Rural Water
Capacity Needs Assessment Annexes

Global Water CENTER

CAWST

RWSN

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ANNEX 1: Survey Questions

Depending on their answers to questions 1 and 14, the respondents were directed to questions relevant to them only. Therefore, the majority of respondents had to answer a maximum of 20 questions.

Capacity Needs Assessment

Section A: Role

* 1. What is your role in the rural water sector? (check one box)

- ◯ I work in the day-to-day operations of getting water safely to rural communities. *For example, supervisor, operator, technician, customer service, community outreach.*
- ◯ I support individuals, teams, and institutions that provide water to rural communities. *For example, WASH Program Manager/ officer (Country level Office), WASH Advisor (multiple countries/ headquarters, Consultant).*
- ◯ I work in other parts of the rural water sector.

Capacity Needs Assessment

Section B: Rural Responsibilities

* 2. In what country do you work?

* 3. Which of the following job titles most closely resemble your job title?

- ◯ Artisan/ Mason
- ◯ Technician (construction and/ technical troubleshooting of the system not day-to-day operation)
- ◯ Water Operator
- ◯ Customer relations/ Collector
- ◯ Supervisor (overseeing operations)
- ◯ Engineer (overseeing rural water supply construction)
- ◯ Community development worker/promoter

* 4. What is your job title?

* 5. What are the three to five key responsibilities you have in your day-to-day work?

Responsibility 1:

Responsibility 2:

Responsibility 3:

Responsibility 4:

Responsibility 5:

Capacity Needs Assessment

Section C: Rural Needs

* 6. In your day-to-day work over the last six months, what was your most important help question?

* 7. Where did you look for responses to this help question? *Please select your top two options.*

- [ ] Asked a colleague/supervisor working on the job site with you (in-person interaction)
- [ ] Messaged a colleague/supervisor/friend (e.g. WhatsApp, SMS)
- [ ] Google / Search Engine
- [ ] Youtube/ Social Media (e.g. Facebook)
- [ ] Online Forum (e.g. KnowledgePoint, SuSana, RWSN)
- [ ] Internal guides/reference books/pdfs from your organization
- [ ] Textbooks or manuals (e.g. Engineering in Emergencies)
- [ ] Artificial Intelligence (e.g. Chat GPT)
- [ ] Other (please specify)

8. What was your second most important help question in the last 6 months?

9. Where did you go to look for responses for your second help question? *Select the top two locations.*

- [ ] Ask a colleague/supervisor working on the job site with you (in-person interaction)
- [ ] Message a colleague/supervisor/friend (e.g. WhatsApp, SMS.
- [ ] Google / Search Engine
- [ ] Youtube/ Social Media (e.g. Facebook)
- [ ] Online Forum (e.g. KnowledgePoint, SuSana, RWSN)
- [ ] Internal guides/reference books/pdfs from your organization
- [ ] Textbooks or manuals (e.g. Engineering in Emergencies)
- [ ] Artificial Intelligence (e.g. Chat GPT)
- [ ] Other (please specify)

10. If you have a third help question, please share.

* 11. What are other barriers that can prevent you from doing your work well? *Select ALL that apply.*

- [ ] Insufficient personnel (e.g. colleagues with capacity)
- [ ] Lack of support (from supervisor/ manager)
- [ ] Lack of materials or equipment
- [ ] Lack of leadership
- [ ] I do not experience any barriers
- [ ] Other (please specify)

Capacity Needs Assessment

Section D: Access to technology

* 12. What technologies do you have access to for using online materials? *Select ALL that apply.*

- [ ] Cell phone or tablet with access to data
- [ ] Cell phone or tablet and reliable access to wifi
- [ ] Computer with internet access at home
- [ ] Computer with internet access at work
- [ ] Camera and microphone for online sessions
- [ ] I have access to internet, but my data is limited or unreliable
- [ ] None of the above

* 13. Does the cost of data restrict your ability to access online resources?

- ◯ Yes
- ◯ No

Capacity Needs Assessment

Section E: Oversight

14. Do you oversee/ supervise other people?

- ◯ Yes
- ◯ No

Capacity Needs Assessment

Section F: Queries by people you oversee

15. Please indicate how often you receive the following type of questions from your team.

	Never	Almost Never (Once every 6 months)	Sometimes (Once a month)	Often (Once a week)	Always (Daily)
Technical queries (e.g. groundwater quality, installation, operation, and maintenance of technologies)	○	○	○	○	○
Regulatory environment (rules, regulations, and procedures that must be followed in specific contexts)	○	○	○	○	○
Project management queries (e.g. planning, costing, budgeting, proposal writing)	○	○	○	○	○
Community engagement (supporting behaviour change, facilitating meetings and training sessions, involving stakeholders).	○	○	○	○	○

Other (please specify)

* 16. Can you provide us with up to 3 key help questions your team have asked you about how to perform their day-to-day tasks in last 6 months?

Help question 1:

Help question 2:

Help question 3:

* 17. How did you respond? *For the first question listed, select the two most applicable options.*

- [ ] I offered to do the task for them
- [ ] I mentored them through the task
- [ ] I sent them to YouTube / social media to find out
- [ ] I sent them to Google/ Search engines
- [ ] I referred them to an advisor (or asked someone else)
- [ ] I sent them to an Online Forum (e.g. KnowledgePoint, SuSana, RWSN)
- [ ] I provided our internal guide/ instructions
- [ ] I provided access to textbooks / manuals (from other organizations)
- [ ] I asked them to check out Artificial Intelligence (e.g. Chat GPT)
- [ ] I sought for right capacity development needed (i.e. training, course, online MOOC, etc)
- [ ] Other (please specify)

Capacity Needs Assessment

Section G: The Support Role

* 18. Which regions have you supported in the last 6 months. *Check all that apply. If you are unsure, please use the SDG regions website to check.*

- [ ] Latin America and the Caribbean
- [ ] Sub-Saharan Africa
- [ ] Northern Africa and Western Asia
- [ ] Central and Southern Asia
- [ ] East and South-Eastern Asia
- [ ] Oceania
- [ ] Europe and North America

* 19. In what country do you work most often?

* 20. In the country where you are working most, what are the top three competencies that are missing to provide safe water to rural communities? *Please be as specific as possible, for example "technical skills" does not provide information to us, but "lack of knowledge on climate adaptability of x water supply technology" does.*

Competency 1:

Competency 2:

Competency 3:

21. Please indicate how often you receive the following type of questions from your team.

	Never	Almost Never (Once every 6 months)	Sometimes (Once a month)	Often (Once a week)	Always (Daily)
Technical queries (e.g. groundwater quality, installation, operation, and maintenance of technologies)	○	○	○	○	○
Regulatory environment (rules, regulations, and procedures that must be followed in specific contexts)	○	○	○	○	○
Project management queries (e.g. planning, costing, budgeting, proposal writing)	○	○	○	○	○
Community engagement (supporting behaviour change, facilitating meetings and training sessions, involving stakeholders).	○	○	○	○	○

Other (please specify)

* 22. In this same country, what are the three key help questions you have received from your water service teams (i.e. water operators, technicians, customer service) over the last 6 months?

Question 1:

Question 2:

Question 3:

* 23. Pick the first help question listed, how did you respond to this query? *Select 1 or maximum 2 answers.*

- [ ] I provided the answer and/ guidance myself
- [ ] I offered to do the task for them
- [ ] I mentored him / her through the task
- [ ] I sent them to YouTube / social media to find out
- [ ] I sent them to Google/ Search engines
- [ ] I referred them to an advisor (or I asked someone else)
- [ ] I sent them to an Online Forum (e.g. KnowledgePoint, SuSana, RWSN)
- [ ] I provided our internal guide/ instructions we developed
- [ ] I provided access to textbooks / manuals (from other organizations)
- [ ] I asked them to check out Artificial Intelligence (e.g. Chat GPT)
- [ ] I decided that the person needed training
- [ ] I decided that we needed to develop guidance/ training
- [ ] Other (please specify)

24. What position(s) in the rural water sector are difficult to fill? *List the most difficult to fill position first.*

Position 1:

Position 2:

Position 3:

25. For the first position you listed, why do you think this position is difficult to fill? *Select ALL that apply.*

- [ ] Limited pool of qualified personnel for the position
- [ ] Lack of practical experience from applicants
- [ ] Competition from other industries for this type of position (i.e. low remuneration in rural water compared to others)
- [ ] Lack of visibility of positions
- [ ] Lack of willingness to work in rural areas
- [ ] Lack of willingness to work in water
- [ ] Other (please specify)

* 26. What are other barriers you see that those working on rural water supply face that disable them to do their job effectively? *Select ALL that apply.*

- [ ] Insufficient personnel (e.g. colleagues with capacity)
- [ ] Lack of support (from supervisor/ manager)
- [ ] Lack of materials or equipment
- [ ] Lack of leadership
- [ ] I do not see any barriers
- [ ] Other (please specify)

Capacity Needs Assessment

Section H: Demographics

We collect demographic information (such as gender, age, region you work in and years of work experience) to be able to analyze the findings and understand the how the needs vary across these demographics. This data is confidential and in no way connected to you personally.

* 27. How do you identify:

- ◯ Man
- ◯ Woman
- ◯ Prefer not to disclose
- ◯ Prefer to self-describe

* 28. How old are you?

- ◯ Under 35
- ◯ 35-55
- ◯ Above 55
- ◯ Prefer not to disclose

* 29. How many years have you been working in the rural water sector?

- ◯ Less than 1 year
- ◯ 1-5 years
- ◯ 6- 20 years
- ◯ 20 or more
- ◯ I have no work experience yet in rural water supply

* 30. What is the highest degree or level of formal education you have received?

- ◯ No formal education
- ◯ Middle school or elementary school
- ◯ High School
- ◯ Vocational / Trade School
- ◯ Diploma
- ◯ Bachelor's Degree
- ◯ Master's Degree
- ◯ Doctorate Degree
- ◯ Prefer not to disclose

31. Please provide any other comments you have on the capacity needs of people working in the rural water sector?

Capacity Needs Assessment

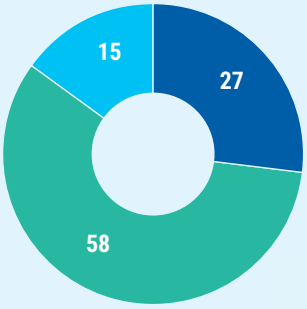
Thank you for participating in the survey!

We plan to share the results of the survey in a webinar and report with RWSN and HWTS Network members in the New Year.

ANNEX 2: Basic Demographics

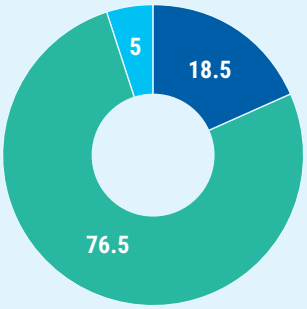
280 complete responses (in 26 cases partial responses were considered in the analysis). The number of responses per role:

Role in the Sector



- I work in other parts of the rural water sector.
- I work in the day-to-day operations of getting water safely to rural communities. For example, supervisor, operator, technician, customer service, community outreach.
- I support individuals, teams, and institutions that provide water to rural communities. For example, WASH Program Manager/ officer (Country level Office), WASH Advisor (multiple countries/ headquarters, Consultant).

