Lessons Learned in NRW reduction

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

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

Ad Doppenberg
- Consultant, Ad Doppenberg Advisory Services in Water

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- Senior Project officer, VEI

Webinar agenda
- What is NRW, why prioritize it?
- Review objectives and approach
- NRW approach & FDW/SWF PPPs
- Achieved results
- Lessons learned
- How can I get involved?
### Introduction - participants

<table>
<thead>
<tr>
<th>Participant groups</th>
<th>No. of participants NL ↔ in-country</th>
</tr>
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<tbody>
<tr>
<td><strong>Sustainable Water Fund - PPP</strong> partner representatives</td>
<td>- 4 (Vergnet - Hydro, VEI, MajiMilele) ↔ 2 (Dorcas)</td>
</tr>
<tr>
<td>- PMs</td>
<td>- 1 ↔ 1</td>
</tr>
<tr>
<td>- Thematic experts</td>
<td>e.g. Mali, Philippines, Indonesia, Kenya (Western Kenya and Nakuru), Ethiopia (Harar and Addis)</td>
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<tr>
<td><strong>WaterWorX (WWX) - WOP</strong> partner representatives</td>
<td>- 8 ↔ 2</td>
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<tr>
<td>- PMs</td>
<td>- 8 ↔ 10</td>
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<tr>
<td>- Thematic experts</td>
<td>e.g. Uganda, Mwanza, Arusha, Zambia, Ethiopia, Mali, Ghana, Indonesia, Bangladesh</td>
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<tr>
<td><strong>GWOPA WOP partner</strong> representatives</td>
<td>2</td>
</tr>
<tr>
<td>RVO staff</td>
<td>5</td>
</tr>
<tr>
<td>Facilitators</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>± 45 (some of which ‘tentative’)</td>
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NRW: what is it, why prioritize it? (1/4)
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)
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.
Root causes and solution lies in inter-departmental collaboration and good corporate governance!
NRW Reduction Roadmap: guiding NRW Strategy/Plan is key!

1. Assessment
   - Awareness raising
   - A. Assessment NRW-components (levels & causes) and utility awareness
     2a: Top-down (company level)
     2b: Organizational Assessment
     3: Bottom-up (from DMAs)

2. Strategy/Plan development with utility partner
   - NRW COP
     - Module 1: Institutional aspects
       - Appropriate organizational structure
     - Module 2: Resourcing/Capacity building
       - DMAs/PRVs/AMR
       - GIS/SCADA
       - Customer/billing software
       - Hand-held/mobile
     - Module 3: Systems
       - Training to enhance skills & knowledge
       - Recruitment of new staff
       - HR arrangement
     - Module 4: Capacity of staff
       - Pressure management
       - Speed and quality of repair
       - Active leak control
       - Asset Management

3. Phasing of implementation (priority setting)
   - NRW Reduction/Management

B. NRW-management Strategy Plan consisting of Interventions for:
   - Management
     - Apparent Losses
     - Real Losses
   - Organizational / Institutional arrangement
     - Unauthorized consumption
     - Meter inaccuracy
     - Data transfer errors
     - Pressure management
     - Speed and quality of repair
     - Active leak control
     - Asset Management

C. Implementation of prioritized Actions
   - Plan for Top 3, 5 & 7 Actions
   - Required O&M budget
   - Short- & mid-term investment requirements

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?
Review objectives and approach

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

<table>
<thead>
<tr>
<th>Country</th>
<th>PPP (WOP)</th>
<th>% of hardware budget (1,000 €)</th>
<th>Hardware € per connection</th>
<th>% of time budget</th>
<th>Connections in NRW component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethiopia</td>
<td>Addis Ababa</td>
<td>5% (136)</td>
<td>85</td>
<td>11%</td>
<td>1,600</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>Harar</td>
<td>9% (183)</td>
<td>92</td>
<td>17%</td>
<td>2,000</td>
</tr>
<tr>
<td>Kenya (10 utilities)</td>
<td>PEWAK</td>
<td>64% (1,050)</td>
<td>25 - 60</td>
<td>67%</td>
<td>59,741</td>
</tr>
<tr>
<td>Rwanda (Kigali)</td>
<td>SUSWAS</td>
<td>44% (575)</td>
<td>37</td>
<td>41%</td>
<td>32,739</td>
</tr>
<tr>
<td>Mozambique</td>
<td>Beira</td>
<td>46% (1,179)</td>
<td>19</td>
<td>47%</td>
<td>62,729</td>
</tr>
<tr>
<td>Malawi</td>
<td>Mzuzu</td>
<td>71% (557)</td>
<td>21</td>
<td>48%</td>
<td>26,743</td>
</tr>
<tr>
<td>Philippines</td>
<td>Cagayan de Oro</td>
<td>14% (411)</td>
<td>4</td>
<td>22%</td>
<td>100,908</td>
</tr>
<tr>
<td>Vietnam</td>
<td>Gia Dinh</td>
<td>13% (822)</td>
<td>6</td>
<td>~5%</td>
<td>132,713</td>
</tr>
</tbody>
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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’

- **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.
Achieved results: RoI (2/4)

• **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)
• **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
**Achieved results: spin-off (4/4)**

- 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
LESSONS LEARNED: APPROACH (1/2)

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 ± €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)

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
How can I get involved?

- 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**, +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-savvyy
    - 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)