

Water cooperation

Water management Non-Revenue Water Reduction Management -(Drought climates and the case of Nicosia, Cyprus)

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Presentation outline

- Water scarcity considerations and Identification of the environment
- Water efficiency and Non-Revenue Water
- Strategic approach and Non-Revenue analysis
- Importance of Non-Revenue Water
- Main pillars of actions
- Decision Support System
- Guiding issues/actions
- Benefits

Water scarcity - Drought climates

Considerations

- The lack of precipitation in many countries produces a very demanding budget for water supply efficiency.
- Water is a necessity for health and life Need to keep attention about the consequences due to lack of water.
- Economic crisis increases the need to take care.
- Economic, Social, environmental issue.
- The role of Civil Engineers.

Problem Identification and the environment

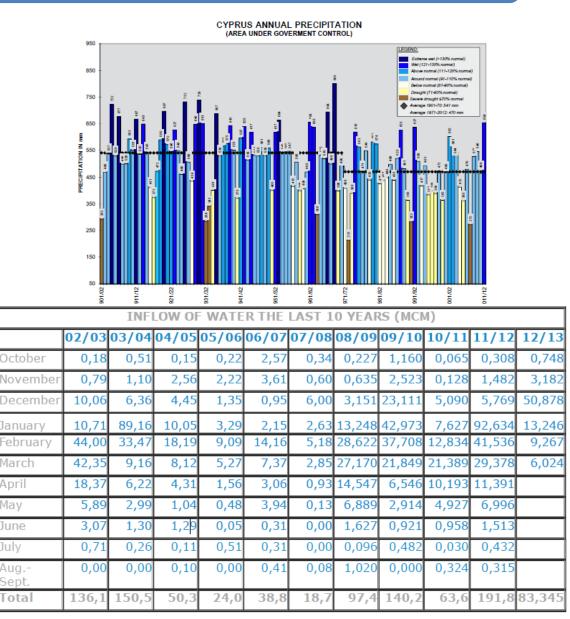
Eg Cyprus

- Subtropical climate of Semi-arid type
- Very mild winters warm to hot summers. Rain occurs mainly in winter, with 8 months summer being generally dry.
- The warmest climate (and warmest winters) in the Mediterranean part of the European Union.
- Average annual temperature (coast) 24
 °C day 14 °C night.
- Middle of summer (July August) is hot
 35 °C day and 23 °C night.



Water supply environment eg Cyprus

- Cyprus is suffering from an ongoing shortage of water. The country relied heavily on rain to provide household water and for many years now, with very few exceptions, the average annual rainfall seems to be decreasing.
- Reservoirs keep water, however, demand has increased annually – a result of local population growth, foreigners relocating to Cyprus and the number of visiting tourists – while rain water supply has fallen.
- 108 dams Total water storage capacity 300 Mm³. Dams was the principal source of water.
- Water desalination plants have been gradually constructed, investing highly, in order to deal with the prolonged drought. production of 200.000m³ (?) daily.
- Efforts to raise public awareness.
- Encourage domestic water users to act more responsibly for the conservation of this increasingly scarce commodity.
- Water is precious



Water shortage – Import water

Year 2008

stock.com · Acozoo



2008-2009: Cyprus, Nicosia

The scarcity of water lead to the application of intermittent supply. Supply 12hrs/48hrs **Intermittent supply** and 3d party activities lead to

- Increase of Non Revenue water.
- High budget deficits.

2012:

Cost of production (Episkopi Desalination) very high (85€sents/m3) compared to the current price WBN buys water from the WDD (77 €sents/m3) Need to Manage efficiently and effectively

Water availability and the Non-Revenue Water issue

• Do we use the available water efficiently?

What is NRW?

- NRW: The water supplied that gives "no revenue".
 = Actual Supply registered consumption.
- Do we know it?
- How accurate can we be? (accuracy of instruments)
- Completeness (quantity & quality) of data.

⇒ Need for a strategy to estimate NRW

Strategic approach

Basis of actions followed:

IWA - Water loss task force and Waterloss-Med program - guiding lines. www.waterloss-project.eu (Partners: Greece, France, Cyprus, Spain, Italy, Slovenia)

