

INTERMITTENT WATER SUPPLY: Ten Reasons why it should be Avoided

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This presentation was made by Bambos Charalambous at the Arab Water Week and Exhibition 'Shaping our Water Future' at The Dead Sea, Jordan in March 2017.

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18 August 2017, transferred to LEAKSSuite Library 21st August 2019

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INTERMITTENT WATER SUPPLY

Definition:

Intermittent Water Supply (IWS) refers to piped water supply service that is available to consumers less than 24 hours per day (Related terms often used: irregular, unreliable, inadequate, poor supply...)

Frequency of Intermittency:

- Regular – Rationing schedule daily / every 2 days / etc..
- Seasonal due to increase in demand which could not be met (tourism, hot weather, etc.)
- Occasional related to source issues (lower yields / quality deterioration / eternal pollution)

Does not relate to temporary cut-offs due to fixing of breaks

MAJOR CAUSES OF IWS

- **Source scarcity** - insufficient quantity at the source – exacerbated by climate change
- **Growing demand-supply** imbalance
- **Poor management of systems** - high leakage & wastage, poor O & M practices, governance issues....
- **Ageing infrastructure** with high frequency of water mains failure
- **Energy-Intermittent** power supply



IWS – GLOBAL ISSUE

- **MIDDLE EAST AND NORTH AFRICA:** For about 75% of the population the supply is often intermittent
- **AFRICA¹:** It is estimated that about 30% of urban water supplies operate intermittently
- **ASIA¹:** Approximately 50% of the systems operate intermittent systems (**SOUTH ASIA:** practically all cities operate intermittently – this is even considered standard water supply practice ...)
- **LATIN AMERICA AND CARIBBEAN²:** Over 60% of the population receive rationed water supply

