IWA YOUNG WATER PROFESSIONALS GERMANY

DWA Klare Konzepte. Saubere Umwelt.

IWA YOUNG WATER PROFESSIONALS CANADA

IWA YOUNG WATER PROFESSIONALS

BUILDING BRIDGES

ONLINE EVENT SERIES

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international@junge-dwa.de

iwa.canada.ywp@gmail.com

Challenges for Water Supply Infrastructure

Wednesday, 2 Mar ‘22 **11 AM (Eastern Standard Time)**

5 PM (Central European Time)

AGENDA (Duration 1.5 hrs)

. 15’ Introduction

. 15’ Guest Speaker Canada: **Dr Alexandra Cassivi** (Université Laval, Quebec)

. 15’ Guest Speaker Germany: **Dr Lisa Bross** (Wasserversorgung Rheinhessen-Pfalz)

. 45’ Networking Discussion

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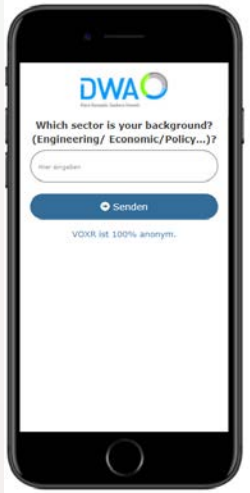
Tell us about yourself!

LINK VOXR: https://voxr.com/dwa



QUESTION 1

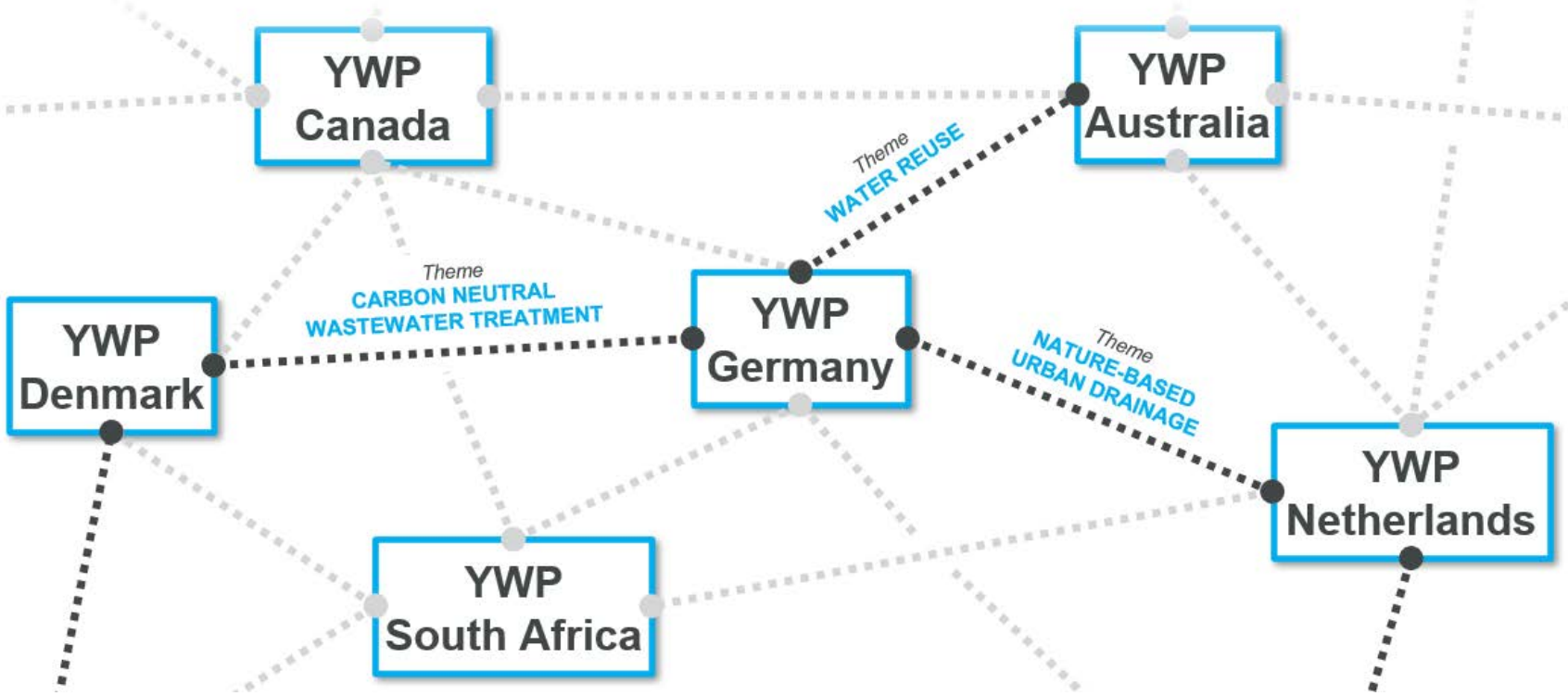
Which sector is your background

Engineering /Economy/ Policy…?

BUILDING BRIDGES ONLINE EVENTS

Concept in a nutshell

- Part of newly created **Building Bridges Online Event Series**
- Regular get-togethers connecting YWP across the globe in **bilateral dialogue**
- Platform to network and **engage over a topic** relevant to both countries
- Platform **empowering YWP** to present insights and to **learn** from peers



INTRODUCING OURSELVES!

JUNGE DWA (YOUNG DWA)

Connect - Roundtables

Exchange - Network Meetings

Grow - Circles & Inclusion

international@junge-dwa.de

https://en.dwa.de/en/jungedwa.html

XING-Gruppe > JungeDWA

INTRODUCING OURSELVES!

IWA YWP GERMANY (YWPGER)

We connect (young) water professionals in Germany with the world, and the world with Germany.

- Organisation of **roundtables** & network events
- **Publications** (national & international)
- **Representing** GER abroad within IWA events and at international conferences
- **Connecting** with other IWA chapters

info@ywp-germany.com

https://ywp-germany.com/ N E W !!!

@YWP_Germany

https://www.linkedin.com/company/ywp-germany/

INTRODUCING OURSELVES!

