Drought Risk Management in the Water Supply Sector

Reduction of Non-revenue Water

International Conference
Drought Risk & Drought Risk Management in Romania & Europe
Bucharest, October 30-31, 2023

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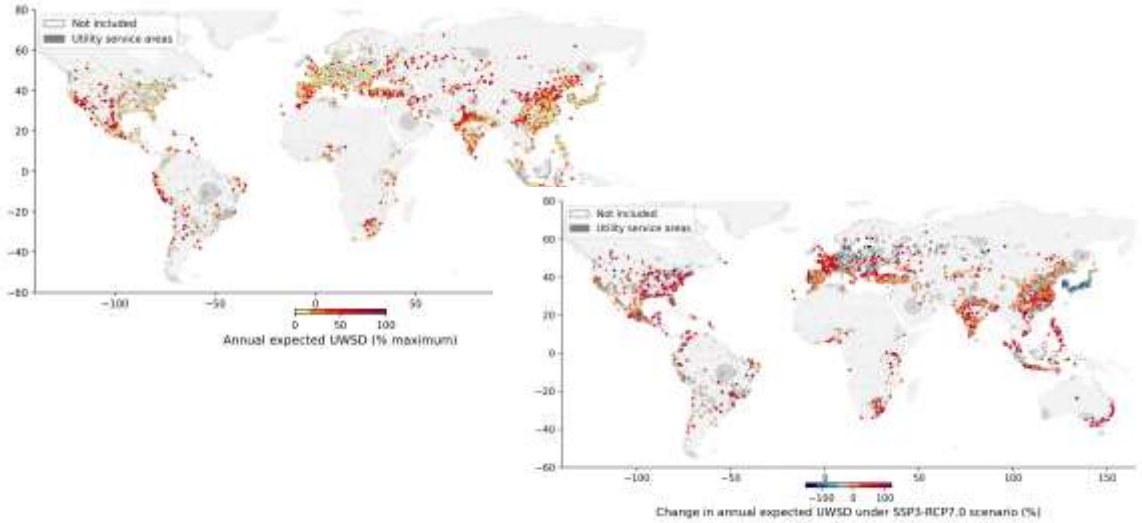
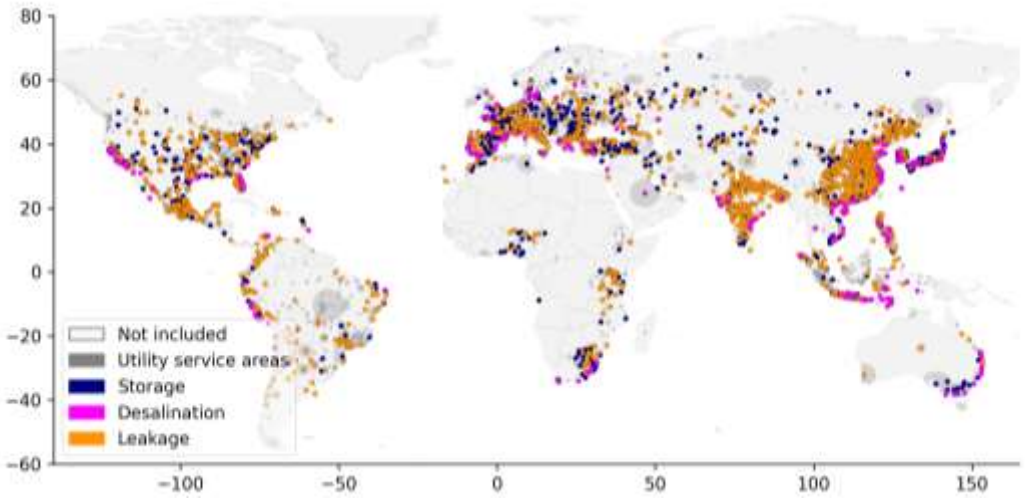
Drought-induced impacts on water supply and means to reduce risk





Present day and projected future situation due to climate change and drought

- **50% of all modelled utilities** are subject to present day **drought-induced water supply disruptions**
- Median utility to be subject to **15 days of unsustainable or disrupted supply** under present day conditions
- Between 70-85% of at-risk utilities are subject to **increased risk in the future** due to climate change

Optimal option type to reduce risk

- **For 60% of utilities, leakage reduction most cost-effective means** of reducing water shortages
- For most coastal utilities, and **10%** of utilities overall, **desalination** is the highest priority option
- **Greater storage** priority option for remaining **30%**

