

Basin Report:

Questionnaire + Addendum

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

Amu Darya Basin

With focus on the Uzbek 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 Uzbek part of the Amu Darya basin.

The invited experts received the questionnaire and the guidance document some weeks prior to the Case Study Review Workshop in Berlin (May 5-7 2010), so that they had time to prepare. The prefilled questionnaire was discussed and completed in workgroup sessions during the workshop. Difficulties concerning single indicators were discussed in the plenum and are documented in the questionnaire. After the workshop, two further Amu Darya experts were involved in post-processing the questionnaire, in order to include further expert knowledge about the Amu Darya.

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-	Law of Water and Water Use 1993, however, only partially implemented
2.	Domestic Water Law: Public character of water and legal status of water use rights	C	water is state property, there are no private water use rights
3.	Domestic Water Law: Explicit recognition of traditional and indigenous water uses	D	no indigenous water uses left after collectivization during Soviet Union
4.	Domestic Water Law: On flow availability, third party rights and ecological requirements	E	the allocation of water rights is not well regulated in the law, however, once a user has been given the right to use water for a certain purpose the use is protected by the law the needs of the population for drinking water and households has highest priority in water use
5.	Integration of domestic water legislation	A	water law of 1993, further amendments
6.	Multilevel structure of domestic water legislation and subsidiarity	B	in 2003 a presidential decree introduced water management organization at the subbasin level, however, authority remains with the national level
7.	Existence of formal domestic administrative structure for water governance	C	agriculture and water management ministries were merged in 1996 to enhance coordination
8.	National basin organisation or comparable arrangement	B	there are several sub basin organizations within the Uzbek part of the Amudarya river basin, however, they are within the structure of the Ministry of Agriculture and Water Management and thus not independent, they are also dominated by agricultural decision making. There is also a branch of the international river basin organization for the Amudarya (BVO).

No.	Indicator	Score	Comments
9.	Formalised transboundary coordination organisation	A	Regular meetings of the ICWC, there is a river basin authority that executes the decisions of the ICWC
10.	Formal institution (legislation) that prescribes the basin management principle	A	Basin organizations are implemented, however, they actually do not have much to say
11.	Water (basin) strategies, programmes and plans	B	Development of a National IWRM Plan and Water Supply & Sanitation Strategy for Uzbekistan supported by UNDP
12.	Financing mechanisms: Degree of investment from private sector/ public/ other sources (e.g. international)	B	Dominant source most likely international aid, although proportions of national funding versus international are not known
13.	Economic instruments Is water for irrigation priced?	C	Water for irrigation itself is not priced and thus there is not effect on water use; but there are some experiments with water pricing under way; WUAs charge a water service fee, which often can not cover expenses
14.	Economic instruments Is water for households priced in urban areas?	B-	Price is charged not for the water, but for the hot and cold water supply and other supply services. Water for households priced everywhere: in rural and urban areas. As for April 2009, tariff for hot water is 3,135.3 sum per person in the absence of measurement devices and 963.3 sum up to 1 m ³ of water in the presence of counters. Rates for water services for the population amount 55.1 sum/m ³ without VAT, the sewage - 35 sum/m ³ without VAT. For households without measuring device (which I assume as many) however the instrument can not work since the price is not linked to consumption
15.	Economic instruments Is water for industry priced?	B	Price for industrial and commercial enterprises are 115,5 sum/m ³ without VAT for water supply services and 72.7 sum/m ³ without VAT for sewers Industrial use water is charged by m ³ and thus it can be expected that the economic instrument of pricing is working.
16.	Tradable permits related to water abstraction/use	C	Water is under state ownership (article 3 “state water ownership”, law “on water and water use”)

No.	Indicator	Score	Comments
17.	Polluter pays principle (related to water)	C	
18.	Environmental subsidies (related to water)	C	Incentives for water saving?
19.	Payment for ecosystem services (related to water)	C	
20.	Tradable permits (related to water quality, maximum, allowable loads etc.)	C	
21.	Environmental tax (related to water)	C	
22.	Presence of substituting informal institutions for management of water	C+	patronage, clientelism, corruption, during drought the governor holds daily meetings with WUA managers to instruct them who to give water
23.	Presence of complementary informal institutions for water management	B	water on the local level can sometimes be allocated according to local practices/informal rules (e.g. give water to the one that needs it most, neighbourhood support)
	<i>Case-specific indicator(s)...</i>		
23.a	<i>Effectiveness of implemented formal institutions or enforcement of legal provisions</i>		formal institutions are often not effective because of lack of monitoring and enforcement and the influence of informal institutions
23.b	<i>rule of law</i>		no independent judicial system, citizens have little chance to claim their rights
b) Formalisation of IWRM principles & Millennium Development Goals			
24.	Formalised IWRM principles	C+	IWRM principles are in the planning
25.	State of implementation of IWRM principles	B	according to UNDP a IWRM strategy for Uzbekistan has been developed (project ended in 2008)
26.	Capacity to implement IWRM	B	there are donor supported projects to build capacity for IWRM, there are pilot studies for water management according to IWRM principles at the Syrdarya river (Ferghana valley)