Source: 1- WHO & UNICEF

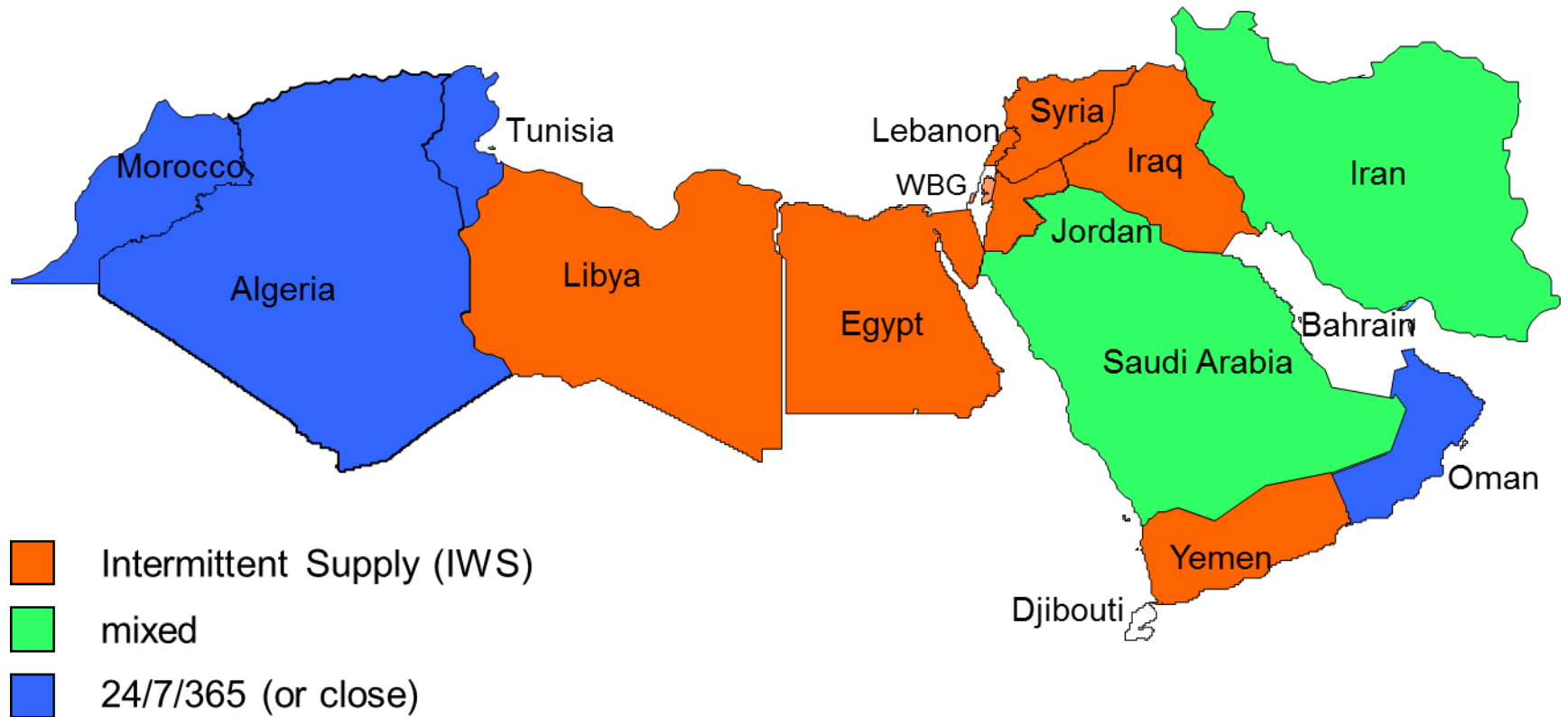
2- PAHO & WHO

IWS – GLOBAL ISSUE

Description	Population (billion)
Worldwide population	7.3
Population in High Income countries (with piped water on premises)	0.9
Population in Low and Middle Income countries	6.4
Population with piped water on premises in Low and Middle Income countries	3.2
Population with piped water on premises affected by IWS in Low and Middle Income countries	1.3

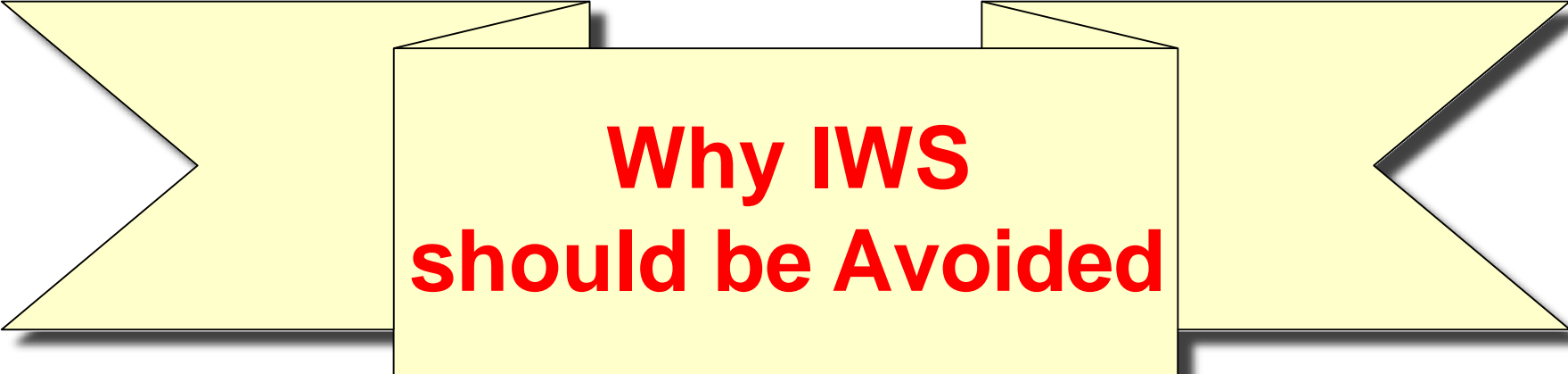
Source: B. Charalambous et al, “Dealing With The Complex Interrelation Of Intermittent Supply And Water Losses” IWAP 2017, ISBN 9781780407067

