



Yemeni-German Technical Cooperation in the Water Sector

Main Achievements of “Institutional Development of the Water Sector in Yemen IDWS” Project and

Preliminary Planning of Follow-on Project: “Strengthening the Resilience of the Water Sector in Yemen”

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The Water Situation in Yemen

- Yemen is one of the **most water-scarce** countries in the world with an availability of only about **83 m³** of water per person annually. Deteriorating economic, social and security conditions endanger the already **vulnerable natural resources and livelihood of the population.**
- **More than 15.4 million** people are in need of humanitarian assistance for adequate access to clean water and appropriate sanitation services (UNICEF, 2021)
- Economic breakdown, cholera & COVID-19 outbreaks, natural disasters, conflicts over water, internal displacement, lack of good governance, excessive agricultural irrigation and the continuing energy crisis are further deteriorating the situation.

Due to the armed conflict:

- Water and wastewater infrastructure has been damaged, spare parts and maintenance are lacking, electricity supply has largely failed, and energy costs have increased considerably.
- Water sector institutions are not able to enforce good governance and integrated water resources management principles. A de jure Ministry of Water & Environment (MWE) exists in Aden and a de facto MWE in Sana'a.
- Institutional, operational and financial **viability of the urban service providers** are weakened and water and sanitation services difficult to be secured.

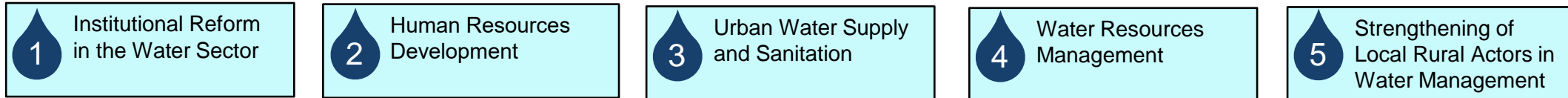
→ in the course of the **BMZ 2030 reform** concept, **Yemen** was categorized as a so-called **nexus and peace partner**, consequently the focus is working on the **structural causes of conflict/displacement, stability and peace potential.**



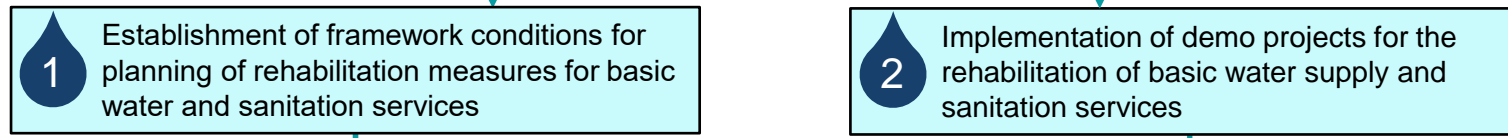


History of the water sector technical cooperation and concept development for the follow phase

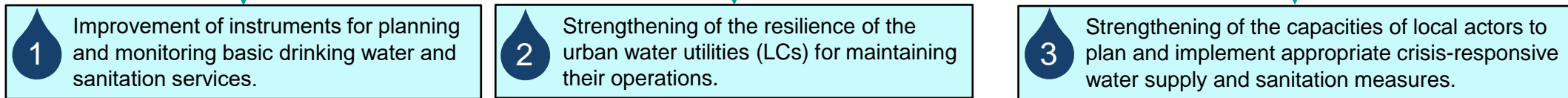
IDWS I & II
until 2016



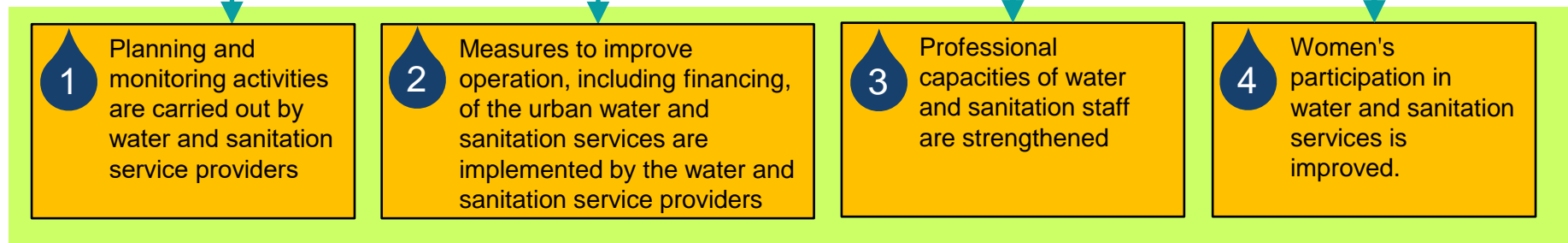
IDWS III
(10/2016 – 05/2021)



IDWS IV
(07/2020 – 12/2023)

