
WS&D Pilot Activity on indicators

Application in Mediterranean countries

Draft Only

Maggie Kossida

European Topic Center on Water (ETC/W)



Presentation Outline

A. Overview of the Pilot Activity

- purpose and overall objective
- methodological process and steps
- data collection using the WISE-SoE#3 “WQ Reporting Tool”

B. Water Scarcity & Drought Indicators System (WSDiS)

- principles and objectives
- methodological approach
- Results from the Pilot Activity in the Mediterranean



WS&D Pilot activity - Objectives

Main objective:

Provide a basis for the harmonized assessment of Drought and Water Scarcity conditions in the Mediterranean taking into account both demand, supply and availability issues (i.e. both socioeconomic and environmental dimensions)

- Support the development of common WS&D **indicators** under the DPSIR framework w/proper level of disaggregation
- Identify **data** capabilities, gaps and needs
- Reinforce exchange of **experiences** between the Mediterranean countries
- Support the implementation of Mediteran. Water Strategy (**SWM**)
- **Streamline** with the ongoing EU activities (DG ENV, EEA, JRC) and with the pilot exercise on indicators carried within the CIS EN on WS&D
- Raise public **awareness** on the specific problem



WS&D Pilot activity – Process & Steps

- Identification of pilot Rivers Basins
Sebou RB (Morocco), Litani RB (Lebanon), Cyprus RBD
- Identification of data availability and data collection capabilities
- Data collection using the WISE-SoE#3 WQ Reporting Tool of the EEA (w/some necessary modifications)
- Data QC/QA
- Formulation of indicators based on specific criteria
- Assessment of WS&D conditions
- Conclusion, recommendations



WS&D Pilot activity – Data collection

The WQ Reporting Tool

Water Availability

→ Hydrological balance
→ Additional Water Resources

Water Abstraction

per source (SW, GW)

per provider (PWS vs. self-supply)

Point data:

Streamflow

Reservoir in/outflow

Groundwater levels

Water Use

per sector (NACE)

per provider (PWS vs. self-supply)

large items

Recycled water



The WQ Reporting Tool - views

 WQReportingTool.exe

Data Entry Wizard

Country: GR/Greece

Data type:

- Wells measuring groundwater level
- Regional water balance
- Reservoirs
- Regional water abstraction
- Stations measuring stream flow
- Regional water use
- Stations measuring precipitation

Spatial scale:

- River Basin District (RBD)
- Subunit (SU)
- Country
- Nomenclature of Territorial Units

Region:

Select a region...

- GR14/Aegean Islands
- GR06/Attica
- GR10/Central Macedonia
- GR13/Crete**
- GR11/Eastern Macedonia
- GR03/Eastern Peloponnese
- GR07/Eastern Sterea Ellada
- GR05/Epirus

Select from the drop down list the region for which you will

Water balance

Region: Code: GR10 Name: Central Macedonia

Hydrometeorological parameters: Water storage | Returned water | Reused water | Desalinated water | Other

Clear table

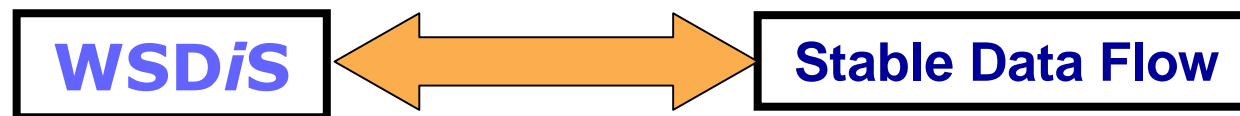
Volume in hm

	Areal Precipitation	Pot. Evapotranspiration	Act. Evapotrans
Month 1 (Jan)			
Month 2 (Feb)			
Month 3 (Mar)			
Month 4 (Apr)			
Month 5 (May)			
Month 6 (Jun)			
Month 7 (Jul)			

Water Scarcity & Drought Indicators System

Objectives of a WSDiS:

- Reliable information (@ appropriate temporal and spatial resolution) required for decision-making
- Supported by data from MS and Stakeholders
- Shared interpretations and definition
- Scientifically sound and representative indicators (avoid long lists)
- Operationally useful indices based on multiple indicators
- A basis for assessment of WS conditions taking into account both *demand, supply* and *availability* issues (i.e. **both socioeconomic and environmental dimensions**)
- Science – Policy Interfacing (SPI)



WSDiS - Methodological approach/steps and progress

Capturing the full problem: Drought and Water Scarcity (environmental and socio-economic dimension) → policy relevance	✓
Selecting the appropriate Framework (DPSIR)	✓
Adopting a sector-based approach (water uses) & Populating each use with indicators (extended sets of indicators)	✓
Criteria development – screening of indicators Pilot RBs testing	In progress
Assessment, selection for the final set of indicators	
Creation of fact sheets and situation assessments	

The **Pilot RBs** are requested to provide as many indicators as possible

- To test the applicability and usefulness of the indicators
- To create pilot Water Scarcity and Drought assessments
- To select the final screened set of indicators



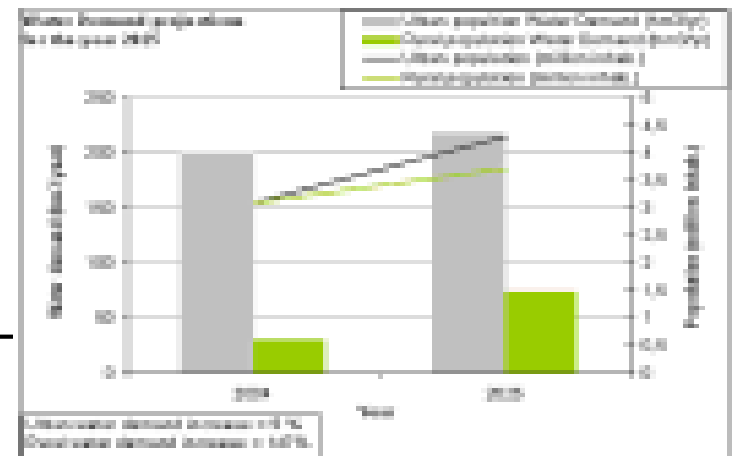
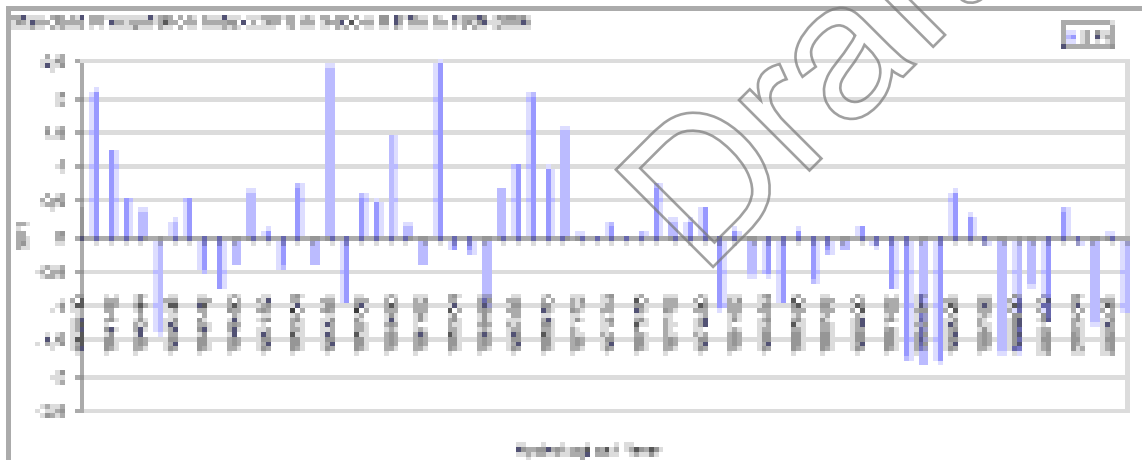
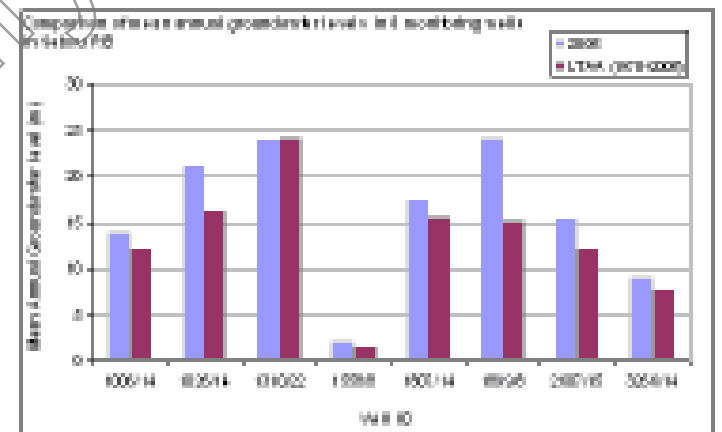
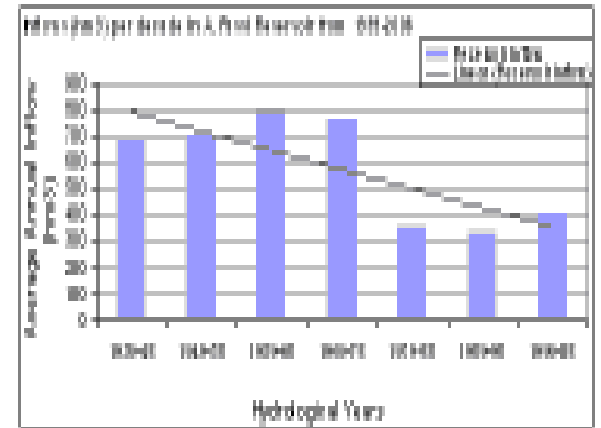
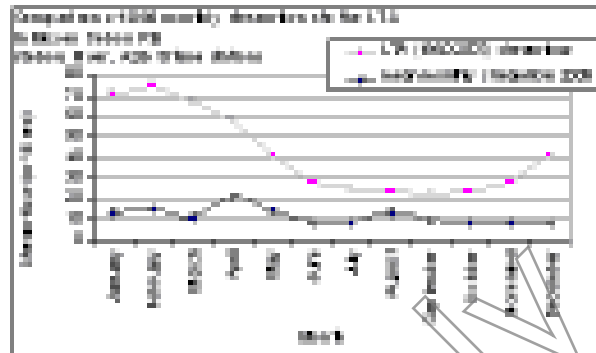
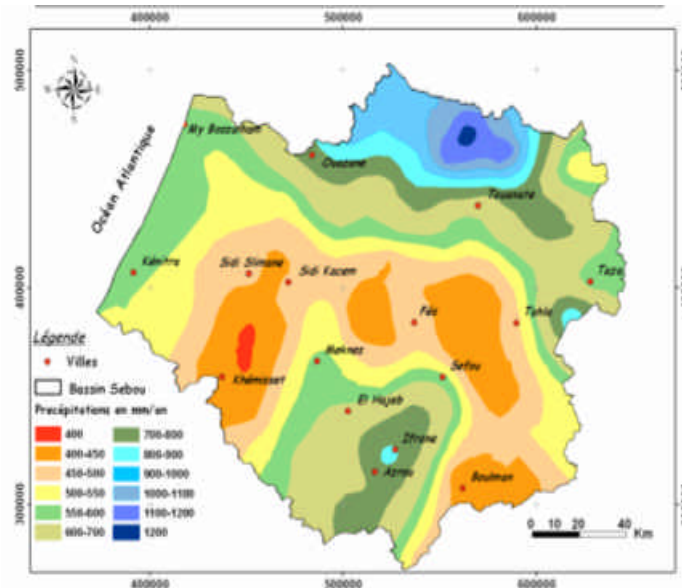
WS&D Indicators: Results in Med. Pilot RBs

