

## Characterisation of Monitoring networks and programmes in Mediterranean Partner Countries

### Synthesis of survey answers<sup>1</sup>

Final version dated 2010-12-06

#### Preamble:

One of the first objectives of the Water Monitoring working group of the Joint Process between the EU WFD and Med-EUWI is to describe the status of water monitoring networks and programmes in Mediterranean Partner Countries. In this framework, between April and September 2009, EMWIS, with support of [Aquapôle](#), carried out a survey among water authorities in the southern Mediterranean and Middle East. This summary reports answers to a questionnaire after a first consolidation work, including answers from 11 countries (Algeria, Cyprus, Egypt, Israel, Jordan, Lebanon, Morocco, Palestine, Syria, Tunisia and Turkey). This summary is intended to be as close as possible to the original replies, but taking into account comments received from the working members in 2010. We are aware that some answers would require further information either because they are incomplete, or because they are not sufficiently specific. The workshop held in Beirut on 6 October 2009 allowed a 1<sup>st</sup> exchange of experiences, some clarifications on country replies and provided some examples of monitoring networks. Further clarifications were provided during a workshop held in Madrid on November 10.

#### 1<sup>st</sup> section: Legal and institutional framework:

The first part of this questionnaire dealt with issues relating to the water sector regulatory framework and its role in integrated water resources management.

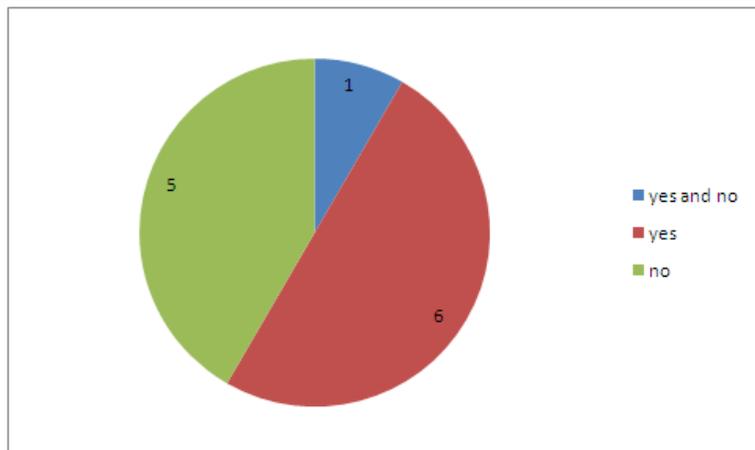
##### Q.1.1: Responsibilities

The distribution of institutional responsibilities related to water is specific to each country. Distribution of tasks between different Ministries is related to water body types (coastal water, inland surface water, groundwater, etc...) and to the various human uses of the resource (drinking water, irrigation, bathing, etc...). In most cases, the Ministry in charge of water resources is the main body responsible for water quality monitoring. In two of the 9 MPCs, the Ministry in charge of water management is also in charge of environmental protection: in other cases the Ministry of Environment focuses more on conservation and the control of effluent discharges. The Ministry for Agriculture (8 countries) and the Ministry of Health (7 countries) have significant responsibility in water-quality related issues.

In addition to this fragmentation of responsibilities, even within a single authority, water-related issues are dealt with in many different departments (water treatment, water quality, hydraulics, industries, agriculture, dams, etc.). These often do not communicate sufficiently.

<sup>1</sup> Survey questionnaires as well as country replies can be found online following [this link](#)

**Q.1.2** Are there entirely or partially privatised water sectors (water supply, wastewater treatment,...)?

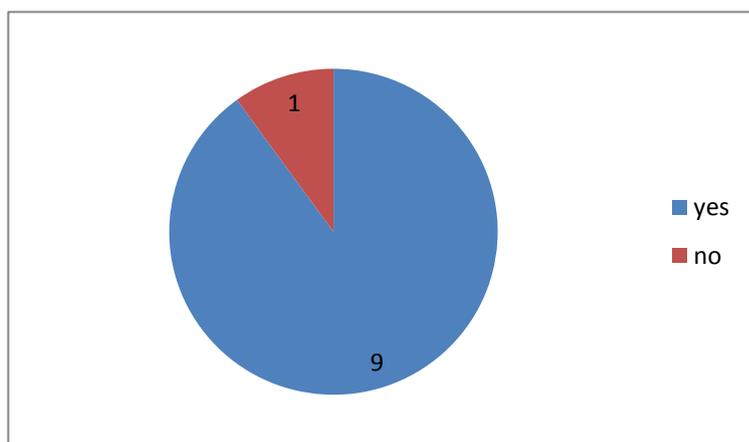


The partially privatised sectors include drinking water supply and wastewater treatment. In **Tunisia**, water supplies for irrigation and drinking water in rural areas are partly privatised: GDA (Agricultural Development Groups for services to the irrigation and rural AEP), fully privatised: bottling units.

There are entirely privatised water sectors, like in **Israel**, desalination plants and sewage treatment institutes. In **Jordan**: Aqaba Water Company, Miyahuna for

Amman Governorate, Madaba for the billing, As Samara Wastewater Treatment Plant (BOT), Abu El Zegan and Zara (BOT) and Irbid (NAGWA). In **Palestine** the Jerusalem Water undertaking. In **Morocco**: the distribution and treatment of water.

**Q. 1.4** Is integrated water resources management (IWRM) effective at the national, regional or local level?



IWRM is implemented in almost all the countries, sometimes since 1990 (Tunisia), or much more recently as in Israel (2007). In Turkey, IWRM is not yet implemented but a project for capacity building in the water sector is underway to harmonise water management to the European legislation, for its accession to the EU. This project which was completed at the end of 2009 led to the formulation of river management plans.

*How is IWRM implemented?*

**Algeria:** integration is taken into consideration in water laws, basin agencies structure, master plans (Master Plan for Water Resources Development), international Co-operation in the field of IWRM.

**Cyprus:** taken into consideration at the national level.

**Egypt:** a National Water Resources Plan for integrated water resources management is under implementation.

**Israel:** adoption of a "master plan" and establishment of a Water Authority Council involving all the Ministries in charge of water as well as representatives of the public.

**Jordan:** adoption of a national water master plan.

**Lebanon:** grouping of the various water sectors (drinking water supply, sanitation and irrigation) within only one body.

**Morocco:** national water plan and programme for Integrated Water Resources Development.

**Palestine:** drilling of a new well in order to enhance distribution.

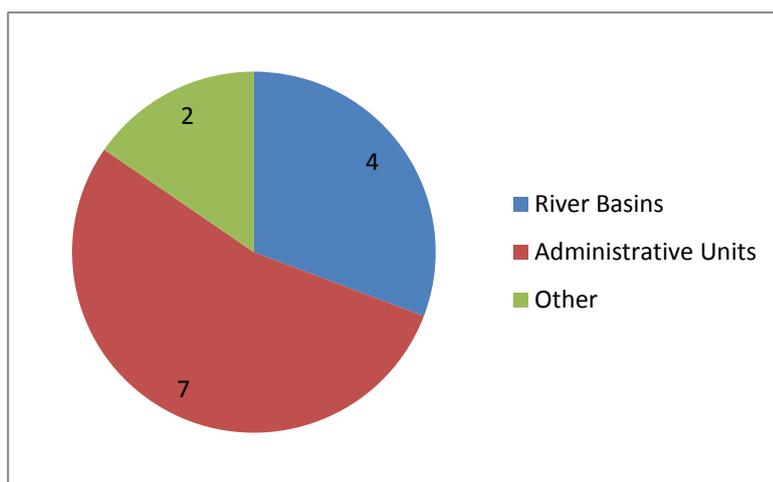
**Syria:** creation of multi-ministerial Steering Committees for water projects. Each water project, law or initiative has a steering committee, which consists of members from different ministries in order to guarantee stakeholder participation. The project is monitored and evaluated by this committee.