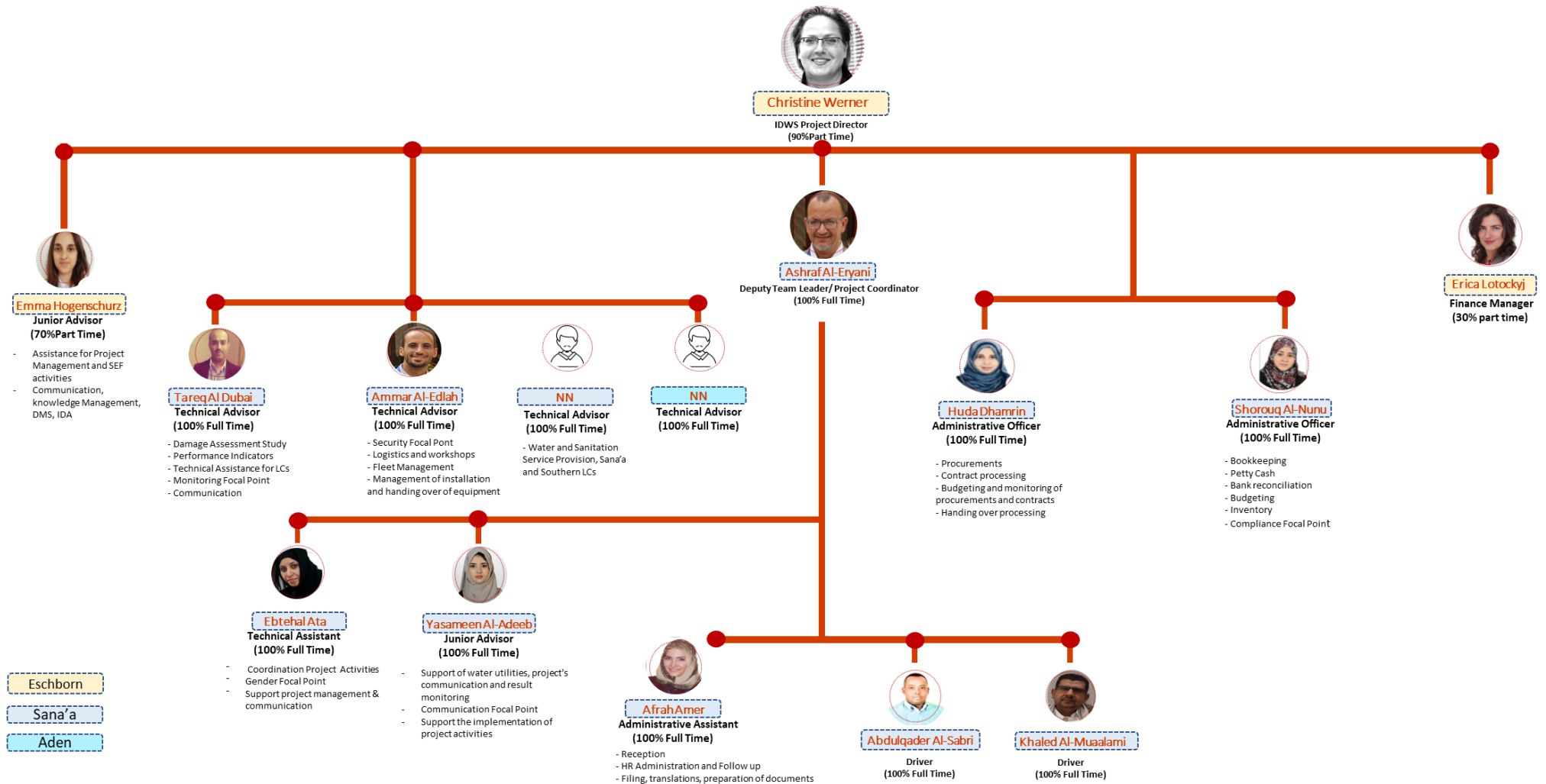


Outputs of follow-on project
(01/2024 – 02/2025 with extension to 12/2026)