Gender



- Male
- Female
- Prefer not to disclose

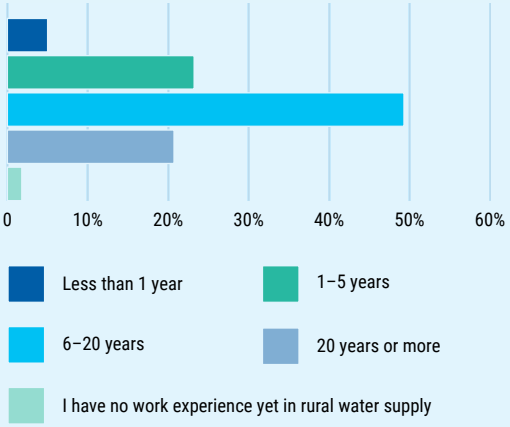
Years of experience working in rural water sector:

28% - 5 years or less
49% - 6-20 years
20.7% – Over 20 years

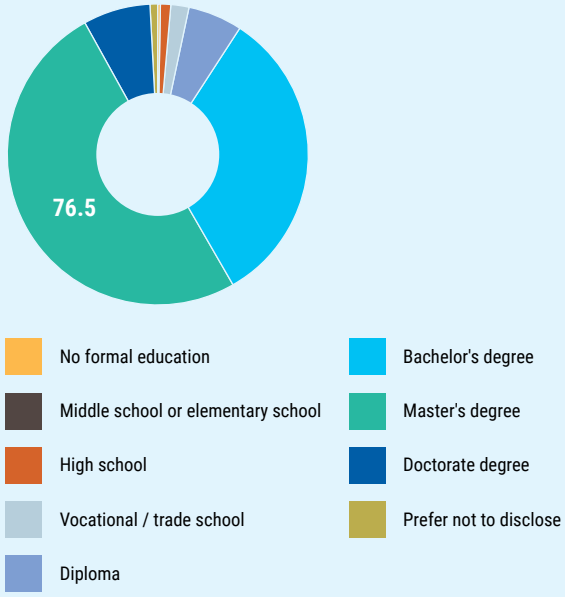
Education level:

82% of respondents have a bachelor's degree or higher

Years of Experience

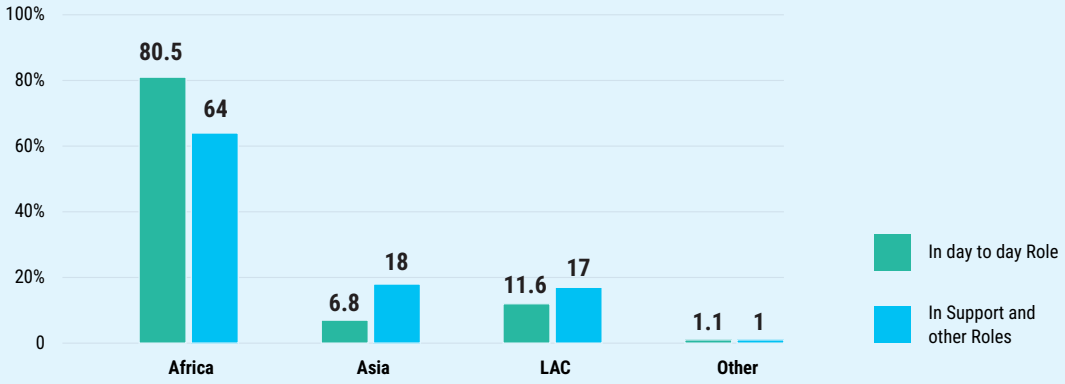


Education Level



Regional Diversity (slightly more difficult to measure, as it combined two different questions)

Regional Distribution

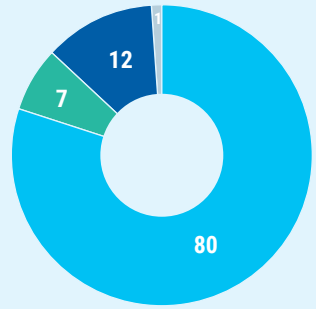


- Africa: 80.5% of “I work in day-to-day role”; 64% of support/other roles
- Asia: 6.8% of “I work in day-to-day role”; 18% of support/other roles
- LAC: 11.6% of “I work in day-to-day role”; 17% of support and other roles
- Other: The remainder 1.1% and 1%

Respondents in Day-to-Day Role

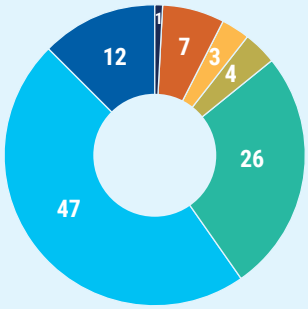
Of getting water safely to rural communities (N104 - includes partial responses)

In Day-to-Day Role



- Africa
- Asia
- LAC
- Other

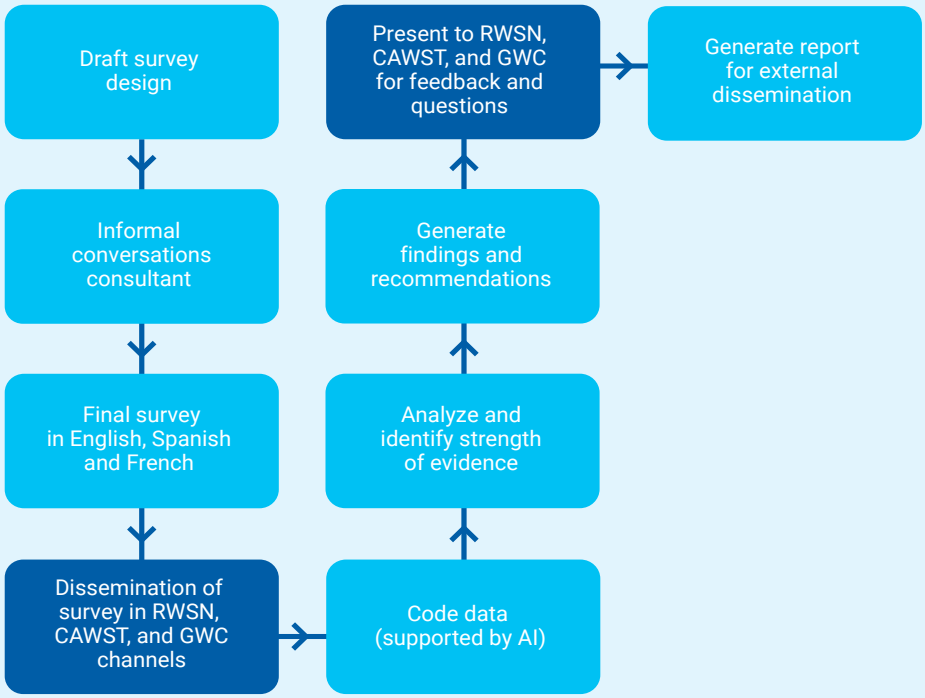
Job Categories



- Artisan/mason
- Technician (construction and/ or technical troubleshooting of the system not day-to-day operation)
- Water operator
- Customer relations/collector
- Supervisor (overseeing operations)
- Engineer (overseeing rural water supply construction)
- Community development worker/promoter

ANNEX 3: Capacity Assessment and Analysis Process

The Process



How data was combined to analyze the capacity needs

Steps to Assess Capacity Needs

Help questions

- Codes were created for each help question group (for those who work in day-to-day roles; those who work day-to-day roles and supervise others; those who work in the support or other roles of the rural sector)
- These were cross-checked and compared, and brought together to encompass everything
- These codes and descriptions were used for each column of help questions
- This allowed us to analyze them separately (per region, per job category), as well as find the overall top themes about which help questions arise.
- This allowed later comparison with missing competencies, and positions difficult to fill
- A list of example questions between the groups were compared also
- This was combined with a closed question on the frequency of a type of question

Missing competencies

- Codes were created for missing competencies
- These codes and descriptions were used for each column of missing competencies
- Many remained faulty, and manually created codes for this column
- This allowed us to analyze them fully, per region and per job category, as well as find the overall top themes of missing competencies
- This allowed later comparison with help questions and positions difficult to fill.

Positions difficult to fill

- Codes were created for positions difficult to fill
- These codes and descriptions were used for each column of positions difficult to fill.
- This allowed us to analyze for them fully, per region and per country – and as well as find the overall top themes about which these competencies
- This allowed a later comparison to help questions and positions difficult to fill.

Codes Defined

Code Responsibilities Defined

Technical support for operations & maintenance
Operating and maintaining water supply systems in rural communities and ensuring efficient and sustainable water services.

Community engagement & hygiene promotion
Engaging with communities to promote WASH practices and facilitate community involvement in WASH projects.

Project management and monitoring & evaluation
Managing, coordinating, overseeing, reporting on, and evaluating the impact of rural water supply projects and water initiatives.

Supervision of construction and operation & maintenance
Supervising construction as well as maintenance and operation of water supply systems, ensuring quality control and sustainability of water sources in rural areas.

Capacity development and training
Providing capacity development activities to water committees, water management committees, operators, technicians or other staff, including training. Assessing water sources, developing water resource management to provide sustainable and reliable water access for rural communities.

Management, planning, and resourcing
Strategic planning and development of rural water supply in organizations (public/private or NGO), as well as managing financial and human resources for sustainable and effective water supply in rural areas.

Infrastructure design, construction, & planning
Designing and planning the construction of water infrastructure for rural areas, ensuring efficient and sustainable water supply systems.

Policy advocacy & stakeholder management
Advocating for policies related to water supply and management as well as stakeholder engagement and management to effectively manage and deliver sustainable and effective water supply in rural areas.

Monitoring water quality and sustainability
Monitoring and ensuring the quality of water sources and sustainability of infrastructure in rural communities, including ensuring compliance with standards and regulations.

Technical troubleshooting & rural water technology
Ensuring quality control of rural water supply technologies, and offering troubleshooting water pumps and boreholes to ensure continuous and reliable water access in rural areas.

Customer relations & revenue collection
Managing customer relations and revenue collection for water services, ensuring efficient and sustainable water supply for rural communities.

Environmental health and impact assessment
Assessing health impacts, and providing health education to communities to participate in water and sanitation initiatives, promoting sustainable health and hygiene practices in rural areas.

Water resource assessment
Assessing water availability, water resources, and demand to provide sustainable and reliable water access for rural communities.

Irrigation system management & sustainability
Managing and ensuring the sustainability of irrigation systems, promoting efficient and sustainable water use for agricultural purposes in rural communities.

Technical support for water treatment
Providing (technical support for) water treatment, ensuring the provision of safe and clean water for rural communities.

Code Help Questions

Capacity development concerns questions on effective capacity development of community, staff, and operators, including the effectiveness of training programs.

Climate change adaptation addresses inquiries related to adjusting water services and infrastructure to withstand the impacts of climate variability and change.

Community engagement refers to engaging communities in activities and determining community demand across varied demographics, as well as setting up water tariffs.

Financial and funding pertains to questions over inadequate funding, budgeting issues, and financial gaps in projects.

Governance and regulation involves questions on compliance with standards and regulations, as well as the organization and management of the sector (with corruption present).

Managing teams describes all questions related to managing teams, contractors, and others involved in the project.

Project management, budgeting, monitoring evaluating, and scaling enhancing project management (cycle) skills, scaling up projects, and evaluating projects to achieve community goals. This encompasses inquiries about budget and project proposals to obtain funding.

Stakeholder engagement involves questions on working with various stakeholders, including community leaders, governments, and other partners for project success.

Sustainability focuses on engaging community members in projects, ensuring project sustainability without funding, and collaborating with partners.

Water quality and safety relates to inquiries about ensuring the safety and quality of water, including chlorination and testing (RAS).

Water Resources involve questions related to the water's source, availability, demand, and management..

Water supply technologies installation and guidance involves estimating the project needs and water tank capacities and understanding the technology to make informed decisions on its installation. This also involves questions about the installation of pumps, pipes, and lightning arresters, offering a technical perspective on operational procedures.

Water system maintenance captures questions related to the efficiency, repair, and leakage issues of pumps, motors, and pipelines.

Working environment improvement describes concerns about obtaining essential working tools, transport, equipment, and enhancements in working conditions, including salary and benefits.

Code Difficult Positions

Community leaders
Community members managing the rural or community-based water systems, including the water user committee members and water committees

Capacity development and training officers
Teachers, educators, professors, and training specialists

Monitoring and evaluation specialists
Experts in collecting, analyzing, and interpreting data related to WASH projects to measure impact, inform strategy, and guide decision-making

Financial and administrative WASH personnel
Professionals overseeing the financial, administrative, and operational aspects of WASH programs, ensuring efficiency and compliance with regulations.

Community mobilisers, hygiene promotion and behavior change agents
Individuals dedicated to promoting hygiene practices through education and community programs, aiming to change behaviors for better health outcomes. In addition, experts mobilizing communities around WASH initiatives.