**Tunisia:** water development plans in the North, Centre and South of the country and strategies for water resources mobilisation.

**Turkey:** The Republic of Turkey has been preparing the process for EU integration. A project called “Capacity Building Support to Turkey for the Water Sector” intends to assist Turkey in updating water management policies to EU water legislation, in particular the Water Framework Directive (WFD) 2000/60/EC of 23 October 2000, the Dangerous Substances Directive (DSD) 76/464/EEC of 4 May 1976, and the daughter directives. The Project lasted from December 2007 to November 2009. A Management Plan is an output of the Project.



**Q.1.5** On what geographical entity basis (unit?) is water managed?



The countries which reported “other” are **Israel**, where water is managed on the basis of hydro-geological basins (groundwater) and **Turkey**, where water resources management is entrusted to governmental institutions which operate by river basins and administrative units. Turkey specified that the Directorate General of the State Hydraulic Works (DSI) represents the main water authority in Turkey and is responsible for the management of water allocations.

*Provide the number of geographical entities, average area and the name of the institutional level, responsible for these entities.*

**Israel:** Mainly on groundwater basins (Coast, Mountain, Western Galily) and Kinnereth basin. The average area is 4200 Km<sup>2</sup>. Supervised by the Water Authority.

**Jordan:** 15 Surface Water Basins and 12 Groundwater Basins.

**Lebanon:** 5 administrative units: 4 EPRE + ONL.

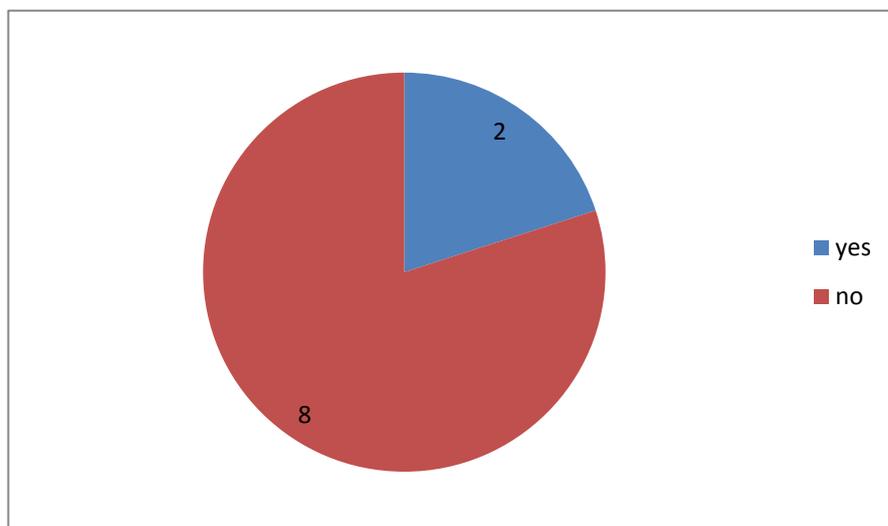
**Syria:** Most governorates in Syria (14 governorates in total) have sub-directorates dealing with water issues: the first one for irrigation (under the authority of Ministry of Irrigation - MOI) and the second water supply and sewage (under the authority of Ministry of Housing and construction - MOHC). Some governorates have a water resources directorate.

**Tunisia:** 24 governorates (under the authority of the Ministry of Interior and local Development -MIDL) each one including a Regional Commissary for Agricultural Development –CRDA- (under the authority of the Ministry of Agriculture and hydraulic resources -MARH).

**Turkey:** Turkey developed its water resources policy taking into consideration the present and the future water needs for its growing population, developments at global levels as well as the on-going EU accession process. Priority is given to policies and plans which uses the full potential of Turkey’s water resources in an efficient manner. The focus has been on securing the quantity and the protection of the quality of water resources. Turkey has a number of governmental institutions in the field of water management, functioning in River basin and other Administrative Units. The situation is not much different from that in most other EU Member States or Accession Countries. The General Directorate of State Hydraulic Works (DSI), is the most established water authority in Turkey and the major institution responsible for water development, management and allocation. DSI is responsible for performing basic investigations such as flow gauging, water quality monitoring, formulation of construction proposals , financing and subsequent operation of these works.

**Q.1.6** The WFD defines a water body as a section of a river, lake, coast which can be regarded as an homogeneous unit, from the view point of natural characteristics and of the pressures exerted by human activities.

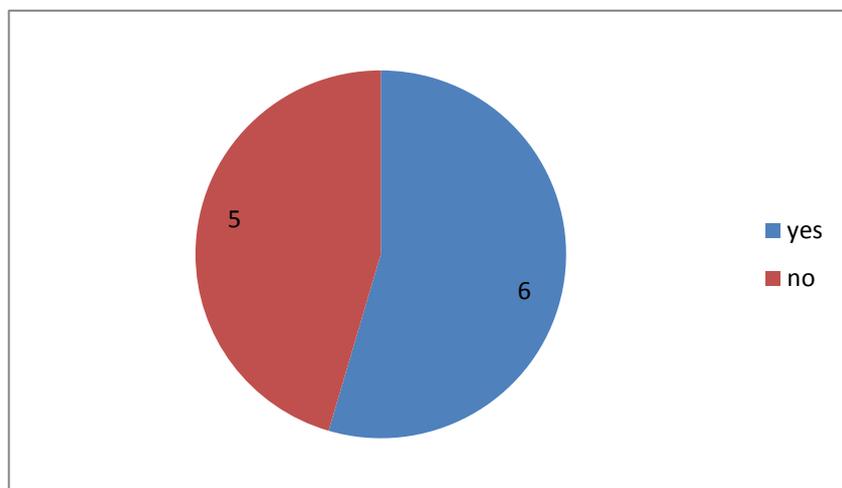
The WFD moreover specifies that all the rivers, whose catchment area is larger than 10 km<sup>2</sup>, must be broken up in water bodies. Is the river network subdivided or not in water bodies, within the WFD meaning?