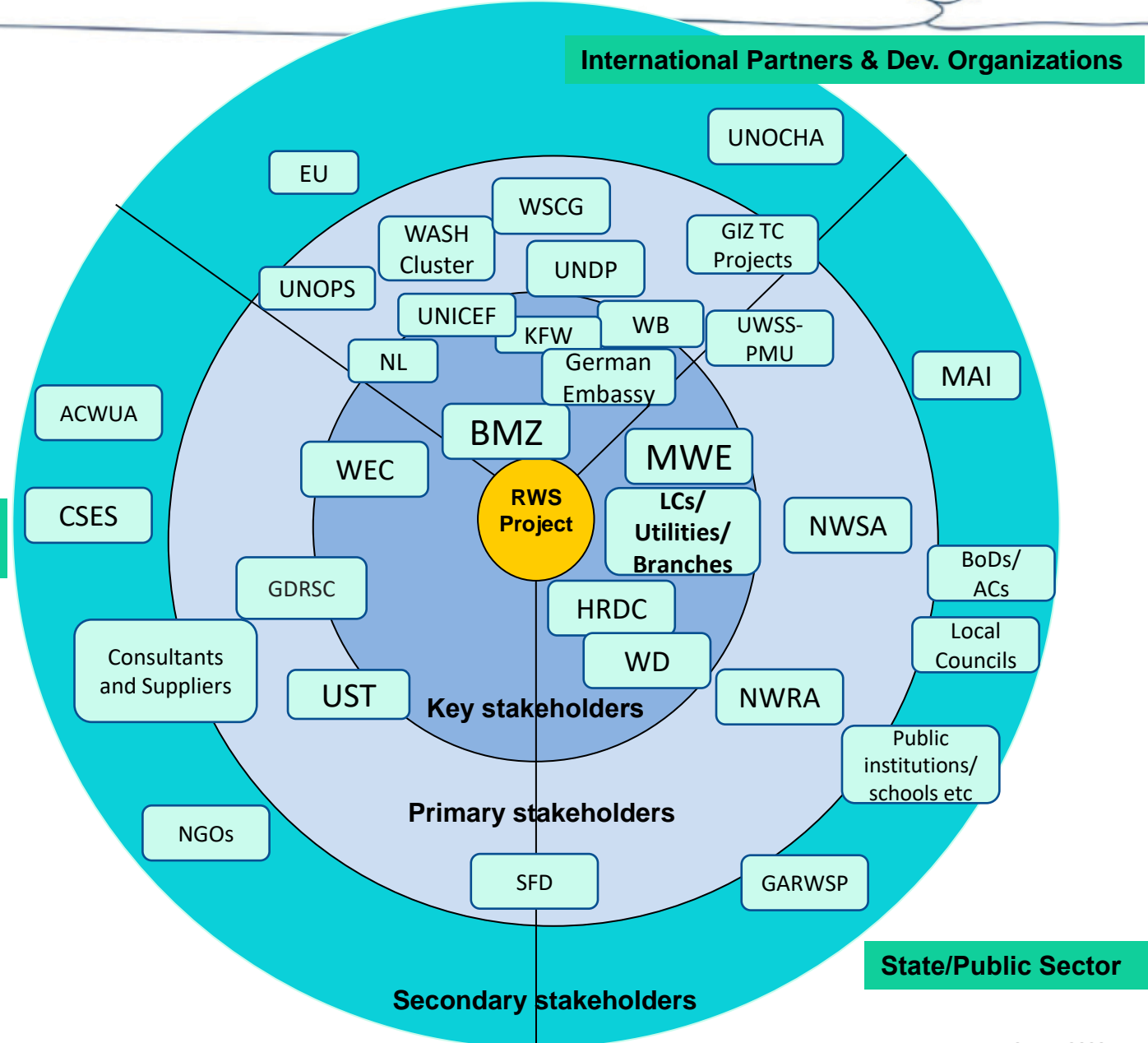
Team Organizational Structure – IDWS IV





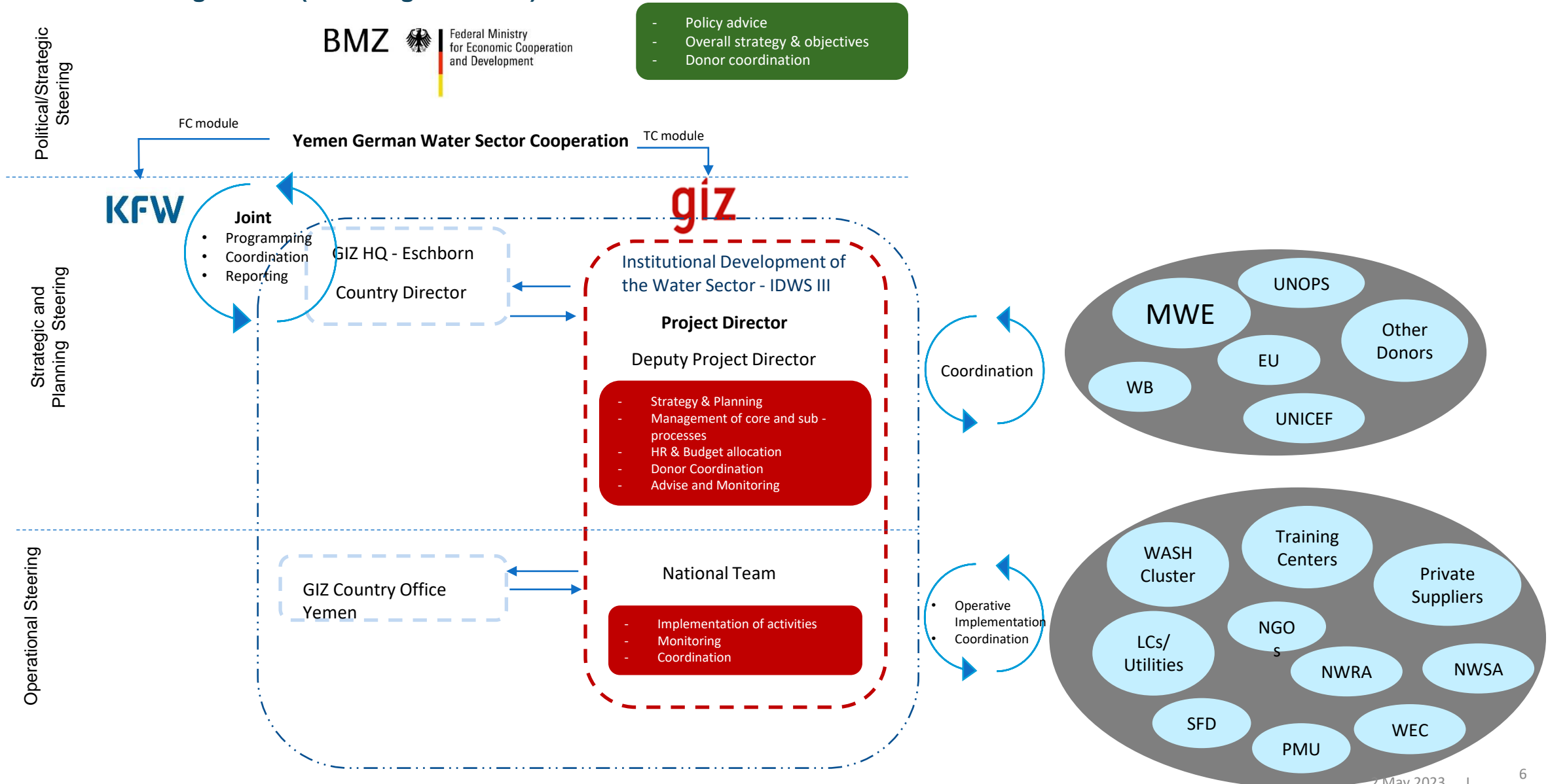
Working with a broad set of actors: Stakeholder Map RWS Project

