



2nd MEDITERRANEAN WATER FORUM

Victor Villegas Auditorium and
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WORKING GROUP ON NEW TECHNOLOGIES: NON CONVENTIONAL WATER RESOURCES AND INFORMATION AND COMMUNICATION TECHNOLOGIES



DOCUMENT FOR THE DEBATE

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FOUR AXES

CHAPTER I: IN A CONTEXT OF WATER SCARCITY

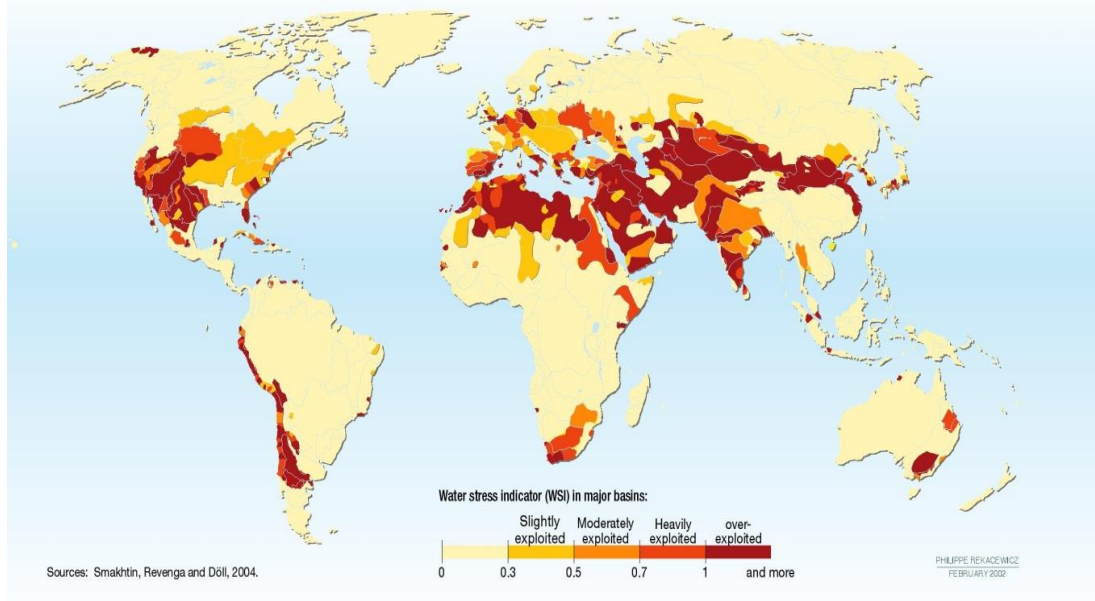
CHAPTER II: WATER DESALINATION IN THE MEDITERRANEAN BASIN

CHAPTER III: WATER REUSE

CHAPTER IV: INFORMATION AND COMMUNICATION TECHNOLOGIES
(ICT) AND NON CONVENTIONAL WATER RESOURCES

IN A CONTEXT OF WATER SCARCITY

- Evidence that increased hydrologic variability and change in climate will continue have a profound impact on the water sector at the global, regional, basin, and local levels.
- Many economies are at risk of significant episodic shocks and worsened chronic water scarcity and security.
- Water and climate change: understanding the risks and making climate-smart investment decisions. (WB)



UN Secretary-General Ban Ki-moon noted that climate change has implications for peace and security, as well as serious implications for the environment, societies and economies