Infrastructure and maintenance technicians
Skilled workers responsible for the physical upkeep, repair, and regular maintenance of WASH infrastructure, ensuring its functionality and longevity.

Rural WASH implementation engineers
Engineers who design, implement, and manage WASH solutions tailored to the unique challenges of rural environments, often dealing with limited resources.

Supply chain and logistics coordinators
Coordinators responsible for managing the supply chain of WASH materials and equipment, ensuring timely delivery and availability of resources (including manufacturers, producers, and shops)

WASH project coordination specialists
Professionals skilled in managing WASH projects from planning through execution, ensuring goals are met and resources are effectively utilized.

Water quality and safety specialists
Specialists focused on testing and monitoring water quality to meet health and safety standards, ensuring the community has access to safe drinking water.

Water system technical managers
Individuals responsible for overseeing technical aspects of water systems, including maintenance, operations, and improvements to ensure efficient service delivery.

Code Competencies

Solar-powered water supply knowledge
Understanding the application and maintenance of solar energy systems for water pumping and distribution.

AI application or smart water technology in water management
Skills in utilizing artificial intelligence or smart water technology for improving water supply systems, including predictive maintenance and optimization.

Climate-resilient water technologies
Knowledge of water supply technologies adaptable to changing climate conditions and suitable for implementation in rural areas.

Project management for rural water communities
Competencies in managing and overseeing water projects at the community level, including planning, execution, and stakeholder engagement.

Technology choice adoption
Knowledge and understanding of rural water supply technologies that are suitable for the context, culture, and geographies of rural settings.

Rural water purification processes
Understanding of water treatment methods suitable for rural community systems, including filtration, chlorination, and desalination.

Sustainable water supply design
Skills in designing water supply networks that are sustainable, cost effective, and suitable for rural environments.

Low-cost water treatment technologies
Awareness of affordable and effective water treatment solutions that can be locally sourced and maintained.

Institutional technical capacity
The capability of local institutions to plan, implement, and manage water supply and sanitation projects.

Groundwater management
Knowledge on assessing ground water access, groundwater quality, technologies, and alternatives to groundwater management.

Water quality monitoring
Competencies in establishing and maintaining systems for regular monitoring of water quality, both raw and treated (including bacterial and chemical contaminants).

Sustainable funding strategies and financial management
Strategies for securing and managing funds to ensure the long-term sustainability of water supply projects.

Water infrastructure operation and maintenance
Knowledge of best practices for the operation and regular maintenance and repair of water supply infrastructure to ensure reliability and longevity.

Water governance and regulations
Understanding of legal and regulatory frameworks governing water resources, and mechanisms to ensure transparency and accountability.

Water resource management and climate change
Skills in managing water resources in the context of climate change, including water conservation and drought management strategies.

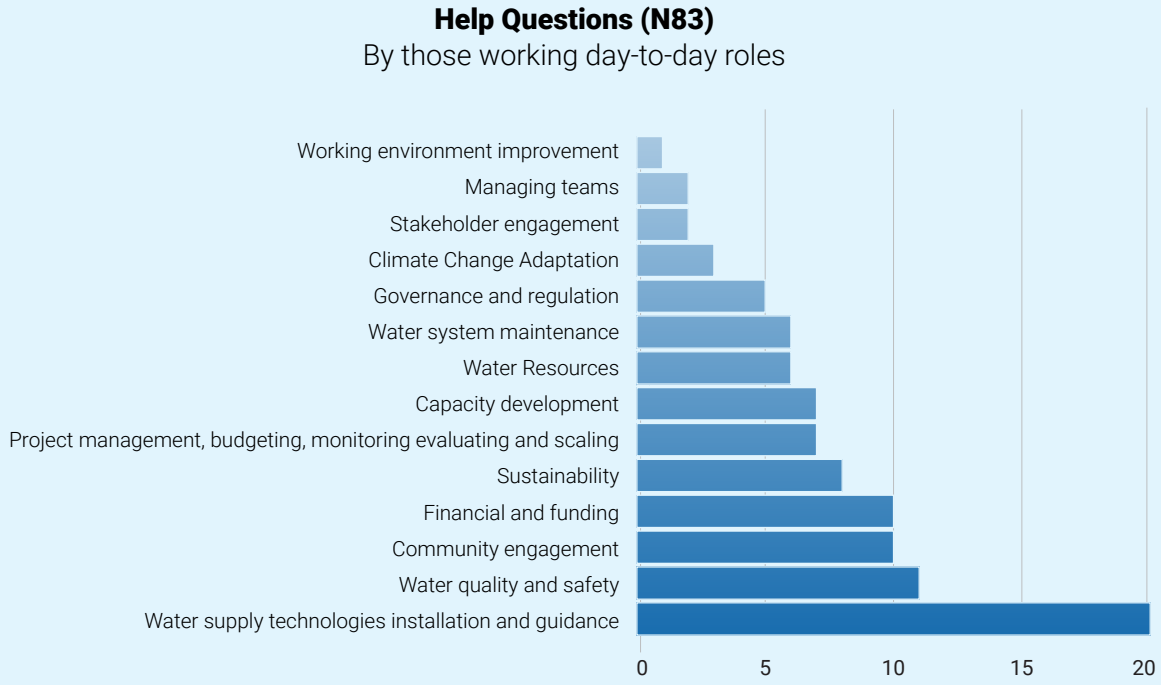
Community engagement in water projects
Techniques for effectively involving local communities in the planning, implementation, and management of water projects.

Water safety plans implementation
Knowledge of developing and implementing water safety plans and risk management approaches to ensure the provision of safe drinking water quality and health.

ANNEX 4: Graphical Representation of Additional Data

Not presented in the report

Help Questions – Individuals working in day-to-day roles



Weak Evidence:

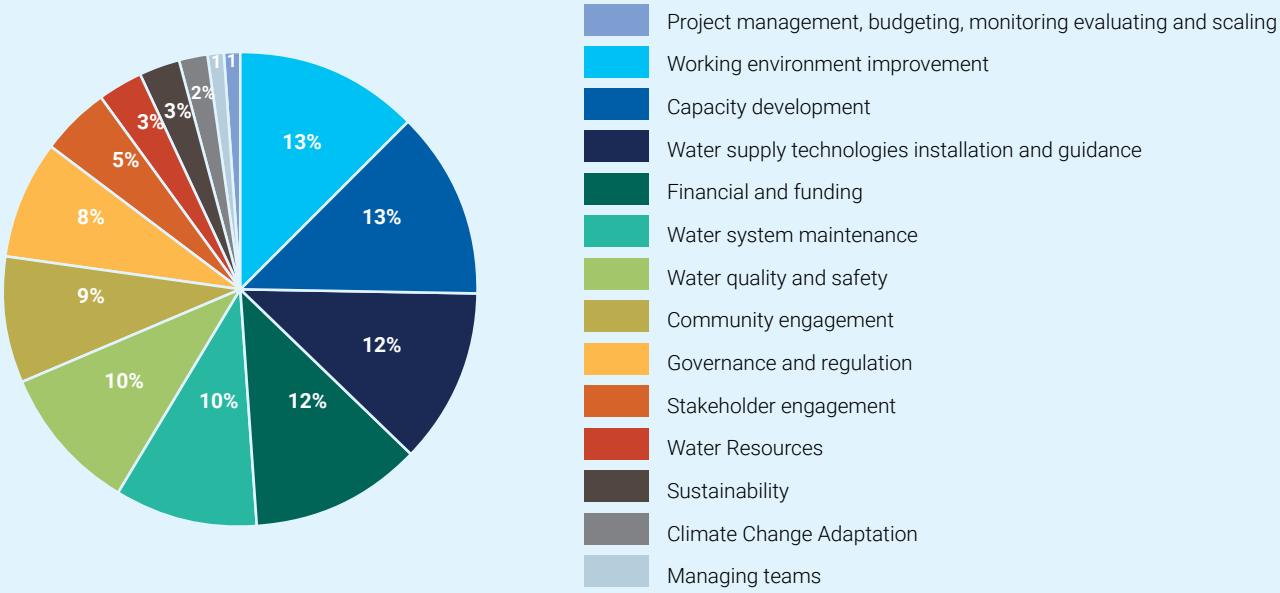
- Asia (N5) - Water resources type questions stand out
- LAC (N8) - Water quality type questions are mentioned much more than in the general overview

Observations:

- The following themes were mentioned far more frequently in the first response, which could be indicative of higher priority:
  - Water supply technologies
  - Project management
  - Water system maintenance
  - Climate change adaptation
- African responses have similar structure to the figure here

Help Questions – Supervisors working in day-to-day operations

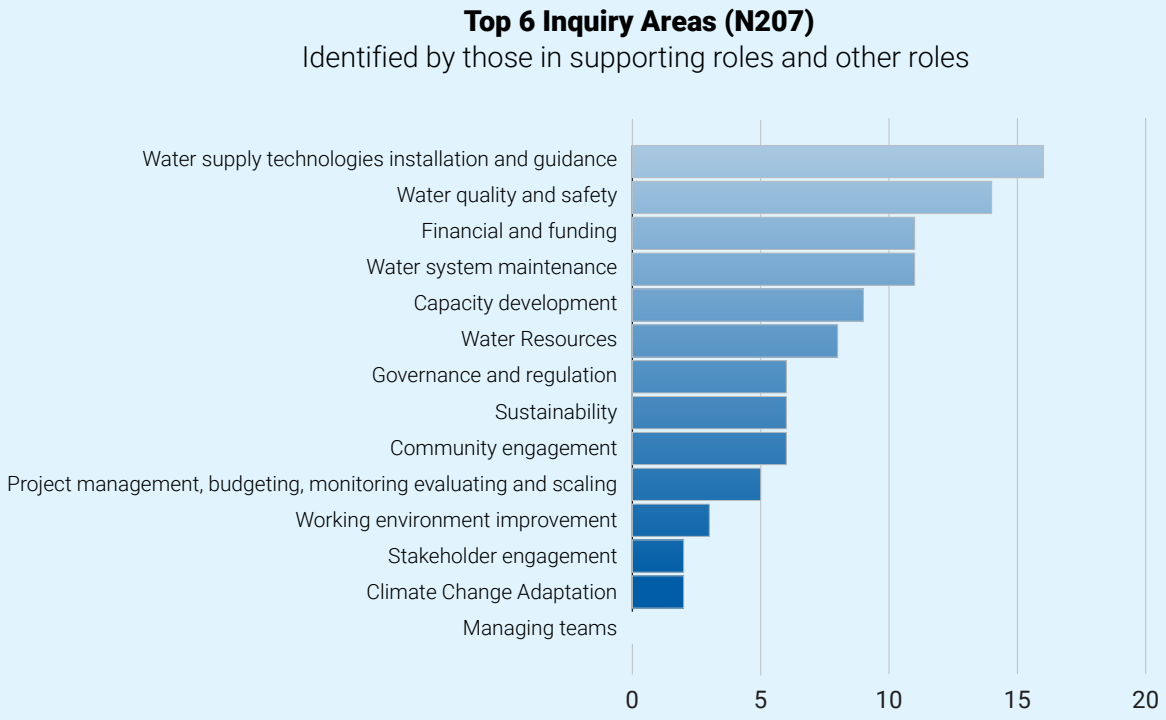
Top 4 Inquiry Areas (N63)
Identified by supervisors working in day-to-day roles



Example Questions

- What elements go into a budget proposal?
- When are we getting the tools to work?
- How do we train operators and communicate technical concepts during trainings?
- How do we ensure pump and motors' efficiency and repair?