Except for **Cyprus** (216 rivers, 18 lakes and 28 coastal water areas) and **Morocco** (a non-specified number of water bodies), the water body concept is not used for subdividing the river network. However, **Turkey** specifies that a capacity building project in the water sector will result in the delineation of water bodies. Turkey launched the project called “Capacity Building

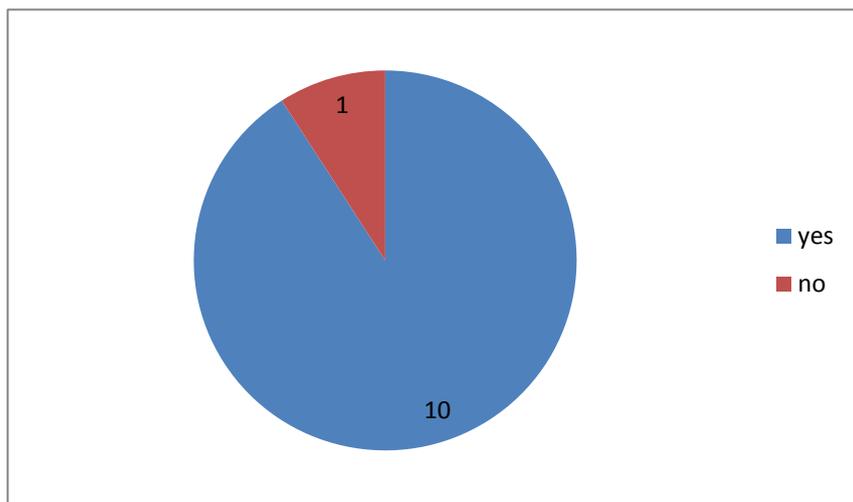
Support to Turkey for the Water Sector” to develop its water management instruments in line with EU water legislation. By means of this project, water bodies were defined in the Büyük Menderes River Basin, and new water bodies will be defined in Sakarya, Yeşilirmak, Akarçay and Akdeniz Basins are concluded.

**Q.1.7** Does the water legislation integrate commitments of results on the good qualitative status of rivers or water bodies?



Achieving good status in surface water bodies is an objective defined as such in the legislation of 6 countries (Algeria, Cyprus, Egypt, Jordan, Syria, and Tunisia).

**Q.1.8** Is there a legal regulatory framework which defines specific national standards for the discharge of pollutants and quality of the environment?



**Lebanon** has no legal regulatory framework for discharges and environmental quality. In **Israel**, new standards have been defined and are waiting for adoption (2009).

Most countries have incorporated in their legislation a regulatory framework for controlling effluent discharges and environmental quality which is sometimes derived from European standards with sometimes the addition

of some parameters (case of **Cyprus**).

*What standards are applied?*

**Algeria:** Executive Order No.: 06-141 u 20 Rabie El Awwal 1427 (corresponding to 19 April 2006) defining the concentration limits in industrial effluent discharges. In addition the ANRH has its own qualifications scale.

**Cyprus:** EU directives' standards are used at national level. For parameters that are absent from the appendices of the directives, older national standards (e.g. National Regulation 102/9) are used to protect environment quality.

**Egypt:** WHO standards are applied

**Israel:** The Water Regulation from the Ministry of Environment (Prevention of Water Pollution) (Metals and Other Pollutants), ref 5761-2000 defines limits concentration of pollutants for wastewater-. Proposals for the definition of new standards are awaiting ratification (2009).

**Jordan:** Jordanian standards cover treated domestic and industrial wastewater, and solid waste.

**Morocco:** Quality Standards for Surface Water (Rivers and lakes). Quality Standards for General and Specific Waste.

**Palestine:** Palestinian Standards as well as Israeli standards, WHO and EPA (USA) standards.

**Syria:** Syrian standards that fit with environmental law no. 50.

**Tunisia:** the standard NT 106.002 establishes the quality of the waste in the maritime and hydraulic public domains, and public canalisations. Concentration limits in wastewater are defined by 54 physico-chemical and bacteriological parameters, for several heavy metals and some organic micro-pollutants (hydrocarbons, pesticides, PCB/PCT and phenols).

**Turkey:** By Law on Water Pollution Control.

**Q.1.9** *What are the past, current and future national and international programmes for monitoring water quality?*

**Algeria:** Programme for monitoring surface and ground water quality established by the ANRH and carried out with the River Basin Authorities (Agences de Bassin Hydrogéologique).

**Cyprus:** On-going monitoring programme for the implementation of the WFD, Article 8.

**Egypt:** National Water Quality Monitoring (NWQM).

**Israel:** On-going monitoring programme including all natural water resources, wastewater, coastal water as well as water produced by desalination, pollution from cars service stations and industrial areas. Expanding the network for monitoring pollution from service stations and building a network for monitoring industrial pollution are planned.

**Jordan:** Several monitoring programmes are underway, supervised by the Jordanian Water Authority, the Jordan Valley Authority, the Ministry for Health and the Ministry for the Environment. The current monitoring programme includes all natural water sources, wastewater, coastal water, water produced from desalination plants, car service station effluents and industrial plants. It is planned to widen the network of gas station pollution monitoring and to establish a network dedicated to industrial pollution monitoring.

**Lebanon:** Between 1990 and 1992, a national survey of the quality of drinking water was conducted

**Morocco:** A national network for monitoring water resources quality was developed in 1984. On-going optimisation of this national network. National Plan for the Protection of Water Quality.

**Palestine:** Monitoring of water resources was carried out since 1967; groundwater resources screened for Chloride and Nitrate; since 1996 monitoring included all water resources (residential and agricultural wells and springs), parameters comprised major chemical anions and cations, Microbiology (total and faecal coliforms) as well as field measurements. Twice a year (spring and autumn), the Ministry of Health monitors consumer taps for total and faecal contamination. Currently, besides what was mentioned above, municipalities monitor the distribution networks for total and faecal coliforms, and chlorination.

**Syria:** Defined within the Ministry of Housing and Construction.

**Tunisia:** Several networks exist: for monitoring surface water quality of the main rivers; a national network is dedicated to the monitoring of groundwater quality, the parameters include dry residues and nitrates; an additional network was designed for monitoring the quality of stored surface water (dams); these are separate from the national network which monitors surface water resource quality.

**Turkey:** A network for monitoring water quality was set up in 1979 to include a description of the water bodies and long-term evolutionary trends of their water quality in order to better understand recent ecological changes. The number of stations gradually increased from 65 to 1,163 between 1979 and 2008, included in the regular systematic monitoring of surface and groundwater over the entire Turkish territory. Water quality monitoring stations are built according to the needs of current and future DSI projects. In the future, pending a twinning project, it is planned to implement a monitoring system in line with the WFD.

