



## **Lessons Learned in NRW reduction**

**from 8 RVO-Sustainable Water Fund (SWF) co-financed  
WOPs with 19 water operators (2012-2019)**

**Webinar agenda**

**What is NRW, why  
prioritize it?**

**Review objectives  
and approach**

**NRW approach 8  
FDW/SWF PPPs**

**Achieved results**

**Lessons learned**

**How can I get  
involved?**

## **1. Introduction**

- **Facilitators:** see separate slide
- **Participants:** please type your name, designation/position/area of expertise in the chat
- **Protocol:** 'microphones on mute', questions in the chat (for Q&A), note down 1 or 2 personal take-aways (what you have learned and its relevance for your profession) in the chat

## **2. What is NRW, why prioritize it?**

## **3. Review approach/focus**

## **4. Achieved results**

## **5. Lessons learned: what now?**

## **6. How can I get involved: the 'Community of Practice' (incl. NRW)**



# Introduction - facilitators

## Webinar agenda

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Sietske Boschma

- Senior Policy Advisor, Sustainable Water Fund (SWF), RVO Netherlands Enterprise Agency



Ad Doppenberg

- Consultant, Ad Doppenberg Advisory Services in Water



Reint-Jan de Blois

- Senior Project officer, VEI



# Introduction - participants



Participant groups	No. of participants NL ↔ in-country
<b>Sustainable Water Fund - PPP</b> partner representatives - PMs - Thematic experts e.g. Mali, Philippines, Indonesia, Kenya (Western Kenya and Nakuru), Ethiopia (Harar and Addis)	- 4 (Vergnet - Hydro, VEI, MajiMilele) ↔ 2 (Dorcas) - 1 ↔ 1
<b>WaterWorX (WWX) - WOP</b> partner representatives - PMs - Thematic experts e.g. Uganda, Mwanza, Arusha, Zambia, Ethiopia, Mali, Ghana, Indonesia, Bangladesh	- 8 ↔ 2 - 8 ↔ 10
<b>GWOPA WOP</b> partner representatives	?
RVO staff	5
Facilitators	3
<b>Total</b>	<b>± 45 (some of which 'tentative')</b>

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# NRW: what is it, why prioritize it? (1/4)

Webinar agenda

What is NRW, why prioritize it?