No.	Indicator	Score	Comments
27.	Is universal and non-discriminatory access to safe drinking water and sanitation a goal?	B	the government has the goal to achieve safe access to drinking water and this is a part of the law “on water and water use” (Chapter VIII “Order and conditions for the granting and the right to use water objects”)
28.	Integration of wetlands in IWRM and IRBM*	B+	there are measure to improve wetland ecosystem services in the delta (e.g. develop schemes to provide them with a reasonable amount of water, however, the water allocation to them has not been institutionalized and is not enforced)
28.a	<i>Case-specific indicator(s)...</i>		
c) Decision making regarding uncertainties			
29.	General practices for dealing with uncertainties	C+	to some extent variability in hydrologic parameters are taken into account but only rudimentary
30.	Dealing with uncertainties: Reversible and flexible options	C	
31.	Dealing with uncertainties: Safety margins	B	e.g. safety margins on dams
32.	Are scenarios used for decision making?	B-	spatial level: river basin and national, some scenarios are being developed within the framework of international climate change impact projects ICWC and Hydromet develop scenarios but they most likely do not affect decision making
33.	Climate risks: Climate variability and change	B-	
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			

No.	Indicator	Score	Comments
34.	Vertical coordination (governmental)	D	no coordination, no overlap, however, very fragmented and non transparent <u>Post-Processing comment:</u> The score was changed from “NA” to “D”. Since there is no coordination and no overlap, this justifies score “D”.
35.	Horizontal coordination (governmental)	D	no coordination, no overlap, there is a ministry of agriculture and water <u>Post-Processing comment:</u> The score was changed from “NA” to “D”. Since there is no coordination and no overlap, this justifies score “D”.
36.	Role of local governments	C	
36.a	<i>Case-specific indicator(s)...</i>		
b) Information sharing via formal rules, dependency relationships etc.			
37.	Kinds of knowledge included => Role of experts/ science, local/traditional knowledge	B	However, no independent science
38.	Access to information => about expert knowledge and management plans	E	Only partial access to information, only government friendly information disseminated <u>Post-processing comment:</u> The score was changed from “C,E” to “E”. Since biased information is distributed, this justifies “E” as the overall score.
38.a	<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?	B	the national level has a dominant actor (the government), the other levels are mainly responsible for executing the orders from the national level
40.	Degree of centralisation	C+	some implementation of policies is controlled by lower level actors

No.	Indicator	Score	Comments
41.	Technical capacity and economies of scale	B	decentralization (introduction of water user associations) has only taken place recently; there is a lack of technical capacity to manage the water efficiently at that scale (because of deteriorating infrastructure, former centralized machine parks, etc.)
42.	Legal obligations and responsibility	B+	the water user associations have been given responsibility for the maintenance of the irrigation system, however, they often do not have the mandate to take their own decisions on operational issues, they also have no financial means
42.a	<i>Case-specific indicator(s)...</i>		

B) Context

No.	Indicator	Score	Comments
I) Societal dimension			
43.	Proportion of the population living in rural areas	UZB: 63.3% TJ: 73.6% TM: 52.7% AFG: 77.1%	Source: United Nations Population Division (2008): World Urbanization Prospects: The 2007 Revision Population Database, http://esa.un.org/unup/ Values for 2005 <i>Comment during workshop on the source: The quality of data that are based on self reporting of the government or governmental statistics is doubtful !!</i>
44.	State of societal development	UZB: C (0.710) TJ: C (0.688) TM: C (0.739) AFG: D (0.352)	Human Development Index Source: UNDP: Human Development Report, online at http://hdr.undp.org/en/statistics/ Values for 2007
45.	Social sustainability (Gini Index)	UZB: B (36.7) TJ: B (33.6) TM: C (40.8) AFG: n/a	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)	UZB: D (2,653 \$) TJ: D (1,413 \$) TM: C (6,914 \$) AFG: E (1,106 \$)	GDP per capita (US-\$, PPP-corrected) Source for TJ (Value for 2005): World Bank, http://siteresources.worldbank.org/ICPINT/Resources/icp-final-tables.pdf - Sources for UZB, TM and AFG (values for 2008): US Census Bureau (population number), http://www.census.gov/ipc/www/idb/informationGateway.php ; World Bank (GDP, US-\$, PPP-corrected), http://siteresources.worldbank.org/DATASTATISTICS/Resources/GDP_PPP.pdf

