – 9,999.9 (D) Low: 1.000 – 4,999.9 (E) Very Low: < 1,000</p> <p>More appropriate categories might be defined at a later stage.</p>	<p>http://www.greenfacts.org/en/water-resources/figtableboxes/3.htm</p> <p>- Take value for 2005 (not 2000)</p> <p>(UNESCO, UN World Water Development Report)</p>

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
59.	Average water availability at the river basin level (1995)	Water “availability” (mm/yr) is defined here as fast surface runoff plus groundwater recharge, and “average” as the annual average during the so-called “climate normal” period of 1961 to 1990. This indicator is different from the previous indicators in the sense that it is expressed at the river basin level, thus taking into account the important differences in availability that often exist within a single nation.	Countries and/ or basins which have little water available, have lower performance in the water governance regime (facing bigger challenges in water management)	Average water availability (category of the figure) and categories - A - B - C - D - E	Water availability in mm/yr, as observed from the figure in the report (A) above 400 (B) between 100 – 400 (C) between 25 – 100 (D) between 5 – 25 (E) between 0 – 5	WaterGAP 2.0 (University of Kassel: see: http://www.env-edu.gr/Documents/World%20Water%20in%202025.pdf) - figure 7 (page 22) Observation: the data on “current” water availability at the basin level contained in WaterGAP 2.0 represent the situation for 1995; other sources may provide more updated information; however this information is typically provided at the country level only)
60.	Annual renewable water supply per person by river basin (1995)	Water supply at the river basin in terms of m ³ /person/year Water experts define areas where per capita water supply drops below 1,700 m ³ /year as experiencing “water stress” - a situation in which disruptive water shortages can frequently occur. In areas where annual water supplies drop below 1,000 m ³ per person per year, the consequences can be more severe and lead to problems with food production and economic development unless the region is wealthy enough to apply new technologies for water use, conservation, or reuse.	Countries and/ or basins which have little water available per capita, have lower performance in the water governance regime (facing bigger challenges in water management)	Annual renewable Water supply (category of the figure) and categories - A - B - C - D - E	Availability in m ³ /person/yr, as observed from the figure in the report (A) above 4,000 (B) between 1,700 – 4,000 (C) between 1,000 – 1,700 (D) between 500 – 1,000 (E) below 500	World Resources Institute, EarthTrends 2001 (can be replaced by local information when available): http://earthtrends.wri.org/pdf/library/maps/2-4_m_WaterSupply1995.pdf Note: the data source has been made at the global level and must therefore be considered as approximate only; expert judgment may be used to reallocate the score for a given basin to another class, if key stakeholders believe there is sufficient argument to do so

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
61.	Projected annual renewable water supply per person by river basin (2025)	<p>Projected water supply at the river basin in terms of m³/person/year, for the year 2025</p> <p>This factor differs from the previous one in the sense that it considers the projected situation of water supply for 2025</p>	Countries and/ or basins which have little projected water available per capita, have lower performance in the water governance regime (facing bigger challenges in water management)	<p>Projected annual renewable Water supply (category of the figure) and categories</p> <ul style="list-style-type: none"> - A - B - C - D - E 	<p>Availability in m³/person/yr, as observed from the figure in the report</p> <ul style="list-style-type: none"> (A) above 4,000 (B) between 1,700 – 4,000 (C) between 1000 – 1,700 (D) between 500 - 1,000 (E) below 500 	<p>World Resources Institute, EarthTrends 2001 (can be replaced by local information when available): http://earthtrends.wri.org/pdf/library/maps/2-4_m_WaterSupply2025.pdf</p> <p>Note: the data source has been made at the global level and must therefore be considered as approximate only; expert judgment may be used to reallocate the score for a given basin to another class, if key stakeholders believe there is sufficient argument to do so.</p>
62.	Relative Water Stress Index	<p>High resolution water stress indices can be computed based on the ratio of total water use (sum of domestic, industrial and agricultural demand or DIA) to renewable water supply (Q), which is the available local runoff (precipitation less evaporation) as delivered through streams, rivers and shallow groundwater. Developed from actual statistics, the Relative Water Stress Index (RWSI), also known as Relative Water Demand, is useful because it is a dimensionless quantity, which can be applied at different scales.</p>	The higher the relative water stress index, the lower the performance of the water governance regime	<p>Mean Annual Relative Water Stress index and categories</p> <ul style="list-style-type: none"> - A - B - C - D - E 	<p>Mean Annual Relative Water Stress index</p> <ul style="list-style-type: none"> (A) Very low: RWSI = 0 (B) Low: RWSI < 0,2 (C) Medium: RWSI = 0,2 – 0,4 (D) High: RWSI = 0,4 – 1 (E) Very high: RWSI > 1 <p>Populations living in water stressed areas: RWSI ≥ 0.4; population living in relatively unstressed areas: RWSI < 0.4</p>	<p>UNESCO: World Water Development Report II: http://www.drii.sr.unh.edu/download.html - Item I4</p> <p>Chose the value that is dominant in the river basin</p> <p>Values were calculated for 1995.</p> <p>This data source shows substantial within-country differences that national estimates often obscure</p>