MENA REGION – CONTINUITY OF SUPPLY



MAIN IMPLICATIONS OF IWS

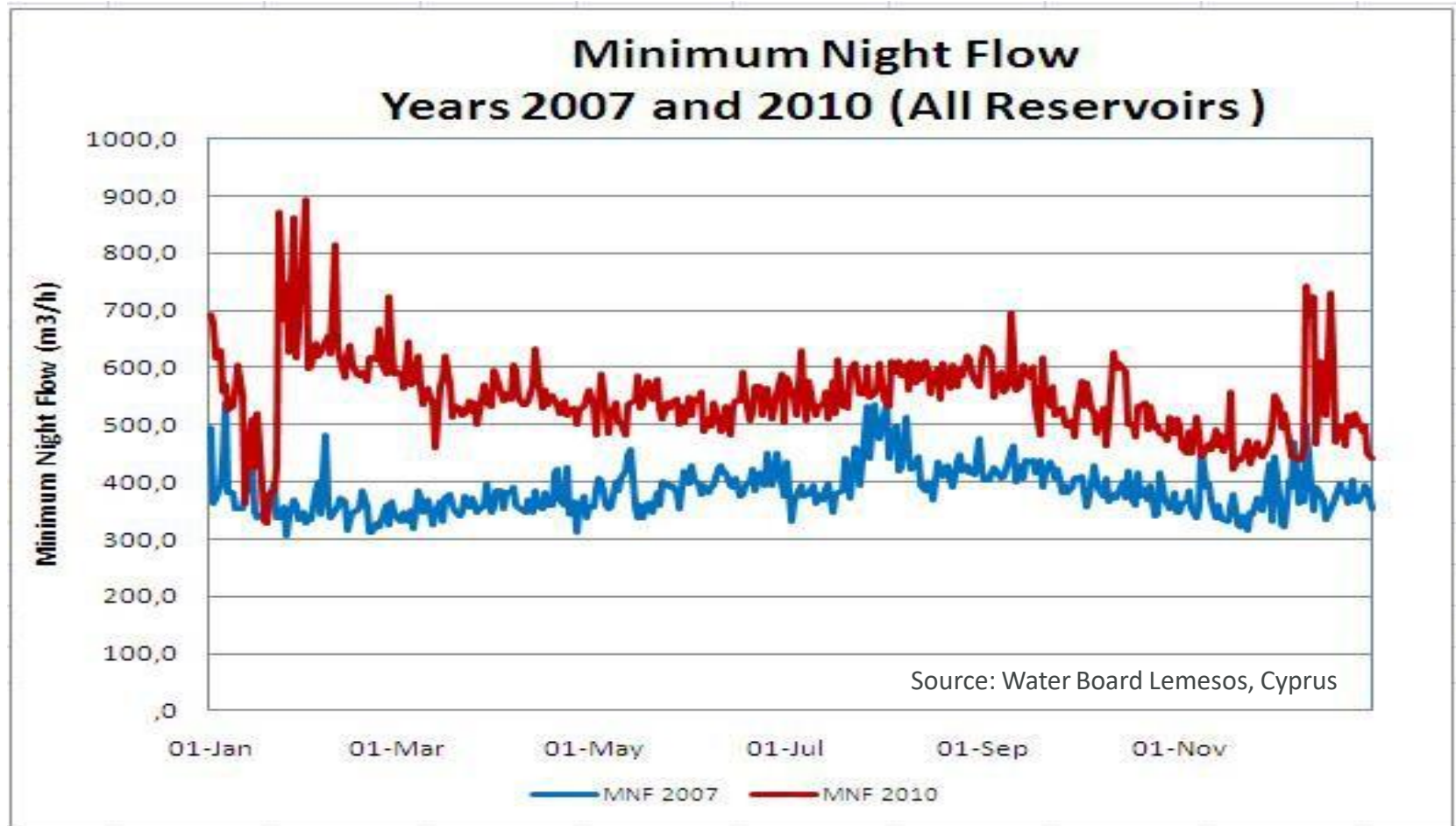
- Meter malfunctioning and accelerated wear and tear
- Customer meters may over-read (due to air)
- Low supply pressures, particularly in high ground areas
- Water quality deterioration
- Customer dissatisfaction / complaints
- Water Wastage – taps left open, tanks overflowing
- High coping costs for customers (tanks, pumps, etc.)
- Increased main and service connection breaks



Why IWS should be Avoided

Source: B. Charalambous et al, "Dealing With The Complex Interrelation Of Intermittent Supply And Water Losses" IWAP 2017, ISBN 9781780407067