IN A CONTEXT OF WATER SCARCITY

Climate change

	HIGH TEMPERATURE					LOW TEMPERATURE				RAINFALL			
	Summer days	Hot Days	Tropical Nights	Days> 90 quantile	Nights> 90 quantile	Frost Nights	Ice Days	Days< 10 quantile	Relative Var.	Dry Days	Rain 1-10 mm	Max. 3-day Rain	
NW Iberian Peninsula	1	1		1	1	-1		-2		2	-2	3	
South of France (Inland)	3	1	1	2	2	-1		-2	-1	3	-2	3	
Coast Southern France	1		2	2	2	-1		-2	-1	2	-2	3	
Corsica	1	1	2	2	2	-1		-2	-1	2	-1	2	
Sardinia	1	1	2	2	2	-1		-2	-1	2	-1	1	
Sicilia	3	3	3	4	2	-3		-3		3	-1	3	
N. Adriatic	3	3		2	2	-2	-1	-2	-1	3	-2	1	
Central Balkans	3	3		2	2	-2	-1	-2		3	-3		
Central Greece	2	1	2	2	2	-1		-2	-1	2	-2	1	
Peloponese	3	3	3	2	2			-3	-1	2	-1	2	
Crete	3	3	3	3	3			-3	-1	2	-1		
Coastal Turkey	1	2	1	1	2	2	2	-2	-1	2	-1	-1	
Turkey Inland	3	3	1	2	3	-2	-1	-2		3	-2		
Cyprus	1		3	1	1			-3	-1	1	1		
Lebanon/Israel	1	1	3	3	3	-1		-3	(0)	1	-1		
Nile Delta													
E. Egypt	3	1	3	2	3			-3	(0)		-1		
E. Lybia	3		3	2	3			-3					
W. Lybia	3	1	3	2	3			-3	-3		-1		
E. Maghreb	2	3	3	2	2	-2		-2	-3	2	-2		
W. Maghreb	3	3	3	2	2	-2		-2		2	-2	-1	
South Iberian Peninsula	2	2	2	2	2	-1		-2	-1	2	-2		
Central Spain	3	3	1	2	2	-2		-2	-1	3	-2	-1	

- Large Change = at least 1 mth duration
- Moderate change = 2-3 wks duration
- Small Change = 1 week duration
- No Change



IN A CONTEXT OF WATER SCARCITY PROPOSAL FOR ACTIONS

- I. Adopting general policies on water resources reassignment under criteria of sustainable development in order to overcome parochial anachronisms.

- II. Acting on continental water resources by means of new facilities:
 - Modernization of irrigation systems.
 - Conjunctive use of superficial and underground waters.
 - Aquifers recharge
 - Environmental regeneration of ecosystems.

- III. Generating new offer by means of non-conventional resources:
 - Wastewater treatment and re-use
 - Desalination
 - Traditional rain harvesting
 - Others

- IV. Acting on demand:
 - Infrastructure renovation to improve the efficiency.
 - Demand management as a complex set of combined policies

WATER DESALINATION IN THE MEDITERRANEAN BASIN

FIGURE 1
Water desalinated distribution according water feed origin in Mediterranean Region

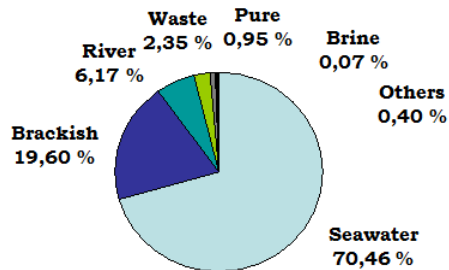
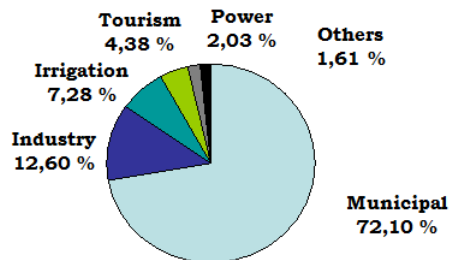
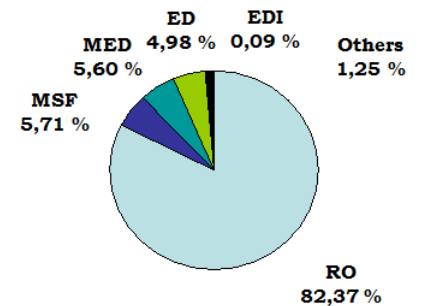


FIGURE 2
Distribution of desalinated water uses in the Mediterranean Region



Country	Production Capacity (m ³ /day)
Morocco	85.471
Algeria	1.700.046
Tunisia	93.276
Lybia	809.875
Egipt	683.277
Israel	1.169.474
Jordan	248.855
Lebanon	29.125
Syria	13.981
Turkey	468.749
Greece	149.250
Cyprus	228,853
Malta	251.151
Italy	698.891
France	233.104
Spain	4.769.582
Portugal	17.087
TOTAL	11.650.047