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
63.	Climate Vulnerability Index	OCWR. 2008-2010: "The Climate Vulnerability Index (CVI) is an extension of the Water Poverty Index (WPI); it includes additional geographical factors that relate specifically to the place being examined. It involves the application of scenarios of change, and by this means it can express the vulnerability of people to global environmental change, and climate change."	The higher the climate vulnerability index, the lower the performance of the water governance regime	<ul style="list-style-type: none"> - A - B - C - D - E 	Climate Vulnerability Index (A) Low: 20 – 27,9 (B) Medium low: 28 – 35,9 (C) Medium: 36 – 43,9 (D) Medium high: 44 – 51,9 (E) High: 52 - 60	Oxford Centre for Water Research (OCWR), 2008-2010: http://ocwr.ouce.ox.ac.uk/research/wmpg/cvi/ Calculated for the national scale
64.	Degree to which water quality status restricts usability of users' types	Degree of quality and type of use Uses types: environment, agriculture and aquaculture, hydropower, domestic and industrial	The higher the usability restrictions due to water quality, the higher the challenges for water management	<ul style="list-style-type: none"> - A - B - C 	(A) Low: environmental health and human use hardly restricted (B) Medium: water quality restrict water uses to a certain extent (C) High: limited water quality heavily affects or restricts current uses	Sources: WFD RBMP for EU basins OECD surface water quality standards for non-EU basins (simple to apply compared to WFD and tested in a number of countries)
65.	Extent of flow and channel modification	Degree to which river flows and channels have been modified by instream infrastructure	Modification of river flows and channels by infrastructure disturbs aquatic and riparian ecosystems with adverse consequences on fisheries and biodiversity	<ul style="list-style-type: none"> - A - B - C 	(A) Not modified, unregulated flows (B) Some infrastructure, mostly small scale (C) Heavily modified	Expert judgement
66.	Impact of land-use changes on hydrological processes	Degree to which river flows have been modified by changes in land-use in the basin	Modification of river flows by changes in land-use impacts valued ecosystem services like flood control, dry season base flows, sediment capture and water filtration	<ul style="list-style-type: none"> - A - B - C 	(A) Much of basin in natural state or with vegetation cover that maintains provides similar watershed functions (B) Somewhat modified and with possibly negative impacts on ecosystem services (C) Heavily modified with clear negative impact on ecosystem services	Expert judgement

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
67.	Uncertainty associated to climate change predictions regarding precipitation in the basin	Associated uncertainty of the expected change	The higher uncertainty, the more difficult the adaptation process	<ul style="list-style-type: none"> - A - B - C - D - E 	<p>Probability p of precipitation decrease</p> <p>(A) 0.80 – 1.00: Increase in precipitation highly probable, high convergence of model results</p> <p>(B) 0.60 – 0.80: More probability of a precipitation increase</p> <p>(C) 0.40 – 0.60: High divergence of model results, no clear dominance of decrease or increase in precipitation</p> <p>(D) 0.20 – 0.40: More probability of a precipitation decrease</p> <p>(E) 0.00 – 0.20: Decrease in precipitation highly probable, high convergence of model results</p>	<p>The MAGICC-SCENGEN tool allows calculating the probability p of a decrease in precipitation as derived from a multitude of General Circulation Models.</p> <p>Please see the map in the annex and choose the average category for the basin.</p>

C) Performance

I) Progress towards stated Goals

This section refers to the progress towards the Millennium Development Goal 7, target 7C: “Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation”. In general these indicators are determined at national level. In transboundary basins the results for the major countries should be given to show possible disparities.