SEBOU RB (Morocco)

Indicator	Target	Actual
1. Prevalence of Diabetes Mellitus	10.0%	10.0%
2. Prevalence of Hypertension	15.0%	15.0%
3. Prevalence of Dyslipidemia	20.0%	20.0%
4. Prevalence of Chronic Kidney Disease (CKD)	5.0%	5.0%

Draft Only

SEBOU RB (Morocco)



SEBOU RB (Morocco)

- The selected indicators for the analysis were subject to **data limitations**
- **Hydrometeorological** parameters were easily available for Sebou RB and for a long historical record which allowed a clear overview of the drought evolution in the area.
- **Socio-economic data such as water use** were more difficult to obtain (although do exist), yet based on the limited analysis in this section (reservoir abstractions, hydropower abstraction, water demand projections) it is clear that they are essential for the assessment of water scarcity, since they can allow the identification of the main drivers and pressures of the system which call for proper response measures and facilitate adequate planning.

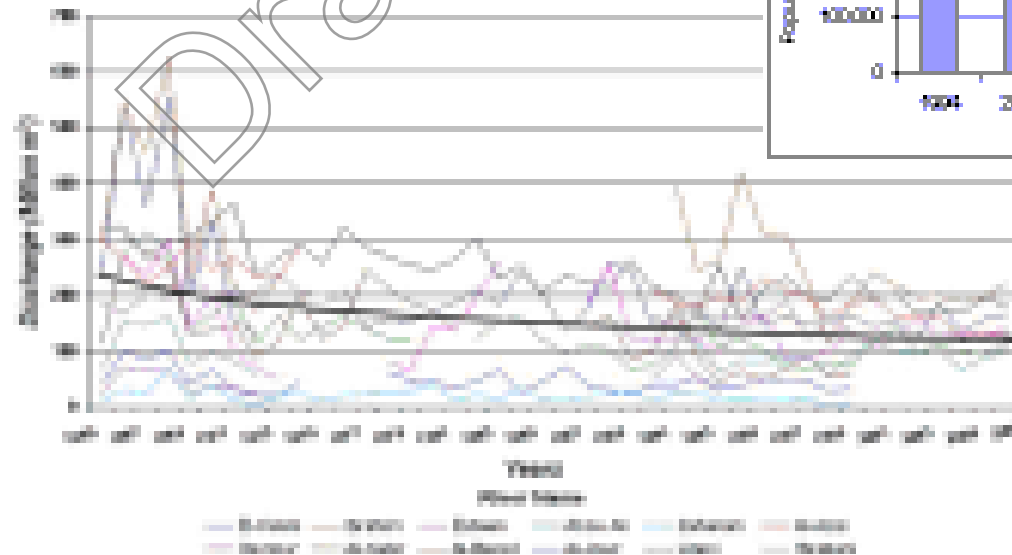
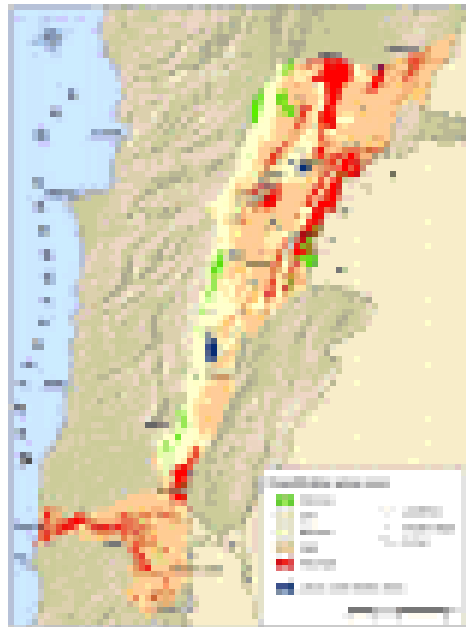
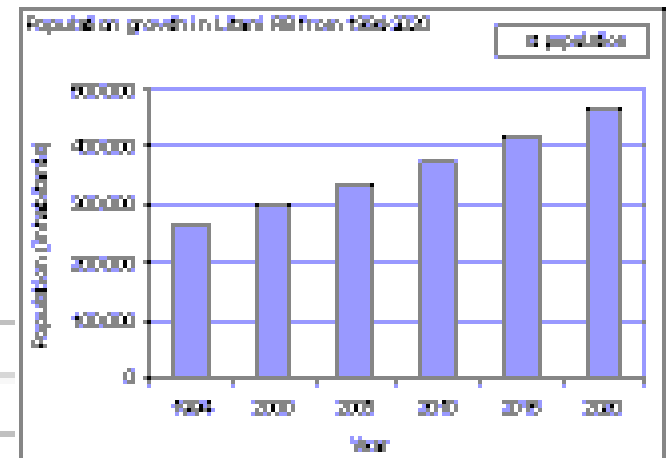
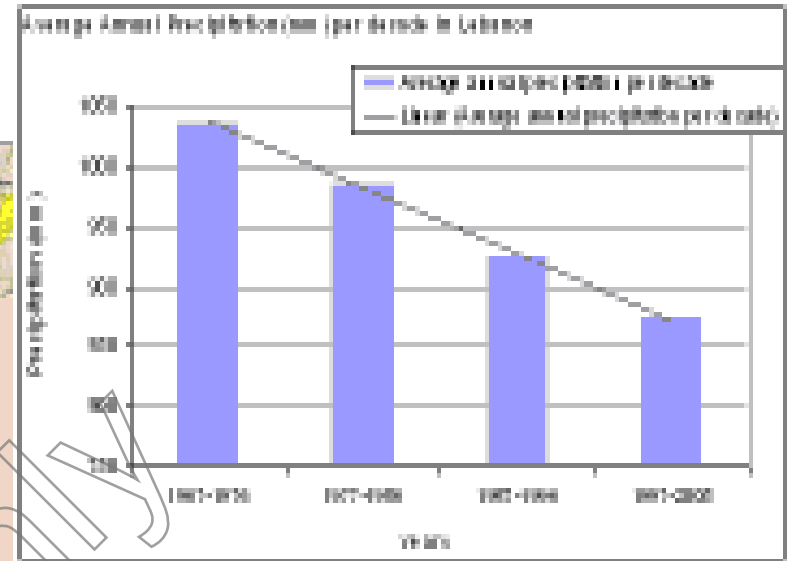
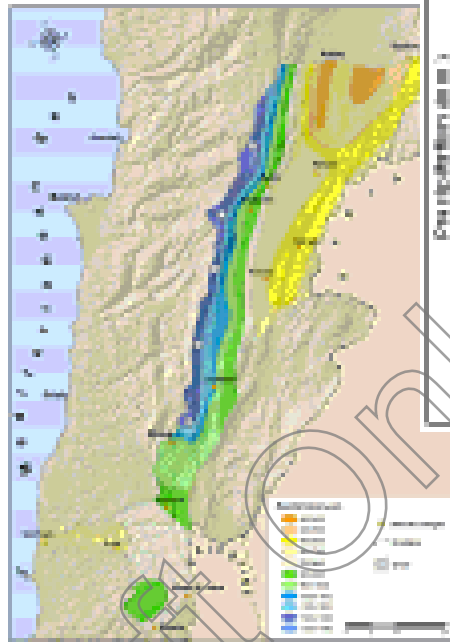
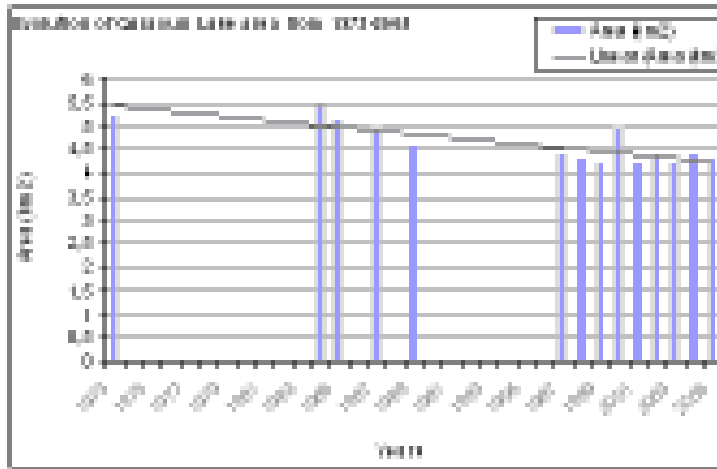