IWA YWP CANADA

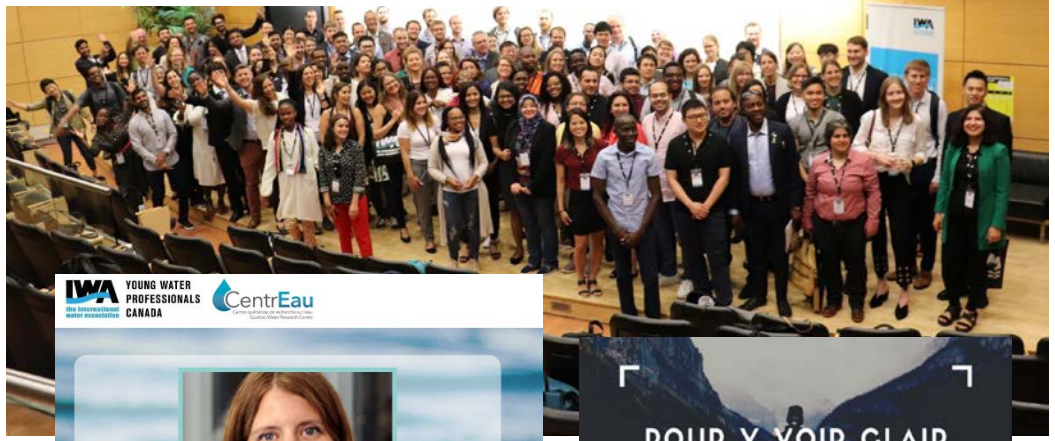
We empower (young) water professionals in Canada and create leaders in water sectors.

- **Event organizations**: National and International conferences, webinars, panels
- **Mentorship program**
- **Representation** in national and international conferences
- **Publication** (national & International)

https://iwa-ywp.ca

https://twitter.com/CanadaIwa

https://www.linkedin.com/company/iwa-ywp-canada



GUEST SPEAKER

YWP CANADA

- **Dr ALEXANDRA CASSIVI**
  Research Fellow, Université Laval, Quebec

Photo/Cristian Gardia

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DRINKING WATER SUPPLY CHALLENGES IN NORTHERN COMMUNITIES IN CANADA

Cassivi Alexandra[1 2], Rodriguez Manuel[1], Guilherme Stéphanie[2]

[1] Chaire de recherche en eau potable, Université Laval
[2] Département de genie civil, Université d'Ottawa

Inuit

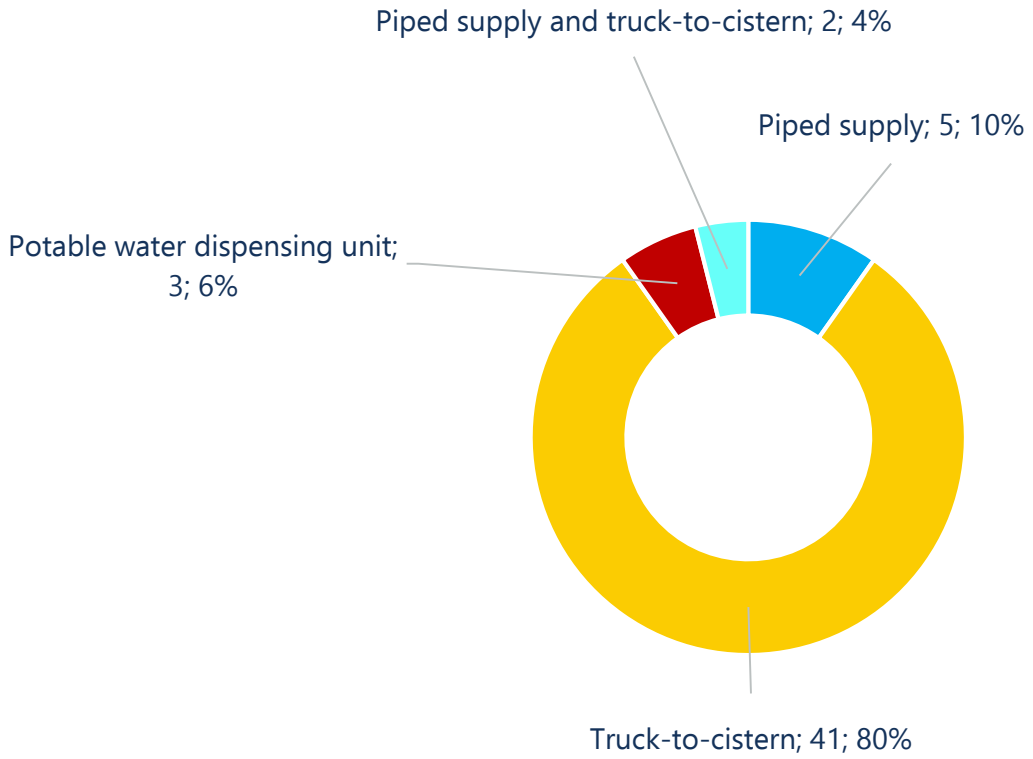
Inuit — Inuktitut for “the people” — are an Indigenous people, the majority of whom inhabit the northern regions of Canada. An Inuit person is known as an Inuk. The Inuit homeland is known as Inuit Nunangat, which refers to the land, water and ice contained in the Arctic region.