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
68.	Progress towards sustainable access to safe drinking water (MDG drinking water target)	Background: Halve, by 2015, the proportion of the population without sustainable access to safe drinking water	<p>Critical to water services provision is the importance of integrated water resource management scarce water resources. These are critical to the economy and the well-being of people. Not only does a mutually beneficial marriage between water resources and services allow and sustain lives, they underpin industrial and commercial activity. Without them a country cannot achieve economic growth nor can people's livelihoods be improved.</p> <p>Meeting the Millennium Development Goals (MDG) for sustainable access to drinking water requires both a good governance system to enable planning, project preparation, project financing and project implementation.</p>	<ul style="list-style-type: none"> - A - B - C 	<p>Progress towards the MDG drinking water target, 2006</p> <ul style="list-style-type: none"> (A) On track (B) Progress but insufficient (C) Not on track 	<p>WHO & UNICEF (2008): Progress on Drinking Water and Sanitation: Special Focus on Sanitation: http://www.wssinfo.org/en/40_MDG2008.html => figure 23 on page 25</p> <p>This report details global progress towards the Millennium Development Goal (MDG) target for drinking-water, and analyses what these trends suggest for the remainder of the UN Decade "Water for Life" (2005 - 2015). Including progress towards the drinking water target</p>

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
69.	Proportion of population with access to improved drinking water	According to WHO & UNICEF (2008), improved drinking water coverage comprises: 1) Piped water on premises: Piped household: water connection located inside the user's dwelling, plot or yard.	Access to improved drinking water is regarded as an indicator for good governance performance.	Percentage number and categories - A - B - C - D - E	Proportion of total population using an improved drinking water source, 2006 (A) 100% (B) 91 – 99% (C) 76 – 90% (D) 50 – 75 % (E) < 50%	UN statistics of MDG progress: http://mdgs.un.org/unsd/mdg/Data.aspx see goal 7 => target 7c => 1 st item (total) => 3 rd item (rural)
70.	Proportion of rural population with access to improved drinking water	2) Other improved drinking water sources: Public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs and rainwater collection.		Percentage number and categories - A - B - C - D - E	Proportion of rural population using an improved drinking water source, 2006 (A) 100% (B) 91 – 99% (C) 76 – 90% (D) 50 – 75 % (E) < 50%	
71.	Progress towards sustainable access to basic sanitation (MDG sanitation target)	Background: Halve, by 2015, the proportion of the population without sustainable access to basic sanitation	Access to improved sanitation facilities is regarded as an indicator for good governance performance.	- A - B - C	Progress towards the MDG sanitation target, 2006 (A) On track (B) Progress but insufficient (C) Not on track	WHO & UNICEF (2008): Progress on Drinking Water and Sanitation: Special Focus on Sanitation: http://www.wssinfo.org/en/40_MDG2008.html => figure 4 on page 9 This report details global progress towards the Millennium Development Goal (MDG) target for sanitation, and analyses what these trends suggest for the remainder of the UN Decade "Water for Life" (2005 - 2015). Including progress towards the sanitation target

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
72.	Proportion of population with access to improved sanitation facilities	According to WHO & UNICEF (2008), improved sanitation facilities are “[f]acilities that ensure hygienic separation of human excreta from human contact. They include:	Access to improved sanitation facilities is regarded as an indicator for good governance performance.	Percentage number and categories - A - B - C - D - E	Proportion of total population using an improved sanitation facility, 2006 (A) 100% (B) 91 – 99% (C) 76 – 90% (D) 50 – 75 % (E) < 50%	UN statistics of MDG progress: http://mdgs.un.org/unsd/mdg/Data.aspx see goal 7 => target 7c => 4 th item (total) => 6 th item (rural)
73.	Proportion of rural population with access to improved sanitation facilities	<ul style="list-style-type: none"> • Flush or pour-flush toilet/latrine to: <ul style="list-style-type: none"> - piped sewer system - septic tank - pit latrine • Ventilated improved pit latrine • Pit latrine with slab • Composting toilet” 		Percentage number and categories - A - B - C - D - E	Proportion of rural population using an improved sanitation facility, 2006 (A) 100% (B) 91 – 99% (C) 76 – 90% (D) 50 – 75 % (E) < 50%	WHO & UNICEF (2008): Progress on Drinking Water and Sanitation: Special Focus on Sanitation: http://www.wssinfo.org/en/40_MDG2008.html => figure 12 on page 12: total => figure 10 on page 11: rural - “100%” is no category.