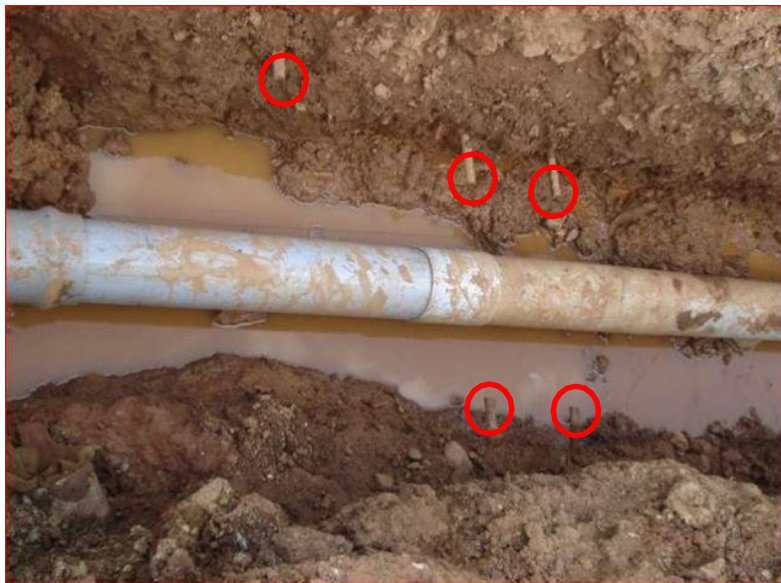
1. INCREASE IN LEAKAGE



May seem to be a water saving measure however in the long run **greater quantities of water will be lost through increased leakage** and wastage compared to the quantities that may initially be saved

2. NETWORK DETERIORATION

Has a detrimental effect on the structural integrity of the distribution network thus leading to quicker asset deterioration



3. PIPE AND SERVICE CONNECTION BREAKS

20 DMAs: 373Km: 45%total

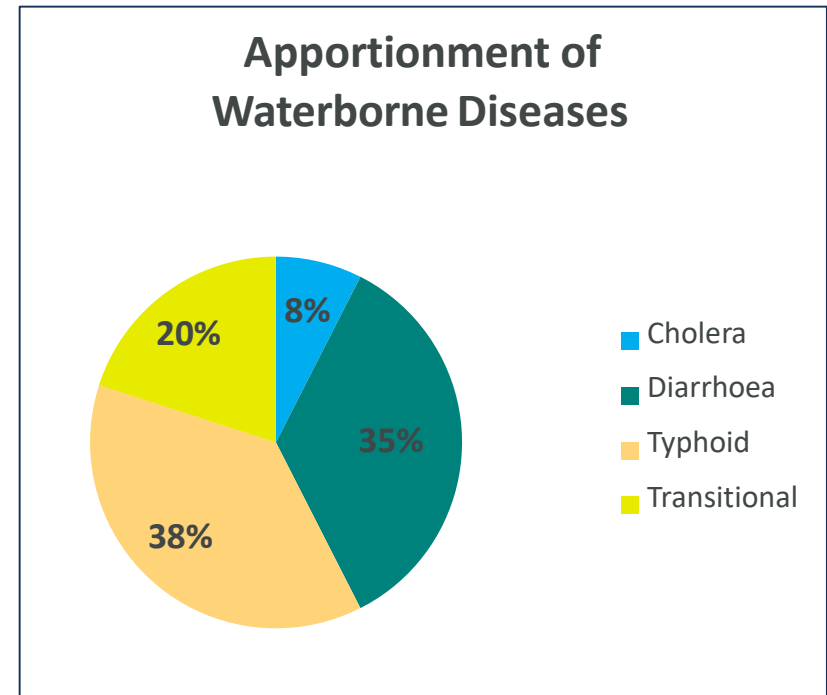
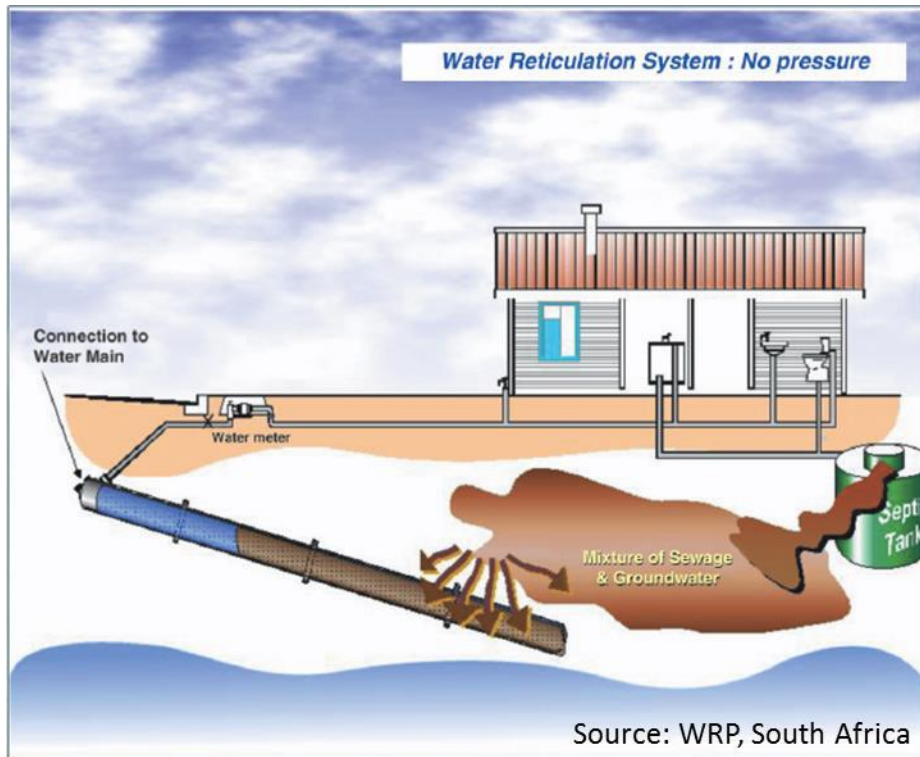
2008 – 2009 Intermittent Water Supply (IWS)