Source: Olivia Becher, Oxford University, Presentation at Danube Water Conference 2023 (unpublished)

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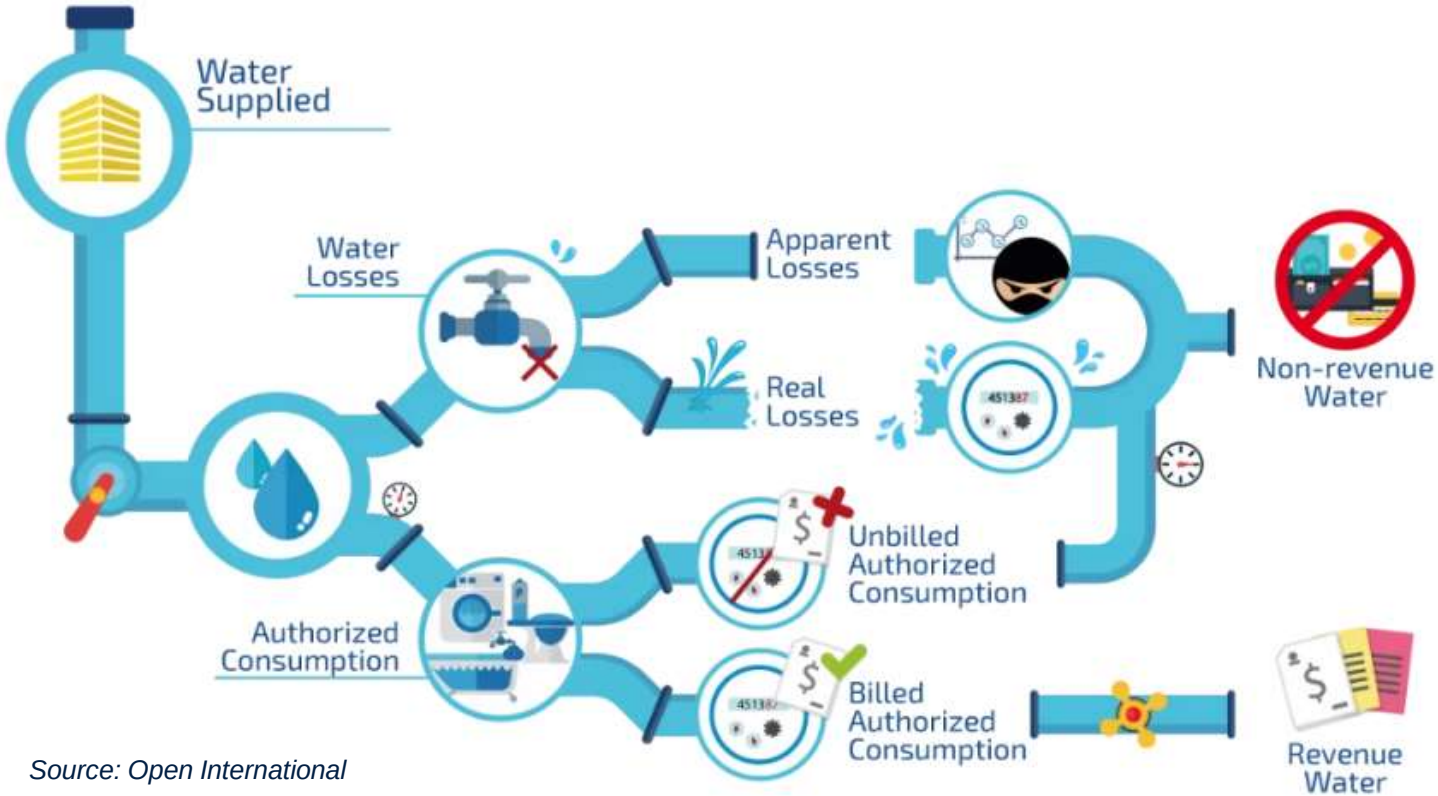
Non-Revenue Water (NRW)
A global sustainability challenge