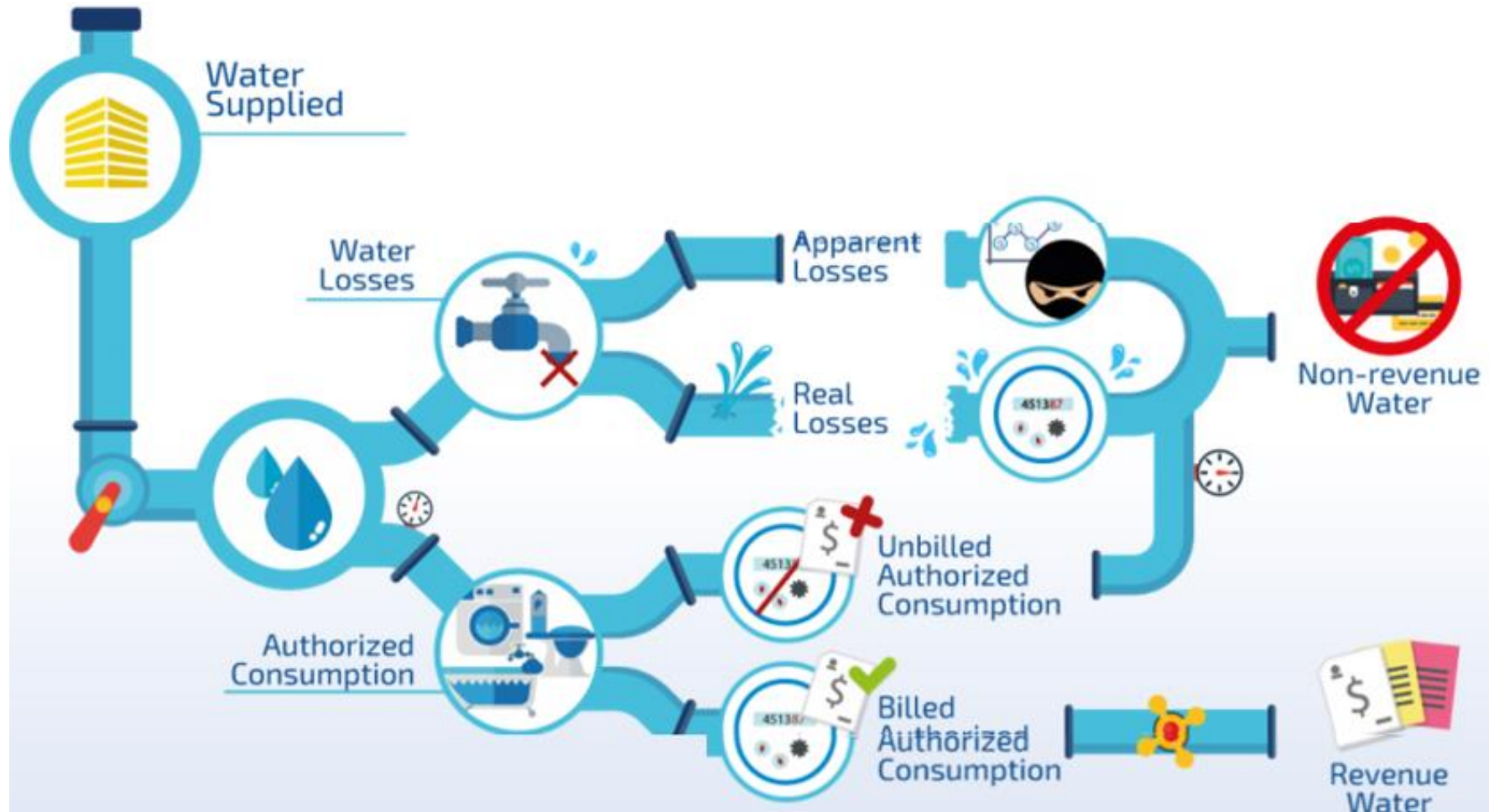
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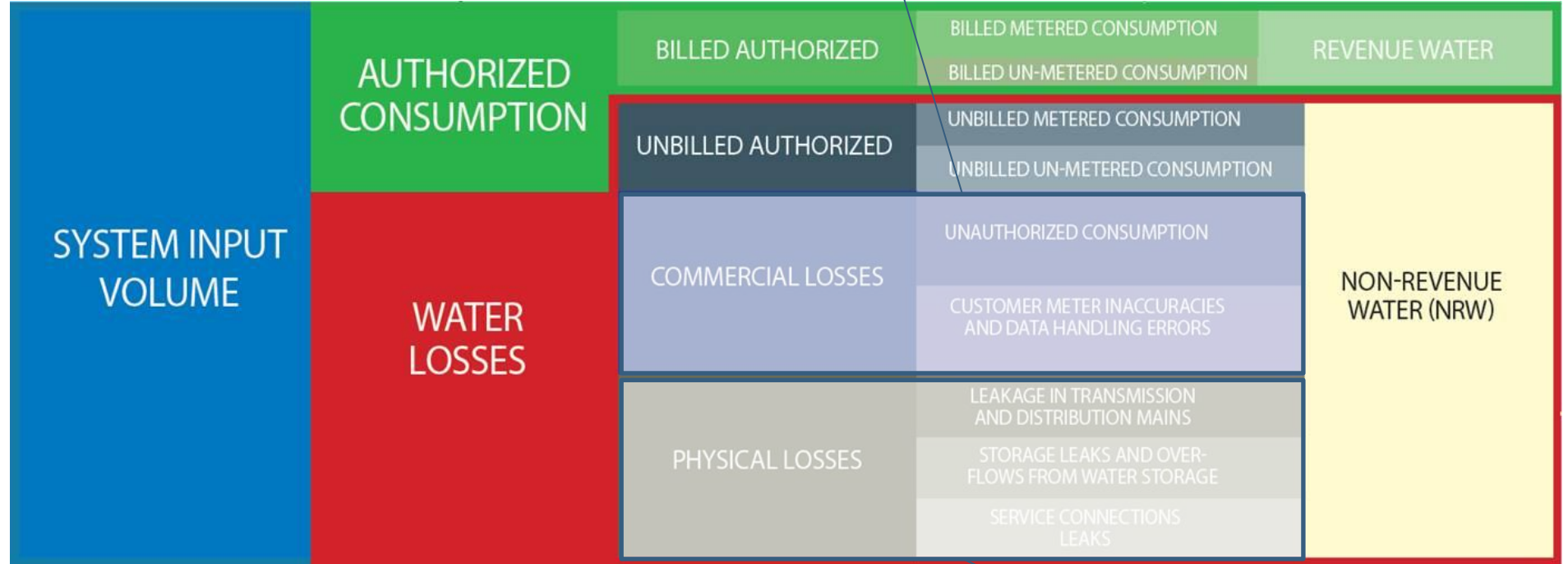
How can I get involved?



