Water Governance Benchmarking Criteria

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A. GOVERNANCE FUNCTIONS

1. Organizing and building capacity in the water sector
- 1.1 Creating and modifying an organizational structure
- 1.2 Assigning roles and responsibilities 1, 2
- 1.3 Setting national water policy
- 1.4 Establishing linkages among sub-sectors, levels, and national sub-regions
- 1.5 Establishing linkages with neighboring riparian countries
- 1.6 Building public and political awareness of water sector issues
- 1.7 Securing and allocating funding for the sector
- 1.8 Developing and utilizing well-trained water sector professionals

2. Planning strategically
- 2.1 Collecting, managing, storing and utilizing water-relevant data 3, 4, 5, 6, 7, 8
- 2.2 Projecting future supply and demand for water
- 2.3 Designing strategies for matching expected long-term water supply an demand and dealing with shortfalls (including drought mitigation strategies)
- 2.4 Developing planning and management tools to support decision making

3. Allocating water
- 3.1 Awarding and recording water rights and corollary responsibilities
- 3.2 Establishing water and water rights transfer mechanisms
- 3.3 Adjudicating disputes
- 3.4 Assessing and managing third party impacts of water and water rights transactions

4. Developing and managing water resources
- 4.1 Constructing public infrastructure and authorizing private infrastructure development
- 4.2 Forecasting seasonal supply and demand and matching the two
- 4.3 Operating and maintaining public infrastructure according to established plans and strategic priorities
- 4.4 Applying incentives and sanctions to achieve long and short term supply/demand matching (including water pricing)
- 4.5 Forecasting and managing floods and flood impacts 9

5. Regulating water resources and services
- 5.1 Issuing and monitoring operating concessions to water service providers
- 5.2 Enforcing withdrawal limits associated with water rights
- 5.3 Regulating water quality in waterways, water bodies, and aquifers (including enforcement) 10, 11, 12, 13, 14, 15, 16
- 5.4 Protecting aquatic ecosystems
- 5.5 Monitoring and enforcing water service standards

B. GOVERNANCE PROCESS CHARACTERISTICS

1. **Transparency.** 17

2. **Participation.**

3. **Accountability and Integrity**.

4. **Rule of law.** 18

5. **Coherency and Integration.**

6. **Responsiveness.**

C. CROSS CUTTING CATEGORIES

1. **Water Sources**
   - 1.1 Surface water 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29
   - 1.2 Groundwater
   - 1.3 Derivative water (reclaimed, reused, desalinated)

2. **Water Uses**
   - 2.1 Irrigation
   - 2.2 Municipal 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40
   - 2.3 Industrial
   - 2.4 Environmental
   - 2.5 Hydropower
   - 2.6 Fisheries, navigation, recreation
   - 2.7 Other uses (including social, esthetic, and religious uses)

Joint Order of the Minister of Infrastructures and the Minister responsible for Land Use Planning, Urban Development, Habitation and the Environment No. 1277-01 of 10 Chaabane 1423 (17 October 2002) establishing quality standards for surface waters used to produce drinking water 10, 19, 30

The Minister of Infrastructures,

In view of Decree n° 2-97-787 of 6 Chaoual 1418 (4 February 1998) relative to water quality standards and the inventory of the degree of pollution of waters; 11, 18

After obtaining the opinion of the Minister of Health and the Minister of the Interior;

Hereby resolve°:

Article 1: As of the publication date of this Joint Order, the quality standards for surface waters used to produce drinking water cited in article 1 of Decree no. 2-97-787 mentioned above are established in the table attached to this Order. 12, 20, 31

Article 2: For the intents and purposes of this Order, surface waters used to produce drinking water are subdivided into three categories: A1, A2 and A3 according to the appropriate treatment procedures°: 21, 32

- category A1 for waters that require a simple physical treatment and disinfection to make them potable, e.g. filtration and disinfection;

- category A2 for waters requiring a normal physical treatment, chemical treatment and disinfection treatment to make them potable; the disinfection will typically entail prechlorination, coagulation, flocculation, decantation, filtration and disinfection (final chlorination);

- category A3 for waters that, to be made potable, require physical and intensive chemical treatment, polishing and disinfection, e.g. by means of chlorination to break point, coagulation, flocculation, decantation, filtration, adsorption (activated carbon) and disinfection (ozone, final chlorination).