Source: Open International

Non-Revenue Water

- Real losses
- Apparent losses
- Unbilled authorized consumption

Source: Aguas de Cascais

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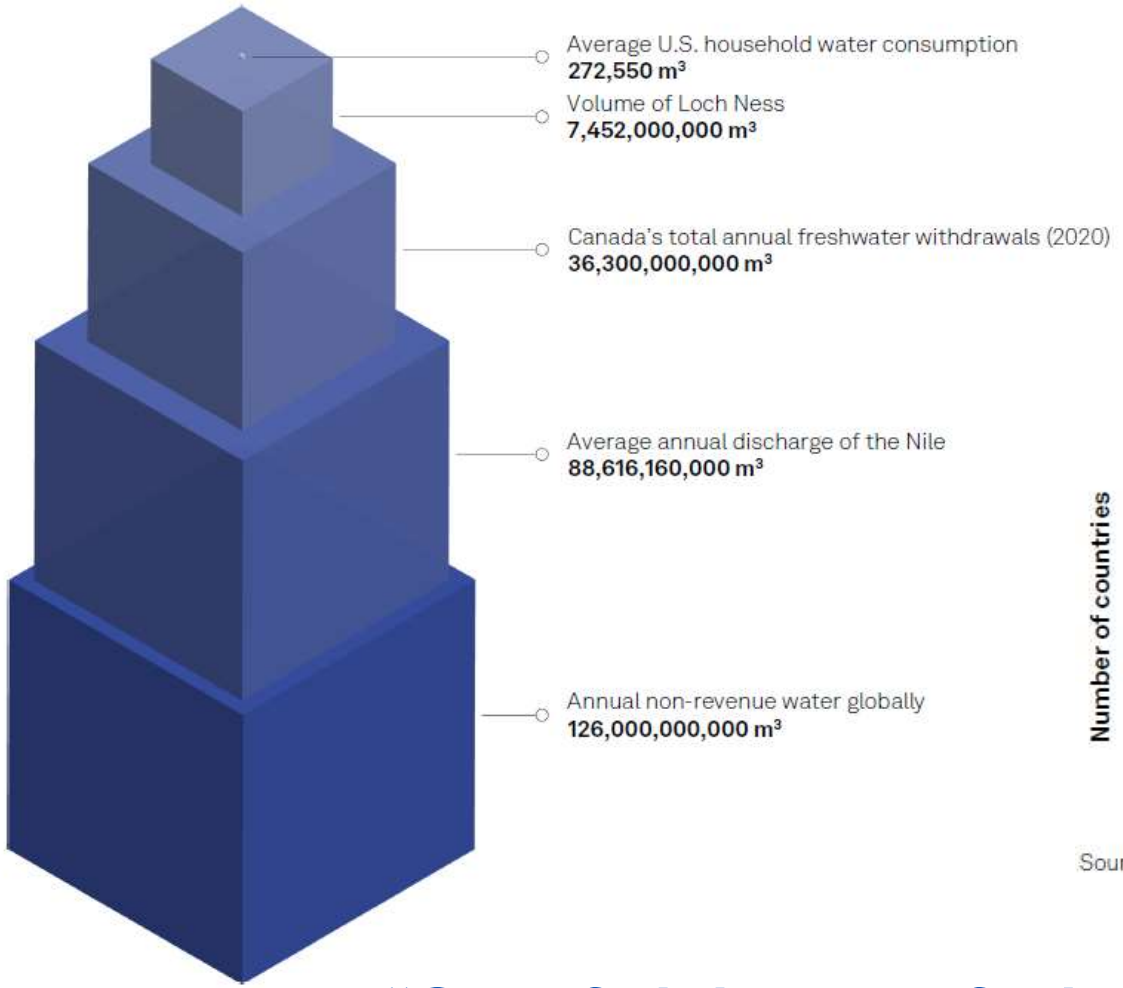
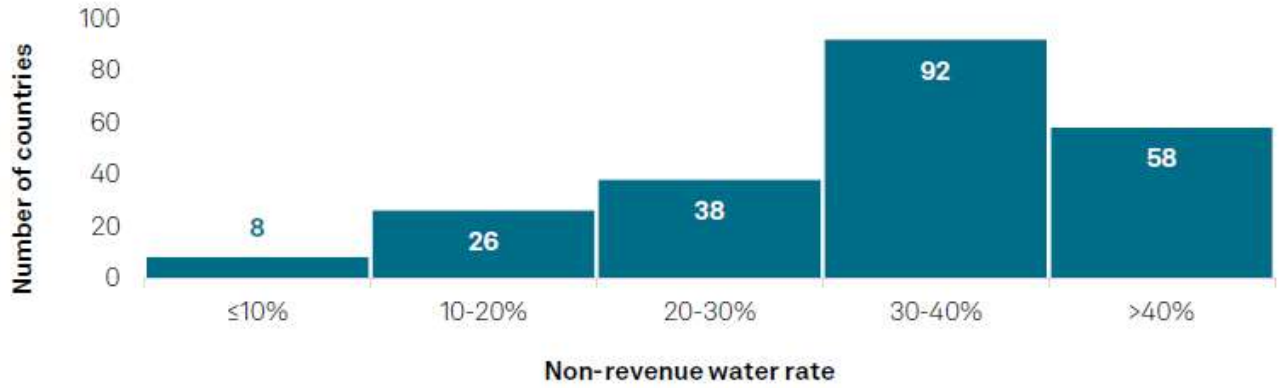
Non-Revenue Water (NRW)
A global sustainability challenge