# NRW: what is it, why prioritize it? (2/4)

Low-cost/high-impact: billing ↑ ⇒ financial performance ↑

## IWA Model (Water Balance): quantifying specific water loss components



High NRW (water losses) ⇒ intermittent supply ⇒ coping costs (in-house storage) detrimental for service delivery to the urban poor

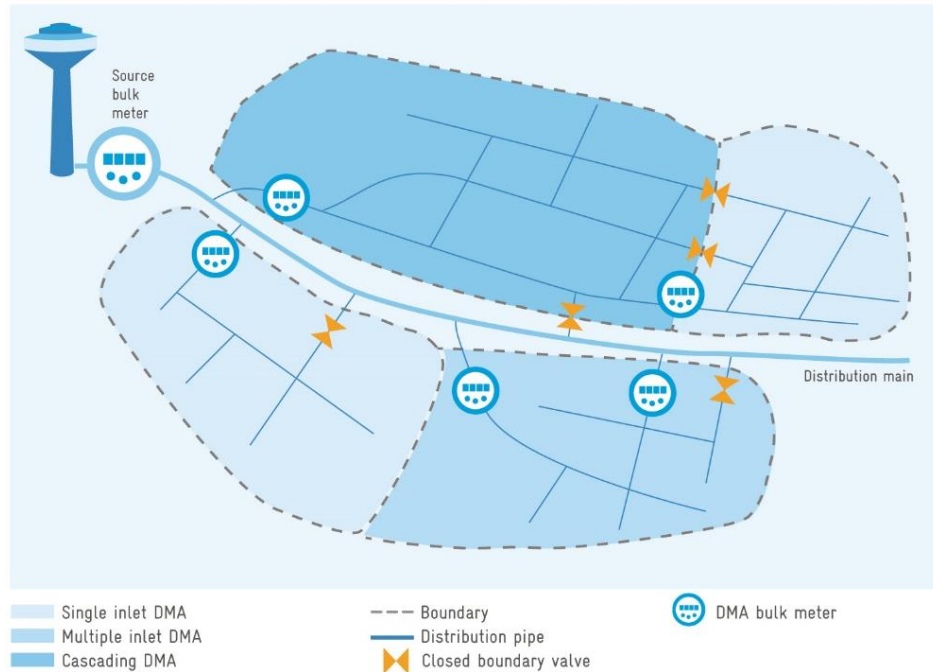
Capital intensive (medium/longer-term network rehabilitation): Improve water use efficiency (in context of climate change)

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# NRW: what is it, why prioritize it? (3/4)

Figure 6.2 Typical layout of DMAs, based on [22]



A 'District Metered Area' (DMA) is:

- a hydraulically isolated sub-section of the water distribution network...
- ...a 'diagnostic tool' to quantify, prioritize (DMAs with largest NRW volume) and monitor progress in reducing the NRW volume.

