

## Questionnaire

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

## RIVER NIGER Basin

With focus on the INNER DELTA part  
Case Study Review Workshop for the WETWIN project  
Loskop Dam, South Africa, 14 – 15.04.2010

## 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.

Please assign a score (e.g. "B") to each of the indicators. In the case of numerical indicators like indices, you should add the numerical value in brackets after the score, e.g. "B (0.178)" or "C (12,534)". For a better understanding of the recorded issue, additional information in the column "comments" is required. Please use this field to explain your reason for assigning a certain score, to specify if your choice was controversial, to document data sources or to add further information that you find relevant for a better understanding of the topic addressed.

If you think that the indicators below do not deal with certain important issues in your case study, please insert additional indicators at the bottom of the tables. Furthermore, please briefly explain the additional case-specific indicators at the end of this document.

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## A) Water governance regime

No.	Indicator	Score	Comments
<b>I) Characteristics of environmental governance regimes</b>			
<b>a) Water policy, institutional &amp; legal framework (formal and informal)</b>			
1.	<b>Domestic water legislation (laws, by-laws, etc.) in place?</b>	B	The National Assembly deliberated and adopted in its session of December 31 <sup>st</sup> 2001. The president of the republic promulgates the law on January 31st 2002.
2.	<b>Domestic Water Law: Public character of water and legal status of water use rights</b>	A	There are at least 2 laws related to this public services and deepen in the national policy of water (e.g Article 12 and 44).
3.	<b>Domestic Water Law: Explicit recognition of traditional and indigenous water uses</b>	A	The article 3 in the chapter of the principles and the field of application deals with this stemming
4.	<b>Domestic Water Law: On flow availability, third party rights and ecological requirements</b>	A	Besides different articles from the law, other sector policy take this topic into account during the conception and implementation of their project.
5.	<b>Integration of domestic water legislation</b>	A	All frameworks related to water issues are implemented in accordance with this piece of legislation
6.	<b>Multilevel structure of domestic water legislation and subsidiarity</b>	A	Article55 of the legislation is related to the fund of public services of water in which are involved central government institutions and local government.
7.	<b>Existence of formal domestic administrative structure for water governance</b>	A	This administration is The Ministry in charge of water and Energy. This refers to article1 of ongoing legislation
8.	<b>National basin organisation or comparable arrangement</b>	B	Under the aegis of the Ministry, the committee of basin or sub basin can formulate proposal or management plan of their intervention area (e.g article 70) <i>[ABFN &gt; protection of basins only, not management which is still ministry](A/B)</i>
9.	<b>Formalised transboundary coordination organisation</b>	A	ABN (Niger Basin Authority fits to this.
10.	<b>Formal institution (legislation) that prescribes the basin management principle</b>	A	The Ministry of water prescribe hydrology principles which are put in action by his dismemberments at lower level (circle, districts and municipalities)

No.	Indicator	Score	Comments
11.	Water (basin) strategies, programmes and plans	B	Water strategy does exist even at local level but poorly implemented.
12.	Financing mechanisms: Degree of investment from private sector/ public/ other sources (e.g. international)	B	The most dominant degree of investment is either a public source of finance or more often the support from outside (International donors).
13.	Economic instruments Is water for irrigation priced?	B	In case of infrastructure settlement for irrigation, there is a price. But in case of natural irrigation process by local community no price. (article 59) <i>[Discussion on either score B or C - dam management decides price (interministerial committee); others (smaller) no...]</i>
14.	Economic instruments Is water for households priced in urban areas?	B	The price may change from one site to another according to the state of the area where is the water source. <i>[Municipality sets price...]</i>
15.	Economic instruments Is water for industry priced?	B	The price is charged for water use but not for waste water in nature or wetland or catchment area.
16.	Tradable permits related to water abstraction/use	B	Tradable permits are used but the generating income is used for other purpose( e.g. repairing)
17.	Polluter pays principle (related to water)	C	Confer to article55 related to public service of water development fund. <i>[There is an article in the law but not applied.]</i>
18.	Environmental subsidies (related to water )	B	There are 4 articles (60,61,62,63) which deal with environment subsidies. <i>[There is an article in the law but not applied.]</i>
19.	Payment for ecosystem services (related to water)	C	There are law to protect ecosystems and their services but price in case of penalty.
20.	Tradable permits (related to water quality, maximum, allowable loads etc.)	B	There are law in favour of environment in terms of right for it pollution. But if this right is due in other way. <i>[permits for discharge polluted water but going to minister of environment]</i>
21.	Environmental tax (related to water)	C	In general, is part of per capita developpment tax.
22.	Presence of substituting informal institutions for management of water	B	Traditional institution in term of ownership (Comités Locaux de l'Eau, Parténariat National de l'Eau et Parténariats Régioaux de l'.Eau, Comités de bassins..)
23.	Presence of complementary informal institutions for water management	B	Local conventions in terms of contributing to legal provision.
23.a	<i>Case-specific indicator(s)...</i>		