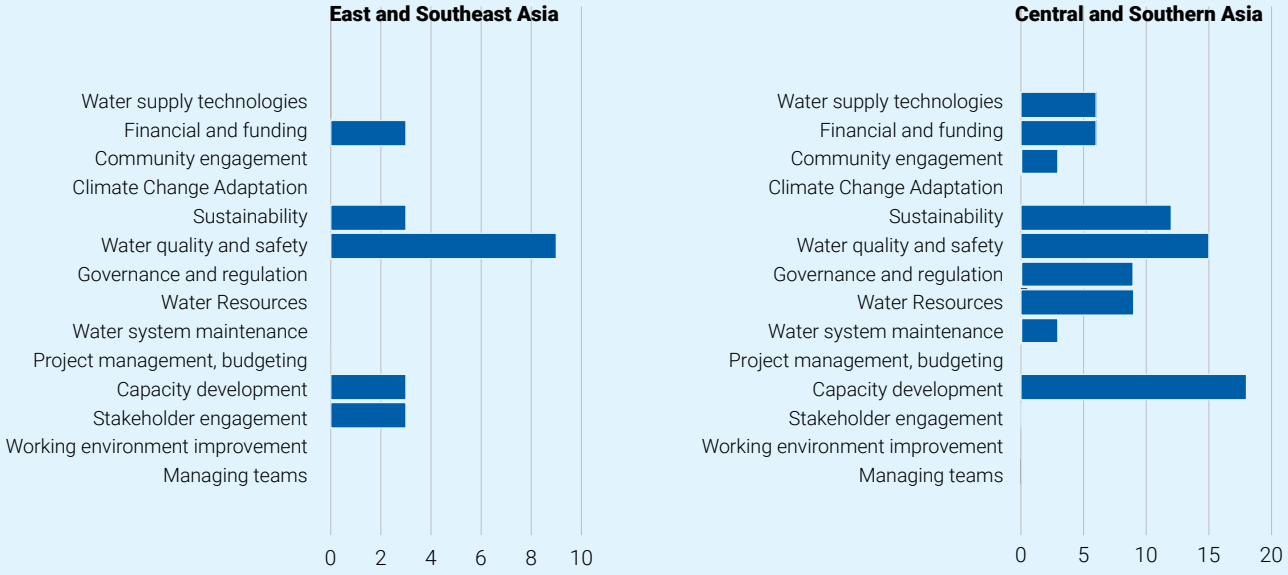
Help Questions – support role and other roles



Help Question Areas – By Region

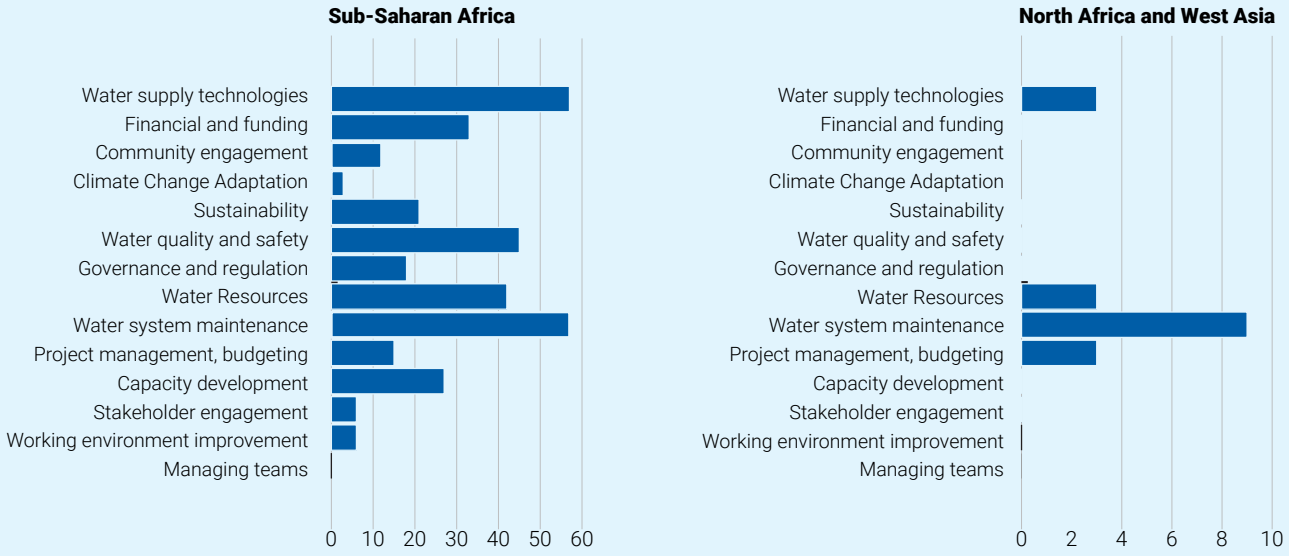
Inquiry Areas Per Region (N39)

Identified by those in supporting roles and other roles



Inquiry Areas Per Region (N165)

Identified by those in supporting roles and other roles



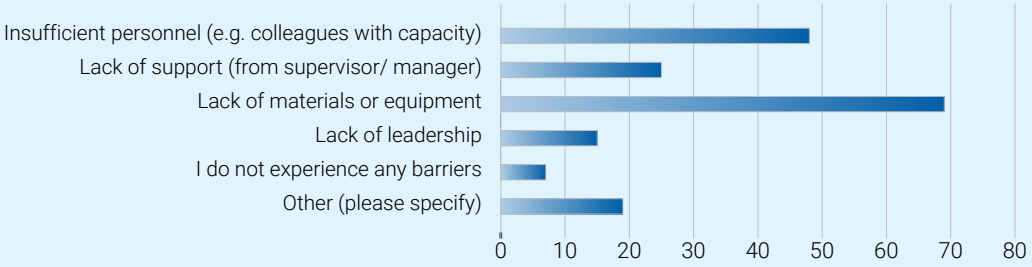
Inquiry Areas Per Region (N18)

Identified by those in supporting roles and other roles

For Oceania, only queries related to water supply technologies installation and guidance were raised

Barriers – by those working in day-to-day roles

Barriers of respondents in day-to-day roles (N84)
Identified by professionals working in day-to-day roles

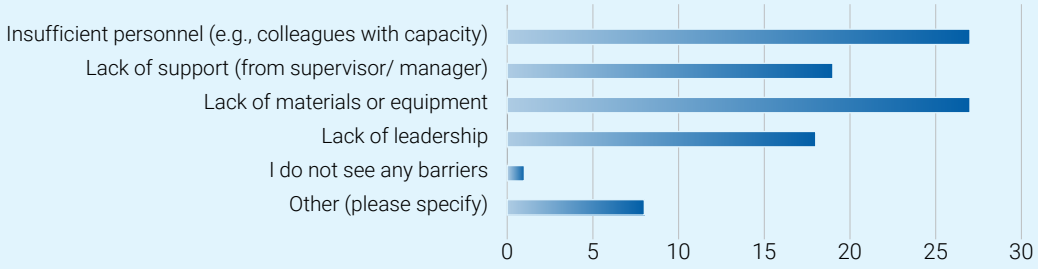


(NB) In Asian countries the lack of materials was not identified as an issue

Other Barriers: Financial constraints; community cooperation and acceptance (paid for water); security issues; skills and training Gap.

Barriers – by support/other roles

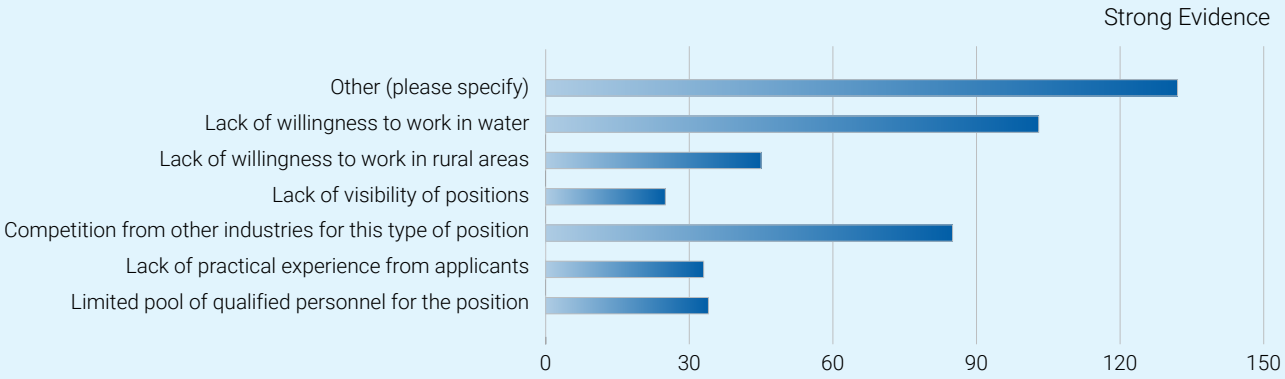
Barriers of Respondents in Support & Other roles (N217)
Identified by professionals working in the support role and other roles



Other Barriers: Safety and security; financial security for families; capacity development and long-term support missing; lack of experience; political will, governance.

Key reasons for difficulty filling a position

3 Key Reasons Why a Position is Difficult to Fill (N210)
Identified by those in supporting role/other role

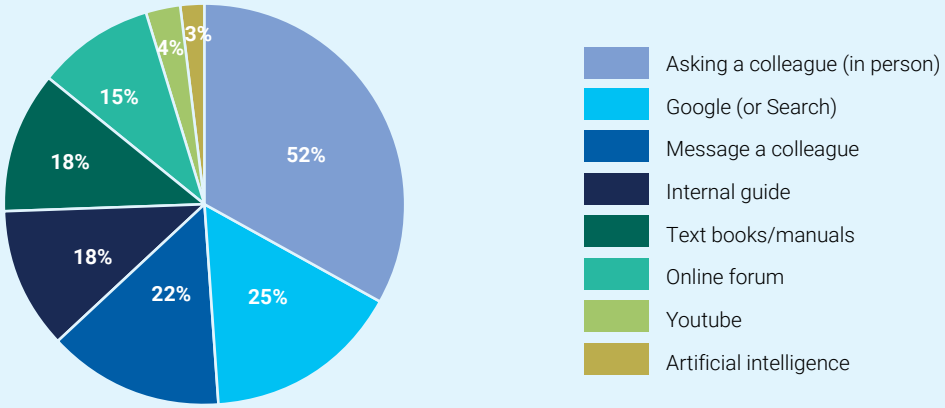


- Limited pool of qualified staff
- Lack of experience
- Lack of willingness to work in rural areas

Other reasons: the assumption that jobs with financing are available; jobs are not on merit; rotation of jobs/promotion of talented staff

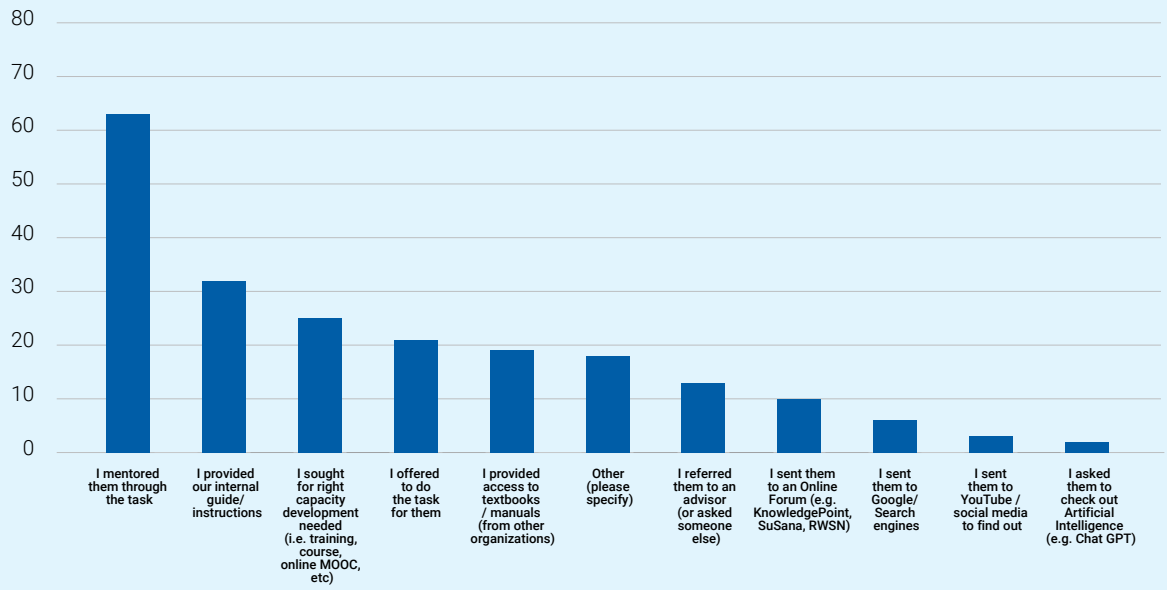
Methods to fill needs

Almost half of the respondents (N150) rely on colleagues or supervisors for issue resolution.