legend	
ACWUA	Arab Countries Water Utilities Association
BMZ	Federal Ministry for Economic Cooperation and Development
BoDs/ACs	Board of Directors/Advisory Committees of the water utilities
Consultants and Suppliers	Consultants and Suppliers in North and South of Yemen
CSES	Center for the Study and Environmental Sciences – Aden Univ
EU	European Union
GARWSP	General Authority for Water & Sanitation Projects
German Embassy	Embassy of the Federal Republic of Germany Sanaa
GDRSC	Gender Development, Research, and Studies Center
GIZ TC Projects	Technical Cooperation Project of the German Agency for International Cooperation
HRDC	Human Resource Development Center
KFW	Kreditanstalt Für Wiederaufbau
LCs/Utilities	Water Local Corporations/ Water Utilities
MAI	Ministry of Agriculture & Irrigation
MWE	Ministry of Water & Environment
NGOs	Non-Governmental Organizations
NL	Netherlands
NWSA	National Water & sanitation Authority
NWRA	National Water Resource Authority
SFD	Social Fund for Development
UNDP	United Nations Development Programme
UNICEF	United Nations Childrens Fund
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
UST	University of Science and Technology, Sana'a
UWSS-PMU	Urban Water & Sanitation Sector – Project Management Unit
WASH Cluster	Water Sanitation & Hygiene Cluster
WB	World Bank
WEC	Water & Environment Center
WSCG	Water Sector Coordination Group



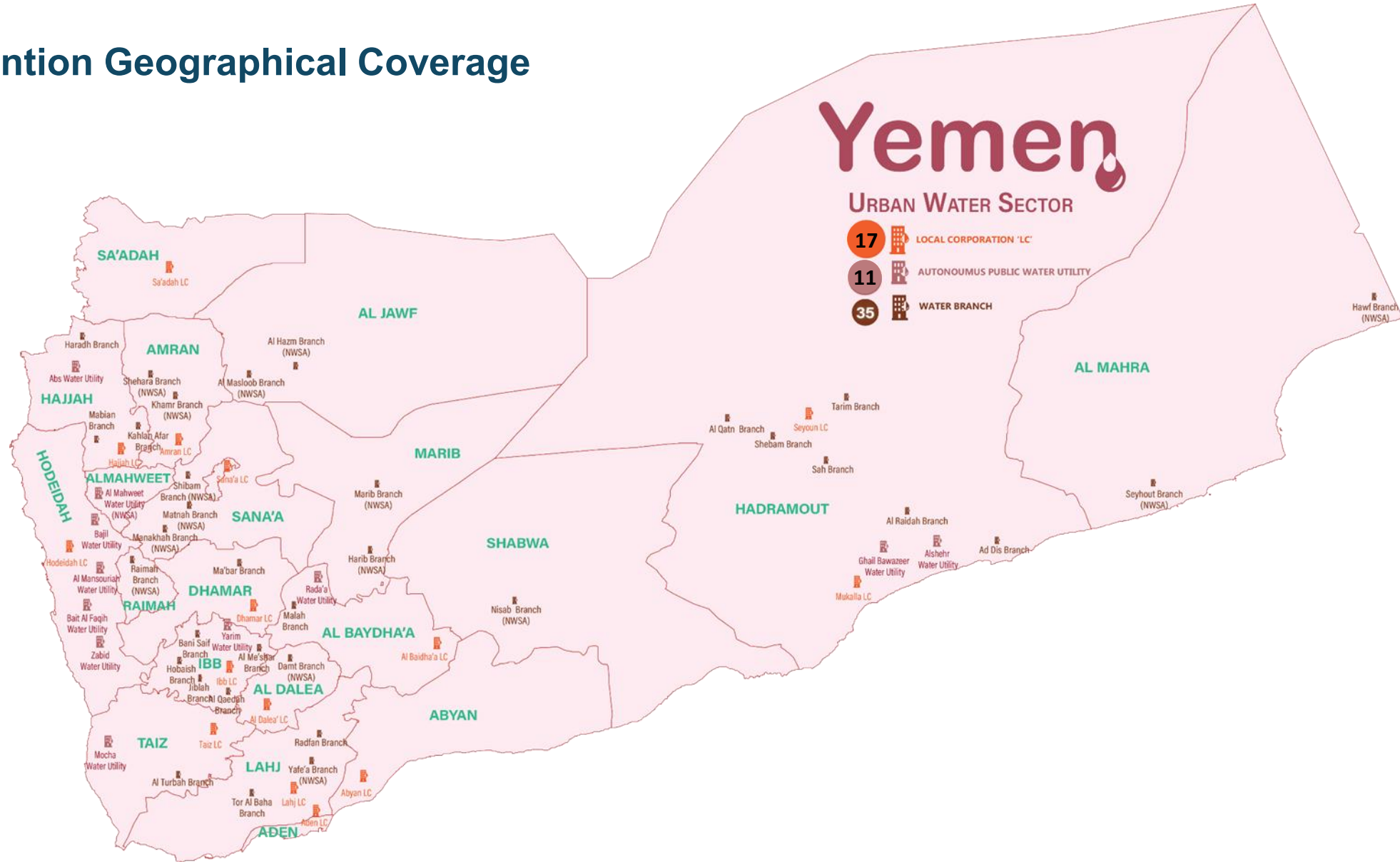


Implementation Arrangements (Steering Structure)