No.	Indicator	Score	Comments
<b>b) Formalisation of IWRM principles &amp; Millennium Development Goals</b>			
24.	Formalised IWRM principles	A	9 principles are pointed out in National Policy of Water which take into account IWRM principles. But because of resources weakness some are difficult to be implemented.
25.	State of implementation of IWRM principles	B	Same report above mentioned
26.	Capacity to implement IWRM	B	The strategy to support the principle is based on 2 mains axes namely National resources and outside support.
27.	Is universal and non-discriminatory access to safe drinking water and sanitation a goal?	A	National policy of water is part of CSCLP [ <i>Poverty Eradication Strategy</i> ] which give an universal and non discriminatory access to safe water. This aspect is also underpinned by article 4 of water legislation.
28.	Integration of wetlands in IWRM and IRBM*	A	There is a national policy of wetlands and its action plan. There is also the signature of Ramsar Convention with the erection of the whole Inner delta as Ramsar site.
28.a	<i>Case-specific indicator(s)...</i>		
<b>c) Decision making regarding uncertainties</b>			
29.	General practices for dealing with uncertainties	A	Theoretically, but in practice uncertainties are tackled according to their degree (draught, floods .). [ <i>e.g warning systems in place (drought, flood...)</i> ]
30.	Dealing with uncertainties: Reversible and flexible options	A	The more option of flexibility or/and reversibility is easy and efficient the more favoured it is.
31.	Dealing with uncertainties: Safety margins	A	Same report
32.	Are scenarios used for decision making?	B	Using scenario depends deeply on polical willing [ <i>at NBA level is it more probable to use scenario's.</i> ]
33.	Climate risks: Climate variability and change	A	All development strategies have at least one action to both climate variability and changes. [ <i>Mainly climate variability, climate change less specifically. It is not easy to see where variability stops and change begins. Has a NAPA but use?</i> ]
33.a	<i>Case-specific indicator(s)...</i>		
<b>II) Actor networks with emphasis on the role and interactions of state and non-state actors and power relationships</b>			

No.	Indicator	Score	Comments
<b>a) Cooperation and coordination structures</b>			
34.	Vertical coordination (governmental)	B	Plans and strategies are conformed with the interest of the other relevant actors at high level in CSCLP and at low level PDSEC. <i>[tasks are clear at national and lower level but no coordination]</i>
35.	Horizontal coordination (governmental)	B	Same report but.....;emphasis on this at local level keep in touch with un prefet <i>[established commissions with participation of different sector representatives at all levels of administration]</i>
36.	Role of local governments	B	In the frame of decentralisation, local government is consulted in creation of Institution and above all if they will be affected by this.
36.a	<i>Case-specific indicator(s)...</i>		
<b>b) Information sharing via formal rules, dependency relationships etc.</b>			
37.	Kinds of knowledge included => Role of experts/ science, local/traditional knowledge	A	Both are taken into account if we consider that 2 kind of law are operating (traditional and modern law)
38.	Access to information => about expert knowledge and management plans	B	Nowadays, decentralization is a tool to open society to development through information access.
38.a	<i>Case-specific indicator(s)...</i>		
<b>III) Multi-level interactions across administrative boundaries and vertical integration across levels and horizontal integration across sectors</b>			
<b>a) Centralisation</b>			
39.	One level one actor?	A	Despite centralisation forces, in the case of water issue we do assist to horizontal integration. It is worth mentioning that besides water issues, there are 2 other sectors (health and education) responding to this kind of integration. These 3 sectors are transferred to local government.
40.	Degree of centralisation	B	In our context, it is a system of supervision. Local governments are involved at highest level in the creation of institutions and call aside to decision making if they are affected by this institution.
41.	Technical capacity and economies of scale	A	The hierarchy power is strongly linked to the decentralisation.
42.	Legal obligations and responsibility	A	The notion of supervision is attached to the decentralisation.