WS&D Indicators: Results in Med. Pilot RBs

LITANI RB (Lebanon)

Indicator	Hydrological years	Comments
Precipitation	1967-2005	Calculation of average annual precipitation per decade in Lebanon to detect trends Comparison of the monthly long-term average precipitation 1975-2006 (LTA) in the 4 eco-climatic zones of <u>Litani RB</u> to assess the spatiotemporal variability
Stream flow	1965-1999	Comparison of annual discharges (hm ³) from 1965-1999
Abstractions from surface water for irrigation	2007-08	Monthly irrigation water abstraction from surface water from the Upper and Lower <u>Litani subcatchments</u> in order to assess the spatiotemporal variability.
Change in Reservoir area	1973-2005 (incomplete time series)	Evolution of <u>Qaraoun Lake</u> area (km ²) from 1973-2005
Reservoir water balance		
Population	1994-2010 and 2015, 2020 projections	Evaluation of the population growth trends
<u>Desertificated</u> areas	prone Map	Evaluation of the <u>areal</u> extend and intensity of desertification risk

LITANI RB (Lebanon)



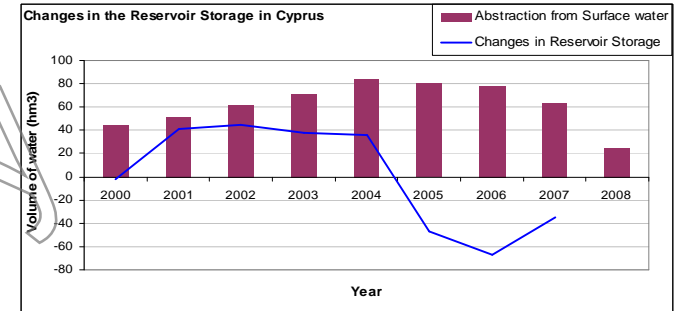
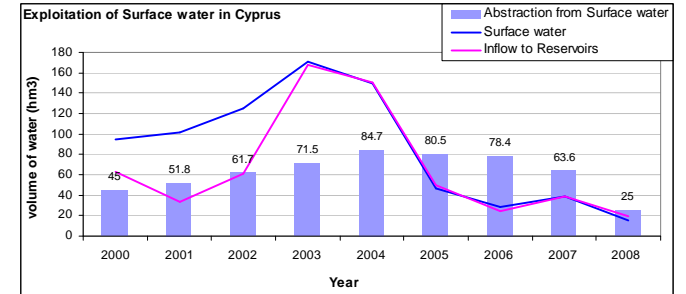
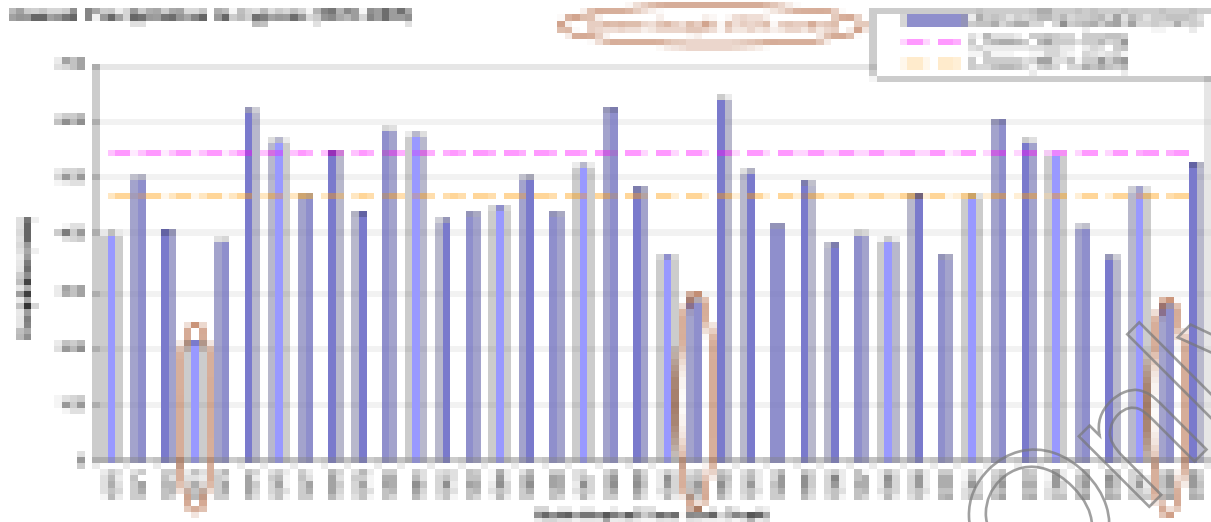
LITANI RB (Lebanon)