Global figures: 25% of countries have NRW rates above 40%



Source: S&P Global Ratings, Liemberger and Wyatt.

"Out of sight, out of mind" often also applies to NRW

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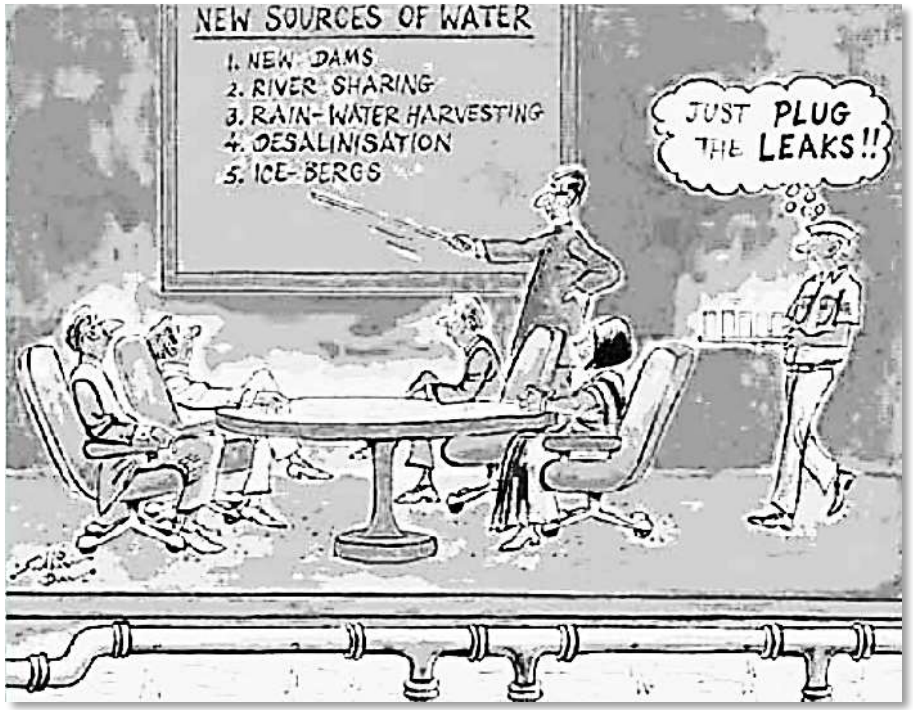
Non-Revenue Water (NRW)

Why should we care?

- **Water utilities are key agents** in the delivery of safe, reliable and affordable water supply
- **Drought-induced disruptions of supply pose risks** to socio-economic development and SDG achievement
- **Benefits** of reducing NRW
  - Improving **operational and financial performance** of water utilities and security of supply
  - **Mitigating water stress** and reducing the impacts of freshwater withdrawals on ecosystems
  - Increasing **resilience against droughts** and adapting to climate change
  - Mitigating global **greenhouse gas emissions** due to lower energy needs for pumping and distribution



Source: Water and Sanitation Program of the World Bank

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New EU Drinking Water Directive

DIRECTIVE (EU) 2020/2184 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 16 December 2020 on the quality of water intended for human consumption

- **New Drinking Water Directive** entered into force in January 2021
- Member States had to transpose by January 2023
- A number of **new requirements**, including risk-based approach and **measures to reduce water leakages:**
  - Member States need to **assess water leakage levels** and potential for improvements
  - Shall take into account relevant **public health, environmental, technical and economic aspects**
  - Assessment shall be communicated to Commission by **12 January 2026**
  - **January 2028**: Commission shall adopt delegated act setting out a threshold above which **Member States have to take action**

DIRECTIVES

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Why do utilities struggle with NRW reduction?