-The Canadian Encyclopedia

Context
Inuit Nunangat

Inuit Nunangat
Source: Statistique Canada

Context
Inuit Nunangat

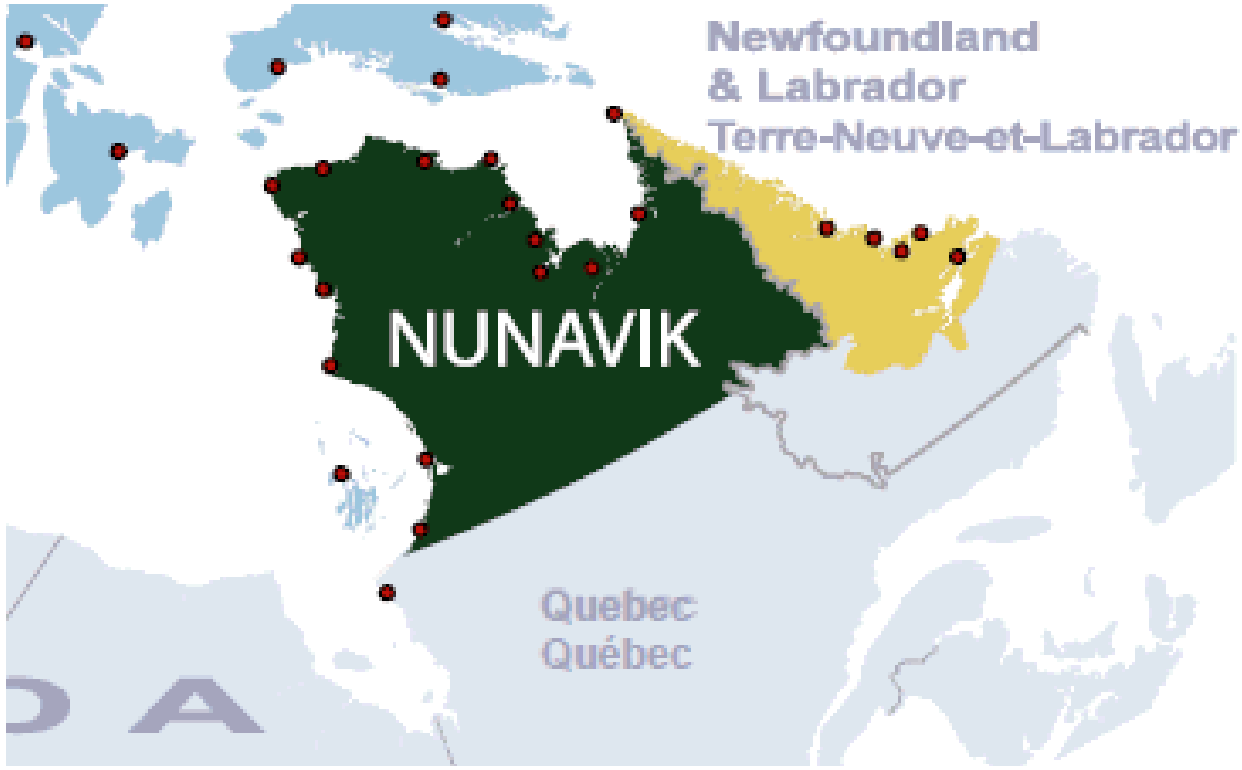


Types of water supply in Inuit Nunangat (N=51)

Context

Québec

Nunavik
Source: Statistique Canada



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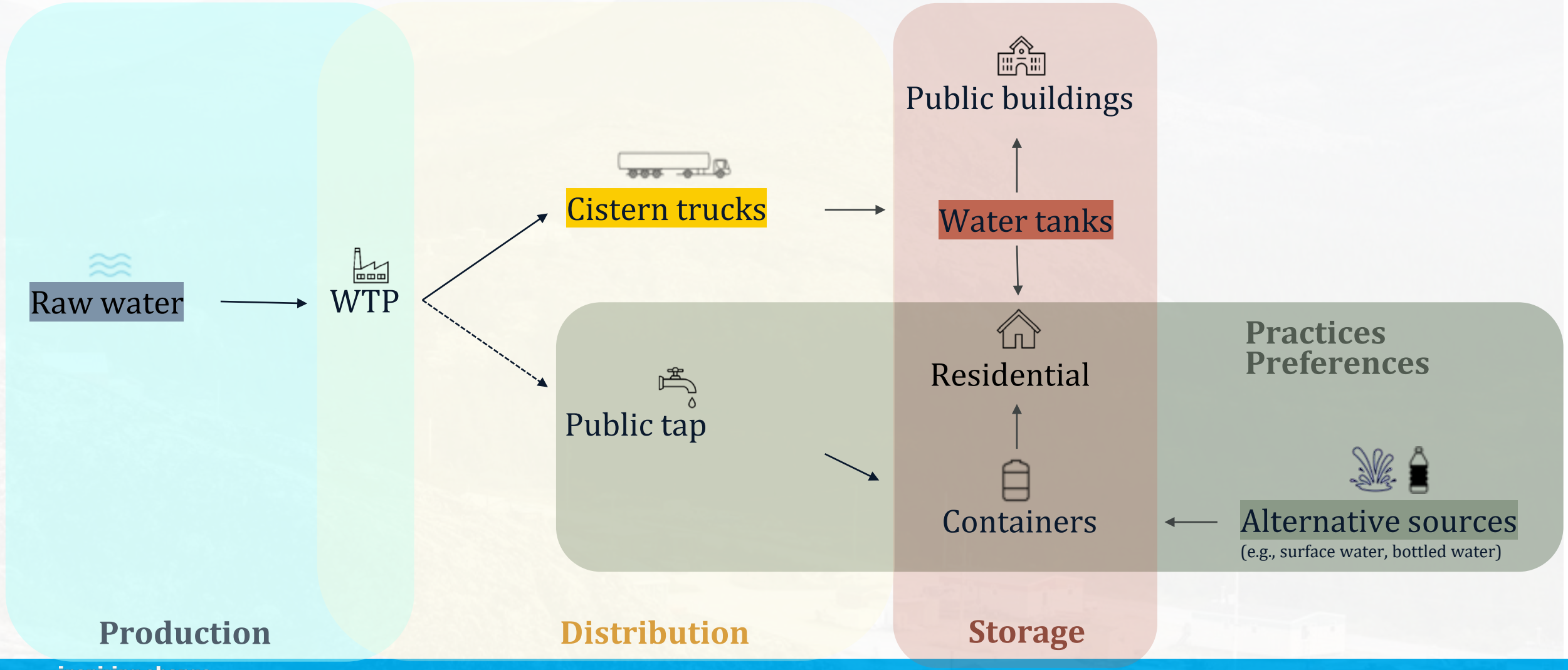
NUNAVIK

14 northern villages

±13 000 inhabitants

Drinking water supply



Main challenge

Ensure safe, affordable and sufficient access to drinking water, from the water source to the point-of-use.

Drinking water production

- Raw water source
- Drinking water treatment and water quality
- Acceptability (e.g., chlorination)

Regulation respecting the quality of drinking water

22.0.1. The person in charge of a distribution system serving more than 1,000 persons with water that originates in whole or in part from surface water or groundwater whose microbiological quality is likely to be altered by surface water must collect or have collected a sample of raw water so that the number of *Escherichia coli* bacteria may be checked according to the frequency determined in the following table:

22.0.2. The person in charge of a municipal distribution system serving more than 500 persons and at least one residence with water that originates in whole or in part from surface water must, for the purposes of controlling the total phosphorus, take or cause to be taken at least one sample of raw surface water during the period from May to October, with at least a 2-week interval between each sampling.

That person must also install a device to continuously measure the turbidity of raw water and take turbidity measurements and keep a record for that purpose. The provisions provided for in the fourth paragraph of section 22 apply, by making the necessary modifications to the provisions for taking measurements in the record.