Limited use of Artificial Intelligence, Youtube and Online forum

63% of the supervisors (N63) mentor their staff to solve issue



Other

- Set up exchange meetings
- Outsourced the task

- 25% seeks capacity development
- 10 % sent them online (e.g., RWSN, knowledge point)
- A limited number refers their staff to YouTube

ANNEX 5: Example Help Questions

	Country Questions	Team	Individual
Capacity Development	How can we strengthen the technical skills of our team in managing water sources? Are there training programs available to address skill gaps in water supply technologies and installation? What capacity building initiatives are needed for effective project management, budgeting, monitoring, evaluation, and scaling?	How can we design a pump station? How can we train operators and communicate technical concepts during training? How can we engage stakeholders using the WASH systems approach? How can we optimize the system? Can we organize for more training?	How can we ensure that O&M (operation and maintenance) of rural water supply systems will be sustained? How do we ensure proper liaison with the community and make projects relatively cheaper? How can we ensure the deadlines are met without fail? How can we scale our services? How can we improve and encourage program implementation with shared responsibilities?
Climate Change Adaptation	How can we incorporate climate change adaptation measures into our water supply projects? What activities can be done to combat or adapt to climate change in the context of water resources management? How can we plan and design sustainable solar water pumping systems considering the impact of climate change?	How can we ensure they have access to GPS coordinates in areas with low network? How can we design a pump station? How can we operate, install, and carry out maintenance for solar water pumps? What strategies can we employ to ensure the long-term sustainability of our water and health projects in rural areas? How can we effectively engage with local communities to understand their specific water and health needs and preferences?	How can we make one understand the fact that they still need to prepare for a dry spell in the rainy season? Why isn't clean energy being adopted despite all the opportunities, including improved efficiency, low costs, and funding? Can you engineer more efficient, cheaper, and quality instead of direct funding to fight against climate change?
Community engagement	How can we ensure a community's effective management of their water sources? What best practices can households use to sustain water points? How can communities be involved in keeping water safe? How do we conduct stakeholder meetings succinctly, ensuring effective community engagement?	How do we engage the community in scooping activities? How do we convince a community lead to chlorinate? How can we mobilize communities to participate actively? How can we engage community members in our projects? How can we engage stakeholders using the WASH systems approach?	How can we collaborate with stakeholders in the implementation of our projects? How can we access water in our community? How can we ensure that our water and health initiatives address the needs of vulnerable/marginalized groups within the community? What strategies can be implemented to promote inclusivity and equity in our programs? How can we get access to water in Kambiti

Financial and Funding	Where can we find financing for water quality monitoring? Can the organization cover the cost to drill a well, and what is the process for obtaining financing for materials? What funding sources are available for solar pumping systems and storage tanks?	How can we get more funding? Why are funds not trickled at the end of financial years? How do we receive our daily/ weekly salaries? How do we source funds to complete our rural solar borehole projects? How can we achieve equity distribution of water points with limited funds?	How do we get more funding to scale up and cover more communities and people? How do we receive financial means to fund our programs related to water? How do we gather money to attend in-person events and/or capacity building workshops? Where can we get extra funding so we may subsidize our services to poor consumers? How will a customer have water supply to their residence? How can the poor communities generate funds to cater to the broken water sources?
Governance and Regulation	How do we design operational governance or water point management mechanisms that are sustainable and effective in low funding environments? What are the legal requirements and regulations applicable to rural water operators, and how can they be simplified? How do we manage safe water points in terms of governance and adherence to regulations?	How can we write a good project proposal? How do you identify stakeholders? How do we assure sustainable support to users and community leaders? How can we collaborate with other partners who will mentor our team Where can they access government standards?	How can each community get access to quality, affordable, and safe drinking water? How can the water and sanitation committee be strengthened? With the government, there is little to no interest in water, sanitation, and hygiene (WASH) in rural communities. What is the possibility of achieving water for all and improved sanitation for all by 2030?
Managing Teams	What is a reasonable cost for water users to guarantee the effectiveness of water service providers and their interest to invest? How can non-state actors effectively drive services without government interferences, and how can service providers be held accountable for transparent and poor-inclusive tariffs? How do we ensure a community-based water management system and engage in effective team management?	How do we build the capacity of community water boards? How can we lead a team of water committees? How can we collaborate with other partners who will mentor our team? Can we organize more training? How can we train ToTs effectively?	How can we motivate staff and the community for better work implementation?

Project Management, Budgeting Monitoring Evaluating, and Scaling	How do we timely manage water quality variations in our projects? What are the key indicators for monitoring water projects, and how do we ensure their sustainability and scalability? How can we effectively scale our water supply projects considering financial, technical, and operational aspects?	How do we plan projects considering cost, time, and quality? How can we evaluate projects so that they can achieve intended goals for the communities? How do we scale up community-based solutions? What elements are needed in preparing a budget proposal for a water scheme? Is the WASH plan completed?	How can we extend our water to meet the needs of the community? How do we improve implementation and support of community-based water treatment systems? How can we prioritize within the budget we have? How do we ensure the proper management of our water facilities? How can we reduce non-revenue water (NRW) further? How can we balance project needs and budget limitations?
Stakeholder Engagement	How do those knowledgeable about good practices engage, and where are discussions on good practices happening? How do we run a stakeholder meeting succinctly, ensuring active engagement? Are transcripts of policy and decision makers available? Where do we convey community concerns about incidents like sexual harassment during project implementation?	How do we engage the community in scooping activities? How can we write a good project proposal? How do you identify stakeholders? How can we collaborate with other partners who will mentor our team? How do we engage stakeholders using the WASH systems approach?	How can we enhance community participation and ownership in our water and programs to ensure long-term sustainability and local capacity building? How to ensure proper liaison with the community and make projects relatively cheaper?
Sustainability	How can we ensure the sustainability of water systems powered by diesel and solar systems? What is the best technology to ensure the durability of the water supply system? How do we ensure the sustainability of operations and maintenance for water infrastructure?	How can we sustain a project managed by the community? How can we assure sustainable support to users and community leaders? How can we make sure that projects are implemented following environmental laws and regulations? How can we ensure the long-term sustainability of water and health projects in rural areas? How do we improve the technical capacities of the communities for project sustainability?	How will these projects be sustainable? Sustainability of rural and urban WASH facilities is a growing concern.

Water Quality and Safety	What treatment method would be effective for a water source containing nitrate outside WHO standards? How do we regulate the pH level in water, and what is the importance of water analysis? How do we detect the type and source of water, and how can we avoid algae formation in water storage and treatment facilities?	How do we install pumps? How do we test the water quality? How do we tend to leakage in a customer's house? How do we capture spring water properly? How can we carry out a particular kind of work (mostly electrical)?	If groundwater is pure, then why do we need to pass it through a filter before drinking? How do we chlorine dose in gravity-fed water systems? How can we conserve water? How can we improve staff productivity? In the communities we have been working with over the past six months, what are the measurable health improvements and changes in water accessibility? How can we further optimize our interventions for greater impact? How can we ensure that our water and health initiatives address the needs of vulnerable/marginalized groups within the community?
Water Resources	How can we ensure drinking water sources' sustainability on a long-term basis? What is the importance of water supply, and where can we find resources for capacity building related to water resources?	How can we estimate the tank capacity for a community? How can we sustain the project managed by the community? What should we consider when carrying out particular training programs in a community? How can we capture spring water properly? How do we stop open defecation in communities?	What kind of water systems are best in rural setups? How can the operation and maintenance of rural water supply systems be sustained? How can we ensure the proper management of our water facilities? How can we improve implementation and support of community-based water treatment systems? What are the technical standards of valley tanks and the design process?
Water Supply Technologies Installation and Guidance	How can we install a submersible pump, and what are the technical details of the installation process? How can we implement household water treatment systems? How are we to train water, sanitation, and hygiene promoters? How can we design an extraction well, and what happens to the water in the soil?	How can we install pumps? How can we install and connect pipes? How can we install a lightning arrester? How does the water supply system simulation work? How does the water pump work?	How can we access water in our community? How can we extend our water to meet the needs of the community? What technology is more adequate for this case? How can we improve staff productivity? How can each community get access to quality, affordable, and safe drinking water? How will a customer have water supply to their residence?

Water System Maintenance	How can we repair distribution pipe networks, and what is the normal period for servicing a generator set? How can we maintain uniform flow among tap stands, and how do we know when a submersible pump is no longer functional? How can communities effectively manage their water sources, and what makes some water from boreholes colored?	How can we receive new capacity building courses? How often does a WASH focal person visit? How can we source funds to complete our rural solar borehole projects? How can we tend to leakage in a customer's house?	When was the hand pump last tested? How can we ensure that O&M of rural water supply systems will be sustained? How can we prioritize within the budget? How will a customer have water supply to their residence? How can we provide maintenance to water facilities?
Working Environment Improvement	How can we improve power supply for water systems, and what are the solutions to address downtime due to power fluctuations? How can we develop land agreements with landowners for piped water schemes, and how can we offset the high cost of fuel? What is the best approach to creating a positive working environment for water operators, technicians, and customer service representatives?	When will we we acquire work tools (i.e., computers, stationery, etc.)? When will the working environment be improved, including salaries and other benefits? How can we engage the community in scooping activities? How can we assure safety in the working environment? What can be done to ensure safety?	How can we ensure that O&M of rural water supply systems will be sustained? How do we scale our services? How can we improve implementation and support of community-based water treatment systems? We need to regularly communicate and update each other on progress and issues. We need to properly reach out to the stakeholders.

Example Help Questions Per Job Category

Artisan

How should we increase the water catchment area?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction)	**What kind of water systems are best in rural setups?**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction)	

Technician

Getting feedback from operatives	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction)		Internal guides/ reference books/PDFs from your organization	
How can we access water in our community?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); internal guides/ reference books/PDFs from your organization	**How long will it take for us to have safe water in our community?**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); liaise with a member of Parliament who is one of the policy makers on developments	**What will be our community contribution?**
How can we operate and maintain this water project for sustainable development?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); Google/search engine; textbooks or manuals (e.g., "Engineering in Emergencies")	**How to design a successful water supply and sanitation project**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); Google/ search engine; YouTube/social media (e.g., Facebook); textbooks or manuals (e.g., "Engineering in Emergencies")	
My most important help question is largely with gaps in management of the water utility.	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); Google/search engine; online forum (e.g., KnowledgePoint, SuSana, RWSN); internal guides/ reference books/PDFs from your organization; textbooks or manuals (e.g., "Engineering in Emergencies"); Artificial Intelligence (e.g., Chat GPT)		Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); Google/search engine; textbooks or manuals (e.g., "Engineering in Emergencies")	**How would the water utility sustain the changes meant to improve water safety and supply?**
La qualité de la tension senelec,et la qualité des équipements	Potentiel, ressources personnelles	**La cherté du courant électrique et les limites de performance du groupe électrogène**	J'ai une expérience de trente quatre ans de service	**La cherté de l'eau que les gens ne parvient pas à acheter**

Water Operator

Continuidad del servicio de acueducto en el sector rura	Message a colleague/ supervisor/friend (e.g., WhatsApp, SMS); Google/search engine; Alcaldía municipal	**Calidad del agua**	Message a colleague/ supervisor/friend (e.g., WhatsApp, SMS); Google/search engine; YouTube/ social media (e.g., Facebook); internal guides/ reference books/PDFs from your organization	**Gobierno departamental**