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No.	Indicator	Score	Comments
42.a	<i>Case-specific indicator(s)...</i>		

## B) Context

No.	Indicator	Score	Comments
<b>I) Societal dimension</b>			
43.	Proportion of the population living in rural areas	1 500 000	73% : From which 30% fishermen, 40% agriculture and 30% cattle breeding.
44.	State of societal development	D	The official listed rank for Mali is 178 with a index of 0.371), this number is contested by national government (assumed to be better);
45.	Social sustainability (Gini Index)	B	<a href="http://hdr.undp.org/en/media/HDR_2009_EN_Complete.pdf">[http://hdr.undp.org/en/media/HDR_2009_EN_Complete.pdf</a> - GINI Mali = 39]
46.	Economic sustainability (e.g. GDP)	E	Strongly linked to climate events. - <a href="#">[PPP 1 027 / US 468]</a> <a href="http://siteresources.worldbank.org/ICPINT/Resources/icp-final-tables.pdf">[http://siteresources.worldbank.org/ICPINT/Resources/icp-final-tables.pdf]</a>
47.	Effectiveness of formal institutions	D	2,8 According to transparency International.
48.	Trustworthiness of economic institutional setting - degree of risk for foreign direct investment	-	<i>No data in case of Mali</i> - If these data could be estimated, the expectation should be better because of political stability.
49.	Presence of avenues of dissent – press freedom, freedom of speech	A	Rank 30 / mark 8; Press freedom became evident since Mars 1991 event that end up to military regime fall.
49.a	<i>Case-specific indicator(s)...</i>		
<b>II) Good Governance Principles at the national level – legal basis at the national level</b>			
50.	Participatory regarding decision making in the water sector	B	If the use of water is not against public interest. Article 2
51.	Transparency regarding water allocation	A	Most economic values depend on ecosystem and environment state in terms of water sector.
52.	Effectiveness and efficiency regarding decision making in the water sector	B	Because of the sector base policy.

No.	Indicator	Score	Comments
53.	Equitable and inclusive	A	Particularly in rural district where the price to access to water is low.
54.	Predictability – with regard to IWRM and climate change	B	When a natural hazard happens there are some orientations from laws favourable to mitigate the effect of this hazard.
54.a	<i>Case-specific indicator(s)...</i>		
<b>III) Environmental dimension</b>			
55.	Köppen-Geiger climate classification (river basin)	BWH, BSH	Project <i>[Inner Niger Delta]</i> side belongs to 2 geographical area.
56.	Climate Moisture Index	A	"1-0,6" The western part of the project site is less arid than the Eastern part.
57.	Climate Moisture Index Coefficient of Variation	A	"0,25"
58.	Per Capita Equivalent of TARWA	D	4 760
59.	Average water availability at the river basin level (1995)	C	50 .
60.	Annual renewable water supply per person by river basin (1995)	A	4000 - 10000 Rural and semi urban are pointed to 46 million m3 and urban 61M/m3
61.	Projected annual renewable water supply per person by river basin (2025)	B	1700-4000 This trend is fragile because of rate demographic increasing.
62.	Relative Water Stress Index	C	"0,2-0,4" Two areas of the project side are in the scope of this RWSI
63.	Climate Vulnerability Index	E	"52-60"
64.	Degree to which water quality status restricts usability of users' types	A	Water quality in project area is still under the warning level. But surface water should be purified before consumption. <i>[pollution not severe, except some areas (Bamako, Segue) which are above thresholds]</i>
65.	Extent of flow and channel modification	B	The Niger a lifeline is illustrative. The existing infrastructure do not have serious effect so far. But the planned infrastructures will lie heavy on downstream area (Fomi dam project in Guinea). <i>[future planned dam may big impact (big infrastructure but limited impact)]</i>
66.	Impact of land-use changes on hydrological processes	B	The different kind of upstream use of water modify somewhat ecosystems services but not quantified.
67.	Uncertainty associated to climate change predictions regarding precipitation for the basin	C	"0,4-0,6" Erratic rainfall happen in project basin. But because of weakness of the slope most of rainfall are evaporated before reaching the river bed.