- The Litani River Authority (LRA) and the Ministry of Energy and Water were considered to be the two main **sources of data**; however needed data were not release due to **bureaucratic obstacles**
- Some data were not available as they were related to private properties (**private wells**) and there were no official measurements taken
- Some measurements were conducted by private universities or research institutes. However, they are considered as **private data** and are not released.
- Most measurements were done only during research periods and not continued later on, thus there is **no continuity** of measurements taken
- This exercise is very useful for **strategic planning and drought forecasting**, that can be adopted by the Litani River Authority
- The requested data and associated indicators have a **great importance for decision making** and this should be communicated to the authorities

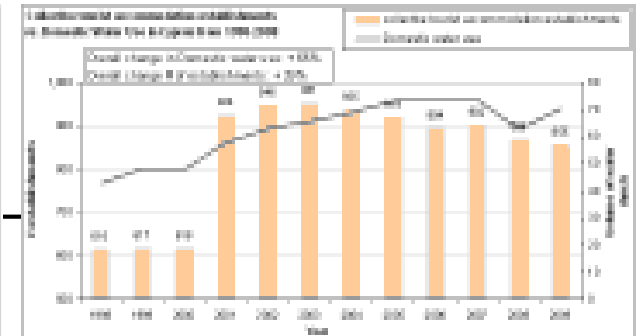
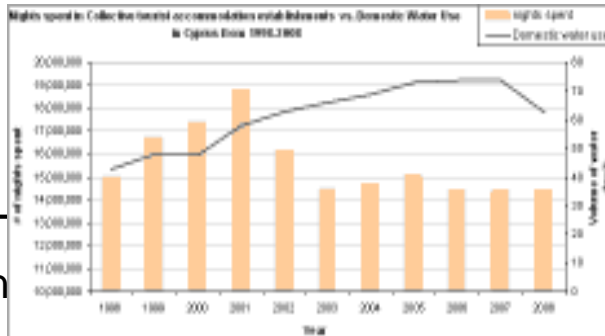
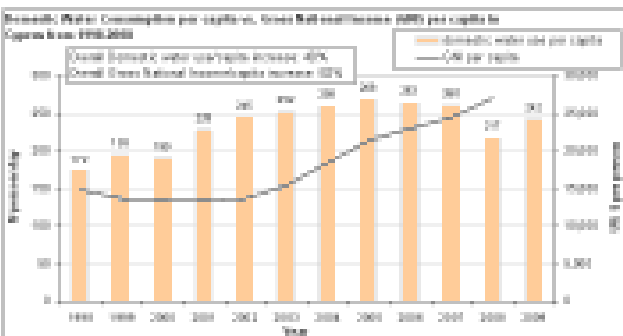
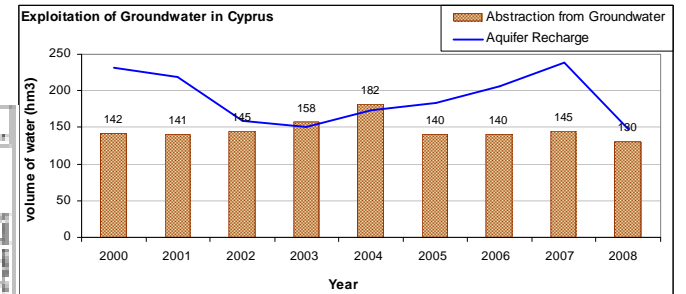
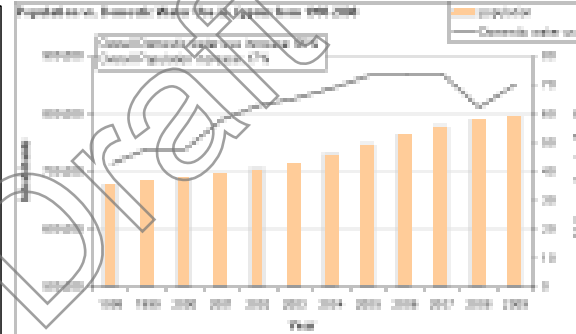
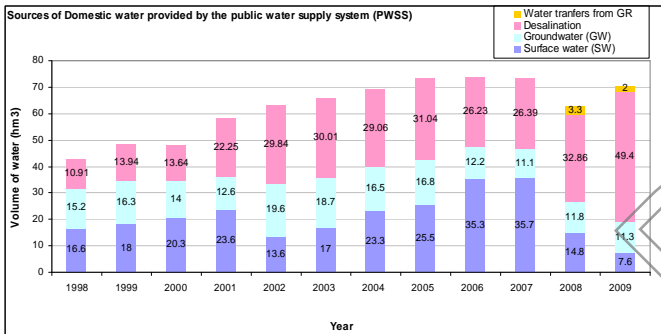