Lack of understanding magnitude, sources and cost of NRW

- Quantifying NRW and its components
- Calculating appropriate performance indicators
- Turning volumes of lost water into monetary values

Missing Management Focus

- Requires time, constant dedication, staff and funding
- More interesting engineering activities than to fix buried pipes
- No “ribbon cutting” involved
- Unpopular decisions might have to be made

Lack of Capacity

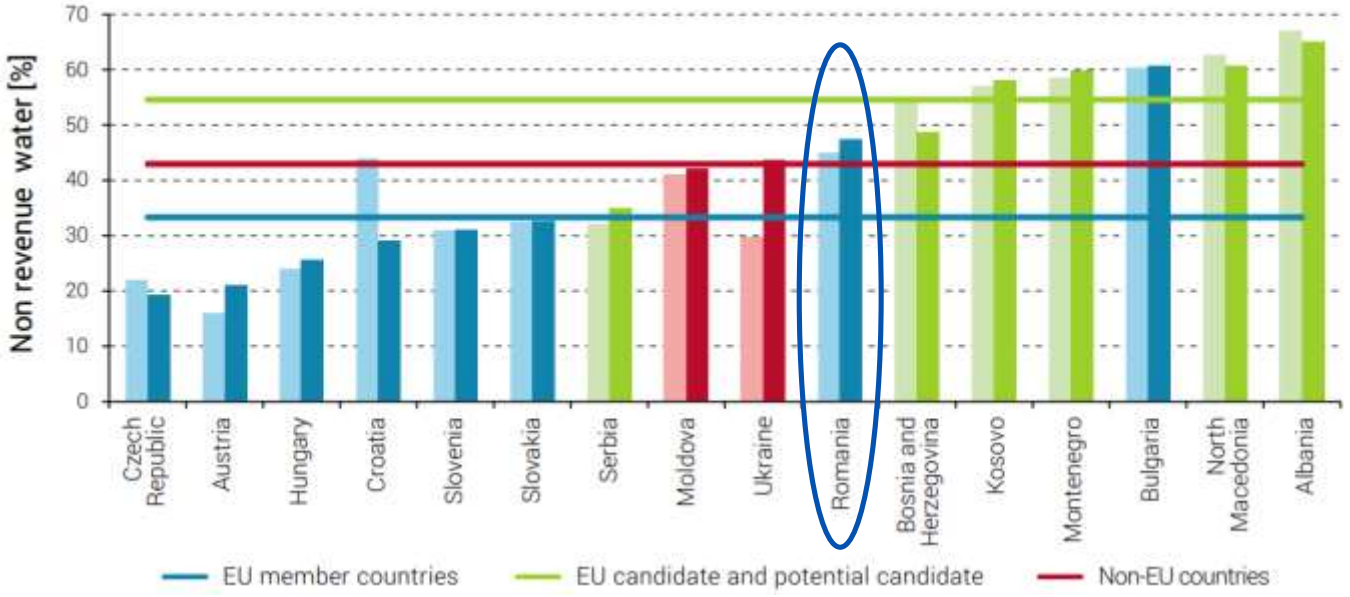
- Requires range of skilled staff
- Managers and professional engineers
- Street crews, technicians, plumbers

Enabling Environment and Incentives

- NRW must not be considered in a vacuum but within broader sectorial context
- What are incentives for managers and staff of the program

NRW in Danube region countries and Romania

Share of NRW in Danube region countries



SOURCE: SOS DATA COLLECTION 2018.
DARKER COLOR REPRESENTS VALUES FOR 2016-2017; LIGHT COLOR REPRESENTS VALUES FOR 2011-2013

Average water losses in Romania estimated at around 50%

According to latest information provided by the Regulatory Authority (ANRSC)

- Increase of access to public water supply systems from 49.2% in 2007 to 74.9% in 2022
- However, high level of NRW putting at risk further network expansion and secure service provision for already connected population
- Weaknesses in customer accuracy and metering
- Lack of standardized methodology at sector level to determine water losses
- Lack of information on level of commercial losses (part of NRW)