Intervention Geographical Coverage





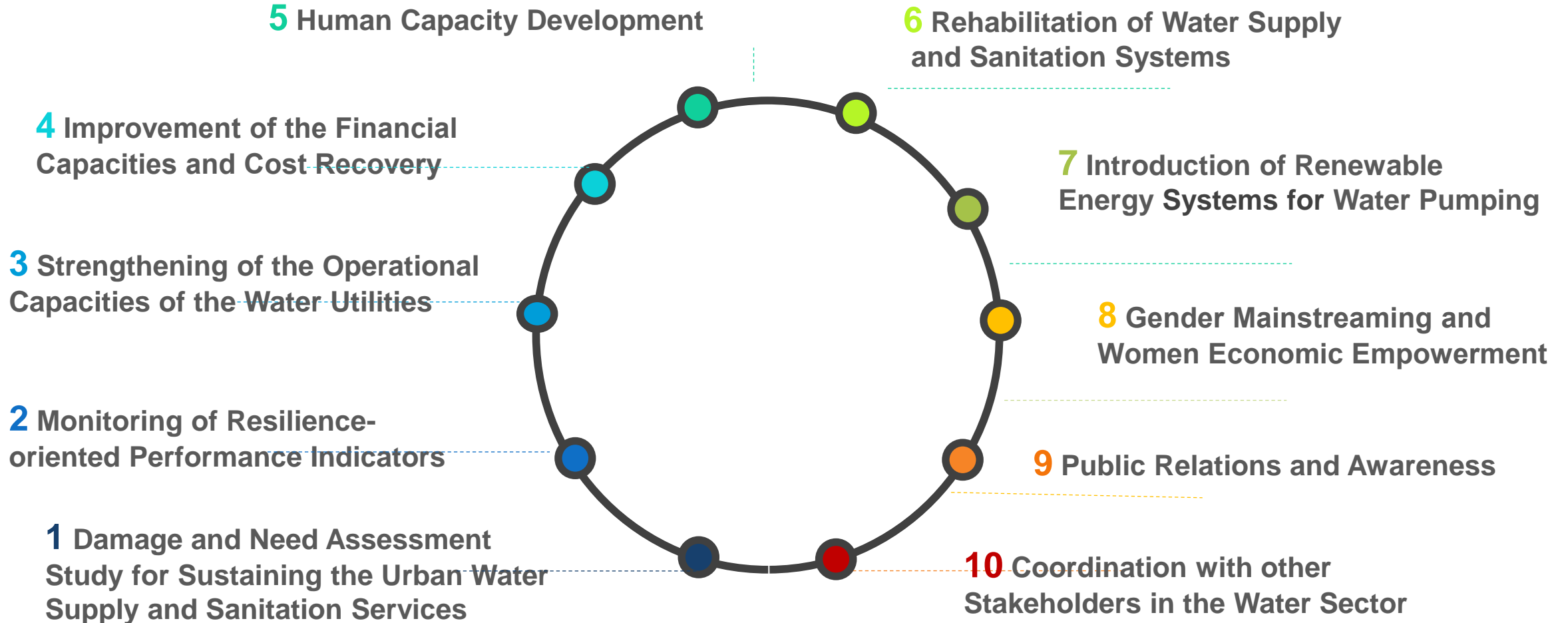
Water Program Major Achievements



Institutional Development of the Water Sector (IDWS) I - IV



Overview of the Main Project Areas (IDWS III + IV)





Damage and Need Assessment Study for the Urban Water Utilities

Purpose

To develop a strategic approach to build up resilience of Water Utilities and to maintain water and sanitation services

To prepare technical assistance packages for capacity development at the institutional and human resource level

To prepare a series of short-term (2-3 year) investment packages for repair and rehabilitation of water supply and wastewater infrastructure

Target Beneficiaries

2018 update 2023



12 15

Water Supply and Sanitation Local Corporations and their affiliated Utilities and Branches.



23 35

Urban Centers



7.5 ~ 9 million

Population

Deliverables

2018 update 2023

Yemen Water Sector - Damage and Need Assessment Report

Part 1: **Resilience Strategy Report** (2018+2023)

Part 2: **Situation Assessment Report and Development of Technical Assistance and Investment Plans** for the Infrastructure Rehabilitation and Restoration of Water Supply and Sanitation Services (2018+2023)





Monitoring of Resilience-Oriented Performance Indicators

- Snapshot information for monitoring the performance of the urban water and sanitation services under current conflict conditions
- Providing impact monitoring and direct priority assistance for international aid agencies
- Regular quarterly reports shared with all stakeholders including WASH Cluster



Emergency Water Sector Performance Indicators

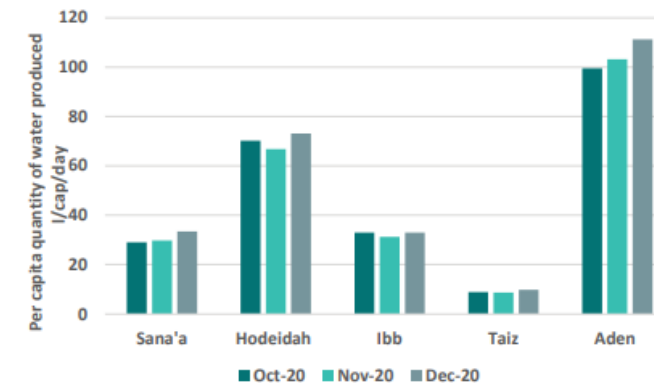
This report measures the resilience of the LCs in terms of the following category of key resilience-oriented performance indicators:

1. Service Coverage, Service Levels and Quality - Piped Water Supply <ol style="list-style-type: none"> Total population in service area (100%) Number of O&M in service area (total) Number of water connections (No.) Number of population covered through water supply network (No.) Water supply service coverage = population covered through water supply network to total population in service area (%) Number of service days of piped water supply per month (day/month) 	<ol style="list-style-type: none"> Number of residual chlorine samples taken (No./month) Number of residual chlorine samples according to standards (No./month) Proportion of bacteriological quality samples of distributed water according to standards - Number of residual chlorine samples according to standards per total number of samples taken (%)
2. Service Coverage and Quality - Sewerage <ol style="list-style-type: none"> Number of population covered with sewerage infrastructure (No.) Number of sewerage connections (No.) Sewerage connection coverage = population covered through sewerage network to total population in service area (%) Number of BOD5 samples of effluent of WWTP taken per month (No./month) Number of BOD5 samples of effluent of WWTP according to standards per month (No./month) Total quantity of water produced (100 months) The volume quantity of water produced (100 months) Storage capacity (m³) Storage capacity share per capita (liters/capita) Total number of repair pumps for the water supply system (No.) Number of functional pumps in service (No.) Number of working hours of all operating pumps of the water supply system (working hours) Number of non-functional pumps (broken due to technical reasons) (No./month) Total operational operational revenues (USD/month) Total billed operational revenues (USD/month) Total operational costs (USD/month) Collection efficiency = Collected revenues vs. Billed revenues (%) 	<ol style="list-style-type: none"> Proportion of efficient quality samples of wastewater treatment plants according to standards - Number of BOD5 samples according to standards per total number of samples taken (%) Average BOD5 value of raw influent at WWTP (mg BOD5/l) Average BOD5 value of treated effluent at WWTP (mg BOD5/l) Treatment efficiency of WWTP regarding BOD5 (%) Energy costs per m³ water produced (USD/m³) Effluent produced (100 months) Effluent treated (100 months) Number of working generators in the operation of pumps (No.) Number of working hours of all operating generators used to run the functional pumps of the water supply system (working hours) Actual operational cost coverage (%) Monthly governmental subsidies (USD/month) Percentage of basic monthly salaries paid (%)
3. Production and consumption <ol style="list-style-type: none"> Total quantity of water produced (100 months) The volume quantity of water produced (100 months) Storage capacity (m³) Storage capacity share per capita (liters/capita) Total number of repair pumps for the water supply system (No.) Number of functional pumps in service (No.) Number of working hours of all operating pumps of the water supply system (working hours) Number of non-functional pumps (broken due to technical reasons) (No./month) 	<ol style="list-style-type: none"> Effluent produced (100 months) Effluent treated (100 months) Number of working generators in the operation of pumps (No.) Number of working hours of all operating generators used to run the functional pumps of the water supply system (working hours)
4. Performance of Pumps and Generators <ol style="list-style-type: none"> Total number of repair pumps for the water supply system (No.) Number of functional pumps in service (No.) Number of working hours of all operating pumps of the water supply system (working hours) Number of non-functional pumps (broken due to technical reasons) (No./month) 	<ol style="list-style-type: none"> Number of working generators in the operation of pumps (No.) Number of working hours of all operating generators used to run the functional pumps of the water supply system (working hours)
5. Financial Sustainability <ol style="list-style-type: none"> Total operational operational revenues (USD/month) Total billed operational revenues (USD/month) Total operational costs (USD/month) Collection efficiency = Collected revenues vs. Billed revenues (%) 	<ol style="list-style-type: none"> Actual operational cost coverage (%) Monthly governmental subsidies (USD/month) Percentage of basic monthly salaries paid (%)

6. Number of service days of piped water supply per month (day/month)



20. Per capita quantity of water produced (l/cap/day)⁴



IDWS III **IDWS IV**

5 **8** LCs



23 **39** Resilience Performance Indicators



Strengthening of the Operational Capacities of the Water Utilities

Procurement of IT and office equipment for LCs, MWE and HRDC

Installation of Solar Power Systems for the LCs offices

Support of organizational development



IDWS III

IDWS IV

18

28

LCs, utilities and
branch offices

3

Other Water Authorities



COVID-19 Prevention

Provision of washing machines, hygiene and personal protection equipment to promote good hygiene practices and safeguard the wellbeing of the staff and protect them against COVID-19



57

LCs, utilities and branch offices with
approx. 10.000 employees





Improvement of the Financial Capacities and Cost Recovery of the Water Utilities

- Improvement of Customer Relations Management
- Provision of water meters, servers, billing printers, paper
- Introduction of Personal Digital Assistants (PDAs) for mobile reading of the water meters, printing of bills and fee collection



IDWS III
3 LCs

IDWS IV
6 LCs



Results

- Improved service quality, customer satisfaction and revenues collection
- Progressive **increase of collected revenues by an average of 106%** (in 2021) compared with 2017 (project intervention baseline).





Capacity Development










Networking Events:

- Workshop on joint dialogue of water and environment stakeholders (Seyoun, Yemen)
- Participation in the “Arab Water Week” (Amman, Jordan)
- Sanitation workshop for best practices and options in sanitation (Sana’a, Yemen)

Development of training material and manuals:

- Development of training manuals for e.g., on solar power pumping systems, domestic plumbing
- Conducting a Mapping Study of Capacity Development and Training Service Providers in Yemen.