No.	Indicator	Score	Comments
47.	Effectiveness of formal institutions	UZB: E (1.7) TJ: E (2.0) TM: E (1.8) AFG: E (1.3)	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	UZB: n/a TJ: n/a TM: n/a AFG: n/a	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	UZB: E (67.67) TJ: D (32.00) TM: E (107.00) AFG: E (54.25)	Press Freedom Index Source: Reporters without Borders, http://www.rsf.org/en-classement1003-2009.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.	Participation regarding decision making in the water sector	B	the law says that the opinions of the citizens are to be heard in water management decision making "Staatliche Organe berücksichtigen die Vorschläge der gesellschaftlichen Vereinigungen, Gemeinschaften und Bürger bei der Durchführung dieser Maßnahmen"

No.	Indicator	Score	Comments
51.	Transparency regarding water allocation	C+	For land management access to complete information on soil quality is guaranteed by law, everybody has access to the governmental land registry, some information only available for payment For water management no right about access to information is stated in the law. Also farmers do not have the option to access processes, institutions and information as suggested in the definition (Guidance p.20)
52.	Effectiveness and efficiency regarding decision making in the water sector	C	however, there are strong controls on cotton production targets (but also much cheating in reporting)
53.	Equitable and inclusive	C	there are no explicit water rights in place, except for the right that water is used first for the drinking water and household needs of the population; no water prices: see comment to indicator 4
54.	Predictability – with regard to IWRM and climate change	C	
54.a	<i>Case-specific indicator(s)...</i>		
III) Environmental dimension			
55.	Köppen-Geiger climate classification (river basin)	ET (source) Dsb Csa BSk BWk (mouth)	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 Values are ordered from the source to the mouth

No.	Indicator	Score	Comments
56.	Climate Moisture Index	H, humid to SA, semi-arid (upstream) A, arid (mid- & 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 Reported are the dominant values in the Amu Darya basin
57.	Climate Moisture Index Coefficient of Variation	A, low (mid- & downstream) C, high (between both zones) A, low (center of upstream)	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 Amu Darya basin
58.	Per Capita Equivalent of TARWA	UZB: D (1,900 m³/yr) TJ: D (2,540 m ³ /yr) TM: C (5,000 m ³ /yr) AFG: D (2,610 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)	C (25-50 mm/y)	Source: University of Kassel, WaterGAP 2.0, http://www.env-edu.gr/Documents/World%20Water%20in%202025.pdf
60.	Annual renewable water supply per person by river basin (1995)	B (1,700-4,000 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)	B (1,700-4,000 m ³ /yr)	Source: World Resources Institute, EarthTrends 2001, http://earthtrends.wri.org/pdf_library/maps/2-4_m_WaterSupply2025.pdf

No.	Indicator	Score	Comments
62.	Relative Water Stress Index	B (low) with patches of E (very high)	Source: UNESCO, World Water Development Report II, http://wwdrii.sr.unh.edu/download.html Downstream is average value The illustration (I4) has bad quality. Please check if the judgement is appropriate.
63.	Climate Vulnerability Index	UZB: C (medium) TJ: C (medium) TM: C (medium) AFG: n/a	Source: Oxford Centre for Water Research (OCWR), 2008-2010, http://ocwr.ouce.ox.ac.uk/research/wmpg/cvi/
64.	Degree to which water quality status restricts usability of users' types	B	salinity of water can affect use in agriculture, other water quality aspects are not considered (e.g. effect of chemical pollution on fisheries)
65.	Extent of flow and channel modification	C	
66.	Impact of land-use changes on hydrological processes	C	also effect on groundwater, e.g. water logging
67.	Uncertainty associated to climate change predictions regarding precipitation for the basin	C (0.4-0.6)	Source: Illustration from MAGICC-SCENGEN tool at the end of the guidance document
67.a	<i>Case-specific indicator(s)...</i>		