## 2<sup>nd</sup> section: Mechanisms and networks for monitoring (or controlling) water quality

### Q.2.1 Networks: synthesis for each country

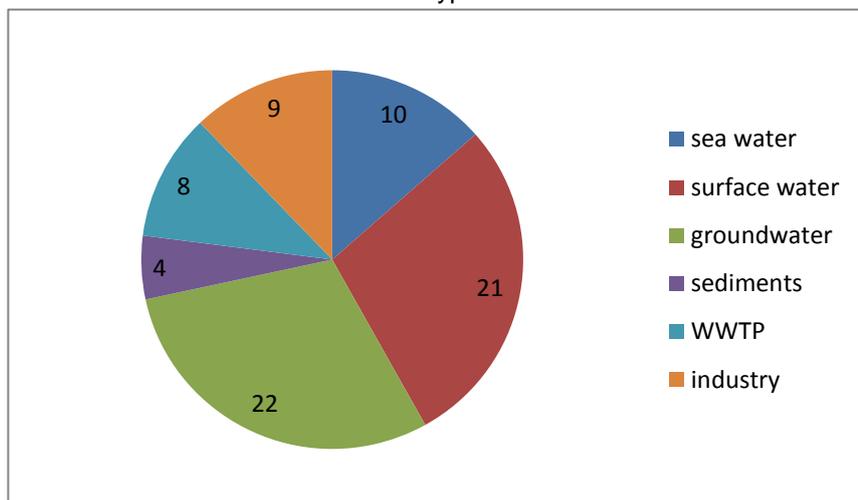
- Algeria:** 2 monitoring networks are established and managed by the public sector: ANRH and MATET . The first one is dedicated to inland waters and the second one to coastal waters. ANRH provides monitoring and operational control and has operated since 1984. It includes 124 stations, measures 30 parameters and concerns 54 dams. The stakes are nature conservation, protection of public health and risk prevention (warning). International standardized procedures of measurement and treatment are used. **The coastal** waters monitoring data record is incomplete.
- Cyprus:** 4 public networks for surveillance monitoring and control of discharge effluents were commissioned in 2007 covering all groundwater resources (84 monitoring stations), part of the lakes (11 monitoring stations and 61% coverage), part of the rivers (31 monitoring stations and 12% coverage) and part of coastal waters (8 monitoring stations and 32% coverage). Protected water uses include drinking water, irrigation and nature conservation. The total number of measured parameters is 282: 123 and 117 the two networks operating for inland surface water, 23 for the network operating in coastal waters, and 19 for the network monitoring groundwater.
- Egypt:** 4 monitoring networks, 2 networks dedicated to the monitoring of discharge effluents (Ministry of Health and Ministry of Housing and new communities), 1 for surface water surveillance monitoring (Ministry of water resources and irrigation, MWRI) and the last 1 for investigative monitoring (Ministry of Environment). The first network, commissioned in 1995, has 434 monitoring stations dedicated to groundwater, WWTP discharges and industrial effluents, a third network is dedicated to coastal water, WWTP discharges and industrial effluents. The first network measures 33 parameters, the standard procedures of measurement and treatment are not standardized between authorities.
- Israel:** 3 networks including one entirely public, which monitors coastal waters and industrial effluents with 150 monitoring stations, while the other two, which are public/private partnerships, deal with swimming pools (2,400 monitoring stations) and drinking water (~2,000 monitoring stations). Each of these 3 networks provides the 3 types of control (surveillance, operational and investigative), all 3 are under the responsibility of the Ministry of Health.
- Jordan:** 1 public network managed by a scientific institute with 13 monitoring stations and covering 63% of groundwater and 23% of lake water, providing the 3 types of monitoring (surveillance, operational and investigative). The water uses protected are drinking water supply and irrigation.
- Lebanon:** 10 networks (8 public and 2 private) cover almost all groundwater, rivers and lakes, but also wetlands and coastal waters. Their commissioning goes back to 1970 for the oldest and to last year for the most recent 2. The concerned use is above all drinking water supply (10 networks) and also irrigation (2 networks). The number of monitoring stations varies between 1 (for 4 networks) and 75 (for 2 networks together) ,the measurement method used is either manual or telemetry. According to the networks, the procedures used are defined by different national authorities on the basis of international standards.

- **Morocco:** 2 public networks; one is dedicated to accidental pollution, covering coastal waters and inland waters; the other one dedicated to monitoring (740 stations) and concerns groundwater (45 aquifers), rivers (46), wetlands, lakes (39 dams). 1 public/private network which deals with the discharges of industries and wastewater treatment plants.
- **Palestine:** 3 networks; Water Service Provider, MOH, Palestinian Water Authority, respectively for monitoring the overall water quality status and monitoring of industrial effluents; the MOH Network monitors accidental pollution; and the PWA combines accidental pollution monitoring, monitoring of water quality status and monitoring of polluting effluents. The first network is dedicated to discharge effluents from WWTP; and the third one to groundwater and WWTP discharges. No biological parameters are measured other than total and faecal coliforms. The networks follow international standardized procedures of measurement and treatment.
- **Syria:** 3 public networks managed by 3 different Ministries (Environment, Housing, Irrigation). They cover 100% of inland and coastal waters. All three of them use national procedures for data measurement and processing.
- **Tunisia:** 7 public networks, including 6 dedicated to monitoring the status of the resource, and 1 dedicated to the 3 types of monitoring. They total more than 6,400 monitoring stations, of which the oldest was commissioned in 1873, and cover 90% of groundwater and 65% of rivers, wetlands, lakes and dam reservoirs and coastal water. They are managed by the National Agency for Environmental Protection (2) and the Directorate-General of Water Resources (5). **The 3 networks** suffer from incomplete data.
- **Turkey:** 4 public networks including
  - 2 survey networks: one for inland surface waters and the other for inland surface waters and sediments
  - an operational network for detecting pollution in coastal waters
  - a network for the 3 types of monitoring

These networks cover approximately 5% of groundwater, 80% of rivers, 5% of wetlands and 15% of lakes and dam reservoirs. The number of monitoring stations is not specified.

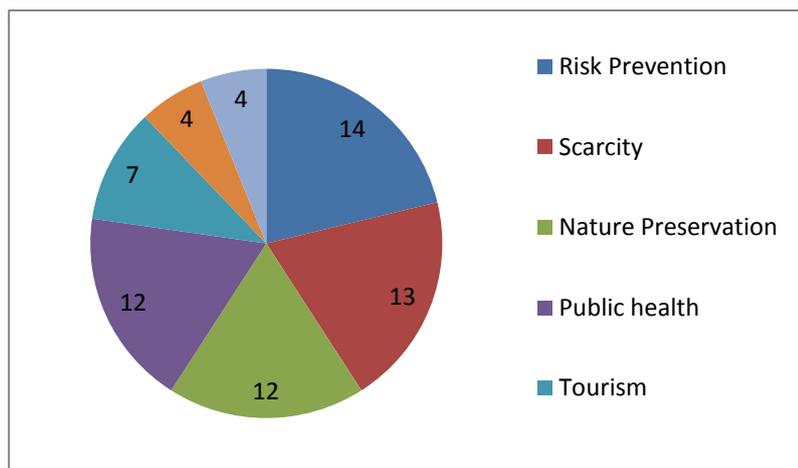
#### Q.2.2 Monitored water resources:

Total number of networks for each type of water



The greatest number of networks is by far for surface water and groundwater.