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No.	Indicator	Score	Comments
67.a	<i>Case-specific indicator(s)...</i>		

## C) Performance

No.	Indicator	Score	Comments
<b>I) Progress towards stated Goals</b>			
68.	Progress towards sustainable access to safe drinking water (MDG drinking water target)	A	From the software called SIGMA, (map of water), there are 24562 drinkable water source from which 93,6% are in good state. <i>[close to target, (regional differences!)]</i>
69.	Proportion of population with access to improved drinking water	D	[2006: 60%] This figure is probably underestimate if we consider NGOs impacts in term of awareness. <i>[ the use of the 2006 figures is contested, current reported figures are significantly higher; 73,1%]</i>
70.	Proportion of rural population with access to improved drinking water	E	[2006: 48%] The same report is at this level because of the decrease or disappearing of dracunculosis called "Guinea warm illness" basically due to bad quality of drinking water. <i>[ the use of the 2006 figures is contested, current reported figures are significantly higher; 71,4%]</i>
71.	Progress towards sustainable access to basic sanitation (MDG sanitation target)	B	Great deal of means is deployed by Government and NGOs to underpin the access to it.
72.	Proportion of population with access to improved sanitation facilities	E	45% This rate according to me view point is increasing because of NGOs and government institution services.
73.	Proportion of rural population with access to improved sanitation facilities	E	39% Particular attention is drawn to rural district to encourage them.
73.a	<i>Case-specific indicator(s)...</i>		
<b>II) Good governance principles as indicators for the process dimension</b>			
74.	Participatory regarding decision making in the water sector	C	It is more and more recognize that women have a tremendous role to play as regards any activity bound to the water.
75.	Transparency regarding water allocation	B	The social position of an individual may affect the transparency as regards the access to the information about water management.

No.	Indicator	Score	Comments
76.	Effectiveness and efficiency regarding decision making in the water sector	B	The efficiency of the goal is more often hampered due to internal factor, sometimes linked to societal organisation.
77.	Equitable and inclusive	A	The limiting factors are lack of resources or corruption inside the management.
78.	Predictability – with regard to IWRM and climate change	B	National water policy has to cooperate with another development policy and they do not have to be excluded.
78.a	<i>Case-specific indicator(s)...</i>	<i>B</i>	<i>NEW indicator; decision making about access to water (score as 77): - Mali: A (Man and woman have same right but corrent situation is still different</i>
<b>III) Stakeholder participation</b>			
79.	Deliberative engagement opportunities	A	Steering committee or management committee in charge of engagement opportunities are very often ineffective due to lack of resources.
80.	Inclusiveness of stakeholder participation	B	The fact that stakeholders have sometimes opposite interests, it is useful to create or to catalyze a win win situation.
80.a	<i>Case-specific indicator(s)...</i>		
<b>IV) Response to climate change</b>			
81.	Strategy for adaptation to climate change in the water sector	B	Facing a lot of hazards, many policies and strategies are underway at national level and water management and its supply are greatly assigned in it (PAGIRE, PANA). <i>[Vision NBA]</i>
82.	Availability of specific knowledge enabling adaptation	A	Adequate options are identified on the basis of the concerned population response face to face of adversities (PANA) <i>[Vision NBA]</i>
83.	Awareness of water managers regarding adaptation to climate change	A	There are even institutions at regional level which take care of this subject.(e.g ABN). <i>[Vision NBA]</i>
84.	Coordinated implementation process regarding adaptation to climate change: Program / Plan of activities and measures	B	Every sector based strategy or policy deals with water sector adaptation nowadays but taking into account the important orientations of government in water issues. Action Plan regarding adaptation to climate change exists but, not yet implemented due to insufficient financial support
85.	Operational activities (measures)	B	A survey referring to river basin scale show the existence of many comprehensive activities fulfilled by NGOs or other formal institutions in terms of soft measures. The hard measures do exist but not enough. <i>[capacity for implementation of measures needs to be improved..]</i>

No.	Indicator	Score	Comments
86.	Ways to deal with climate variability (floods and droughts)	A	A great deal of means from NGOs or public power do exist to react or to anticipate against climate variability in our project area for instance, tool of flood predictability developed by wetlands international and DNH and also locust invasion predictability and artificial rainfall (Early Warning system).
86.a	<i>Case-specific indicator(s)...</i>		