If the water of more than one surface water withdrawal site gets mixed in the treatment facility, the obligations in the first and second paragraphs of this section apply to each of the withdrawal sites.

O.C. 699-2014, s. 2.

22.0.3. Sections 22.0.1 and 22.0.2 do not apply to territories north of the 55th parallel.

O.C. 699-2014, s. 2.

Regulation respecting the quality of drinking water

DIVISION II
WATER SUPPLIED BY TANK TRUCK

26. The provisions of Chapter II and those of Division 1 of this Chapter, except those of sections 12 and 14.1, apply, with the necessary modifications, to the water intended for human consumption supplied by a tank truck to more than 20 persons. Therefore, the person in charge of the tank truck is bound by the same obligations as those incumbent on the person in charge of a distribution system under the above-mentioned provisions. The samples to be collected under those provisions are collected at the outlet of the tank.

In the territories located north of the 55th parallel, the samples collected pursuant to sections 11, 14, 15 and 18 must be collected at the outlet of the reservoir where the tank truck is supplied with water.

Sections 21 and 23 do not apply to water supplied by a tank truck north of the 55th parallel.

O.C. 647-2001, s. 26; O.C. 467-2005, s. 23; O.C. 70-2012, s. 32.

27. The person in charge of a tank truck that supplies water intended for human

Water distribution

- Safe water quality from the WTP to the POU.
- Trucks operation and maintenance
- Distribution frequency to ensure water availability and enough quantities.

Storage / water tanks

- Share water tanks (Multi-units housing)
- Water tanks cleaning to avoid biofilm formation.
- Household water use

Practices and preferences of the population

Use of alternative water sources (e.g., surface water, bottled water)

- Raw water quality and vulnerability
- Post-collection contamination
- Reluctance and confidence in the distribution system

Case study

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KANGIQSUALUJJUAQ

58°41′ 00″N 65°57′ 00″ O

Households
274

Population
±1 000

Figure 4. Kangiqsualujjuaq
Source: Hydro-Quebec

Étude de cas

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KANGIQSUALUJJUAQ

TRUCK-TO-CISTERN SUPPLY

- **Drinking water supply**
- **Wastewater collection**

Terrain

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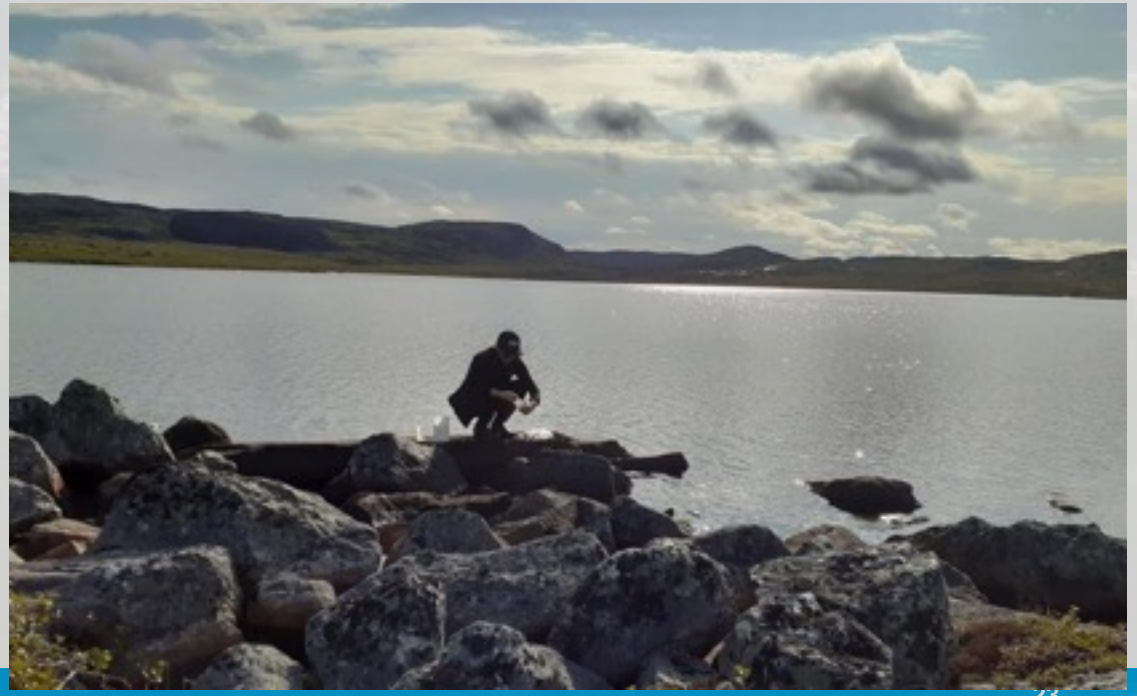
KANGIQSUALUJJUAQ

58°41′ 00″N 65°57′ 00″ O



August/September 2021

4 weeks

Objectives

Optimise management of drinking water supply services in isolated communities in the Arctic.

- Document drinking water supply challenges in the Arctic.