A DMA typically contains 500 to 1,000 connections. Water flows to the DMA via 1 or 2 feeder mains, which are metered.

On a monthly basis a water balance is compiled of the total inflowing water and the total water billed of the connections in the DMA. The difference between the total inflow and water billed is NRW.

$$\text{Water PRODUCED} - \text{Water BILLED} = \text{NON-REVENUE Water}$$

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# NRW: what is it, why prioritize it? (4/4)

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**What is NRW, why prioritize it?**

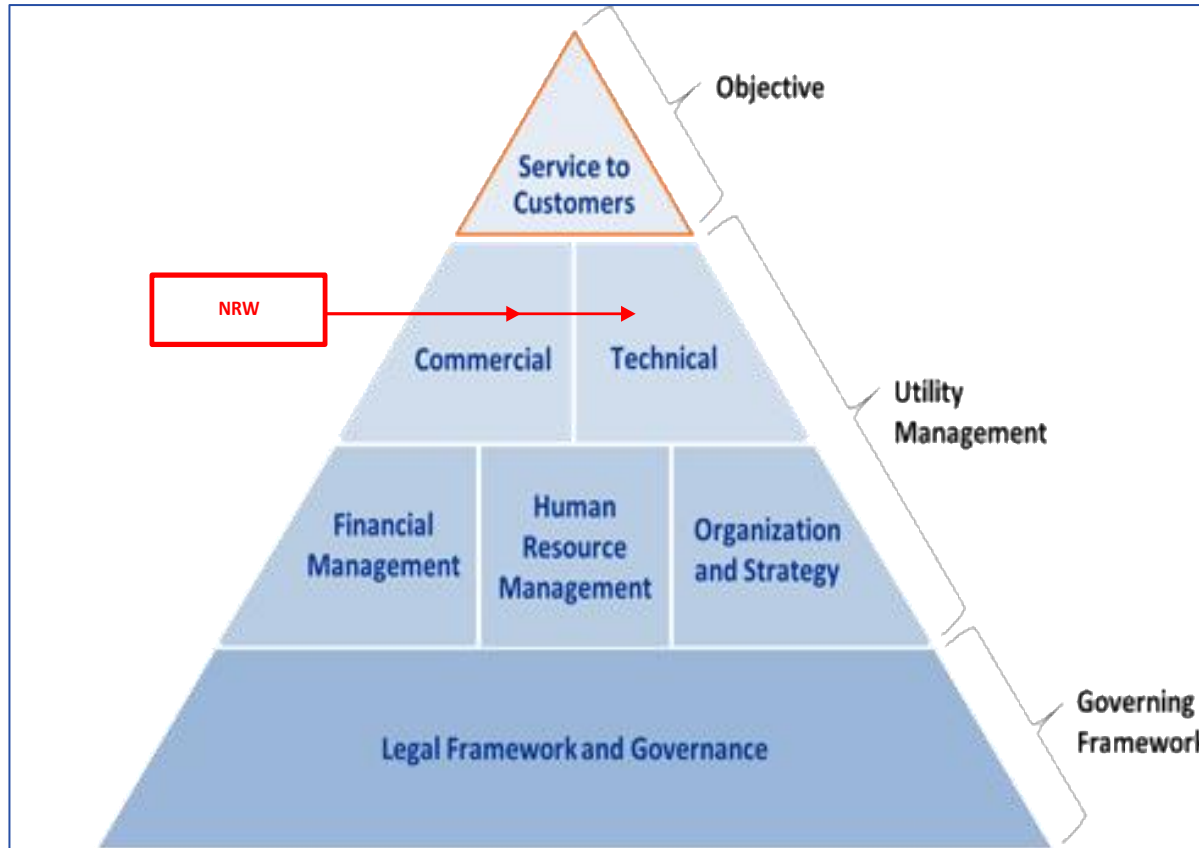
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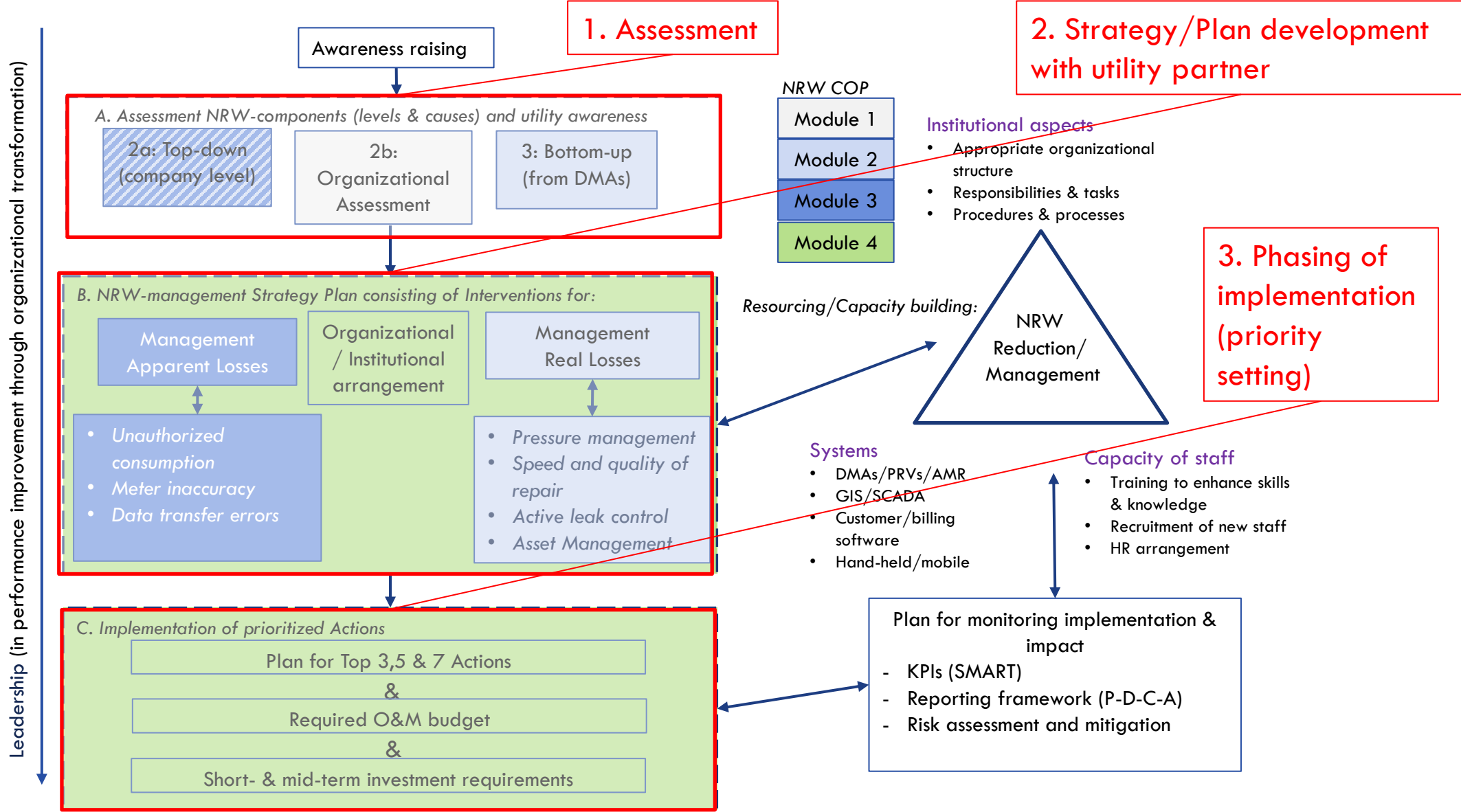
How can I get involved?