C) Performance

No.	Indicator	Score	Comments
I) Progress towards stated Goals			
68.	Progress towards sustainable access to safe drinking water (MDG drinking water target)	UZB: C TJ: (A) TM: n/a AFG: n/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	UZB: C (88%) TJ: D (67%) TM: n/a AFG: E (22%)	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	UZB: C (82%) TJ: D (58%) TM: n/a AFG: E (17%)	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)	UZB: A TJ: A TM: n/a AFG: C	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
72.	Proportion of population with access to improved sanitation facilities	UZB: B (96%) TJ: B (92%) TM: n/a AFG: E (30%)	Source: UN statistics of MDG progress, http://mdgs.un.org/unsd/mdg/Data.aspx Values for 2006

No.	Indicator	Score	Comments
73.	Proportion of rural population with access to improved sanitation facilities	UZB: B (95%) TJ: B (91%) TM: n/a AFG: E (25%)	Source: UN statistics of MDG progress, http://mdgs.un.org/unsd/mdg/Data.aspx Values for 2006
<i>73.a</i>	<i>Case-specific indicator(s)...</i>		
II) Good governance principles as indicators for the process dimension			
74.	Participation regarding decision making in the water sector	E	Stakeholders directly effected by the decisions do not have a voice in decision making and are nor informed about the decisions (however, some people can influence decisions to their benefit through relationships with people involved in the decision making process)
75.	Transparency regarding water allocation	C	In theory the procedure is clear and transparent: the farmers announce how many ha they plant of each crop, MAWR calculates the water needs and allocates the water accordingly. In practice however, farmers are often told what to plant or have to follow state order and informal institutions obstruct this procedure and make water allocation highly intransparent.
76.	Effectiveness and efficiency regarding decision making in the water sector	C	no real implementation of plans and goals (except maybe for the cotton production target which is achieved but with extremely high costs with regard to damage to other water users and the environment: however, even cotton targets are often not met, water is used for other purposes, e.g. rice production)
77.	Equitable and inclusive	C	It is less about equity between men and women, it is more dependent on the distance from the source (upstream and downstream in the rural areas) and availability of the tap water (again in the rural areas). In the cities, everyone has water access.
78.	Predictability – with regard to IWRM and climate change	C	not consistent nor predictable

No.	Indicator	Score	Comments
78.a	<i>Case-specific indicator(s)...</i>		
III) Stakeholder participation			
79.	Deliberative engagement opportunities	B	Deliberative arenas exist, but there are on the forced or compulsory basis (it regards to all levels of water management)
80.	Inclusiveness of stakeholder participation	C	stakeholder interests are not represented (except through informal channels that good connected individuals can use)
80.a	<i>Case-specific indicator(s)...</i>		
IV) Response to climate change			
81.	Strategy for adaptation to climate change in the water sector	C+	but water is considered, there are strategies to cope with drought, e.g. by reducing rice planting, enhancing monitoring, etc.
82.	Availability of specific knowledge enabling adaptation	C	there might also be some vulnerability assessments <u>Post-processing comment:</u> The score was changed from “C/D” to “C”. Since there has been an impact assessment in the water sector (“C”), this justifies “C” as the overall score.
83.	Awareness of water managers regarding adaptation to climate change	B-	there is awareness about the need to deal with climate change (also due to donor involvement), however, it is not very broad and other issues such as water scarcity are much more
84.	Coordinated implementation process regarding adaptation to climate change: Program / Plan of activities and measures	C-	there are activities concerning climate change adaptation, e.g. development of second communication to the UNFCCC, however, they are not coordinated and often donor driven
85.	Operational activities (measures)	D	some measure are in place to cope with low flow years (drought)

No.	Indicator	Score	Comments
86.	Ways to deal with climate variability (floods and droughts)	B	some reactive measures have been introduced after the extreme drought in 2000/2001
<i>86.a</i>	<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
23.a	<i>Effectiveness of implemented formal institutions or enforcement of legal provisions</i>			- A	(A)	
23.b	<i>rule of law</i>			- A	(A)	
	<i>Case-specific indicator 3</i>			- A	(A)	
	<i>Case-specific Indicator 4</i>			- A	(A)	
	<i>Case-specific Indicator 5</i>			- A	(A)	