Trainings:

- | | | | |
|--|---|------------|--|
| ▪ Use of PDAs for metering, billing, printing and fee collection |  | 30 | LC staff |
| ▪ Design, installation and Maintenance of Solar Power Systems for Water Pumping |  | 127 | Staff of 21 LCs and water utilities |
| ▪ Programming and Check Performance of Maximum Power Point Tracking (MPPT) for Pumps |  | 127 | Staff of 21 LCs and water utilities |
| ▪ Use of the “Performance Indicator Information System (PIIS)” |  | 19 | PIIS key staff of LCs and MWE |
| ▪ Organizational Restructuring & Job descriptions Adjustment |  | 33 | Key staff of MWE, LCs and utilities |
| ▪ Project Preparation and Management Focusing on Gender-Mainstreaming |  | 31 | Female employees of MWE, LCs, NWSA, HRDC |
| ▪ Installation and Maintenance of Domestic Water Supply and Sanitation Systems |  | 30 | Women |
| ▪ Training Course on Professional Project Planning |  | 27 | Female employees |
| ▪ Provide training course "Financial internal auditing |  | 31 | Key staff of MWE, LCs and utilities |





Rehabilitation of Water Supply and Sanitation Systems

Rehabilitation of Water Networks, Maintenance & Provision of Spare Parts and Water Meters


IDWS III **IDWS IV**
8 **7** LCs

> 454,000 Beneficiaries
> 513,000



Replacement & Provision of skid-shovel for waste removal / treatment plant


IDWS III **IDWS IV**
2 **1** LCs

> 120,000 Beneficiaries
> 40,000



Replacement & Provision of generators and pumps


IDWS III **IDWS IV**
7 **6** LCs

> 577,000 Beneficiaries
> 761,000



Introduction of Renewable Energy Systems for Water Pumping

Installation of solar water pumping systems



Baseline study on the possibility of the use of wind energy systems in Aden and installation of wind measuring equipment





Gender Mainstreaming and Women Economic Empowerment

- Addressing of gender issues in the Damage Assessment Study
- Support of the Women Departments of MWE and LCs, development of a Gender Action Plan
- Implementation of training courses for female staff in the water sector e.g., training course on "Project Preparation and Management Focusing on Gender-Mainstreaming."
- First implementation of a female plumbers training for the installation and maintenance of domestic water and sanitation systems. Continuation of the course is in preparation.
- Implementation of demonstration project for the gender and disability friendly rehabilitation of the WASH facilities in Sana'a LC, serving over **1000** staff members.





Public Relations and Awareness



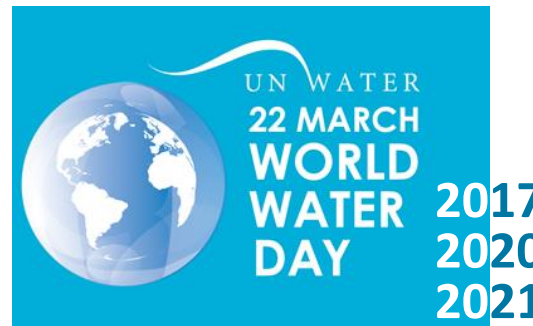
7 LCs displayed public awareness messages on water bill payments for customers.



232 primary schools supported in integrating water related educational awareness messages in schoolbooks.



4 Sponsored events on national level for important dates e.g., (World Water day, World Toilet day)





Coordination with other Stakeholders in the Water Sector

1) WASH Cluster

- Participation in the UNICEF-led WASH Cluster and responsibility for supplying the monthly monitoring reports on behalf of all GIZ Yemen projects' WASH-activities.
- Participation as permanent member in **Strategic Advisory Group (SAG)** of the WASH Cluster
- Lead of the **Sanitation Technical Working Group (STWG)**

2) Water Sector Coordination Group (WSCG)

- Participation in the international donor coordination WSCG
- Technical support to the Counsellor/ Head of Cooperation of the German Embassy to Yemen and UNDP in their role as lead of the group.



Preliminary Planning of Follow-on Project

“Strengthening the Resilience of the Water Sector in Yemen”





Objective and field of actions for the new water sector project

The resilience of urban water and sanitation service providers
in sustaining water supply and sanitation services in Yemen is strengthened

1 Planning and monitoring activities are carried out by water and sanitation service providers

2 Measures to improve operation, including financing, of the urban water and sanitation services are implemented by the water and sanitation service providers

3 The professional capacities of water and sanitation staff are strengthened

4 Women's participation in water and sanitation services is improved.

Proposed project components and duration: Confirmed 01/2024 – 02/2025 with planned extension until 12/2026
(overall budget 4,1 + 3,9 Mio €)



Output 1: Planning and monitoring activities are carried out by water and sanitation service providers

Key activities:

- **Regular update of Damage and Need Assessment Study (DAS) via digital system:**
 - Activate responsible units in the Ministries for coordinating and validating the update of assessment questionnaires, TA and Investment plans (Advisory Group / technical departments)
 - Set-up of digital system, procure equipment and train staff and Advisory Groups at MWE in northern and southern governorates
 - Support WS utilities in updating the DAS data (via external consultants + local focal points in WS utilities)
 - Further develop the digital DAS system and reporting
- **Enabling of local institutions to manage the Performance Indicator Information System (PIIS)**
 - Integrate and merge Emergency Indicators and regular PIIS System Indicators in coordination with the technical departments of the MWE in the north and south
 - Further develop and improve PIIS System(s), including modernization of the data base
 - Develop and update manuals, standard procedures and guidelines for performance monitoring
 - Provide IT Equipment for utilities for the operation of the PIIS System (in coordination with other donors)
 - Reactivate or extend the operation of the PIIS System in further utilities