Article 3: The values indicated in columns G (guide values) of the table mentioned in article 1 above, corresponding to the requirements that all surface water used to produce drinking water must meet to be classified in one of the categories mentioned in article 2 above. 22, 33

The values indicated in columns I (imperative values) of the table mentioned in article 1 above correspond to the requirements that all surface water used to produce drinking water must indispensably meet to be classified in one of the categories mentioned in article 2 above. 13, 23, 34

Article 4: Surface waters used to produce drinking water are considered compliant with category A1 when the following rules are complied with°: 3, 24, 35

1- the water samples must be taken, before treatment, at regular intervals and in the same place°;:

2 - for each parameter belonging to the imperative column (I), 95% of the values measured are compliant with those stipulated by the standard, and for each parameter pertaining to the guide column (G), 90% of the values measured are compliant with those specified by the standardº;

3 - and for the 5% and 10% representing the non-compliant samples, the value of the parameter does not deviate by more than 50% from the values set, except for the temperature, the pH value, dissolved oxygen and bacteriological parameters.

Article 5: The minimum number of samples on the basis of which the surface water is used to produce drinking water is determined according to the size of the population served by the surface water collection in question and its vulnerability, and according to each parameter. 4, 14, 25, 36

In all cases, this minimum number of sample takings must be at least six times per year for a production outflow ranging from 100 to 20,000 cubic meters per day, with a frequency of at least once every two months, and at least 12 times when the production outflow exceeds 20,000 cubic meters per day with a frequency of once a month

Article 6: All samples on the basis of which the surface water used to produce drinking water is classified in the categories mentioned in article 2 above, must be 24-hour composite samples. 5, 26, 37

For the intents and purposes of this Order, a composite sample is understood to be any intermittent or continuous mixture in suitable proportions of at least six samples or parts of samples of which the average value of the desired parameter can be obtained.

Article 7: The parameters indicating the quality of the water destined for drinking water production are measured according to standardized methods which set, for each parameter, the properties of each method (detection limit, measurement precision, etc.). 6, 15, 38

Article 8: Having recourse to additional stages to reinforce the treatment in case some parameters are exceeded (taste, odor, Fe, Mn, etc.) is necessary. This applies to the injection of activated carbon or potassium permanganate, etc. Intermediate channels may also prove necessary to take into account the distribution of the parameters between two different categories.

Technical notes justifying the use of such treatment procedures must be sent to the control authority responsible for applying this Order. 7

Article 9: Surface waters extracted through a shoreline intake, some of whose values exceed the level A3 limit for the suspended solids (SS) parameter may be used if an appropriate pretreatment is applied that enables the water quality characteristics to be reduced to a level that is compliant with A3. 16, 27

Article 10: The following derogations are provided:

a) In case of flooding, accidental pollution incidents or natural catastrophes; 9

b) In case certain parameters exceed the limits set for categories A1, A2 and A3, due to exceptional weather or geographic conditions for surface waters extracted through a shoreline intake (river, canal, etc.) and for waters in storage dams, as well as lakes less than 20 meters deep, and also semi-stagnant waters whose renewal takes more than one year; 28

c) When surface waters undergo natural enrichment in certain substances that cause the limits set for categories A1, A2 and A3 to be exceeded. 29

Natural enrichment is understood to be the process by which a body of water receives certain substances from the soil that are contained in it, without human intervention.

d) In case only one water resource exists whose waters have characteristics that exceed the imperative limits corresponding to A3 treatment (scarcity of water resources, drought, etc.).

The derogation procedure must be implemented for a possible exceptional use of these waters after an appropriate treatment, to include mixing, that will enable all the water quality characteristics to be made compliant.