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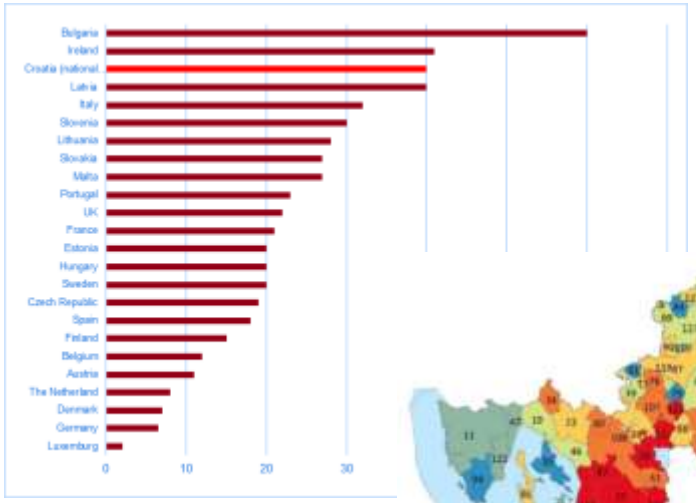
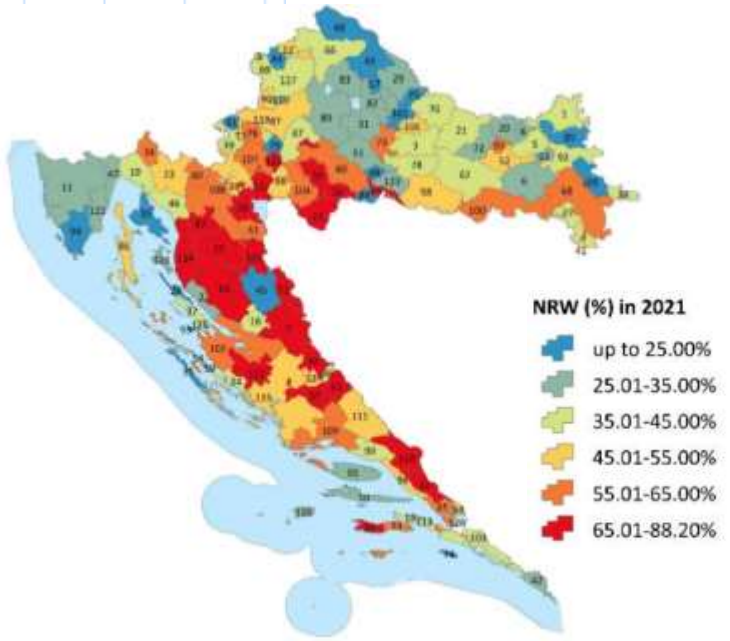
Example Croatia

Overview public water utility sector



Croatia: No. 3 in terms of water losses in the EU



Spatial distribution of the **Non-Revenue Water** (NRW) share in Croatia – current PWSPs level

- **Connection rate** to water supply systems ~ **90%**
- Current service areas: **160 Public Water Service Providers** (PWSPs); 128 dealing with water supply
- Ongoing reform process for the **aggregation of 160 PWSPs to 41**
- Average rate of **Non-revenue Water** (NRW) around **50%**, varying between ~ 25% up to around ~ 80% per PWSP
- Impacts of **climate change** on water availability and demand
- Requirements **new EU Drinking Water Directive**
- Obligations from EU **National Recovery and Resilience Plan** (NRRP) for Croatia

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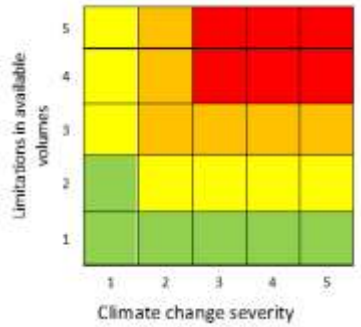
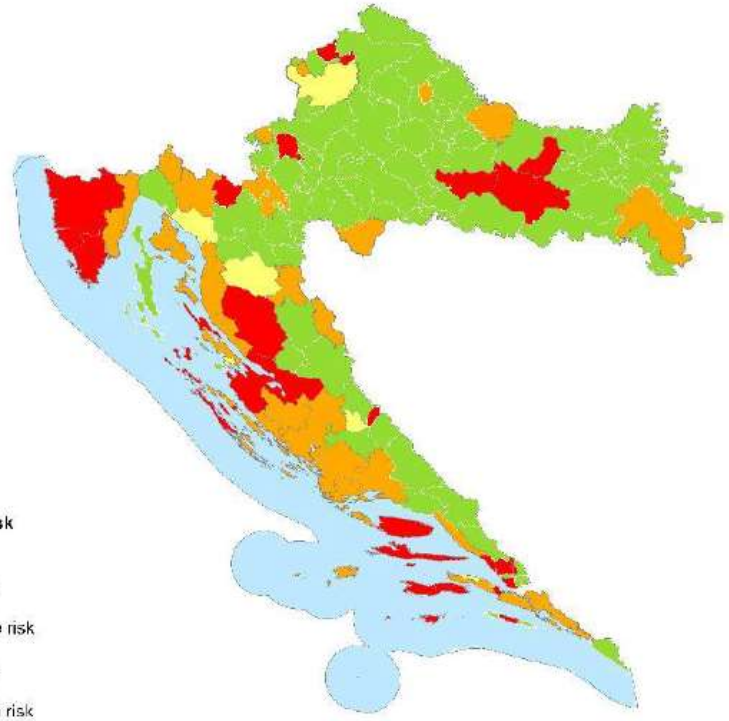
Example Croatia