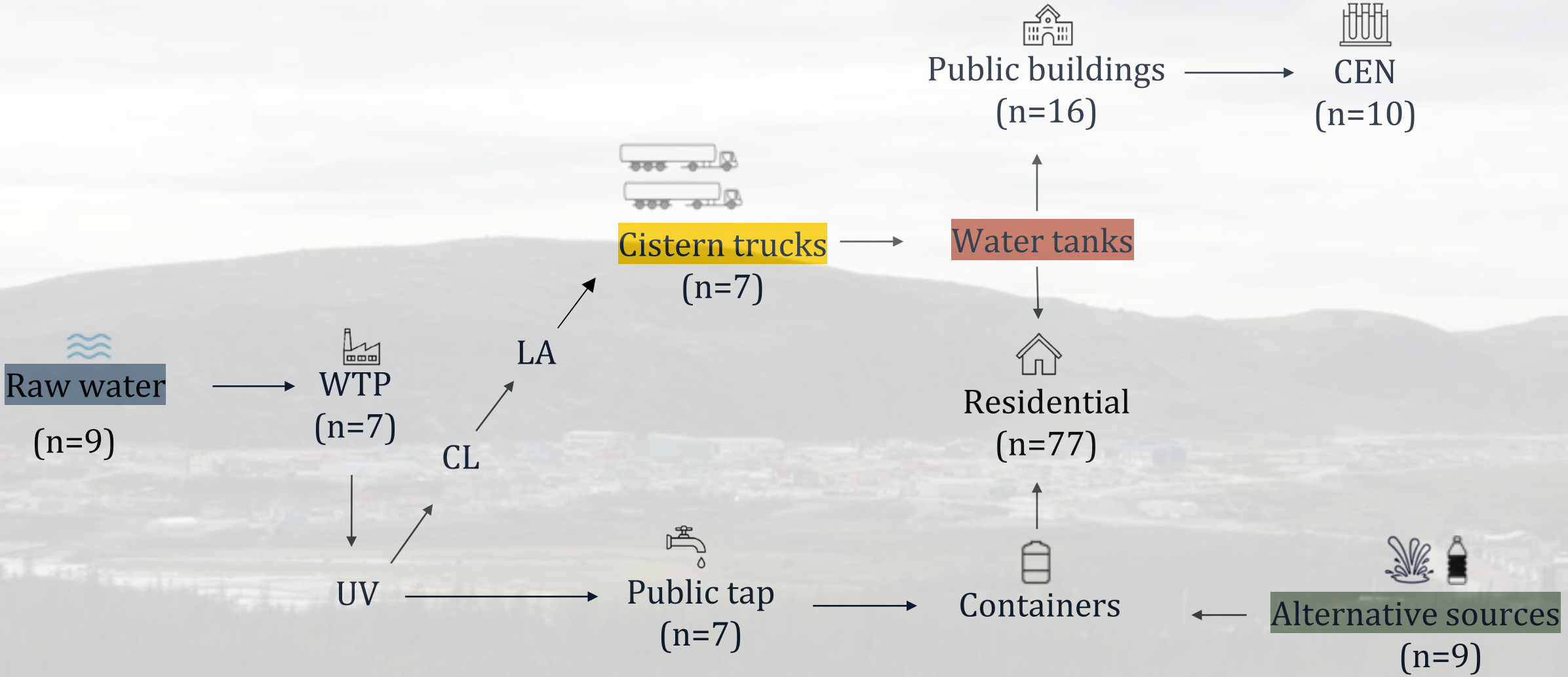
.

- Establish a portraot of water qualitu and availability the source to the tap .
- Identify sources of contamination and asses risks to human health.
- Develop a water safety plan for isolated northern communities

Methods

1) Water quality testing

- Physico chemicals
  (pH, temperature, TOC, chlorine, etc.)
- Bacterias (coliforms, *E.coli*)
- Disinfection by-products (HAAs, THMs)


Public buildings
(n=16)
CEN
(n=10)
Cistern trucks
(n=7)
Water tanks
Raw water
(n=9)
WTP
(n=7)
LA
CL
Residential
(n=77)
UV
Public tap
(n=7)
Containers
Alternative sources
(n=9)

Methods

2) Household survey

- Distribution and residential water tanks
- Water use and quantities
- Practices and preferences
- Use of alternative water sources

n=68

3) Observations

- Cistern trucks distribution routes
- Housing and types of reservoirs
- Localisations (GPS coordinates).

Next steps

Short term

- Data analysis.
- Data collection
  - Kangiqsualujjuaq, Nunavik (phase 2): water supply and domestic hygiene
  - Pond Inlet, Nunavut (phase 1-2): water supply and domestic hygiene

Mid term

- Replication in other communites of **Inuit Nunangat.**
- **Elaboration of a Water safety plan (WSP)**

DRINKING WATER SUPPLY CHALLENGES IN REMOTE ARCTIC COMMUNITIES.

Alexandra Cassivi
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LinkedIn. linkedin.com/in/CassiviA
Twitter. twitter.com/CassiviA

GUEST SPEAKER

YWP GERMANY

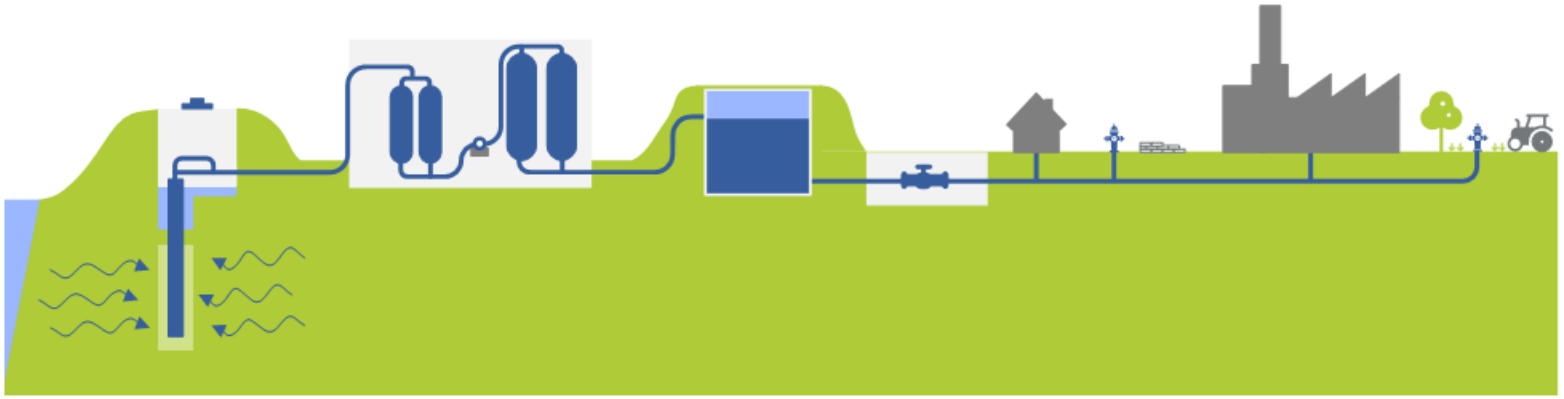
- **Dr LISA BROSS**
  Research & Development, Wasserversorgung Rheinhessen-Pfalz GmbH

Increase Water Production or Reduce Water Use?
(Digital) Strategies of Water Utilities to Deal with Climate Change Impacts