Description	Number of reported breaks		
	2007 Before IWS	2010 After IWS	% increase
Mains	14 / 100km	42 / 100km	200
Service connections	15 / 1000 connections	30 / 1000 connections	100

Source: Water Board Lemesos, Cyprus

Results in a **substantial increase in the number of pipe bursts** in mains and service connections thus increased leakage.

4. WATER QUALITY PROBLEMS-HEALTH HAZARD



Poor public service delivery, reflected especially in significant water and electricity shortages, are binding constraints on the population's quality of life. Safe drinking water is of crucial importance to the preservation of human health, especially among children

5. ADVERSE FINANCIAL EFFECT

Cost to the utility for the 2 years (2008 – 2009) of Intermittent Supply :

Loss of revenue:

➤ reduction in sales – cost of water saved: € 300.000

Additional operational expenses:

➤ staff overtime for opening / closing valves: € 365.000

➤ repairing additional reported breaks: € 325.000

€ 990.000

Additional cost to the utility after Continuous Supply was established:

➤ Additional leakage(2010 – 2011): € 1.325.000

➤ Estimated cost of locating leaks: € 150.000

➤ Estimated cost of repairing leaks: € 135.000

€ 1.610.000

Source: Water Board Lemesos, Cyprus

Has an adverse financial effect on the water utility resulting in lower water sales and higher costs due to additional O&M activities needed to run IWS.