Main stakes:

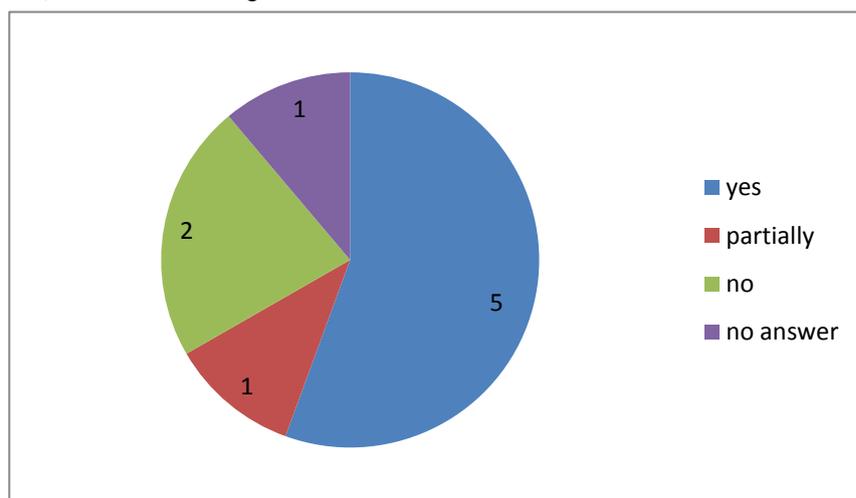


Risk prevention, water resource scarcity, nature conservation and public health are the stakes most often quoted regarding the building of the networks.

*Note: Values are approximate because the stakes are not specified for all networks.*

#### Q.2.4 Inventory of pollutants

The WFD insists on the importance of establishing a link between the pressures exerted on the environment and the impacts on water quality (pressure - impact relationship). This requires the availability of **inventories** (or land registers) for **urban and industrial effluent discharges**, coming from **wastewater treatment plants**, and related to agriculture. Are there such inventories?



If yes, for which types of discharges and are they regularly updated, and are they mapped (GIS)?

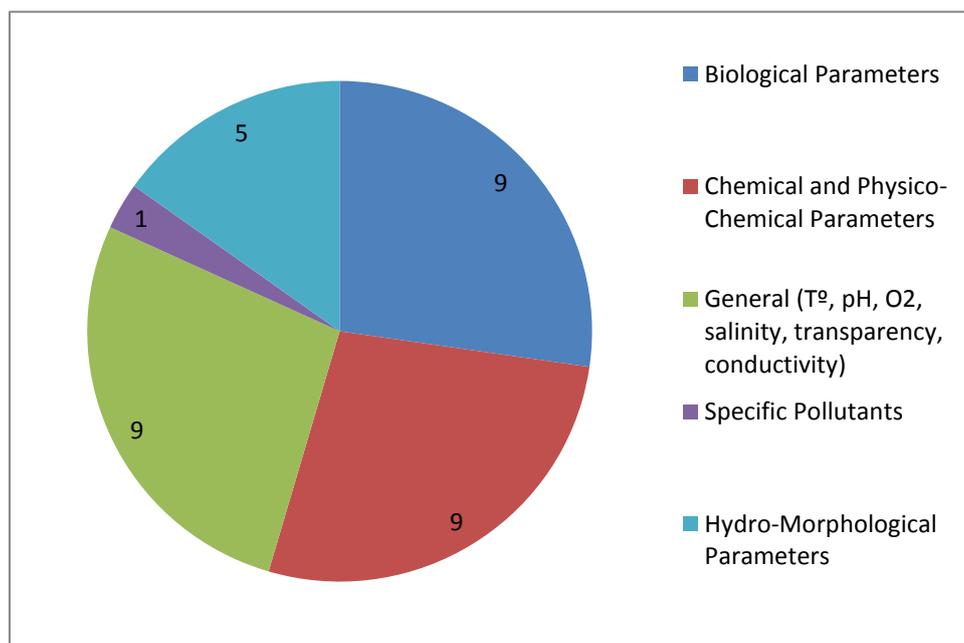
- **Algeria:** urban discharges, wastewater treatment plants and industries (partial mapping)
- **Cyprus:** farms, slaughter-houses (no GIS)
- **Egypt:** wastewater treatment plants and industrial discharges, urban discharges (no GIS).
- **Israel:** agriculture and others (GIS)
- **Jordan:** urban discharges (partial mapping).
- **Lebanon :** urban and industrial discharges
- **Morocco:** domestic, industrial, agricultural discharges (GIS being developed)
- **Palestine:** wastewater treatment plants' discharges (no GIS).
- **Syria:** urban, wastewater treatment plants and industrial discharges, (no information about mapping).
- **Tunisia:** industrial, wastewater plants and urban discharges (partial mapping).
- **Turkey:** wastewater plants and urban discharges (SIG).

- Q.2.5 Monitored Parameters

	Algeria	Cyprus	Egypt	Israel	Jordan	Lebanon	Morocco	Palestina	Syria	Tunisia	Turkey
<b>Biological Parameters</b>		√	√	√	√	√	√	√		√	√
Phytoplankton		√			√					√	
Other aquatic flora (e.g. phytobenthos & macrophytes)		√			√					√	
Benthic invertebrate fauna		√			√						
Fish fauna					√						
Bacteria (Coliform, faecal coliform, streptococcus, staphylococcus, enterococcus, escherichiacoccus, legionella...)			√	√	√	√	√	√		√	√
<b>Chemical and Physico-Chemical Parameters</b>	√		√		√	√	√	√	√	√	√
DCO, DBO <sub>5</sub> , COD, TSS, TDS	√		√		√		√		√	√	√
Ca	√				√		√	√			
Cl	√				√		√	√			
MOA, Phenols, MAP, OCP	√				√	√	√	√			√
Heavy metals	√				√	√	√	√	√	√	√
NKjeldahl, NO <sub>2</sub> , NO <sub>3</sub> , NH <sub>3</sub>	√				√	√	√	√	√	√	√
Phosphates (PO <sub>4</sub> ...)	√				√	√	√		√	√	√
Sulfates (SO <sub>4</sub> , SO <sub>2</sub> ...)	√				√	√	√		√	√	√
<b>General</b>	√		√		√	√	√	√	√	√	√
Transparency/Turbidity					√	√	√	√	√	√	
Temperature			√		√		√		√	√	√
Oxygenation	√				√	√	√			√	√
Salinity					√	√	√			√	
PH	√		√		√	√	√	√		√	√
Conductivity	√					√	√			√	
<b>Specific pollutants</b>							solved hydrocarbures, anionic detergents, pesticides				
<b>Hydro-morphological Parameters</b>		√			√	√				√	√
Quantity and dynamics of water flows		√			√	√				√	√
Connection with groundwater body		√			√						
Residence time (lake)		√			√						
River continuity		√			√						
Depth variation		√			√					√	

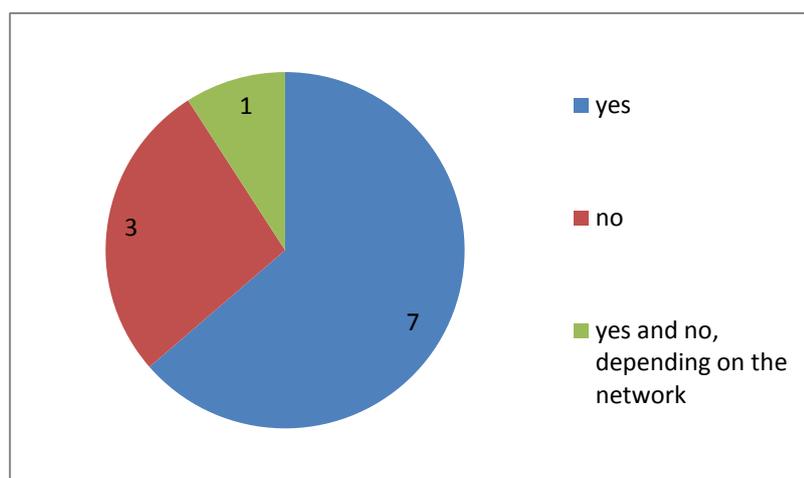
	Algeria	Cyprus	Egypt	Israel	Jordan	Lebanon	Morocco	Palestina	Syria	Tunisia	Turkey
Width variation (rivers)		√			√					√	
Structure of substrate		√			√					√	
Quantity of substrate (lakes, transitional water)		√			√					√	
Tidal Regime		√									

Number of countries monitoring the different parameters:



### 3<sup>rd</sup> section: Data processing and dissemination

**Q3.1** Is there a centralised collection and information system?



In **Lebanon** the situation differs according to the networks:

- yes: EEBML, EELN, EELS
- no: ONL

Specify how data are transferred: teletransmission from the stations, computer file, manual data entry, other?