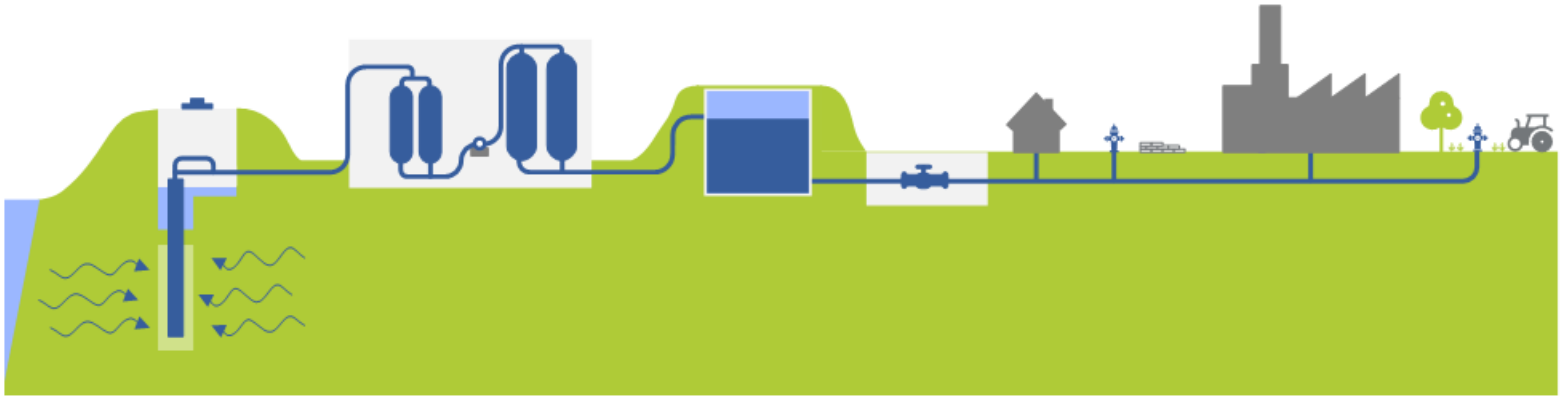
Dr. Lisa Broß

Head of Research and Development

wvr supplies over 235,000 inhabitants annually with approx. 15 million m³ of drinking water



Challenges for water supply today and in the future

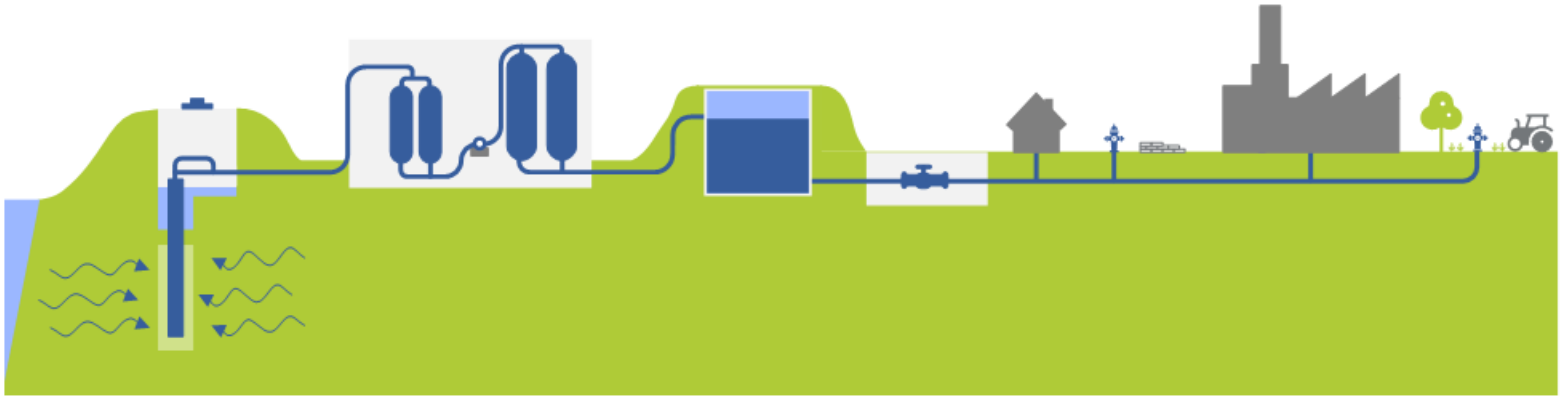


Decreasing groundwater recharge

Increasing water demand

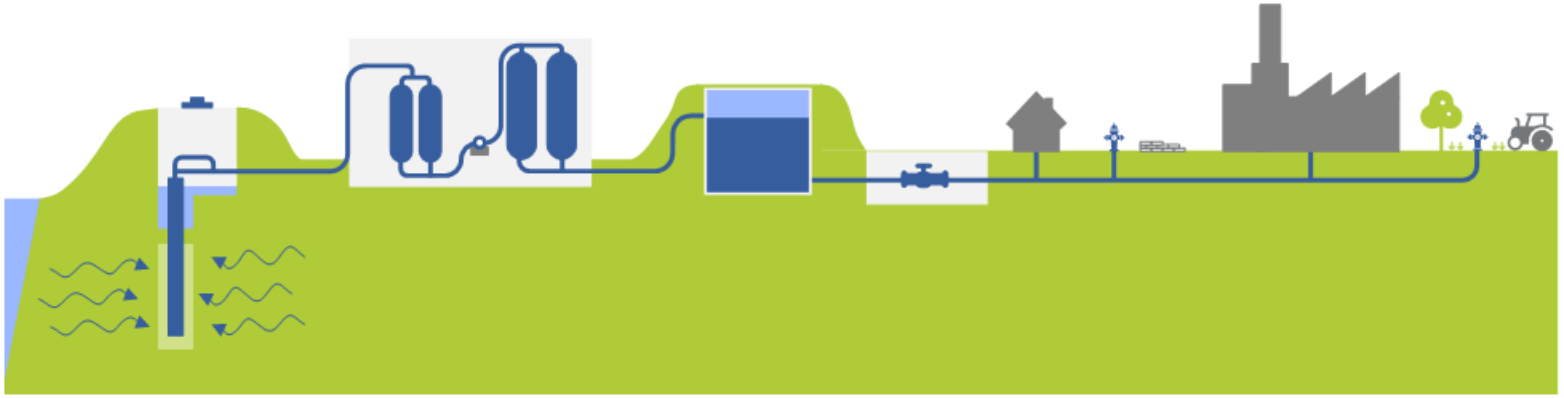
Reduction of sustainably produced water volumes