Examine the cause and the effect of each Non-Revenue water component



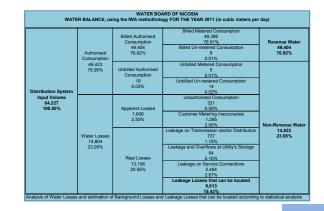
Pilot areas of WATERLOSS project



Components of NRW

- Unbilled authorised consumption
- Apparent losses
- Real Losses

Water Balance – average daily 2011



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Water Balance – year 2011

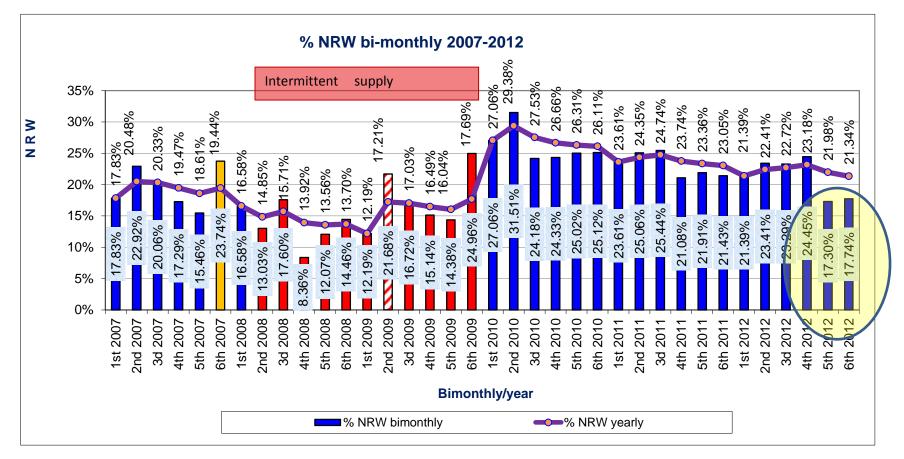
WATER BOARD OF NICOSIA WATER BALANCE, using the IWA methothology FOR THE YEAR 2011 (in cubic meters)

9% - RL2.109.844m3		Authorised	Billed Authorised Consumption 18,032,374 76.92%	Billed Metered Consumption 18,029,434 76.91% Billed Un-metered Consumption 2,940 0.01%	Revenue Water 18,032,374 76.92%			
	Distribution System	18,039,427 76.95%	Unbilled Authorised Consumption 7,053 0.03%	Unbilled Metered Consumption 1,835 0.01% Unbilled Un-metered Consumption 5,218 0.02%				
Data reliability	Input Volume 23,442,714 100.00%	Water Losses 5,403,288 23.05%	Apparent Losses 586,068 2.50%	Unauthorised Consumption 117,214 0.50% Customer Metering Inaceuracies 468,854 2.00%	Non-Revenue Water 5,410,341 23.08%			
8,43% - RL3.176.487m3				Leakage on Transmission and/or Distribution 268,846 1.15% Leakage and Overflows at Utility's Storage				
RL3.170.4871113			Real Losses 4,817,220 20.55%	23,443 0.10% Leakage on Service Connections 906,565 3.87%				
ΣΥΜΒΟΥΛΙΟ ΥΔΑΤΟΠΡΟΜΗΘΕΙΑΣ ΛΕΥΚΩΣΙΑΣ	Analysis of Water Losses	and estimation of	Background Losses and	Leakage Losses that can be located 3,618,366 15.43% d Leakage Losses that can be located according	to statistical analysis			

Importance of NRW-Reduction

- NRW can be considered as a source of water supply.
- NRW varies from city to city.
- World Bank study- 2006: Developing countries
 - Loss of water 45M cubic meters/day
 - Not paid water 35 M cubic meters/day
 - Theft
 - Corruption
 - Poor metering
 - \Rightarrow Water needs for Cyprus for one year

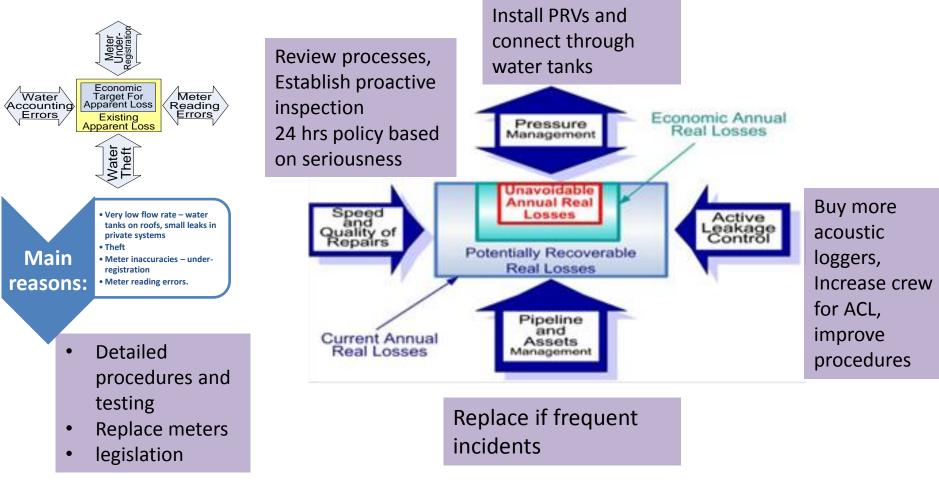
Progress of NRW for the Water Board of Nicosia 2007-2012