Data entry is manual in almost all the countries (except **Morocco**, only computer files), but it is most often coupled with data-processing techniques (at least for certain networks). **Tunisia** alone specifies using only manual acquisition.

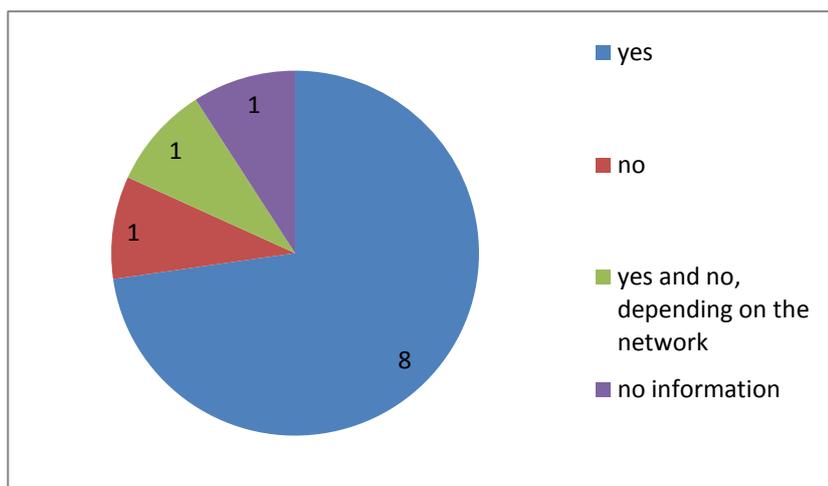
The data-processing techniques can be:

- teletransmission, telemetry
- transmission on computer media (CDROM, USB key)

Who manages this centralised system?

- **Algeria:** The *Ministry of Water Resources* at the national level.  
The *ABHs* at the regional level.
- **Cyprus:** *Water Development Department* and *Department of Fisheries and Marine Research*.
- **Egypt:** *Ministry of Water Resources and Irrigation*, *Ministry of Health and Population* and *Ministry of Environmental Affairs*.
- **Israel:** *Public Health Headquarters (Ministry of Health data)*.
- **Jordan:** There are 2 systems one at the *Water Information Department* of the *Ministry of Water and Irrigation* and one at EMARCU/RSS.
- **Lebanon:** technical office (EEBML).
- **Morocco:** SEE/Water Department.
- **Palestine:** Data Bank department.
- **Syria:** *Ministry of state for Environment Affairs*, *Ministry of Housing and construction* and *Ministry of Irrigation*.
- **Tunisia:** COPEAU and MED POL/ANPE  
**SYGREAU** : Currently being developed (Data processing system for surface and ground water resources management) – DGRE  
**SYNEAU:** Federating and advanced information system (National Water information System) – DGRE
- **Turkey:** *DSI Water Monitoring System*, *EIE Monitoring System*, *General Directorate of Protection and control network*, and *DGEM Monitoring System*.

### Q3.2 Are collected data validated?



In **Lebanon** the situation differs according to the networks:

- yes: EEBML, EELN, EELS
- no: ONL

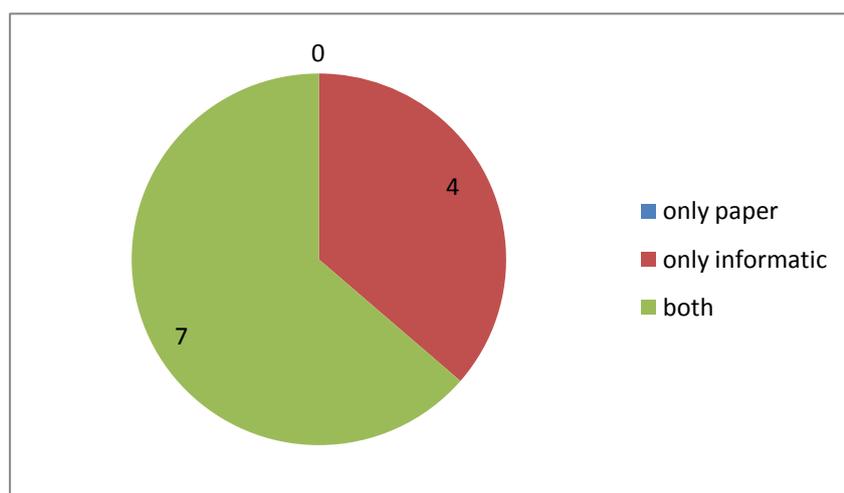
As for **Syria**, there is no information.

### What are the methods used for validation?

- **Algeria:** comparison homogeneity test, validation at the source
- **Cyprus:** checking by qualified personnel to detect obvious errors, etc.
- **Egypt:** statistical methods.
- **Israel:** laboratory procedures and computer programmes
- **Jordan:** using functions included in the software and daily analysis of the data by water specialists
- **Lebanon:** manual and computerised methods - *The ISO methods*
- **Morocco:** chemical control tests (ionic balance, dry residues, etc.) - Statistical analyses (Identification of aberrant values, whisker package)
- **Tunisia:** computerised (quality, integrity)

### Q3.3 Data storage/processing:

Under which (electronic, paper) format(s) are data stored?



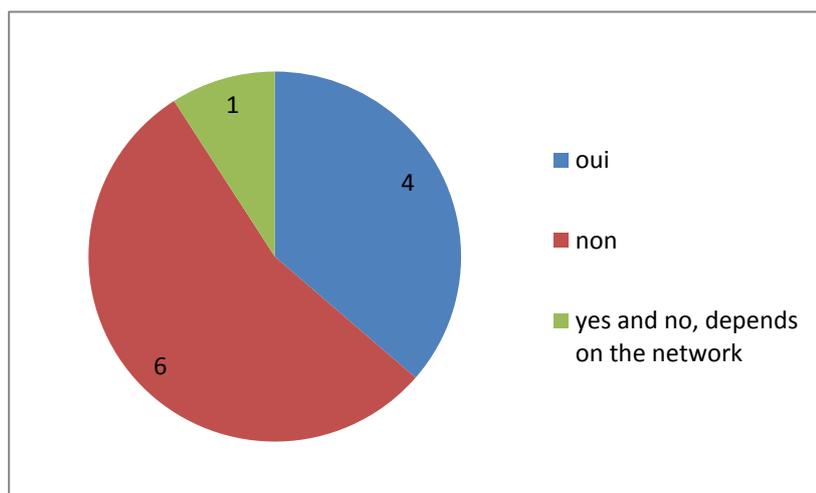
All the countries store their data on computer media.