6. CUSTOMER DISSATISFACTION - POOR LEVEL OF SERVICE

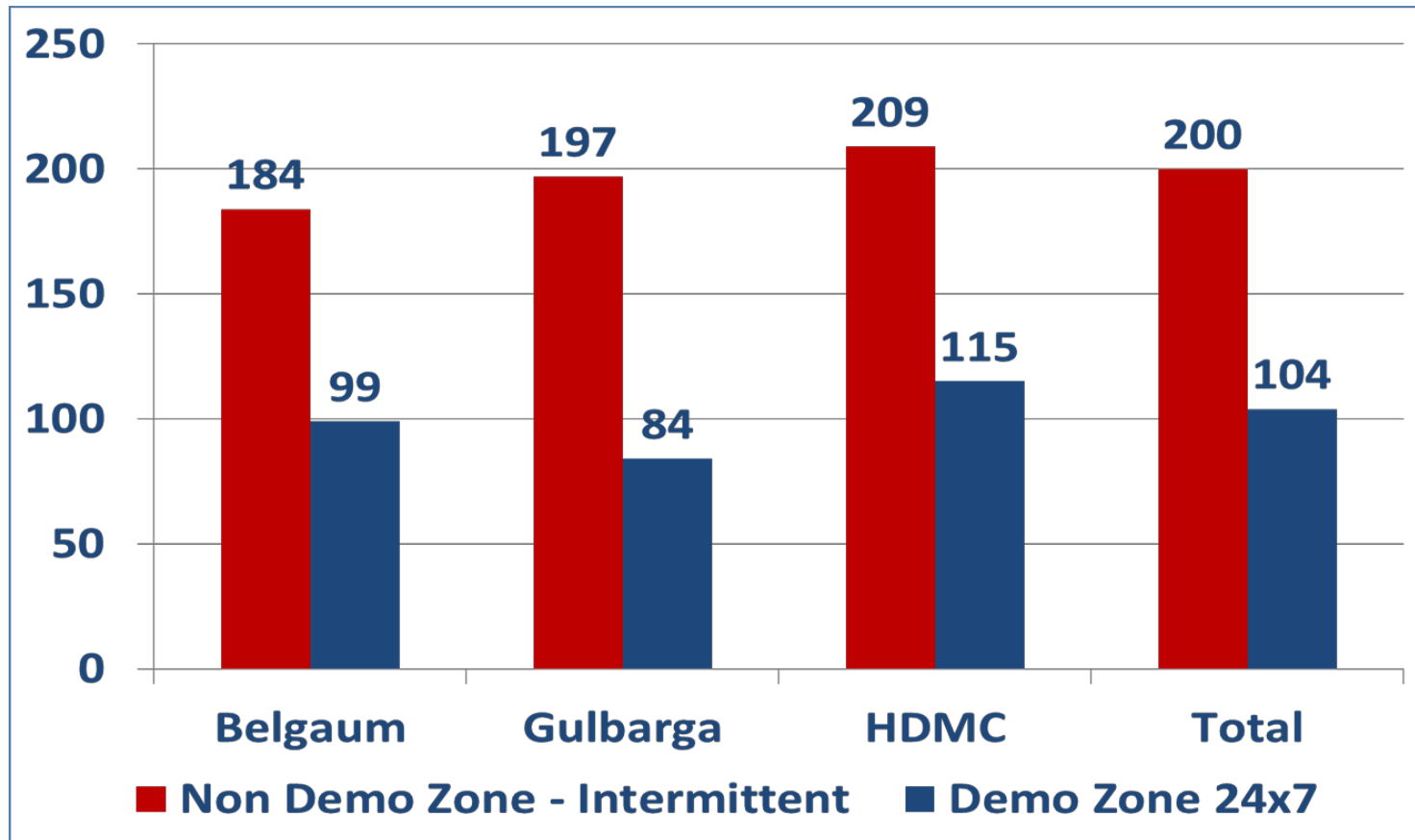
- Customer meters over-register (due to air)
- Low supply pressures, particularly in high ground areas
- Water quality deterioration and health issues
- High coping costs for customers (tanks, pumps, etc.)



7. FINANCIAL BURDEN ON THE CONSUMERS



8. NOT AN EFFECTIVE WATER DEMAND MANAGEMENT MEASURE



Water distribution input including losses in litres per capita per day

9. NOT AN EFFECTIVE INTERVENTION

Year	System Input Volume	Customer Consumption
2007 Before Intermittent Supply	0% (base line)	0% (base line)
2008 Intermittent Supply	-17,5%	-9,2%
2009 Intermittent Supply	-9,1%	-8,9%
2010 After Intermittent Supply	+12,8%	-1,2%