CYPRUS RBD

Annual Per Capita Supply (litres per day)



Domestic Water Use



CYPRUS RBD

- Cyprus RBD has large data availability (water related + socioeconomic)
- Data water use per sector (domestic, agriculture, industry, tourism) and respective yields and income generated from these activities, allow for a comprehensive assessment of all the water users, making possible the identification of the drivers and causes of failure of the system, and thus allowing adequate proactive planning and management to mitigate WS&D impacts
- Indications of miss-management and over exploitation of the of the water resources during the wet years 2000-2004, resulting in severe stress the following dry years.
- Desalinated water substituted natural water resources in domestic water supply, yet the excess water was not saved for the future but used instead in agriculture.



WSD Indicators Pilot activity in Mediterranean

Conclusions

- Water scarcity and drought **monitoring** is an essential element in the decision making process for planning proper measures of prevention and mitigation of the impacts
- Data gaps (some countries not covered, major lacks of information) → **fortify the process of data collection**, as well as the validation and QA, since reliable information is the basis for all assessments
- Using a common tool for data collection ensures **harmonization**, while facilitates exchange (especially in transboundary WR) and common understanding of definition
- Additional work is needed in order to deliver a comprehensive **overview of the extent and impacts** of water scarcity and droughts in the Mediterranean Region



WSD Indicators Pilot activity in Mediterranean

Conclusions (*cont.*)

- Indicators are a powerful and easy to communicate tool yet, for holistic and rounded assessments of WS&D a **combination of indicators** is needed
- Socio-economic indicators are proven very important from a water management and policy aspect as they allow for clear identification of drivers and pressures, they demonstrate strong links between socio-economic trends and water abstraction behavior, they are valuable in the evaluation of the **efficiency and performance** of the system as well as in assessing **vulnerability** and future trends
- Integrate **more pilots** → Develop stakeholder-tailored indices, on the basis of common descriptive indicators. Develop index “products” in stages as diagnostic and forecasting tools.



Thank you!

Draft Only