Water availability, climate change scenarios, risks

Limitations in **available water volumes**

Risk matrix





Climate change scenarios

Spatial distribution of risks according to the risk matrix, limitations in available water volumes and climate change severity

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Example: Croatia Water Loss Reduction Project

Overview project activities

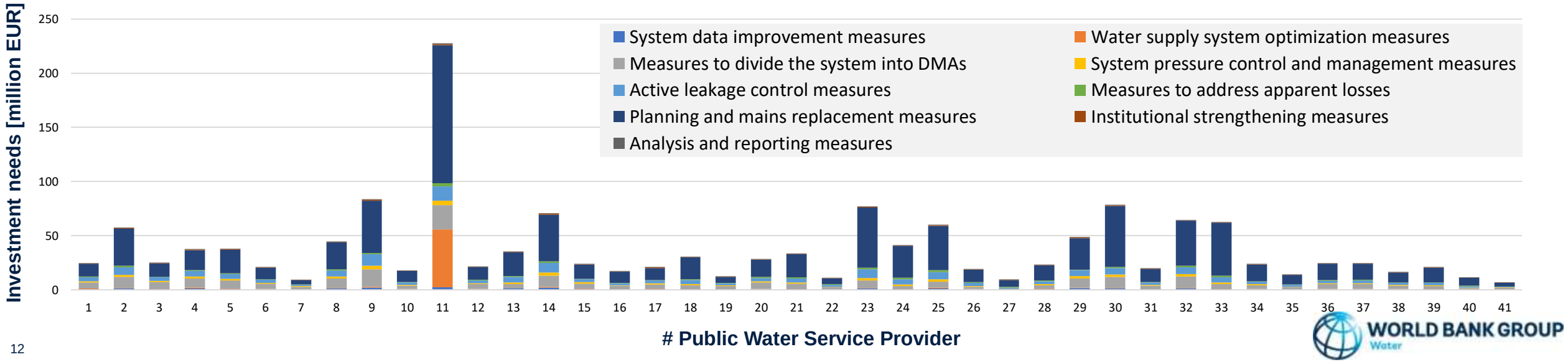
- **Technical Assistance Project** to support the Croatia Water Services Sector
- Financed by European Commission (DG REFORM) and **implemented by World Bank**
- Project period: **May 2022 – November 2023**
- Overview **range of project activities**:
  - Activity 1: **Stocktaking** exercise
  - Activity 2: Preparation of a **draft National Loss Reduction Action Plan** (NLRAP)
  - Activity 3: **Building the capacity of Public Water Service Providers** for the implementation of the NLRAP
  - Activity 4: Development of a knowledge base and **indicators for utility performance evaluation**
  - Activity 5: Development of recommendations for establishment of a **national monitoring body** on water loss reduction
  - Activity 6: Preparation of a **final National Loss Reduction Action Plan** (NLRAP)

	Q2 - 22			Q3 - 22			Q4 - 22			Q1 - 23			Q2 - 23			Q3 - 23			Q4 - 23		
ACTIVITY	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Activity 1 - Stocktaking exercise																					
Activity 2 - Draft NLRAP																					
Activity 3 - Capacity building and p2p exchange																					
Activity 4 - Utility performance evaluation																					
Activity 5 - National Monitoring Body																					
Activity 6 - Final proposed NLRAP																					