Addendum - Context

No.	Indicator	Score	Comments
I) Basin Characteristics			
67a	Sub-Basin Size	200,000 km ²	<p>This estimation is based on the visual interpretation of an Amu Darya catchment map from: Revenga, C., S. Murray, J. Abramovitz, and A. Hammond, 1998. Watersheds of the World: Ecological Value and Vulnerability. Washington, DC: World Resources Institute. [online] URL: http://earthtrends.wri.org/text/water-resources/map-343.html</p> <p>According to the map, slightly less than half of Uzbekistan's total area of 447,000 km² is covered by the Amudarya basin.</p> <p>The source above specifies the basin size as 534,764 km². Other sources like most official sites specify the basin size as 309,000 km². WaterWiki.Net (http://waterwiki.net/index.php/Amu_Darya) refers to both numbers. The reason for the deviation is a dispute whether the Zerafshan River is part of the Amu Darya catchment or not. This river was a tributary of the Amu Darya, but due to water abstraction for irrigation, its water does not reach the Amu Darya any more.</p> <p>The sub-basin area for Uzbekistan specified for this indicator will be smaller if the Zerafshan River is excluded.</p>
67b	Transboundary	Yes	Countries of the Amudarya river basin are Tajikistan, Afghanistan, Turkmenistan, Uzbekistan and Kyrgyz Republic.

Addendum - Performance

No.	Indicator	Score	Comments
I) Environmental sustainability			
a) State of the water resources and the environment			
87	Aquatic biodiversity	C	<p>20 of the 24 original fish species believed to occur in the Aral have disappeared (USAID 2001, Sandra Postel. 1999. Sharing the Rivers, http://www.jdainternational.org/Resources/Rivers.PDF). Many non- native species have been introduced. Those are under pressure because of the high variability of water levels in the wetland lakes and the resulting unfavourable water quality (particularly high salinity)</p> <p>See also: N. Aladin, I. Plotnikov, T. Ballatore and P. Micklin “Biodiversity loss in a saline lake ecosystem Effects of introduced species and salinization in the Aral Sea” In: NATO Science for Peace and Security Series – C: Environmental Security. Environmental Problems of Central Asia and their Economic, Social and Security Impacts. Edited by Jiaguo Qi, Kyle T.Evered. Springer. 73-98.;</p> <p>P. Micklin. 2007 The Aral Sea Disaster Annu. Rev. Earth Planet. Sci. 2007. 35:47–72</p>
88	Invasive exotic species	D	<p>Some species such as grass or silver carp have been introduced during Soviet times to clean the canals, they are very valued by the population who fish them intensively; other saltwater species were introduced when the salinity of the Aral Sea increased, other species were introduced accidentally and have major impact. While biodiversity had increased by fourteen species of fishes and four species of invertebrates, only a few of these species had commercial value or could serve as a food for fishes.</p>

No.	Indicator	Score	Comments
89	Surface and groundwater quality	C	High salinity of surface or groundwater affect wetland ecosystems such as riverine forests or deltaic lakes (see comment above), however, major cause of degradation is insufficient water supply (i.e. water quantity) There were serious issues of pollution from agricultural chemicals, however, it is not clear to what extent this problem persists today because of a reduction of the use of fertilizers and pesticides.
90	Groundwater use	B	Groundwater exploitation is growing with surface water scarcity. Groundwater is heavily used in drought years, however, exploitation is constrained by water quality (i.e. there are areas where groundwater salinity is extremely high). Irrigation and merlioration impact groundwater quality. Rakhmatullaev, Shavkat et al. 2010. "Groundwater resources use and management in the Amu Darya River Basin (Central Asia)." Environmental Earth Sciences 59:1183-1193.
91	Water Exploitation Index (WEI)	D (115%)	Score at national level www.FAO.org/nr/water/Aquastat/factsheets (2002)
b) Management practices			
92	Water allocated for aquatic ecosystem	B	There are plans to mix freshwater with drainage waters to maintain wetland ecosystems and infrastructure has been developed to facilitate this. However, as soon as water resources are scarce those demands are not fulfilled.
93	Water pollution incidents	--	I am not aware of a surface or groundwater pollution incident in the Amudarya river basin
94	Water quality monitoring	B-	Uzhydromet monitors water quality at some stations <u>Post-processing comment:</u> The score was changed from "B-C" to "B-". According to the comment, there is a monitoring system in some places, which corresponds to score "B" rather than "C".
95	Hydrometeorological monitoring – levels	C	Uzbekistan depends on monitoring of snow and glacier level and runoff in the upper river basin (Tajikistan) for forecasting of river flows. The monitoring networks (both technically and socially) have degraded severely after the breakup of the Soviet Union. .

No.	Indicator	Score	Comments
96	Level of understanding of groundwater resources	B	Groundwater abstraction has not played a major role so far because of abundant surface water. However it became much more important during recent droughts, both state managed extraction and illegal extraction by farmers. Mainly for drinking water but also increasingly for irrigation.