FIGURE 3
Frequency of water desalination methods in the Mediterranean Region



WATER DESALINATION IN THE MEDITERRANEAN BASIN PROPOSAL FOR RECOMMENDATIONS

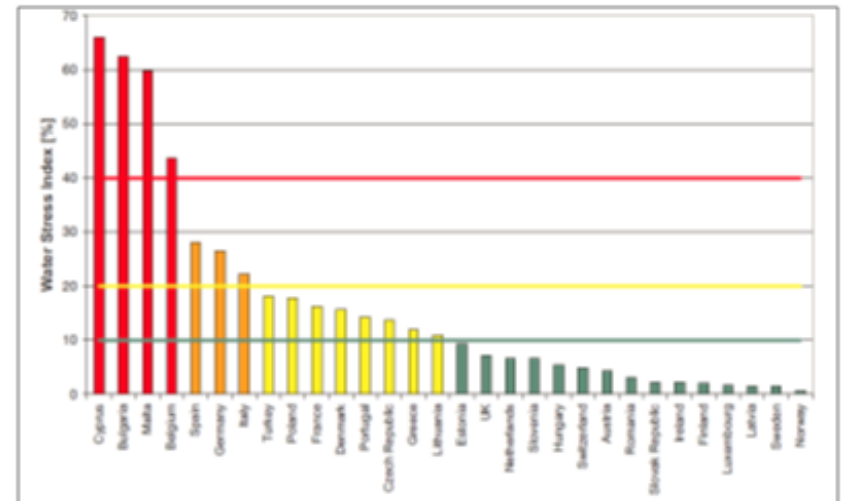
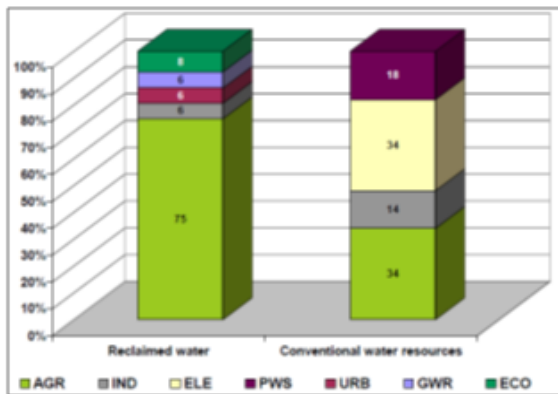
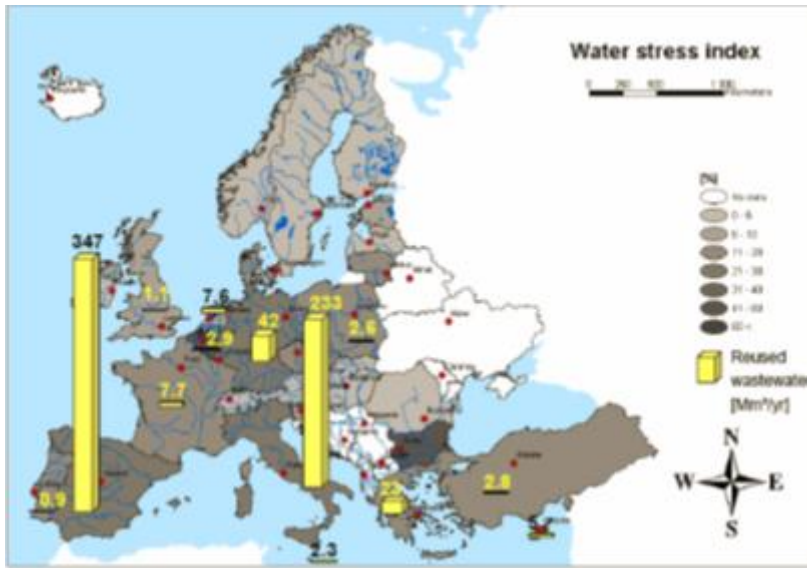
- Rec. 1: Desalination policies must consider that water and sanitation is a human right adopted by the General Assembly in July 2010.
- Rec. 2: New resources from water desalination should be conceived as a complement into a clever combination of measures for water management. In principle, desalination should be planned and designed within an IWRM context to sustain socio-economic development of communities. Desalination should not be considered as a mere non-conventional water resource, but as a community development project.
- Rec. 3: Water desalination projects must be conceived, developed and put on line taking into account sustainable development criteria, encouraging mitigation of Green-House Gases emissions.
- Rec. 4: There is an urgent necessity to develop regulation and establish criteria for brine discharges.
- Rec. 5: It is necessary to join efforts of on research, development and interchange knowledge about water desalination. For that will be useful establish a Mediterranean Observatory of Water Desalination participated, initially by the countries of the Mediterranean basin and hosted by Mediterranean Water Institute.
- Rec. 6: Combination of renewable energies and desalination needs to adapt regulations and policies in order to cover present difficulties. Any case, parallel development promise potential improvements.