Customer Relations

How can I get access to water in Kambiti?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction)	**How can I access your service without all the water connections' money?**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction)	**Are you sure the water you will be supplying here will not be salty?**
There should be a quick response to a breakdown in the water system.	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction)	**How can we get a backup source of power supply? For instance, solar energy to support when electricity is off.**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction)	
Unreliable supply of water	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); message a colleague/ supervisor/friend (e.g., WhatsApp, SMS)	**What other alternatives of water supply are available?**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); message a colleague/ supervisor/friend (e.g., WhatsApp, SMS)	
How can we raise funds to support our cause?	Message a colleague/ supervisor/friend (e.g., WhatsApp, SMS); Google/search engine	**What access do WASH NGOs currently have to funding?**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); Google/search engine	**How do we get the right donors that support WASH initiatives? How do we integrate technology?**

Community Development Worker

Besoins d'eau potable en quantité et qualité suffisantes	Asked a colleague/ supervisor working on the jobsite with you (in-person interaction); J'ai transmis la demande à un partenaire étatique et j'ai conseillé la communauté à bien s'organiser pour subvenir à ce besoin	**Besoins de sensibilisation pour les changements de comportements hygiéniques**	J'ai contribué à mettre en place des comités endogènes de sensibilisation sur les bonnes pratiques WASH	

When was the hand pump last tested ?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction)	**What is the best way to treat drinking water?**	Google/search engine	
How can we collaborate with stakeholders in the implementation of our projects?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); Google/search engine	**How will these projects be sustainable?**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); Google/search engine	**As a grassroot nonprofit, how can we progress our projects without funding?**
How can we implement inclusive programs related to water in our communities?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); Google/search engine	**How do we receive financial means to fund our programs related to water?**	Message a colleague/ supervisor/friend (e.g., WhatsApp, SMS); Google/search engine	**How do we gather money in order to attend in-person events and/or capacity building workshops?**
How do we work with communities to address water cartel/gang/ mafia menace for people living in Mukuru kwa njenga slums?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); online forum (e.g., KnowledgePoint, SuSana, RWSN); Artificial Intelligence (e.g., Chat GPT)	**How can we mentor a colleague living in Uganda, our neighbor country?**	Online forum (e.g., KnowledgePoint, SuSana, RWSN)	
How can each community get access to quality, affordable, and safe drinking water?	Textbooks or manuals (e.g., "Engineering in Emergencies")	**How do we ensure the proper management of our water facilities?**	Internal guides/ reference books/PDFs from your organization	
How do we perform a Water quality test	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction)			
In the communities we have been working with over the past six months, what are the measurable health improvements and changes in water accessibility? How can we further optimize our interventions for greater impact?	Internal guides/ reference books/PDFs from your organization	**How can we enhance community participation and ownership in our water programs to ensure long-term sustainability and local capacity building?**	Internal guides/ reference books/PDFs from your organization	**How can we ensure our water and health initiatives address the needs of vulnerable / marginalized groups within the community? What strategies can be implemented to promote inclusivity and equity in our programs?**
How do we respond to customers queries about Rural Water Tariff Adjustment?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); messaged a colleague/supervisor/ friend (e.g., WhatsApp, SMS)			

extension et ou réalisation des infrastructure hydraulique	lors de la mise en œuvre de nos activités sur le terrain	**transformation de FPMH au PEA ou mini AEP**	Lors de la mise de nos activités sur le terrain.	
Comment on va s'organiser pour assurer une bonne maiten des ouvrages?	Google/search engine; internal guides/ reference books/PDFs from your organization; textbooks or manuals (e.g., "Engineering in Emergencies")	**C'etait sur différentes maladies d'origine hydrique**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); Google/search engine	
How do we operate and maintain this rural water supply scheme	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); Google/search engine; online forum (e.g., KnowledgePoint, SuSana, RWSN)	**How do we respond to a community asking for the same project as another community that we cannot grant due to budget constraints?**	Try to convince a donor agency to allocate the budget for the construction of a water supply scheme.	

Supervisor

What is the capacity development of the staff in water-related fields?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); online forum (e.g., KnowledgePoint, SuSana, RWSN)	**How can we use the training of trainers workshop on project designing in practice?**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction)	
Water quality test	Message a colleague/ supervisor/friend (e.g., WhatsApp, SMS); online forum (e.g., KnowledgePoint, SuSana, RWSN)	**Community training**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); internal guides/ reference books/PDFs from your organization	**Quality access in WASH project**
Comment la communauté doit maintenir durablement ses ouvrages d'eau à travers la promotion de paiement du service de l'eau	YouTube/social media (e.g., Facebook); Lecture sur l'experience d'autres pays	**Pour les sources en aval du village à grand débit comment le pomper afin qu'elle désert le reste de la population a moins de 15 minutes de marche**	Online forum (e.g., KnowledgePoint, SuSana, RWSN); Lecture sur le pompage solaire	
How can we improve and encourage program implementation with shared responsibilities?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction)	**How can we motivate staff and the community for better work implementation?**	Google/search engine	**How can we get more funding to scale up and cover more communities and people?**

How do we scale our services?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction)			
How can we extend our water to meet the needs of the community?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); Google/search engine; internal guides/ reference books/PDFs from your organization	**If our water keeps reducing, what do we do?**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); message a colleague/ supervisor/friend (e.g., WhatsApp, SMS)	
Renouvellement des équipement d'exhaure	Aux autorités étatiques	**extension de réseau d'adduction d'eau potable**	Aux autorités étatiques	**Réaliser des ouvrages hydrauliques**
Can we get safe drinking water in our village?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction)	**Can water be supplied to our homes instead of public tap?**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction)	
How can we improve implementation and support of community-based water treatment systems?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); message a colleague/ supervisor/friend (e.g., WhatsApp, SMS)	**How do we face technical challenges with treatment systems (e.g., regeneration of adsorption media, system design)?**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); message a colleague/ supervisor/friend (e.g., WhatsApp, SMS); Google/search engine; internal guides/ reference books/PDFs from your organization	
	Textbooks or manuals (e.g., "Engineering in Emergencies"); Artificial Intelligence (e.g., Chat GPT)	**Why do we do things this way?**	Google/search engine; online forum (e.g., KnowledgePoint, SuSana, RWSN); textbooks or manuals (e.g., "Engineering in Emergencies")	
How can we ensure O&M?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); online forum (e.g., KnowledgePoint, SuSana, RWSN); internal guides/ reference books/PDFs from your organization; textbooks or manuals (e.g., "Engineering in Emergencies")			

Water resource management	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); Google/search engine; internal guides/ reference books/PDFs from your organization; Artificial Intelligence (e.g., Chat GPT)	**GIS mapping of Water Use Master Plan (WUMP)**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); internal guides/ reference books/PDFs from your organization; Artificial Intelligence (e.g., Chat GPT)	
Access to funding	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); messaged a colleague/supervisor/ friend (e.g., WhatsApp, SMS); Google/search engine; online forum (e.g., KnowledgePoint, SuSana, RWSN)	**What is the balance between access to water (quantity) and water quality? How much should we spend on water quality if this means we can implement less water points because of budget constraints?**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); message a colleague/ supervisor/friend (e.g., WhatsApp, SMS); online forum (e.g., KnowledgePoint, SuSana, RWSN)	**What causes water pollution and how can we prevent it?**
What is the best practice model for rural water?	Google/search engine	**How can we improve the service through technology?**	Google/search engine	**None**
Because program pinancing is a serious challenge, there are no funds to successfully conduct WASH programs.	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction)	**How do we manage collaboration?**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction)	
How can we reduce NRW further?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); online forum (e.g., KnowledgePoint, SuSana, RWSN)	**How can we improve staff productivity?**	Google/search engine; textbooks or manuals (e.g., "Engineering in Emergencies")	**Where can we get extra funding to subsidize our services to poor consumers?**
How will a customer have water supply to their residence?	Message a colleague/ supervisor/friend (e.g., WhatsApp, SMS); internal guides/ reference books/PDFs from your organization	**How can we provide maintenance to water facilities?**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); internal guides/ reference books/PDFs from your organization; textbooks or manuals (e.g., "Engineering in Emergencies")	
Will the project help everyone in the community?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction)	**What else can we do?**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction)	

Besoin d'accès à l'eau en milieu rural	La liste de nos projets en cours. Avec les ONG nationaux et internationaux			
What is the peoblem?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); messaged a colleague/supervisor/ friend (e.g., WhatsApp, SMS); internal guides/ reference books/PDFs from your organization			

Engineer

Safe water	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); internal guides/ reference books/PDFs from your organization; textbooks or manuals (e.g., "Engineering in Emergencies")	**Water management**	Online forum (e.g., KnowledgePoint, SuSana, RWSN); diploma	**Sustainable water**
How can we manage the operation and maintenance of water schemes?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); message a colleague/ supervisor/friend (e.g., WhatsApp, SMS)	**How can the community be involved with the tariff setting for rural water schemes?**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); internal guides/ reference books/PDFs from your organization	
How can we monitor the borewells' yield?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction)	**Solar pumps**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction)	
If groundwater is pure, then why do we need it filtered before drinking?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); Google/search engine	**Why is there water everywhere but too little to drink?**	Internal guides/ reference books/PDFs from your organization; textbooks or manuals (e.g., "Engineering in Emergencies")	**Why is the public water supply network not able to provide water to all?**
How can we ensure deadlines are met without fail?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); messaged a colleague/supervisor/ friend (e.g., WhatsApp, SMS); Google/search engine	**How can we ensure the proper liaison with the community and make projects relatively cheaper?**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); message a colleague/ supervisor/friend (e.g., WhatsApp, SMS); Google/search engine	**Mechanisms to use in places where, for example, water production does not meet the projected demand of the said community.**

The most important help question I was asked was how to get support for water well digging when I visited IDPS camp in Godinlabe, a city of Galmudug, Somalia, which houses more than 300 families. They requested me to dig a water well.	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); message a colleague/ supervisor/friend (e.g., WhatsApp, SMS)	**The same camp that I mentioned requested food.**	Message a colleague/ supervisor/friend (e.g., WhatsApp, SMS); local NGOs but they give nothing	
Pouvez-vous nous amener l'eau potable?	Moi même j'ai répondu de ma manière	**Est-ce que ce possible de nous amener l'eau?**	Moi même	
Procedure log	Message a colleague/ supervisor/friend (e.g., WhatsApp, SMS)	**Dimensionnement**	Internal guides/ reference books/PDFs from your organization	
Vu les revenus faibles des populations la vente de l'eau pose s'énormes difficultés causant souvent des maisantes dans la communautés alors la question qu'elle pose est de savoir comment resoudre ce problème.	Futur pompe mais la réponse ne permet pas de résoudre le problème	**Appui en AGR comme le maraîchage**	Proposition de projet à des bailleurs	
Etude géophysique pour l'implantation d'un forage	Textbooks or manuals (e.g., "Engineering in Emergencies"); base donnée des ressources en eau souterraine	**Description technique pour réaliser un forage**	Textbooks or manuals (e.g., "Engineering in Emergencies")	
How can we conserve water?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); Google/search engine; online forum (e.g., KnowledgePoint, SuSana, RWSN); internal guides/ reference books/PDFs from your organization; Artificial Intelligence (e.g., Chat GPT)	**What are the best methods of public awareness?**	Google/search engine; online forum (e.g., KnowledgePoint, SuSana, RWSN); internal guides/ reference books/PDFs from your organization; Artificial Intelligence (e.g., Chat GPT)	