*If databases are computerised, what are the software programmes used?*

There are several systems for each country (often different from one network to another).

- **Algeria, Jordan, Tunisia, Cyprus:** applications developed within the network
- **Algeria, Egypt, Lebanon, Morocco, Tunisia:** Microsoft Access
- **Algeria, Lebanon, Tunisia:** Excel
- **Lebanon, Tunisia:** Word
- **Algeria, Cyprus:** SQL Server 2000 (regional data base)
- **Lebanon:** Rv telemetry
- **Morocco, Turkey:** ORACLE

*Are data integrated into a GIS?*



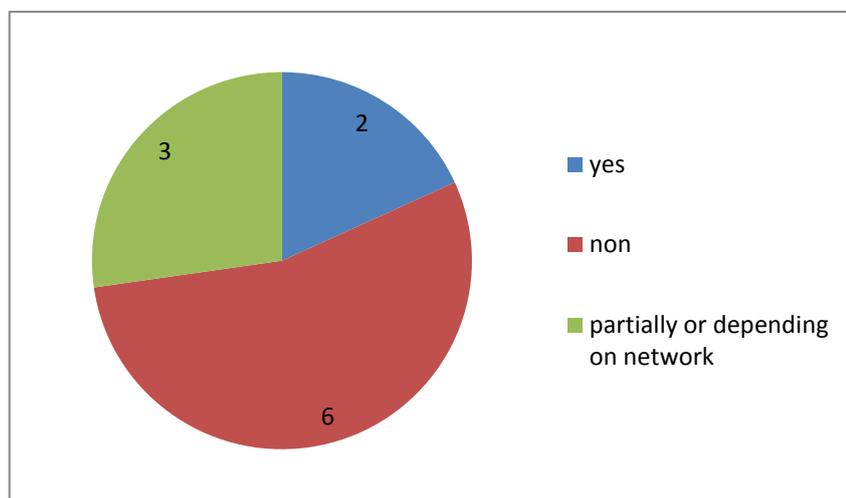
In **Lebanon** the situation again differs according to the networks:

- yes: EEBML
- no: ONL, EELN, EELS

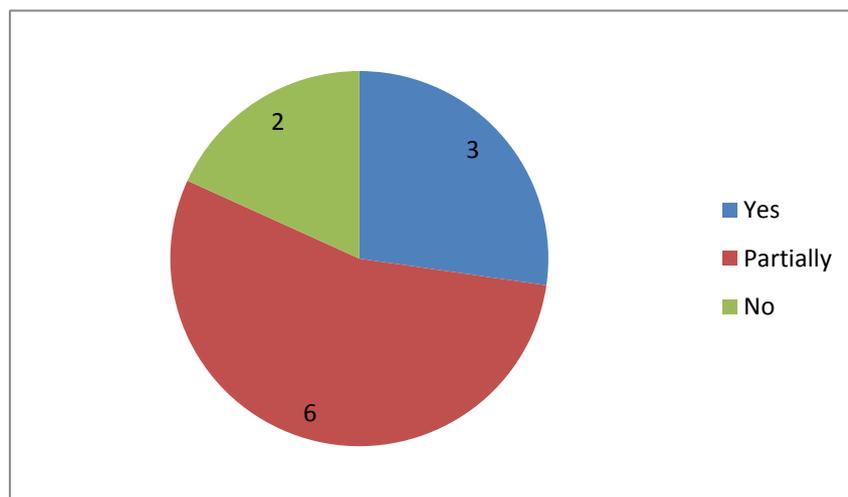
*What are the formats used for data storage (please provide the data structure separately, whenever possible)?*

- **Algeria, Cyprus:** ESRI ArcGIS shapefiles & geodatabase
- **Algeria:** Mapinfo
- **Jordan:** ORACLE data base
- **Lebanon:** Informatics and intranet (EEBML), CD-R and files and hard USB (EELS)
- **Morocco:** Access or SQL Server, ArcMap/ArcGIS, Visual Studio 2005

*Are data accessible on the Internet?*



**Q3.4 Data dissemination:**  
Are data disseminated?



**General public**

Dissemination method used for the general public:

	Total	Algeria	Cyprus	Egypt	Israel	Jordan	Lebanon	Morocco	Palestine	Syria	Tunisia	Turkey
Upon request	6	√	√		√	√	√		√			
Free	5	√			√				√	√	√	
Event (fairs...)	1							√				
Official publications	1										√	
No	2			√								√

How is the dissemination made to the general public?

	Total	Algeria	Cyprus	Egypt	Israel	Jordan	Lebanon	Morocco	Palestine	Syria	Tunisia	Turkey
Website	6	√	√		√	√				√	√	
Publications	4	√			√		√				√	
The medias	2				√						√	
Computer file	5		√		√	√	√		√			

What is the frequency used for dissemination to the general public?

	Total	Algeria	Cyprus	Egypt	Israel	Jordan	Lebanon	Morocco	Palestine	Syria	Tunisia	Turkey
Monthly	2	√					√					
Half-yearly	1										√	
Yearly	4	√			√					√	√	
Never	1											√
Other	6	Occasionally	Daily storage of main reservoirs		Biannual	No specific frequency	Upon request		Upon request			

## Political World

Dissemination method used for the political world:

	Total	Algeria	Cyprus	Egypt	Israel	Jordan	Lebanon	Morocco	Palestine	Syria	Tunisia	Turkey
Upon request	9	√	√	√	√	√		√	√	√	√	
Free	5	√			√			√	√		√	
Official publications	2			√							√	
No	2						√					√

How is the dissemination made to the political world?

	Total	Algeria	Cyprus	Egypt	Israel	Jordan	Lebanon	Morocco	Palestine	Syria	Tunisia	Turkey
Website	3	√			√						√	
Publications	6	√		√	√	√		√			√	
The medias	2				√			√				
Computer file	5		√		√	√			√	√		

What is the frequency used for dissemination to the political world?

	Total	Algeria	Cyprus	Egypt	Israel	Jordan	Lebanon	Morocco	Palestine	Syria	Tunisia	Turkey
Monthly	1	√										
Half-yearly	1										√	
Yearly	3			√				√			√	
Never	1											√
Other	4	Upon request				No specific frequency				Upon request		Upon request, Events

## Universities

Dissemination method used for the universities:

	Total	Algeria	Cyprus	Egypt	Israel	Jordan	Lebanon	Morocco	Palestine	Syria	Tunisia	Turkey
Upon request	8	√	√			√	√	√	√	√	√	
Free	4	√						√	√		√	
Official publications	1										√	
No	2			√								√

How is the dissemination made to the universities?