WATER DESALINATION IN THE MEDITERRANEAN BASIN PROPOSAL FOR RECOMMENDATIONS (CONITNUED)

Rec. 7: New imaginative but physically reliable procedures to provide fresh water to meet humankind needs must to be continuously under research. RO is near to reach its maximum performance in terms of efficiency and no relevant improvement in energy consumption should be expected.

Rec. 8: It is necessary that environmental assessment of water desalting projects contemplate conservation and good status of Mediterranean Sea.

WATER REUSE



- Definition of water quality levels for each one of the possible uses of the reclaimed water.
 - Identification of the treatment processes that can be applied to reach the water quality levels for each use
- Reclaimed wastewater reuse requires:
- Transportation to where is needed.
 - Storage and regulation.
 - Minimization of risks through the implementation of good practice regulations.

WATER REUSE RECOMMENDATIONS

Rec. 1: Before reuse, a health and ecological **risk assessment** have to be performed, followed by an adequate health and ecological **risk management**. Health risk management involves the development of **standards and guidelines** to determine what management or technology is necessary to limit the risk to an acceptable level.

Rec. 2: Treated wastewater has to undergo additional or complementary treatments in order to make this water suitable for its subsequent use through a **multi barrier approach**. The goal of this approach is to cut off the flow of pathogens and chemicals from the environment (wastewater, soil, crops) to workers and final consumers.

Rec. 3: When discussing treatment for reuse, the key objective is to achieve a quality of reclaimed water which is appropriate for the intended use and is protective of human health and the environment. Regardless of the reclaimed water use, the most critical treatment objective is **pathogen inactivation**.

Rec. 4: It is necessary a **legal framework** for each country which establishes the quality criteria for the reuse of reclaimed water according to the use is intended for, in order to preserve health and the natural environment.

WATER REUSE RECOMMENDATIONS CONTINUED

Rec. 5: Wastewater collection and treatment must be incorporated within the **regional planning** to ensure long-term sustainability. The most important criteria to achieve sustainability are: affordability, operability, reliability, environmental soundness and suitability in the Mediterranean climate.

INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) AND NON CONVENTIONAL WATER RESOURCES



- ❖ ICT AND WATER RESOURCES MANAGEMENT
- ❖ INFORMATION AND PUBLIC PARTICIPATION IN INTEGRATED WATER MANAGEMENT (IWRM)
- ❖ STARTING e-GOVERNANCE

INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) AND NON CONVENTIONAL WATER RESOURCES CONCLUSIONS

Concl. 1: ICT's are necessities to facing actual challenges of sustainable development. ICT's are fundamental to check day by day climatic change manifestations and for its rational interpretation.

Concl. 2: The application of ICT's to integrated water management will have an essential transcendence to realize human right to water and sanitation.

Concl. 3: ICT's applied to e-governance will provide the most direct way for governments to be in touch with their populations. ICT's are anteroom of water e-governance.

Concl. 4: ICT's are essential to realize in the water sector the right of access to public information, to participate in the public decisions and to access to the justice.

**INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) AND
NON CONVENTIONAL WATER RESOURCES
CONCLUSSIONS (CONTINUED)**

Concl. 5: ICT's application to improvement and modernization of irrigated area will support largely increase of irrigation water efficiency with significant reduction of water needs. As well to the management of hydric resources in large reservoirs, water distribution in mayor networks and urban supply services.

Concl. 6: ICT's plays a fundamental role to evaluate in real time environmental impacts of desalination activities. The same transcendence is predicted on management of its energetic demands.

Concl. 7: ICT's provides indispensable tools to water reuse management.



Mediterranean Water Forum

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THANKS