Output 2: Measures to improve operation, including financing, of the urban WS services are implemented by the WS service providers

Key activities:

- **Support organizational development of water and sanitation service providers and Ministries**
 - For selected WSSP and/or selected topics, update of business plans, organizational structure, job descriptions and working procedures
 - Development of energy saving plans for selected WSSP including potential applications for renewable energy
 - Development of a handout on mandate, structure and procedures of the Board of Directors / Advisory Committee of water and sanitation service providers
 - Advise for the reactivation of the auditing process of water and sanitation service providers
- **Improvement of the digital infrastructure of water and sanitation service providers and Ministries**
 - Assess and contribute to modernization/revitalization of GIS – based utility management systems (customer database, billing system, asset documentation and inventory,...)
 - Provision of software support and complementary IT Infrastructure for water and sanitation service providers
- **Improvement of revenue collection and economic efficiency**
 - Hard- and Software support to the Customer Relations Departments of selected WS utilities (equipment, IT infrastructure, customer complaint systems, ...)
 - Update of customer databases and billing and collection systems in selected water and sanitation service providers
 - Maintain and extend the use of mobile meter reading and billing devices (PDA)
- **Improvement of operational efficiency of water and sanitation service providers and climate resilience of urban water supply and sanitation services**
 - Implementation of small-scale rehabilitation and demonstration projects for resilience-oriented water and sanitation services: e.g.: Rainwater harvesting, solar pumping, innovative water treatment technology, wind energy, energy efficiency...



Output 3: The professional capacities of water and sanitation staff are strengthened

Key activities:

- **Qualification of the institutions responsible for human resources in the water sector at the national level for the coordination and monitoring of training measures**
 - Capacitate the Human Resource Development Center (HRDC) Sana'a & HR Department of MWE Aden in coordination and monitoring of training measures (optional: joint capacity development initiative coordination)
- **Reactivate the implementation of operational training programs in the water sector**
 - Update vocational training contents and develop ToTs in cooperation with the Dahban Vocational Training Center and with support in specific topics from the Water and Environment Center (WEC) & others
 - Rehabilitate the Water Department of Dahban Vocational Training Center (IT, rehabilitation and modernization of workshops, laboratory material)
 - Reactivate the vocational and technical water and sanitation diploma training course (long-term) and specific short courses (theoretical and on the job trainings for selected topics) and at the Dahban Vocational Training Centre
 - Identify Vocational Training Center in Aden for setting up a Water Department and development of a water and sanitation vocational training program, conduct specific short trainings
- **Improve the capacity of staff of selected water and sanitation service providers**
 - Facilitate knowledge-transfer between water and sanitation service providers
 - Conduct trainings and on the job support in selected topics (e.g. DAS, PIIS, GIS applications customer relations and revenue collection)
- **Coordination of knowledge exchange between representatives of water and sanitation service providers on selected topic areas**



Output 4: Women's participation in water and sanitation services is improved

Key activities:

- **Promote community engagement and create perspectives for women at the local level**
 - Training of female plumbers to maintain household water and sanitation installations in 2 selected cities in cooperation with a local NGO
 - Assist in the mobilization of outreach workers together with 2 urban water and sanitation service providers to conduct awareness raising activities, e.g., on water conservation and improving willingness to pay
 - Organize information days for women and youth on vocational training opportunities and job perspectives in the water sector
- **Gender mainstreaming in the water sector institutions**
 - Support the organizational development of Women Departments (WD), clarification of their mandate and their role for advancing gender mainstreaming in the water sector
 - Support the development / update of Action Plans of the Women Departments in the MWEs north and south
 - Assist WD in ministries in supporting WSSP in the development and updating of their action plan
- **Upskilling of female staff in water sector institutions**
 - Organize selected short training courses for women in ministerial departments and WS utilities (e.g. customer relations and revenue collection)
 - Ensure active participation of female staff of water sector institutions in regular updates of DAS study
 - Promote participation of women and female staff in capacity development measures
 - Promote gender friendly and inclusive WASH facilities for public institutions



Target groups and partners of the follow-on project

Target Groups:

- The population of Yemen, mainly the urban population (ca 9 Mio people), served by the 17 Local Corporations for Water Supply and Sanitation and selected branches of the National Water and Sanitation Authority (NWSA),
- Staff of Local Corporations and technical departments of MWE in the north and south, as well as their women departments for capacity development,
- Vulnerable groups of the society, in particular women & youth, for plumbers training and engagement in neighbourhood activities in up to 3 selected intervention zones.

Partners:

- Yemeni water sector institutions, especially the Local Corporations for Water Supply and Sanitation (LCs) as well as the technical departments of the Ministry of Water & Environment (MWE), as well as their women departments,
- Capacity development institutions in the water sector (e.g. Human Resource Development Center (HRDC), Water and Environment Center (WEC), Gender Development Research Studies Center (GDRSC), Center of Studies in Environmental Sciences Aden (CSES), Center of Env. Studies and Water Resources Hadramout)),
- Vocational training institutes such as Dhahban Vocational Training Institute (Sana'a), Al-Mansourah Vocational Training Center (Aden),
- Local partners, e.g. NGOs, within the WASH Cluster and international donors supporting water sector activities in Yemen.



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