Challenges for water supply today and in the future



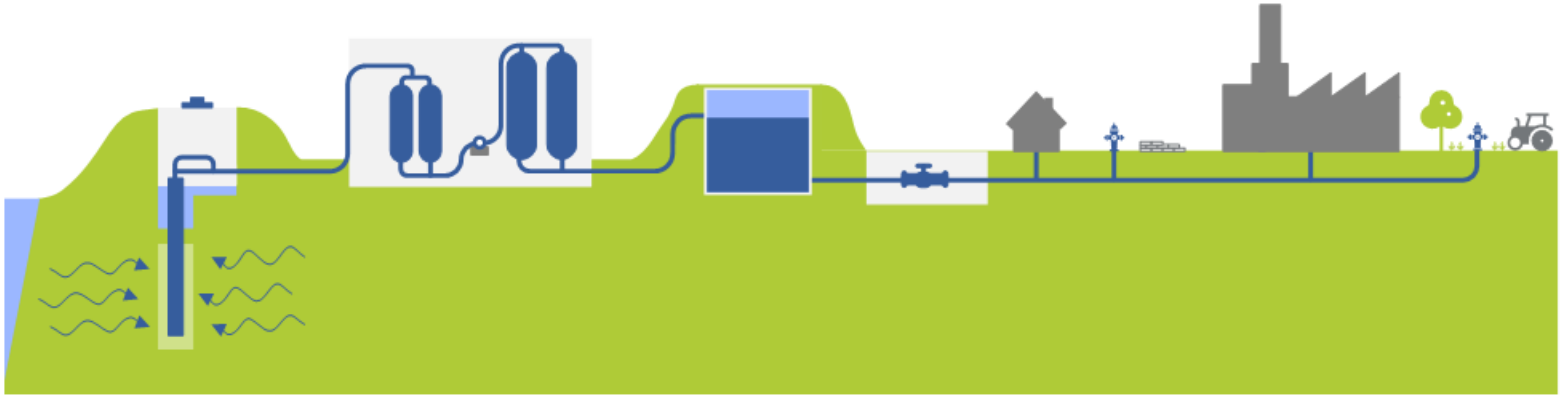
Decreasing groundwater recharge Increasing water demand Reduction of sustainably produced water volumes	Increased requirements lead to increased effort and energy demand

Challenges for water supply today and in the future



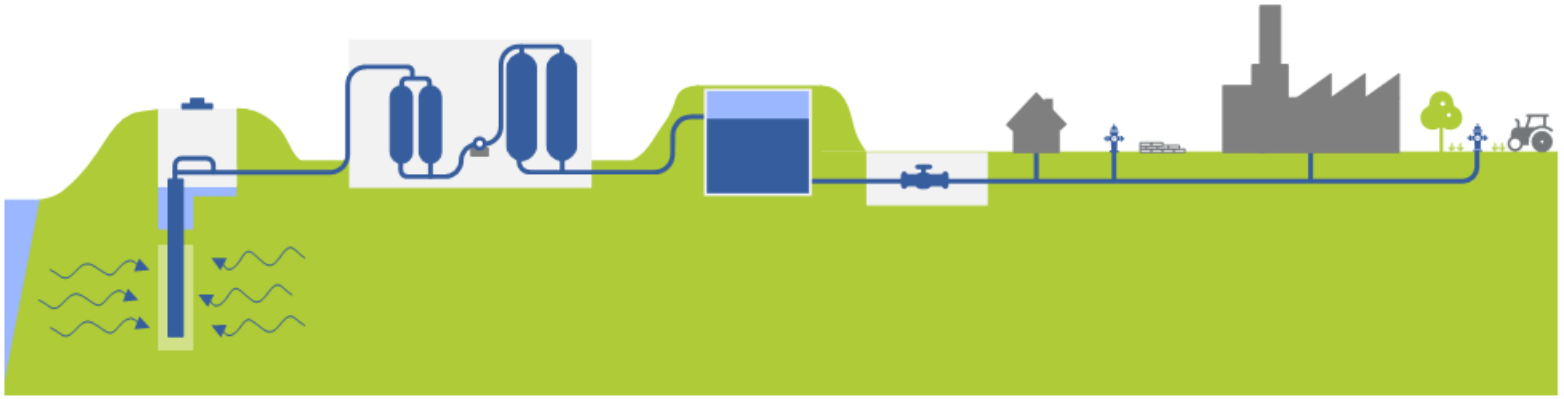
Decreasing groundwater recharge Increasing water demand Reduction of sustainably produced water volumes	Increased requirements lead to increased effort and energy demand	Adaptation of storage management to optimize energy consumption

Challenges for water supply today and in the future



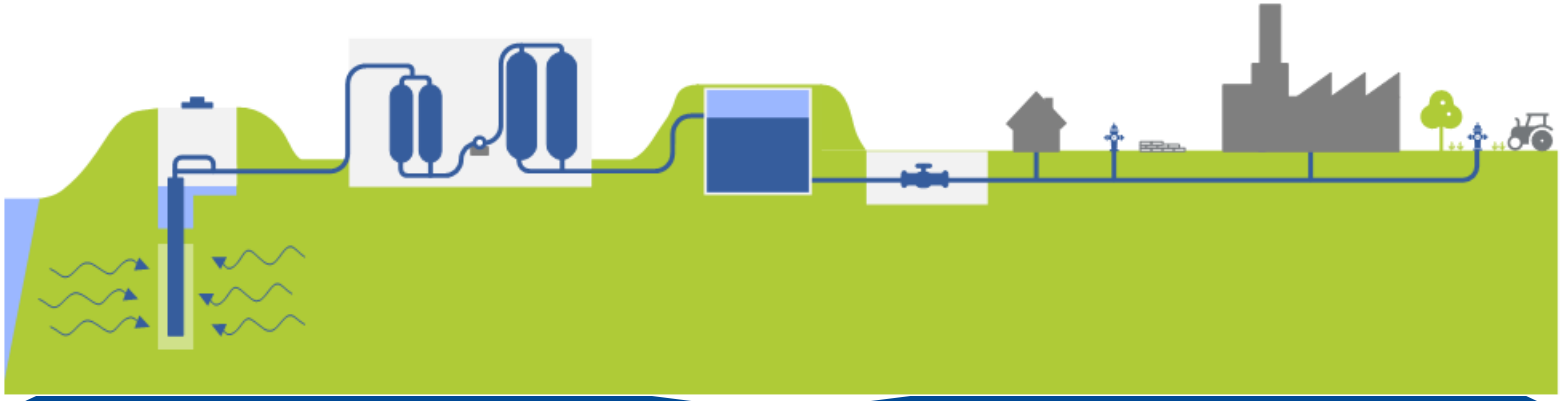
Decreasing groundwater recharge Increasing water demand Reduction of sustainably produced water volumes	Increased requirements lead to increased effort and energy demand	Adaptation of storage management to optimize energy consumption	Sustainable operation of the distribution network Change in usage profile (daily and hourly peak demand) Increase in the number of customers