## Addendum - Context

No.	Indicator	Score	Comments
<b>I) Basin Characteristics</b>			
67a	Sub-Basin Size	On the 1 994 402 km <sup>2</sup> of the total area of the Niger Basin, 578 850 km <sup>2</sup> (29%) is located in Malian portion of the Niger Basin	47% of Mali area is entirely part of the Niger Basin. Among the fourth sub basins of the Niger Basin, part of the two sub basins are located in Mali: Upper Niger, and Medium Niger. The Inner Niger Delta is located in Mali ( 84 500 km <sup>2</sup> )
67b	Transboundary	Yes	The Niger River and its affluent are critical links between nine riparian countries: Benin, Burkina Faso, Cameroon, Ivory Coast, Guinea, Mali, Niger, Nigeria and Chad.  The Niger River is Africa's third longest river (4200 km). It is the longest river in the world. Its basin covers an area of nearly of 2.2 million km <sup>2</sup> including 1.5 million km <sup>2</sup> of an active hydrological basin. Although its catchment covers nine countries, more than 80% of its area covers three countries: Mali, Niger and Nigeria

## Addendum - Performance

No.	Indicator	Score	Comments
<b>I) Environmental sustainability</b>			
<b>a) State of the water resources and the environment</b>			

No.	Indicator	Score	Comments
87	Aquatic biodiversity	A	<p>It should be noted that 80% of the Niger's biodiversity as well as most of the natural ecosystems playing a key role in the maintenance of biodiversity are found the national portion of the basin. The Inner Niger Delta ( Ramsar site), 4 119 450 ha, is fully located in Mali shelters 138 fish species among which 15 and 10 have respectively disappeared from fisher catches and became rare. Waterbirds are an indicative taxon in some bio-regions. Among 117 waterbird species encountered in the Malian portion of the basin Niger, 27 meet criteria 1% of the Ramsar Convention and the area supports 3 to 4 millions of migratory waterbirds, both residents and migratory coming from Europe, America and Asia. Although subject to strong human pressure, the aquatic fauna notably hippopotamus and the West Africa manatee are still present..</p>

No.	Indicator	Score	Comments
88	Invasive exotic species	D	<p>Invasive exotic plants have been introduced as ornamental plants and constitute nowadays real threats for rivers and socio-economic development activities such as fishing, transport, water distribution, hydro-electric production and rice farming.</p> <p>At the Malian portion of the Niger River, the most affected areas by invasive plants are :</p> <ul style="list-style-type: none"> <li>- Segment Bamako- Markala ;</li> <li>- Irrigation channels of Baguineda, Sukala and Dougabougou ;</li> <li>- Irrigation channels of Office du Niger (Sahel channel);</li> <li>- Channels of Office Riz Ségou.</li> <li>- Inner Niger Delta area downstream Wabariya bridge (Gao)</li> </ul> <p>The main invasive plants identified on the Malian portion of the Niger River are : Water Jaccinth (<i>Eichornia crassipes</i>), Water salad (<i>Pistia stratiotes</i>), Floating grasses (<i>Vossia cuspidata</i>) , Water fern (<i>Salvinia molesta</i>)</p> <p>If the density is weak the invasive floating plants are useful (water oxygenation, feeding and shelter for fishes, absorption of toxic components such as heavy metals and phenols) in the contrary at high density they become harmful: a) Disturb use of rivers: obstruction of paths: transport and fishing, b) reducing of river flow: disturb irrigation, water distribution, hydro-electric production, c) replacing <i>Echinochloa stagnina</i> (bourgou) pastures, d) rapidly drying out rivers: evaporation of water covers by water jacinth is 7 to 9 times than open water and favoring breeding of vector borne diseases such as malaria and schistomiasis.</p>