These waters must only be used for drinking water production subsequent to the favorable opinion issued by the control authority responsible for applying this Order after the said authority has examined the dossier. In parallel with this decision a program for improving the quality of these waters must be launched.1, 39

Article 11: The hydrological basin agency is responsible for ensuring compliance by the drinking water production and distribution organizations with the prescriptions stated in this Joint Order, which will be published in the *Bulletin Officiel* (Official state gazette). 2, 17, 40

Rabat, 10 Chaabane 1423 (17 October 2002).

The Minister of Infrastructures,,
Bouamor Taghouan

The Minister for Land Use Planning,
Urban Development, Habitation and the Environment,
Mohamed El Yazghi

Quality Grid 8

	Category		A1		A2		A3	
			G	I	G	I	G	I
ORGANOLEPTIC PARAMETERS								
1	Color	mg pt / l	<10	20	50	100	50	200
2	Odor at 25° C		<3	-	10	-	20	-
PHYSICO-CHEMICAL PARAMETERS								
3	Temperature	° C	20	30	20	30	20	30
4	pH	pH	6.5 - 8.5	-	6.5 - 9.2	-	6.5 - 9.2	-
5	Conductivity at 20° C	µs/cm	1300	2700	1300	2700	1300	2700
6	Chlorides (Cl-)	mg/l	300	750	300	750	300	750
7	Sulphates (SO_4)	mg/l	200	-	200	-	200	-
8	SS	mg/l	50	-	1000	-	2000	-
9	Dissolved O_2	mg/l	7 (90%)	-	5 (70%)	-	3 (50%)	-
10	BOD_5	mg/l	3	-	7	-	10	-
11	COD	mg/l	-	-	25	-	40	-
12	Oxidizability	mg/l	2	-	5	-	10	-
UNDESIRABLE SUBSTANCES								
13	Boron	mg/l	-	1	-	1	-	1
14	Ammonium	mg/l	0.05	0.5	1	1.5	2	4
15	NTK	mg/l	1	-	2	-	3	-
16	Nitrates (NO_3)	mg/l	-	50	-	50	-	50
17	Phosphorus	mg/l	0.4	-	0.7	-	0.7	-
18	Barium	mg/l	-	1	-	1	-	1
19	Copper (Cu)	mg/l	-	1	-	2	-	2
20	Zinc (Zn)	mg/l	-	5	-	5	-	5
21	Manganese (Mn)	mg/l	-	0.1	0.1	0.1	1	-
22	Dissolved iron (Fe)	mg/l	-	0.3	1	2	1	3
23	Fluorides (F)	mg/l	0.7	1.5	0.7	1.5	0.7	1.5
24	Dissolved hydrocarbons	mg/l	-	0.05	-	0.2	0.5	1
25	Phenols	mg/l	-	0.001	-	0.005	-	0.01
26	Anionic detergents	mg/l	-	0.5	-	0.5	-	0.5
TOXIC SUBSTANCES								
27	Arsenic (As)	µg/l	-	50	-	50	-	100
28	Cadmium (Cd)	µg/l	1	5	1	5	1	5
29	Total chromium (Cr)	µg/l	-	50	-	50	-	50
30	Lead (Pb)	µg/l	-	50	-	50	-	50
31	Mercury (Hg)	µg/l	-	1	-	1	-	1
32	Selenium (Se)	µg/l	-	10	-	10	-	10
33	Nickel (Ni)	µg/l	-	50	-	50	-	50
34	Cyanides (CN-)	µg/l	-	50	-	50	-	50
35	Pesticides by subst.	µg/l	-	0.1	-	0.1	-	0.1
36	Total pesticides	µg/l	-	0.5	-	0.5	-	0.5
37	PAH	µg/l	-	0.2	-	0.2	-	0.2
BACTERIOLOGICAL PARAMETERS								
38	Fecal coliforms	/100 ml	20	-	2000	-	20000	-
39	Total coliforms	/100 ml	50	-	5000	-	50000	-
40	Fecal streptococci	/100 ml	20	-	1000	-	10000	-

G: Guide value
I: Imperative value

A1: Simple physical treatment and disinfection
A2: Normal physical, chemical and disinfection treatment
A3: Physical and intensive chemical treatment, polishing and disinfection