What is the sustainability of a water scheme?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); Google/search engine; YouTube/social media (e.g., Facebook); internal guides/ reference books/PDFs from your organization	**What is the management of your community water user association?**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); Google/ search engine; YouTube/ social media (e.g., Facebook)	
What technology is most adequate for this case?	Google/search engine; textbooks or manuals (e.g., "Engineering in Emergencies")	**Where can I buy this technology in my country or another country with a low price and good quality?**	Google/search engine; Artificial Intelligence (e.g., Chat GPT)	
How can we chlorine dose in gravity-fed water systems?	Enlist in a university study to come up with a simple design			
Aide d'eau	Google/search engine	**Aide humanitaire**	Textbooks or manuals (e.g., "Engineering in Emergencies")	**Non pas encore**
Eau	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); services technique de l'Etat ou les Mairies par exmeple	**Vivres**	Message a colleague/ supervisor/friend (e.g., WhatsApp, SMS); ECOSEC	
comment adapter les projets aux urgences qui surviennent,à la conception des ouvrages	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction)			
How can you make one understand the fact that they still need to prepare for a dry spell in the rainy season?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction). I also asked a few customers that have already installed solarpowered irrigation systems (SPISs) on their farms.	**Why is clean energy not being adopted despite all the opportunities including improved efficiency, low costs, and funding?**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction). I asked a few customers using solar PV systems for different purposes (e.g., SHSs, SPISs, etc.) about challenges they face with the technology and how likely they would be to recommend it to friends.	**Can you engineer more efficient, cheaper and quality products instead of direct funding to fighting against climate change? Is capacity building for installers enough, or do we need to do more on the user side as well?**

Pourquoi on ne change pas les systèmes en polyéthylène	Experience de travail	**Aide nous à capter de nouvelles sources pour qu'il y ait plus de l'eau dans les localités**	Textbooks or manuals (e.g., "Engineering in Emergencies")	**Aides nous à avoir un forage**
Geotechnical works of tanks	Google/search engine; YouTube/social media (e.g., Facebook); textbooks or manuals (e.g., "Engineering in Emergencies"); Artificial Intelligence (e.g., Chat GPT)	**About transition regime of water addiction**	Textbooks or manuals (e.g., "Engineering in Emergencies")	
Approvisionnement en eau par adduction gravitaire	Asked a colleague/ supervisor working on the jobsite with you (in-person interaction); internal guides/ reference books/PDFs from your organization	**construction abris d'urgence**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); internal guides/ reference books/PDFs from your organization	**eau, hygiene et asaainissement dans le millieu carseral**
We need to regularly communicate and update each other on progress and issues.	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); message a colleague/ supervisor/friend (e.g., WhatsApp, SMS); internal guides/ reference books/PDFs from your organization	**We need to properly reach out to the stakeholders.**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); message a colleague/ supervisor/friend (e.g., WhatsApp, SMS); online forum (e.g., KnowledgePoint, SuSana, RWSN); internal guides/ reference books/PDFs from your organization	**We need to focus on community engagement.**
la pénurie d'eau qui a vécu la Tunisie et les solutions possibles	l'échange et la coopération entre plusieurs partenaires nationaux et internationaux	**l'allocation et le rationnement des ressources qui sont limitées**	suivi hebdomadaire des stocks d'eau dans les barrages	
Check quality compliance	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); Google/search engine	**Manage timelines**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction)	
Logistics for monitoring	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); message a colleague/ supervisor/friend (e.g., WhatsApp, SMS)	**How do we overcome inaccessibility to some areas due to rain?**	Message a colleague/ supervisor/friend (e.g., WhatsApp, SMS)	

How can we learn from various players in the water sector under changing dynamics?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); message a colleague/ supervisor/friend (e.g., WhatsApp, SMS); Google/search engine; YouTube/social media (e.g., Facebook); online forum (e.g., KnowledgePoint, SuSana, RWSN); internal guides/ reference books/PDFs from your organization; textbooks or manuals (e.g., "Engineering in Emergencies")			
How can the operation and maintenance of rural water supply systems be sustained?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); messaged a colleague/supervisor/ friend (e.g., WhatsApp, SMS)	**How can the water and sanitation committee be strengthened?**	Online forum (e.g., KnowledgePoint, SuSana, RWSN); internal guides/ reference books/PDFs from your organization	**How can poor communities generate funds to cater to the broken water sources?**
How can we prioritize within our budget?	Message a colleague/ supervisor/friend (e.g., WhatsApp, SMS); textbooks or manuals (e.g., "Engineering in Emergencies")			
Designing, simulation, and system optimization	Online forum (e.g., KnowledgePoint, SuSana, RWSN); textbooks or manuals (e.g., "Engineering in Emergencies")	**Water supply system optimization**	Online forum (e.g., KnowledgePoint, SuSana, RWSN); textbooks or manuals (e.g., "Engineering in Emergencies")	
Técnica y fibanciera	Google/search engine; Búsqueda de financiamiento	**Trasmisión de conocimiento**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); Google/search engine; online forum (e.g., KnowledgePoint, SuSana, RWSN); textbooks or manuals (e.g., "Engineering in Emergencies")	**Ninguna**

How can we enhance the quality of our drilling services?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); message a colleague/ supervisor/friend (e.g., WhatsApp, SMS)	**How can we improve water resource management?**	Message a colleague/ supervisor/friend (e.g., WhatsApp, SMS); online forum (e.g., KnowledgePoint, SuSana, RWSN)	**How can we get funding for our projects?**
With government having little to no interest in water, sanitation, and hygiene (WASH) in rural communities, what is the possibility of achieving water for all and improved sanitation for all by 2030?	Online forum (e.g., KnowledgePoint, SuSana, RWSN); NGOs and concerned philanthropists	**How can we revolutionize the WASH sector using Artificial Intelligence and machine learning?**	Google/search engine; YouTube/social media (e.g., Facebook); online forum (e.g., KnowledgePoint, SuSana, RWSN); Artificial Intelligence (e.g., Chat GPT)	**The sustainability of rural and urban WASH facilities is a growing concern.**
Where can we visit a borehole?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); online forum (e.g., KnowledgePoint, SuSana, RWSN); Internal guides/ reference books/pdfs from your organization; textbooks or manuals (e.g., "Engineering in Emergencies")			
Technical standards of valley tanks and design process	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); message a colleague/ supervisor/friend (e.g., WhatsApp, SMS); textbooks or manuals (e.g., "Engineering in Emergencies")	**Health and safety standards**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); message a colleague/ supervisor/friend (e.g., WhatsApp, SMS); internal guides/ reference books/PDFs from your organization; textbooks or manuals (e.g., "Engineering in Emergencies")	
La création de nouveaux systèmes d'alimentation en eau potable dans treize zone à stress hydriques élevé dans la région de Louga.	Base de données régionale de planification pour l'atteinte de l'ODD 6	**Extension des réseau d'AEP existants pour une meilleure couverture et desserte**	Base de données régionale de planification pour l'atteinte de L'ODD 6	**Besoin en solarisation et traitement d'eau saumâtre pour 150 systèmes d'alimentation en eau**

How can we get affordable solar solutions?	Message a colleague/ supervisor/friend (e.g., WhatsApp, SMS)			
Approvisionnement en eau	Les réponses sont fournies sur base d'une expérience professionnelle	**Assainissement adéquat de l'environnement**	Textbooks or manuals (e.g., "Engineering in Emergencies")	
How can we balance project needs and budget limitations?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); message a colleague/ supervisor/friend (e.g., WhatsApp, SMS); textbooks or manuals (e.g., "Engineering in Emergencies")			
How can we use the sand abstraction system to supply water in rural areas?	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); message a colleague/ supervisor/friend (e.g., WhatsApp, SMS); Google/search engine; textbooks or manuals (e.g., "Engineering in Emergencies"); discussion with expertise from various representative companies	**How do communities adjust and adopt the use of new water technologies?**	Ask a colleague/ supervisor working on the jobsite with you (in-person interaction); message a colleague/ supervisor/friend (e.g., WhatsApp, SMS); Google/search engine; textbooks or manuals (e.g., "Engineering in Emergencies")	

ANNEX 6: Missing Competencies Per Country

(Identified by those working in supporting/other roles)

Most Worked Country	Missing Competencies
Angola	Technical skills; lack of knowledge on climate adaptability of groundwater water supply technology; water security
Bangladesh	Feasibility study water supply; detail design for water supply and distribution; project management
	Lack of knowledge regarding water quality; inadequate capacity of water source management; lack of knowledge and networking skills
	Water governance regulation and accountability; equitable water access issues on pricing and budgets; staff capacity on roles
Benin	"Compétences techniques" Manque de techniciens bien outillés pour la recherche de l'eau surtout en milieu de socle; "Compétences techniques" Manque d'outils ou de matériels de pointe pour la recherche; Manque de moyen financiers surtout dans les zones rurales pour implémenter les projets d'eau
	Dimensionnement des ouvrages utilisant le système solaire
	Hydrogeological experts who can assist with finding water; financial management skills for local staff; alternate forms of water provision (e.g., filters, rainwater collection, purification systems, etc.)
Bolivia (Plurinational State of)	Diseño de sistemas de agua poco sostenibles; Habilidades técnicas; cambio de hábitos
	Habilidades institucionales: falta de planificacion y monitoreo de condiciones WASH a nivel rural; Habilidades tecnicas: falta de capacidades para fortalecer la sostenibilidad de los sistemas de agua potable; Habilidades administrativas: falta de capacidades para lograr los presupuestos necesarios para avanzar al ODS 6
	Lack of updated information on the status of RWASH; low expending capacity of public WASH funds; weak institutional capacity of the WASH sector at national and local levels
Brazil	Design standards updated; necessary to be more popular in urban areas; local laws for use in buildings
	Projetos em saneamento; Reuso de efluentes tratados; Qualidade de água
Bulgaria	Lack of reliable infrastructure (e.g., aging pipelines, pumpstations); poor water treatment (pathogens and nitrates are often present); the population does not know their rights
Burkina Faso	Technical skills; lack of knowledge on climate adaptability of water supply technology
	Lack of sociological knowledge for the easy acceptance of the population to more complex technologies for drinking water supply; lack of local capacity for repair and maintenance of complex water supply technology; lack of coordination between stakeholders (repair artisans, water user associations, rural communities); and difficulty of accessing Human Hand Pump (HHP) spare parts
	Water projects' design, installation, operations and maintenance
Cambodia	The local government has a lack of knowledge and skills on clean water supply and water treatment technique/technology; lack of behavior change/ communication skills of the local government to educate local people on using water; the national and sub-national governemnet has a lack of skillsto facilitate the cooperation and partnership between stakeholders (inter-government agencies and private sector)
	Viable technical solutions to the challenging environment; commitment and motivation of local actors in project implementation; harmonization among the WASH sector, as different ministries take charge in the water sector and some guidelines and practices are not well-harmonized
	Water source management; HWTS option; water safety plan

Cameroon	Lack of knowledge in water supply techniques; lack of skills in water quality testing; limited access to information on rural water supply
	Lack of technical skills; lack of financial skills; lack of knowledge on climate adaptability of water supply technology
	Mise en place et gestion des petits partenariats publics privés pour la gestion du service d'eau potable et d'assainissement au niveau des Municipalités; Gestion intégrée de l'eau potable et de l'assainissement à l'échelle des petites villes; Valorisation des boues de vidanges à des fins utiles et commerciales
	Planning, management, and monitoring expertise; technical expertise; institutional expertise
	Technical skills; lack of labor force; lack of financial resources
Central African Republic	Competence technique; Compétences d animation
	Competency with online project management and planning tools; water quality monitoring and water treatment management; digital asset and inventory management/reconciliation
Chad	Manque de connaissance des systèmes d'approvisionnement solaire; Manque de connaissance des techniques d'agroécologie économes en eau (goutte à goutte, etc.); Manque de connaissance sur le suivi des eaux souterraines
Colombia	Acompañamiento institucional a las comunidades ante eventos adversos donde requieren apoyo técnico; Conocimiento de las autoridades gubernamentales sobre el tema con el fin de planear politicas en el mediano/largo plazo; Conocimiento acerca de cómo acceder a recursos económicos gubernamental o de cooperación
	Área administrativa; Sistema de saneamiento; Sistema de control de consumo
	Capacidad tecnica; Disponibilidad de pago ; Calidad de agua
	Deficiencia de infraestructura para el tratamiento del agua para consumo humano ; Capacidad técnica de los operarios de los sistemas para la efectiva operación de las infraestructuras; Difusión de la importancia de la cultura de pago del servicio,de la importancia de la administración, operación y mantenimiento de los sistemas y del uso eficiente del agua
	El conocimiento de los operadores de sistemas comunitarios rurales acerca de los procesos de potabilización es insuficiente.; El conocimiento de los operadores de sistemas comunitarios rurales acerca de los parámetros que definen la calidad del agua, sus implicaciones para la salud y las alternativas de manejo previo al consumo humano, es insuficiente.; No hay cultura de registro de información relacionada con la gestión hídrica, ni conocimiento para hacer uso y aprovechamiento de la misma.
	General knowledge from users
	normatividad ajustada; la creación de operadores sea fácil; falta recursos técnicos y económicos
	Política públicas; Habilidades técnicas; Salud ambiental
	Recursos monetarios; Colaboración estatal ; Dispersión de las comunidades
Costa Rica	capacidad técnica institucional; reglamentos inapropiados a realidad climática y diversa del país; infraestructura instalada defectuosa, sin elementos de control
Côte D'Ivoire	Compétences techniques dans la conservation; Compétences sociales dans la préservation du bien commun ; Compétences techniques dans l'adaptation au changement climatique
	Manque de connaissance sur l'utilisation des équipements d'acheminement d'eau; Pas de technicien qualifié pour la réparation des équipements d'acheminement d'eau; Pas d'adaptabilité au climat de la technologie d'acheminement d'eau