No.	Indicator	Score	Comments
89a	Surface water quality	B	<p>In general, it could be notice that year to year deterioration of surface water.</p> <p>Results of available punctual measurements did not show nowadays existence of alarming physic-chemical pollution of surface water. However, bacteriological quality is worse (total coli form and fecal for 100 ml), consequently they are unsafe as drinking water. They could use without problem for bathing, sports and leisure time</p> <p>In conclusion, it could reported that, major rivers and their tributaries (Niger, Bani and others),although their auto-filtering capacities linked to hydrology are more and more facing divers sources of pressure exacerbating pollution phenomena of surface water. I could be cited:</p> <ul style="list-style-type: none"> <li>- Human and animal organic wastes: waste domestic waters; water derived from craft activities (dying, tanning); slaughterhouse waters, etc.,</li> <li>- Organic and chemical fertilizers and pesticides coming from of irrigated fields (rice, tobacco, sugar cans, etc.),</li> <li>- Liquid industrial waste water dumped in the river without any treatment,</li> <li>- <b>Domestic wastes:</b> solid wastes, liquid domestic wastes and sewage waste dumped straight to the Niger River,</li> <li>- <b>Industrial activities:</b> effluent of most of industries located along the Niger River are dumped without treatment in the river. The Niger River receives yearly 800 000 m<sup>3</sup> waste water coming from mainly big industries but also small industries (dying),</li> <li>- <b>Mining activities:</b> Gold mining contribute also to pollute water resources mainly in the Upper Niger</li> <li>- <b>Crafting activities:</b> Water resource pollution is caused by waste water from dyers who work in general along the banks of the Niger River are washed down by the first rains into the Niger River</li> </ul>

No.	Indicator	Score	Comments
89b	Groundwater quality	A	Groundwater in Mali are not affected by pollution mainly from human activities. However, in big cities, agricultural areas which depend of huge use of fertilizers and pesticides, intensive livestock breeding, few cases of pollution have been seen. These pollution concerned mainly not deep groundwater in alluvium. Other pollution risks exist knowing that there are hydrological links between groundwater and those in deep cracked rocks. It has been proven that contamination of groundwater of Bamako city is as well as chemical and bacteriological. Indeed, all groundwater resources analyzed in four of Bamako have shown huge quantities of bacterial contamination, as a result they are dangerous for human consumption.
90	Groundwater use	A	Groundwater has many uses in Mali. In rural area, most of the Malian population get drinking water from forages and /or traditional and improved wells, 20 litres/person /day. The total drinking water needs for livestock of Mali is estimated about 260 000 m <sup>3</sup> /day from which groundwater contributes for 2/3 and surface water 1/3. Through the country it is noticed many industries are depend on groundwater such as breweries, oil factories, slaughterhouses, textiles, mining and hotels. The daily groundwater consumption of these industries without the mining sector is estimated to be more than 3000 m <sup>3</sup> /day
91	Water Exploitation Index (WEI)	A “<10%”	WEI = 3,7% at national level with annual renewable water resources equal to 135 km <sup>3</sup> ; abstraction excluding hydropower generation is equal to 5 km <sup>3</sup>
<b>b) Management practices</b>			
92	Water allocated for aquatic ecosystem	B	Environmental water needs mean those related to flora and wild fauna. For these needs, heights and environmental flows have not been determinate. Only minimum flows have been estimated downstream some major dams such as Markala 40m <sup>3</sup> /s . Taousa dam project has been revised to take into account aquatic ecosystems needs in the Inner Niger Delta

No.	Indicator	Score	Comments
93	Water pollution incidents	B	<ul style="list-style-type: none"> <li>- Dante, 1994 reported that some fishers use toxic chemical products for facilitating fish catches.</li> <li>- It could cited pollution which happened in 1993, where huge amount of Lindane and Diazinon have been dumped in the Niger River, consequently during two days tap water in Bamako was inappropriate for drinking.</li> <li>- Very often, accidental pollutions occur in the South part of the River and are due to worse storage of pesticides and herbicides</li> <li>- Dying clothes along the Niger River is one of the main causes of pollution. The chemical products for these activities contains high concentration of phenol, as a result huge quantities of dead fishes could be seen nearby.</li> </ul>
94	Water quality monitoring	B	<p>Surface water mainly Niger River have not been regularly monitored by the National Water Quality. However, few punctual measures have been carried from 1995 to 1996 by the pilot project Guinea-Mali by putting in place hydro-ecologic monitoring of the Niger. These measures have added to those done from 1900 to 1994 by IRD ( former ORSTOM) and from 1999 to 2002 by the GHENIS project. During the WETwin project (2009-2011) the water physic –chemical and bacteriological qualities of the three sites inside the Inner Niger Delta are being monitored.</p>
95	Hydrometeorological monitoring – levels	C	Lack of capacity building and financial support for a sustainable operation of hydrometeorological monitoring networks
96	Level of understanding of groundwater resources	C	No adequate groundwater monitoring network