Challenges for water supply today and in the future



Decreasing groundwater recharge Increasing water demand Reduction of sustainably produced water volumes	Increased requirements lead to increased effort and energy demand	Adaptation of storage management to optimize energy consumption	Sustainable operation of the distribution network Change in usage profile (daily and hourly peak demand) Increase in the number of customers	Priority of drinking water supply for the population over agriculture and industry Limitation of the usage quantity

(Digital) Strategies of Water Utilities to Deal with Climate Change Impacts



Increase Water Production?

Opening up more water resources?

Impact on the environment due to groundwater recharge?

Online monitoring of (ground) water levels?

Decrease Water Use?

Consequences of restricting services of general interest?

Ensuring emergency supply of critical infrastructures?

Economic consequences for water utilities?

Dr. Lisa Broß

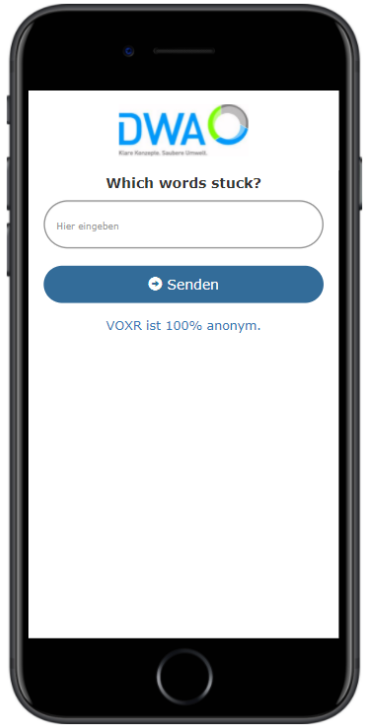
l.bross@wvr.de

SESSION FEEDBACK

QUESTION 2

Presentations! Which word stuck with you the most?

Link VOXR: **https://voxr.com/dwa**

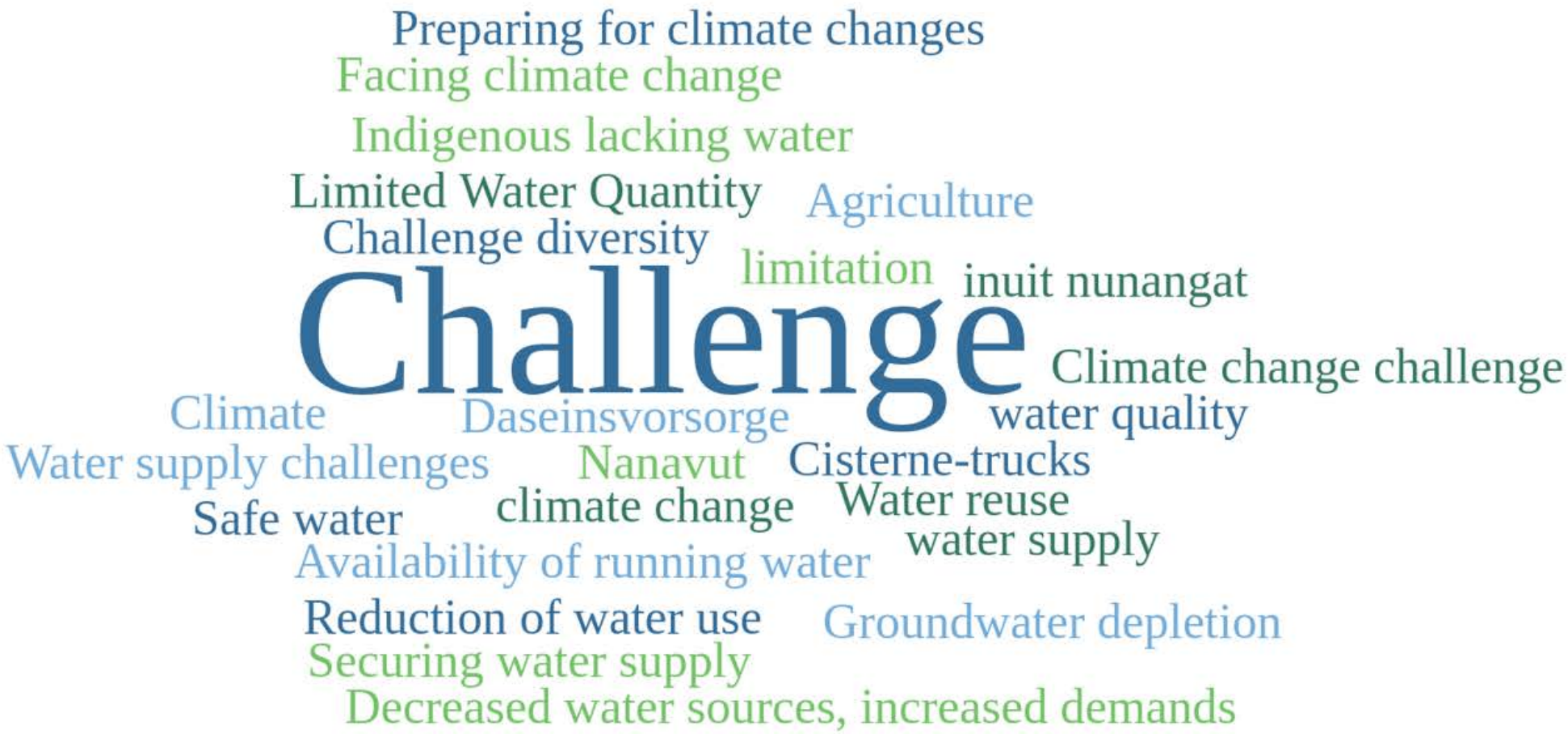


SESSION FEEDBACK

Which sector is your background? (Engineering/ Economic/Policy…)?

SESSION FEEDBACK

Which words stuck?



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THANK YOU

FOR YOUR PARTICIPATION