Root causes and solution lies in inter-departmental collaboration and good corporate governance!



# NRW Reduction Roadmap: guiding NRW Strategy/Plan is key!



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# Review objectives and approach

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## 1. Improve or change set-up of NRW-reduction projects

- Increased insight in effective approaches
- Engagement donors/IFIs and recipient utility

## 2. Adopt 'lessons learned'

- Within VEI: ongoing [FDW/SWF](#) (e.g. Cebu, Rwanda, Cagayan de Oro) and [WaterWorX \(WWX\)](#) WOPs
- Beyond VEI i.e. dissemination of lessons learned to (other) FDW/SWF-PPP partners + other practitioners i.e. [WWX \(non-VEI WOPs\)](#), [GWOPA supported WOPs \(this workshop\)](#)

## 3. Key research questions of the Review

- How [NRW-reduction is achieved](#) in 8 FDW-projects?
- How effectively NRW-reduction enhances the [financial sustainability \(O&M - Full Cost Coverage\)](#)  
-> [\(Up-\)scalability](#)?
- How effectively NRW-reduction contributes [to improving the service delivery to the urban poor](#)?



# NRW approach 8 FDW PPPs/WOPs: scale and budget

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Country

Ethiopia

Ethiopia

Kenya (10 utilities)

Rwanda (Kigali)

Mozambique

Malawi

Philippines

Vietnam

Mekong Delta)

PPP (WOP)	% of hardware budget (1,000 €)	Hardware € per connection	% of time budget	Connections in NRW component
Addis Ababa	5% (136)	85	11%	1,600
Harar	9% (183)	92	17%	2,000
PEWAK	64% (1,050)	25 - 60	67%	59,741
SUSWAS	44% (575)	37	41%	32,739
Beira	46% (1,179)	19	47%	62,729
Mzuzu	71% (557)	21	48%	26,743
Cagayan de Oro	14% (411)	4	22%	100,908
Gia Dinh	13% (822)	6	~5%	132,713

### Take note:

Varying scales of intervention (DMAs/zones in 3 + 1 = 4 WOPs, company-wide in 4 WOPs)!



# Achieved results: NRW volume reduced (1/4)



Note: targets range from 'halving NRW volume at company level...' to '...at DMA level'

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- **Substantial NRW reduction (6-20% of System Input Volume)**

- 10 utilities in Kenya (27 DMAs) under the 'PEWAK' PPP
- Rwanda, Kigali (2 branches)
- Malawi, Mzuzu (company-wide)
- Vietnam (Mekong Delta), Gia Dinh (company-wide) though mostly due to parallel ADB investment/TA

- **Moderate NRW reduction (<6% of System Input Volume)**

- Soc Trang and Tra Vinh though minimal TA input NRW
- Beira (company-wide).

- **No sustained NRW reduction in Addis Ababa and Harar**

- due to technical set-backs and institutional (motivational) constraints.



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- **Implemented interventions do have impact and are effective**

- Focus on low-cost/high-impact interventions!
- Return on Investment (payback period) infra/equipment (mostly commercial) typically 2 - 4 yrs
- Updated customer database, curbing illegal water use (based on H2H surveys)
- Improved customer billing: meter management -> meter reading -> billing

- **Improved financial performance**

- Valid (in particular) for company-wide NRW projects
- Operating Cost Coverage (OCC)/working ratio increased for most water operators
- ...as such NRW-reduction *contributes to* improved commercial performance and credit-worthiness (debt-financing capacity)