Source: Water Board Lemesos, Cyprus

Is not considered an appropriate intervention to drought / water shortage

10. TAKES “1 HOUR” TO INTRODUCE BUT YEARS TO REVERSE.

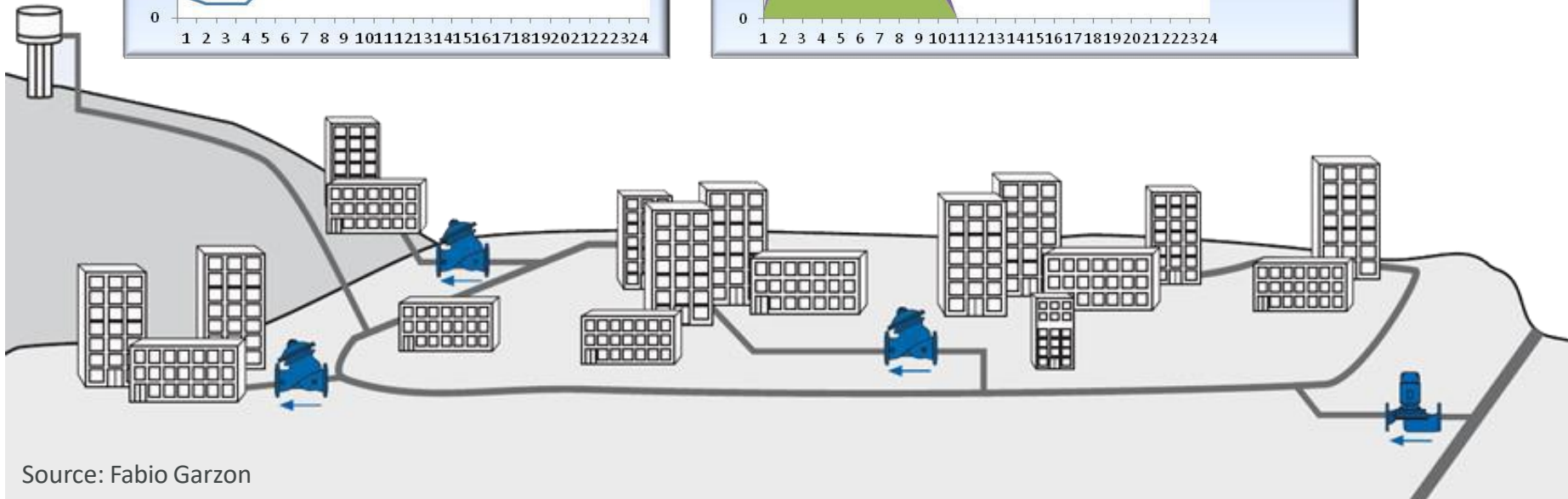
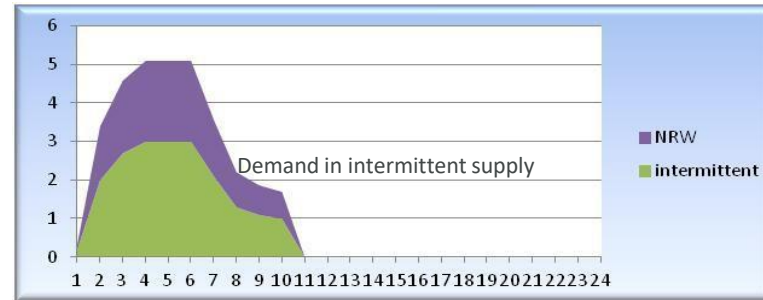


While it is relatively easy to turn a 24x7 system to an intermittent supply, it is **extremely difficult to do the opposite**

BARRIERS TO CONTINUOUS SUPPLY

- Limited water quantities - source limitations
- Reluctance to change – we are ok as we are
- Poor or non-existent planning
- Insufficient funding and policy decisions
- No penalties for poor service
- Lack of water regulations
- There is no top-down initiative
- There is no bottom-up pressure
- Water is a state / municipal matter
- Mimicking 24x7 is OK for some (decision makers...)
- Poor awareness of options

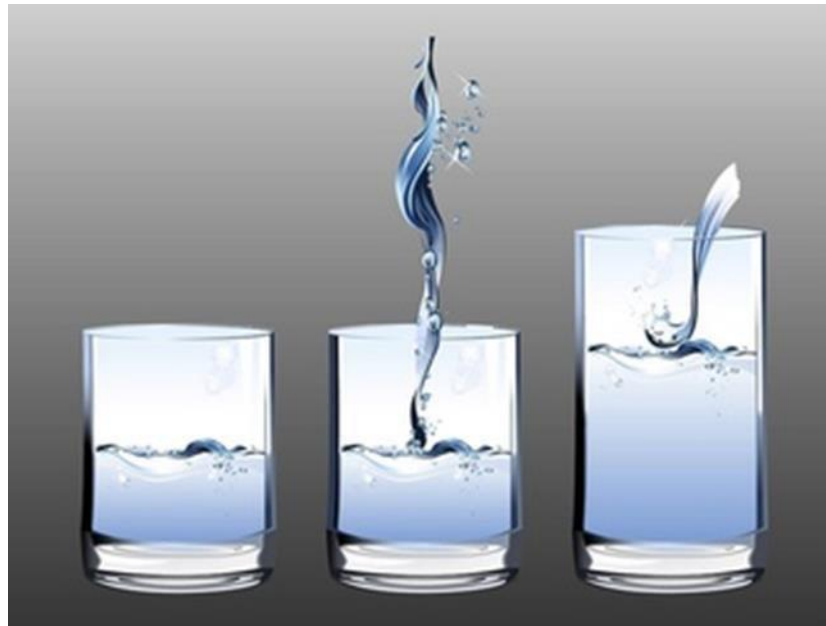
IMPROVE IWS CONDITIONS – TRUNK / DISTRIBUTION MAINS PRESSURIZED 24/7



Source: Fabio Garzon

- Eliminate pipe refill time
- Reduce operational costs
- Reduce infrastructure damage

THANK YOU



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