Example: Croatia Water Loss Reduction Project

Measures and effects

Number	Group	% of the cost of measure	% NRW reduction
I.	System data improvement measures	2,1%	4,0%
II.	Water supply system optimization measures	4,2%	5,8%
III.	Measures to divide the system into DMAs	14,6%	4,0%
IV.	System pressure control and management measures	3,6%	8,6%
V.	Active leakage control measures	10,5%	40,4%
VI.	Measures to address apparent losses	2,2%	3,2%
VII.	Planning and mains replacement measures	61,2%	33,1%
VIII.	Institutional strengthening measures	1,2%	0,7%
IX.	Analysis and reporting measures	0,4%	0,0%



Example: Croatia Water Loss Reduction Project

Overview measures and estimated costs

Measures

Responsibility	Number	Group
PWSP measures	I	System data improvement measures
	II	Water supply system optimization measures
	III	Measures to divide the system into DMAs
	IV	System pressure control and management measures
	V	Active leakage control measures
	VI	Measures to address apparent losses
	VII	Planning and mains replacement measures
	VIII	Institutional strengthening measures
	IX	Analysis and reporting measures
	X	Technical (external) assistance to PWSPs to implement the measures
MESD measures	XI	Establishment of the PWSP benchmarking system and performance indicators (establishment of the national database, training PWSPs to report to the Ministry)
		Costs of the national control body for the reduction of losses (expert assistance for the verification and implementation of PWSPs' action and investment plans during NLRAP implementation)

Costs Croatia

Responsibility	Number	Group	Amount (EUR)
PWSP measures	I-IX	Measures total	1,533,330,000
	X	Technical assistance to PWSPs to implement the measures (3% of the value of Measures I-IX)	45,950,000
MESD measures	XI	Establishment of the PWSP benchmarking system and KPI (establishment of the national database, training PWSPs to report to the MESD)	670,000
		Costs of the national control body for the reduction of losses (expert assistance for expert verification of PWSPs' action and investment plans during NLRAP implementation)	2,000,000
Measures total			1,581,950,000

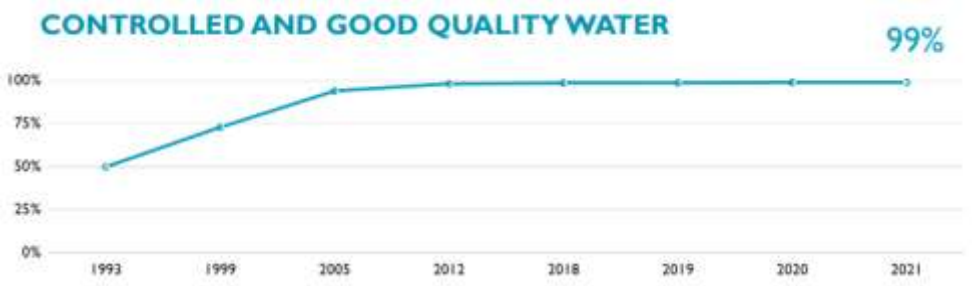
Cost estimates to reduce NRW in Croatia from 50% to 25% over a period of 15 years

Cost estimates for Romania?

Example Portugal

Water sector performance

- **Significant progress** in performance of WSS sector since 90's driven by EU accession
- Dedicated **reform program** for WSS sector
- **Range of measures**, including legal reforms, creation national regulator, aggregation of utilities, private sector involvement, performance-based contracting, etc.
- **Support** from European Union and IFIs
- Current national level **NRW down to 26%**



Progress in the access to safe water supply in Portugal at national level

Example for successful NRW reduction: Águas de Cascais water utility

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Danube Learning Partnership (D-LeaP)

Building capacity at water utility level

- Utility capacity building offers under the Danube Learning Partnership
- NRW one of the programs

- Commercial Efficiency (CE) offered in Romania
- Opportunity to offer additional programs, e.g. NRW

Key messages

- **Reduction of water losses** and Non-Revenue Water (NRW) important measure for **reduction of drought risk**
- NRW management is not technically difficult, but it is **complex**
- Understanding the **baseline situation**: Critical step towards effective reduction program
- Need for a **concerted national effort**, including targeted policies, effective regulation, allocation of required financial resources, and the right incentives
- Need for **institutional capacity building** at different levels
- Creating awareness about the issue and **political will**

Prepared for Droughts?

Danube Water Program Utility Drought Risk Assessment

Raise awareness about the challenges posed by droughts and explore potential adaptation measures

Assessment of annual average drought risk for each participating utility

Analyzed by collecting information on their customer-bases, leakage losses and water sources

Present day and three possible future climate change conditions

Free of charge

Join now!

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Thank you!

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