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## • Reflections on achievements

- 'Yes we can'! with and through our local beneficiary partners (internal) <-> enabling environment (external)
- Varying *results* at varying *scales of intervention*: one size does not fit all.
- € 4 to € 92 investment per DMA connection: in most cases > € 30-40 per DMA conn. required
- Level of OPEX allocated by the recipient utility dictates which intervention can be sustained
- Uncertainties about upscaling after project completion

## • Pro-poor results in a nutshell:

- 340,000 un(der)served Low Income Area (LIA) residents acquired access to safe drinking water
- Average investment of € 20 per capita towards 'last mile connectivity' (network extensions and service connections)
- NO DIRECT correlation between NRW reduction and pro-poor service delivery except e.g. for Beira (LIA focus)
- Grant co- and/or blended financing required considering relatively low RoI (LIA) in *some* cases



- **NRW Master Class refined (2018) on the basis of evidence as to ‘what works’**
- **Engagement of wash practitioners globally (Community of Practice) through GWOPA, more on this later**

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## **LESSONS LEARNED: APPROACH (1/2)**

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- 1. NRW Strategy/plan is indispensable tool to engage recipient partner and for performance & impact monitoring (internal and external)**
- 2. Assessment of Commercial & physical losses mandatory at start of project**
- 3. Company-wide NRW-reduction project is preferred above DMA-piloting (with upscaling after project completion)**
- 4. Nurturing ambition and generating resources for post-intervention up-scaling purposes**
  - NRW reduction requires perseverance -> up-front investment -> is not sexy
  - Evaluated Business Cases can motivate MTs -> to free up the required OPEX + CAPEX
- 5. NRW-reduction project budget of  $\pm$  €40/connection**
- 6. A Monitoring framework is essential to understand VEI's interventions:**
  - Progress of project
  - Impact on NRW reduction
  - Institutional uptake (improvements, source allocation, etc.)
- 7. Trade-off for VEI's support is commitment from recipient utility to sustain services to urban poor**





## **LESSONS LEARNED: (CO-)FINANCIER RVO-SWF (2/2)**

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- 1. Min. 6-month Inception Phase for Assessment of NRW volumes + 'root cause analysis' and adjustment of targets/budget priorities is key!**
- 2. Need for tri-partite agreement RVO – VEI – utility partner(s) at the onset on post intervention sustainability (scaling-up, embedding in working processes, ring-fencing revenue/plough-back service provision urban poor)**
- 3. Company-wide NRW-reduction is a must for commercial/financial/operational performance improvement and thus service delivery improvement to the urban poor**



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- **Access the detailed and summary ‘Practice notes’ on GWOPA website**  
<https://gwopa.org/return-on-investment-in-nrw-reduction/>
- **Join the NRW and/or other (related) ‘Communities of Practice’**
  - 2-3 monthly webinars co-hosted by a network of 75++ NL <-> utility partner NRW experts/practitioners
  - Day-to-day contact through **WhatsApp** and **Yammer**
  - NRW Master Class: 4 x 2,5 hour Modules, PPT and video stream recording accessible now
  - ..this and other resource material (webinars, PPTs, tools, case studies) on **Sharepoint**
  - Accessible NRW CoP Coordinator ([reint-jan.deblois@vei.nl](mailto:reint-jan.deblois@vei.nl), +31653365046)
  - Looking for a motivated co-Coordinator/Moderator!
    - Full-time NRW team leader/expert from a water utility in Africa, Asia or Latin America
    - ... (ICT, social media) tech-savvy
    - with (online) webinar/training facilitations competences and experience
    - ...on a voluntary 😊 basis



**Thanks for your attention ;-)**

**Questions and answers...**

**...your experiences...?**

**...your take-aways?**

Please don't forget to write 1 or 2 personal take-aways (what you have learned and its relevance for your profession)



**Extra slides from here on**  
**(subject to Q&A participant priorities)**