II) Good governance principles as indicators for the process dimension

This part refers to implementation: **how is it indeed being dealt with in practice** (in contrast to the context section above, which is about the legal basis for the good governance principles)

This section refers to the **basin of interest**. If this is impossible, you may refer to the national level (please indicate if you do so).

General hypothesis: good governance principles describe the quality norms for the governance processes and regimes. Respecting them implies that the ultimate goal of water governance (to regulate the provision of water related services in a sustainable way) is more likely to be achieved.

No.	Indicator	Definition (according to UN)	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
74.	Participatory regarding decision making in the water sector	All men and women should have a voice in decision-making, either directly or through legitimate intermediate institutions that represent their interests. Such broad participation is built on freedom of association and speech, as well as capacities to participate constructively. => including perceptions of stakeholders => inclusiveness	General hypothesis for all principles: good governance principles describe the quality norms for the governance processes and regimes. Respecting them implies that the ultimate goal of water governance (to regulate the provision of water related services in an environmentally, socially and economically sustainable way) is more likely to be achieved.	- A - B - C - D - E	Are the following really happening: (A) Active involvement, co-decision-making (B) Consultation with obligation to take into account results in decision-making (C) Consultation without binding consequences (D) Only information (E) No participation	Expert judgement
75.	Transparency regarding water allocation	Original def.: Transparency is built on the free flow of information. Processes, institutions and information are directly accessible to those concerned with them, and enough information is provided to understand and monitor them. - How are allocation rules made? Is the process evident? - How is allocation really done?	Basin specific;	- A - B - C	(A) Transparency regarding how are allocation rules made (documented and documents have to be accessible*) and how allocation is really done (B) Only one or the other (C) No transparency regarding either * e.g. development of European laws = very transparent	Expert judgement

No.	Indicator	Definition (according to UN)	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
76.	Effectiveness and efficiency regarding decision making in the water sector	Original def.: Processes and institutions <u>produce results</u> that meet needs while making the best use of resources. Effectiveness = (progress towards) achievement of stated water management goals Efficiency = High output is achieved with little input	National: Water and Basin specific:	- A - B - C	(A) Goals are achieved effectively and efficiently (B) Goals are achieved effectively, but not efficiently (C) Goals are not achieved (Neither effective nor efficient)	Expert judgement
77.	Equitable and inclusive	All men and women have opportunities to improve or maintain their well-being Equity = do all people (men and women, all ethnic groups, etc.) have equal opportunity of access to water? (In practice, not only on paper!)	National scale, Water and Basin specific:	- A - B - C	(A) Yes, equitable and inclusive access have been achieved (B) Considerable progress towards ... has been made (C) Current situation is still very exclusive and unequal Additional information to the scores is most probably necessary to explain the background (inequality is based on what? etc.).	Expert judgement

No.	Indicator	Definition (according to UN)	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
78.	Predictability – with regard to IWRM and climate change	<p>According to the Asian Development Bank, “[p]redictability refers to (i) the existence of laws, regulations, and policies to regulate society; and (ii) their fair and consistent application. [...] The rule of law encompasses both well-defined rights and duties, as well as mechanisms for enforcing them, and settling disputes in an impartial manner.”</p> <p>The focus here is on how far the development and implementation of water policies deal with IWRM and climate change in a consistent and predictable way.</p>	<p>National scale,</p> <p>Water and Basin specific:</p>	<ul style="list-style-type: none"> - A - B - C 	<p>Regardless of the actual degree of IWRM and climate change consideration:</p> <p>(A) IWRM and climate change are addressed in a consistent and predictable way by all or most water policies.</p> <p>(B) IWRM and climate change are addressed in a consistent and predictable way by several water policies.</p> <p>(C) IWRM and climate change are addressed in a consistent and predictable way by few or no water policies.</p>	Expert judgement

=> cf. also table “Governance Regime”: Good Governance Principles – legal basis at national level

III) Stakeholder participation

This section refers to the **basin of interest**.