On 1/5/09 release of measures: 14hrsX3 days/week+10hrs Sunday c/o availability



Main pillars of action – Non revenue water management. Apparent and Real Losses



After classifying main NRW components consider methods of improvement

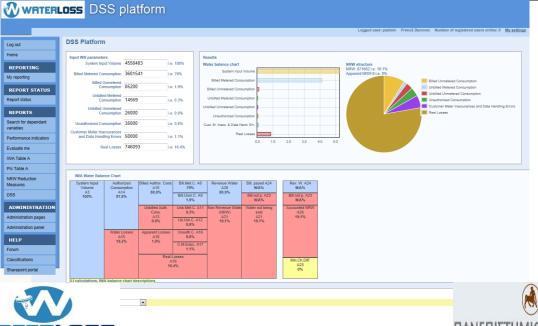
WATERLOSS Decision Support System

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Home	Fi10 Electriacl enegry costs Composition of running costs	G13 G13 Leasing and rentals G13 Leasing and rentals [EUR]
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Search for performance indicators & related parameters

WRITERLOSS DSS platform



Procedure for assessment

Results including the Water Balance by IWA.

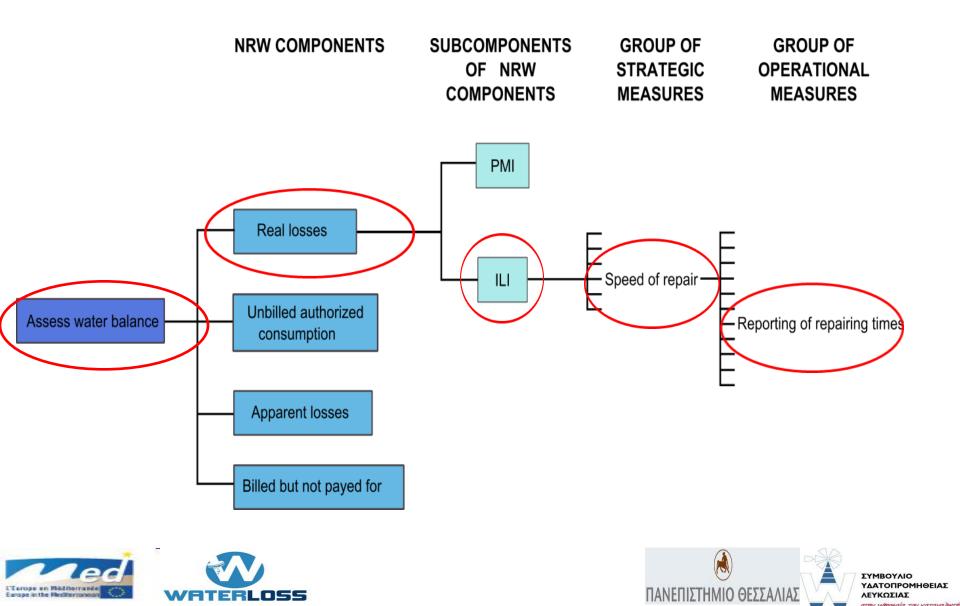
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Components of NRW and strategic and operational measures for N<u>RW-reduction</u>



Benefits

- Satisfied customers/citizens.
- Less energy consumption.
- Less carbon footprint from Water supply chain.
- Less Non-Revenue Water.
- More just pricing.
- Better image.
- Better knowledge of the system.
- Less system input volume.
- Less # leaks recorded.
- Decrease in overtime work.
- Better system operation.
- Decrease apparent losses, etc



Conclusions

- Utilities have to **manage effectively** to avoid losses either in productivity or due to waste of Water. Quality management is essential.
- **Technology** can be used to upgrade the management of Non-revenue water.
- Water loss can be considered as the biggest bad consumer of water.
- Keep and assess critical variables and indicators related to the economics of water.
- Collection of data and assessment must be continuous. A Decision Support System/tool (DSS) can help simplifying processes.
- Continuously **improve the infrastructure and the processes**. It worth.
- Implementation and **utilization of experience gained.** Expand the benefits and lessons learned to other systems.
- **Opportunity for Civil Engineers**







Thank you for your attention

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