	Total	Algeria	Cyprus	Egypt	Israel	Jordan	Lebanon	Morocco	Palestine	Syria	Tunisia	Turkey
Website	3	√			√						√	
Publications	5	√			√		√	√			√	
The medias	1				√							
Computer file	7	√	√		√	√	√		√	√		

What is the frequency used for dissemination to the universities?

	Total	Algeria	Cyprus	Egypt	Israel	Jordan	Lebanon	Morocco	Palestine	Syria	Tunisia	Turkey
Monthly	1	√										
Half-yearly	1										√	
Yearly	2							√			√	
Never	1											√
Other	3	Upon request				No specific frequency	Upon request					

### Others

Dissemination method used for others:

	Total	Algeria	Cyprus	Egypt	Israel	Jordan	Lebanon	Morocco	Palestine	Syria	Tunisia	Turkey
Specify		Partenaires		M. Environment		M. water, Environment, Health, Agriculture	M. Energy & Water		Researchers & students		Ministeries, Water Adm., Research Students	
Upon request	7	√	√	√	√		√		√		√	
Free	4				√	√	√		√			
Official publications	1										√	
No	3							√		√		√

How is the dissemination made to others?

	Total	Algeria	Cyprus	Egypt	Israel	Jordan	Lebanon	Morocco	Palestine	Syria	Tunisia	Turkey
Website	3				√	√					√	
Publications	3				√		√				√	
The medias	1				√							
Computer file	6		√	√	√		√		√		√	

What is the frequency used for dissemination to others?

	Total	Algeria	Cyprus	Egypt	Israel	Jordan	Lebanon	Morocco	Palestine	Syria	Tunisia	Turkey
Monthly	1						√					
Half-yearly	0											
Yearly	3			√	√						√	
Never	1											√
Other	3					No specific frequency			Upon request		Upon request	

*Is data dissemination following a particular agreement protocol?*

- **General public:** no for all the countries, except **Lebanon**, MED POL. (**Tunisia**), and **Cyprus**.
- **Political world:** no for all the countries, except **Lebanon** and **Morocco**.
- **Universities:** no for all the countries, except **Lebanon** and **Cyprus**.

**Q.3.5** *Are data used for modelling or simulation?*

Yes for all the countries, except 2 networks (ONL and EELN) in **Lebanon**. **Israel** did not answer to this question.

*What are the objectives?*

- **Algeria:** implementation of general or regional studies on the various parameters.
- **Cyprus:** water quality (sea water intrusion), *water abstraction*.
- **Egypt:** data are used for modelling and simulation in a small scale and it will be expanded in the coming months also, data are disseminated based on request.
- **Israel:** no answer.
- **Jordan:** groundwater modelling, tool for the completion of the National Water Plan (MWI /WAJ/JVA). Applied research projects (EMARCU/RSS, universities).
- **Lebanon:** comparative study of previous years (rainy year) (EEBML). To be up to date, to meet our needs and to be faster in the controls, results and monitoring (EELS).
- **Morocco:** to take actions for pollution removal.
- **Palestine:** Special researches or studies *depending on the study objective*.
- **Syria:** decision-making.
- **Tunisia:** on-going study on the feasibility of modelling covering the whole Medjerda river basin (ANPE) - studies, forecasts, planning, management.  
To simulate pollution sources and hydrology, floods, high water flows (sources of influence) and status (quality) of the Medjerda river basin, to be used as a decision-making supporting tool.
- **Turkey:** no answer.

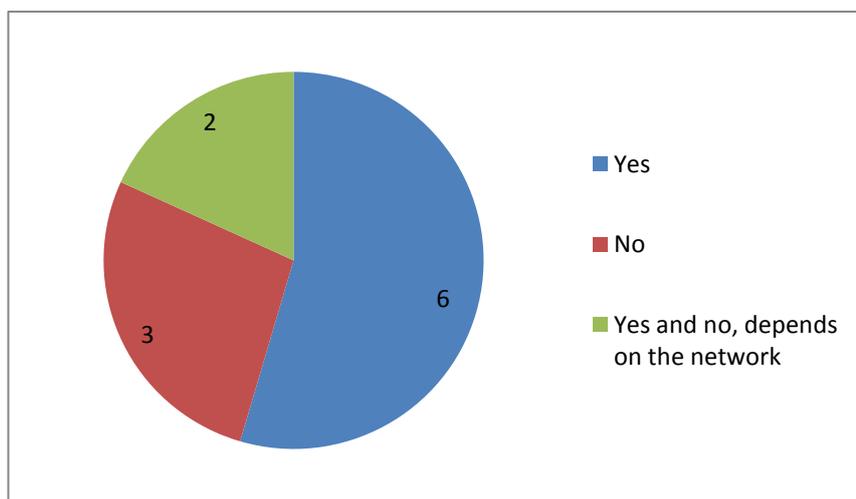
*What are the software programmes used?*

- **Algeria:** data processing software: SIQUEAU, SASS - specific software developed for the Master Plan for Water Resources Development (PDARE) called BILAN.
- **Cyprus:** Modflow, Feflow.
- **Egypt:** no answer..
- **Israel:** no answer.
- **Jordan:** no answer.
- **Lebanon:** telematics programme (EEBML) - Access or other according to the specific need (EELS).
- **Morocco:** Modflow.
- **Palestina:** Aquachem, Surfer for contour mapping, and Mt3D.
- **Syria:** the Arab Centre for Studies of Arid and Dry Zones: ACSAD.
- **Tunisia:** the model considered for the Medjerda modelling: PEGASE (ANPE.)
- **Turkey:** no answer.

What are the organisations in charge of this modelling?

- **Algeria:** the departments of the ANRH and ABHs.
- **Cyprus:** *Water Development Department.*
- **Egypt:** no answer.
- **Israel:** no answer.
- **Jordan:** Ministry of Water and Irrigation and two units which depend on it (WAJ, JVA) - EMARCU/RSS, universities.
- **Lebanon:** private organisations (contractual) (EEBML) - IT department: internal or subcontracting (EELS).
- **Morocco:** Water Department, River Basin Agencies, ONEP.
- **Palestina:** NGOS, PWA, Universities, research centers.
- **Syria:** Ministry of Agriculture and Agricultural Reform.
- **Tunisia:** Aquapôle (university of Liege) as well as other national institutions (ANPE, ONAS, DGRE, etc.).
- **Turkey:** no answer.

**Q.3.6** Are data used for reporting at the international level (conventions, agreements, etc.)?



The level of awareness on international reporting obligations varies from one institution to the other e.g. in **Lebanon** only the EELS, in **Tunisia** only ANPE

Who takes care of this reporting?

- **Algeria and Palestine:** no reporting mentioned
- **Cyprus:** the department in charge (see question Q.1.1).
- **Egypt:** no reporting.
- **Israel:** the Ministry of Health (MoH).
- **Jordan and Morocco** no answer.
- **Lebanon:** the Head of Department of the laboratory.
- **Syria:** the State Ministry for Environmental Affairs and the Ministry of Irrigation.
- **Tunisia:** the ANPE submits annual reports on the quality of the marine environment to the coordination unit of the MED POL. Programme (UNEP-MAP).
- **Turkey:** the Organisation for Economic Cooperation and Development (OECD), European Environmental Agency (EEA).