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
79.	Deliberative engagement opportunities	Deliberative platforms or arenas convened by state or non-state actors explore water management, development and policy options	Where deliberative arenas are common and effective water, public acceptance is higher and decisions more likely to promote sustainability	<ul style="list-style-type: none"> - A - B - C 	<p>(A) Deliberative arenas are common, widely used, and often influence decisions</p> <p>(B) Deliberative arenas infrequent, partly engaged in, or rarely influence decisions</p> <p>(C) Deliberative arenas rare to non-existent</p>	Expert judgement

80.	Inclusiveness of stakeholder participation	Degree to which all stakeholder interests are represented – with special emphasis on marginalised and vulnerable groups	More inclusive engagement with stakeholders improves long-term performance	- A - B - C	(A) All stakeholders given opportunity to engage and be represented (B) Most stakeholders (C) Few stakeholders	Availability of institutions that support an inclusive stakeholder participation.
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IV) Response to climate change

This section refers to the **basin of interest**.

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
81.	Strategy for adaptation to climate change in the water sector	A strategy which promotes and enables adjustments in human systems in response to actual or expected climatic stimuli or their effects which moderate harm or exploit beneficial opportunities (IPCC definition of adaptation)	Integration of an adaptation strategy at river basin level contributes to improved preparedness regarding climate change	- A - B - C - D	(A) Adaptation strategy is part of a river basin plan (B) Adaptation strategy is adopted (on the national scale), and water is explicitly mentioned (C) Adaptation strategy in development, but with no specific reference to water (D) Nothing is going on regarding an adaptation strategy	International: http://unfccc.int/cooperation_support/least_developed_countries_portal/items/4751.php Submitted NAPAs only. For European Countries: EEA technical report, http://www.eea.europa.eu/publications/technical_report_2007_2 Further: RBMP of WFD implementation give indications for role of CC in water management so far. NeWater: Synthesis Product No. 6 gives indications (Cross-Comparison of Climate Change Adaptation Strategies across Regions - Compares the awareness of climate change and adaptation strategies in several regions. Patrick Huntjens' PhD Expert statement

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
82.	Availability of specific knowledge enabling adaptation	Refers to basin level also including sub-basins;	Any good strategy or programme of adaptation requires a sound knowledge base	<ul style="list-style-type: none"> - A - B - C - D - E 	(A) Specific adaptation options are identified (B) Vulnerability assessment conducted (C) Impact assessment in the water resource sector conducted (D) Downscaled climate change scenarios are available (E) No assessment of climate change at the basin level has been conducted at all	Expert judgement
83.	Awareness of water managers regarding adaptation to climate change	Are water managers aware of the needs regarding adaptation to climate change?	Awareness is a pre-condition for taking action	<ul style="list-style-type: none"> - A - B - C 	(A) There is a shared vision at basin level of needs to deal with climate change (B) Broad awareness at basin scale about the needs to deal with water management in the context of climate change (C) Limited or no awareness about the needs to deal with water management in the context of climate change	Expert judgement
84.	Coordinated implementation process regarding adaptation to climate change: Program / Plan of activities and measures	How are activities/measures with regards to climate change adaptation implemented?	Coordinated and programmed activities increase the impact and efficiency of adaptation measures because it reduces redundancies and negative side effects as well as allows synergies	<ul style="list-style-type: none"> - A - B - C - D 	(A) National water sector adaptation programme under implementation (donor funded initiatives, nationally owned programmes, etc.) (B) Activities are coordinated but without a national overall programme/ approach (C) Activities are in place, but not coordinated (D) No activities are going on at all	NAPA project database: http://unfccc.int/cooperation_support/least_developed_countries_portal/items/4751.php Submitted NAPA countries only, very non-exhaustive list.

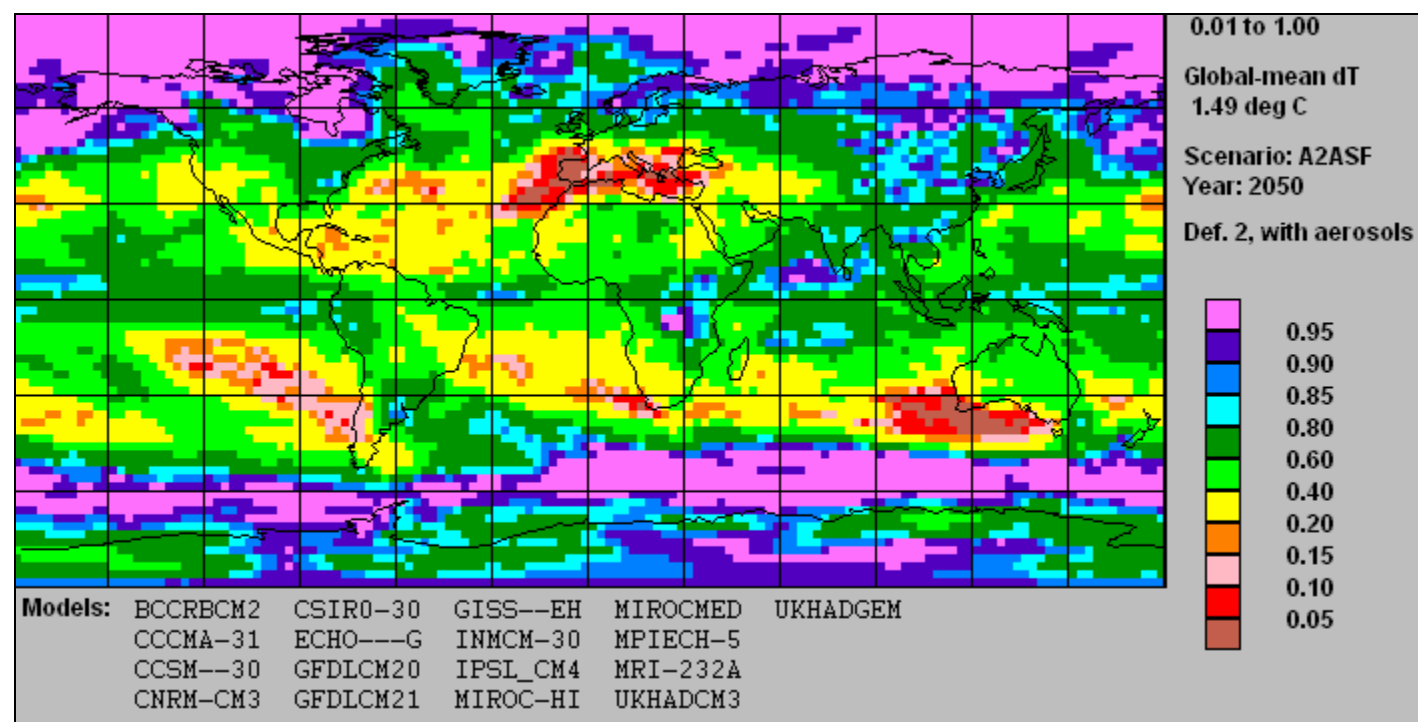
No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
85.	Operational activities (measures)	Activities refer to river basin level, activities refer to all measures that are taking place with respect to adaptation to climate change	Both soft and hard measures are required to achieve adequate levels of adaptation	<ul style="list-style-type: none"> - A - B - C - D - E 	(A) Comprehensive activities (measures packages) in terms of soft (education, public awareness programmes, etc.) and hard measures (infrastructure) are in place (B) Comprehensive activities (measures packages) only either in terms of soft (education, public awareness programmes, etc.) or hard measures (infrastructure) are in place (C) Single activities in terms of soft (education, public awareness programmes, etc.) and hard measures (infrastructure) are in place (D) Single activities in terms of only either soft or hard measures are in place (E) No measures take place at all	Expert judgement
86.	Ways to deal with climate variability (floods and droughts)	Level to which water management is able to deal with current climate variability	The better you are able to deal with current climate variability, the better you will be prepared to deal with future climate change impacts	<ul style="list-style-type: none"> - A - B - C 	(A) Both reactive (like disaster response) and anticipative (e.g. early warning) measures are in place (B) Only either reactive or anticipative measures are in place (C) No measures are in place	Expert judgement

Annex

Probability of increase in annual precipitation by 2050

Considering results of 17 different General Circulation Models (CGM), for the SRES emission scenario A2-ASF (global mean delta_T of 1.49°C)

The MAGICC-SCENGEN tool (<http://www.cgd.ucar.edu/cas/wigley/magicc/>) was used to create the map below. MAGIC-SCENGEN allows calculating the probability p of a decrease in precipitation as derived from a multitude of General Circulation Models; values of p around 0.5 indicate high divergence of GCM model results.



To obtain this map from MAGICC-SCENGEN version 5.3, the following settings were used:

MAGICC

- Edit > Emissions Scenarios: select A2-ASF and B1-IMA
- Run > Run model
- SCENGEN > Run SCENGEN

SCENGEN

- Analysis > Inter-model > P(increase)
- Models > select all, except FGOALSg-1.0, GISS-ER and NCARPCM1
- Models > select "aerosol effects"
- Models > select "def2"
- Warming > run for scenario A2ASF, year: 2050