Democratic Republic of the Congo	Compétences techniques; Compétences logistiques; Compétences managériales
	Compétences techniques; Manque de financement; Des ateliers de formation fréquents dans le cadre de renforcement des capacités
	Compétences techniques; Manque de connaissance
	Depuis le débâcle de OGB, toutes les organisations se sont alignées dans le secteur Wash les principes ont changés la compétence est revu en baisse seul le CICR est resté crédible; Approche communautaire n'est pas pris en compte; l'influence sur les recrutements de l'équipe
	Knowledge on the daily water supply delivery; understanding of the water quality and methods to solve them; basic software
	Lack of knowledge about forage and pumping with solar energy; lack of knowledge about the analyses and treatment of water in rural area; lack of knowledge about the maintenance of a hydraulic system's protection
	Lack of understanding the importance of life cycle costing; lack of understanding how to apply WASH system's strengthening approach; lack of understanding on how to calculate user numbers for a water system
	Manque des connaissances sur la gestion administrative et financiere des ouvrages d'eau par les associations d'usagers de l'eau; Manque des competences techniques sur l'installation des pompes immergees solaires; Manque des connaissances sur la legislation regissant le secteur de l'eau au niveau national
	Techinique; technologique; manageriale
Dominican Republic	Inversión focalizada en sistemas rurales; Falta de regulador a nivel nacional que establezca reglas de cobertura, calidad, tarifa... a nivel local; Falta de Ordenamiento territorial, que hace que las soluciones se adapten a las formas irregulares y desordenadas de los parajes
Ecuador	Lack of knowledge/valuation to achieve adequate chlorination (understanding of needs for pretreatment, importance point-of-use free chlorine monitoring, enforcement mechanisms); limited skills to reduce NRW (accounting to compare macro- and micro-metering results, deficient financial planning and political capital to use tariffs to avoid miuse of water); weak financial/administrative skills to ensure financial sustainability of rural water systems
	Technical and administrative skills for managing the water system; empowering people over the water system
Egypt	Intermittent water pumping in the public network leads to many water quality problems; underground private water storage concrete tanks and their contaminants; mixing different types of water, like public network water and private borehole water, leads to deterioration of water quality and inability to know the source of contamination
Ethiopia	Difficult water access (Ogaden Desert) - water table 500-600 meters deep, no nearby natural source, often water table is salinated; lack of resources - minimal NGO or government work in these areas; no power; pastoral communities with a lack of technical skills; remote (6-7 hours from paved road)
	Lack of financial support alternatives; lack of knowledge on climate adaptability on WASH interventions; lack of knowledge on solar technlogies for WASH service delivery
	Lack of knowledge on climate adaptability; technical skills; water supply technology
	Lack of skill on saline water abstraction and use for drinking water; lack of knowledge on looking or using other water sources other than surface and ground water; working on alternative energy source to not rely only on fuel for energy source; electromechanical skills and updated skill gap

	Lack of affordable and low-cost water treatment options; lack of awareness; lack of efficiency in most community-based water projects
	Lack of water supply technology; inaccessibility of the safe water projects; lack of coverage; lack of financial funding
	Leadership and commitment problems; financial shortage to maintain the water points; technical skills
	Operation and management capacity of rural water users; water tariff management; accountability
	Water resources scarcity, availability and variability in space and time; poor economic conditions and lack of knowledge; associated cost recovery challenges and scattered settlements bring challenges for infrastructure provision
	Water safety planning for both urban and rulal small systems; limited private sector engagement; both organizational and technical personnel capacity limitations
Ghana	Funding; commitment to rural folk; software skills or capacity building
	High non-revenue water; inadequate routine maintenance; aged infrastructure
	Participation du secteur privé africain; Problème de financements; Manque de partenariat Afrique - Europe
Guatemala	Habilidades tecnicas diseño proyectos; Habilidad negociacion proyectos; Habilidades para la operacion, administracion y mantenimiento
	Paraprofessional engineers with community experience; technicians with Mayan language fluency; community organization
Guinea	Maintenance des installations (pompes); Gouvernance interne (gestion de l'installation ouvrage); Le traitement de l'eau
Haiti	Manque de promotion sociale; Manque de connaissance sur le changment climatique; Manque de materiel pour faciliter l'acces a l'eau dans les milieux ruraux
Honduras	Acceso a fuentes de agua ; Acceso a financiamiento; Acceso a tecnología
	Culture; does not provide information to us; lack of knowledge of climate adaptability
	Gestion con enfoque de sostenibilidad; Capacidades técnicas y de administracion; Esquema de apoyo post construccion
	Habilidad Tecnicas; Personal para capacitaciones; Medios de Transporte
	Knowledge; implementing and selecting HWTS; teaching WASH techniques
	Lack of government support with applying law and projects counterparts; lack of knowledge about water quality causing illnesses; people with the ability to support communities with a proper and resilient infrastructure
India	Awareness; knowledge transfer; systematic approach
	Governmentdoes not make a purifier customized to the region's needs; at implementation level, there is no bottom of the pyramid deliverance happening; the decision makers do not know of nature-based or green alternatives other than R.O., M.F or U.F. and only insist on buying them rather than going for economical and green alternatives
	Lack of knowledge on climate adaptation; raising costs in treatment and use; water distribution
	Leadership at rural level for managing the water assets and supply; empowering women in the rural committee as they know the pain and value of water management; Need to pick a responsible person as waterman to innovate at the grassroot level to minimize waste

	Low-cost locally sourced HH water systems; Low-cost water treatment system for community water treatment
	Planning, designing, implementation, quality assurance, monitoring, and evaluation of drinking water supply schemes; Planning and design of drinking water security and sustainability of ground water sources using watershed approach and remote sensing and GIS tools; planning, design, implementation, monitoring, and evaluation of performance of solar water pumping systems
	South Asia; India; Gujarat state/Vadodara city.
	Technical competence; water scarcity; poverty
	Technical skills; actual water testing; training/provided object feedback
	Technical skills
	Technological options; mapping; training implementors
Indonesia	Lack of awareness or acceptance of decentralized safe drinking water solutions; lack of national certification mechanism for water filters; lack of awareness of the importance enough safe drinking water
	Lack of awareness, competency, and local government support
Kenya	Capacity of community ownership and management; support and funding for ongoing maintenance and spare parts; social behavioral change communication on point of use water treatment; safe handling and storage at households
	Community water supply management and sustainability skills; aquifer recharge characteristics and climate change adaptability; managed aquifer recharge technologies
	Existence of local community-based organization needed to maintain sustainability; knowledge of intercultural communication; knowledge of country-based regulations and practices concerning geology and effect on water purity
	Inadequate water resources assessment and data management; lack of knowledge on organizational development for water supply and sanitation utilities; lack of knowledge on fundraising for community; self-supply and supported self-supply initiatives
	Lack of knowledge about reverse osmosis and battery technologies; challenges around groundwater access and boreholes; government relations and regulations
	Lack of knowledge in water management; unavailability of reliable water sources; lack of water technology
	Lack of maintenance programs and personnel for water infrastructure; lack of business plans for water management; insufficient water supply both in quantity and quality
	Lack of technical skills in water management; lack of grants to implement community water supply projects; no coordination of donors with grassroot community-based organizations;
	no Kenyan government commitment to address waterborne disease at the community level, despite the 2010 Kenya constitution stating that safe drinking water is a basic right of all Kenyans; Recognizing there is no probability of installing treatment and distribution facilities where citizens have only unimproved drinking water sources; Use of obsolete three tube MPN for testing for thermotolerant coliforms instead of the chromogenic tests of Colilert and E. coli Count Petri film
	Lack of reliable water usage pricing models; lack of community ownership of the water supply facility; poor leadership leading to embezzlement of funds and negligence of the water facility

	Water infrastructure; poverty; rivers and streams are easily accessible
	Road network; lack of communication; collaboration from community
	Safe drinking water supply; awareness of WASH; access to water facilities
	WASH data management; WASH sector coordination challenged; M&E capacity
Liberia	Availability of limited pipe-borne water for all our counties; well-equipped and limited trained water quality personnel; lack of adequate WASH partners in country
Madagascar	compétences techniques; compétences de gestion des infrastructures
	Lack of understanding and resources for adaptive management of water points; in case of breakdown or water table level change due to climate, the water management committees fail in adaption or repairs; lack of support from local authorities (technical, knowledge, financial); water safety planning nearly never exists or is obsolete
	Manque de connaissance sur la capacité de l'ovrage de captage d'eau souterraine; Manque de connaissance sur le dimensionnement des systèmes de pompage solaire; Manque de connaissance sur le dimensionnement des ouvrages de traitement
Malawi	Climate change adaptation; water resources and catchment management; business models and sustainable mechanisms for filling financing gaps
	Financing for rural water supply operations and maintenance; community level water quality testing; management systems for solar-powered water supply
	Lack of knowledge about the design of extraction wells; lack of knowledge about maintenance of extraction wells; lack of knowledge about geohydrology
	Lack of political will from the government
	Limited understanding of solar-powered water supply systems by government staff to enable them to support communities with ongoing operation and maintenance once donor funded projects phase out; lack of innovative ways to convince communities to pay for water services, which will help generate revenue for operation and maintenance; lack of understanding the wholistic approach to provision of water services beyond the actual service delivery; very few sector players have knowledge and understand systems strengthening issues and the impact of service provision
	Provision of technical skills to water technicians and water users; knowledge management on the safe use of drinking water for communities; proper access and use of technologies in the water sector
	Skills for monitoring rainwater infiltration and water levels in springs, rivers, ponds, lakes, and other water bodies; ability to localize data from national and international databases for forecasting water deficits and floods; ability to set up community maintenance and funding mechanisms for sustaining group water systems
Mali	Lack of knowledge on solar energy irrigation systems; lack of knowledge on climate adaptability of water supply technology; lack of knowledge on water quality
	Manque de competences en ce qui concerne la maintenance et reparation des installations.; Manque de compétences dans l'elaboration des specifications techniques pour les infrastructures d'eau potable
	manque de connaissances en ce qui concerne l'adaptabilité au climat de la technologie d'acheminement de l'eau ; Manque de Technologie innovente
	renforcer la capacité d'entretien et de maintenance des ouvrages; Gouvernance des eaux en milieu rural; Gestion intégrées des eaux
Mauritania	Qualité ; Ponctuel ; Expérience

Mexico	Cantidad de agua, limitada por fuentes de abastecimiento; Infraestructura para distribucion y recoleccion de agua; Morosidad en el pago de los servicios de agua y saneamiento
	Infraestructura para el tratamiento del agua; Capacidades técnicas en la comunidad ; Uso, operación y mantenimiento adecuados
Myanmar	Climate change nexus WASH; renewable Energy nexus WASH; WASH in inclusion
	Sustainable solution for infrastructure; community participation; budget
Namibia	Capacity building to manage rural water supply and sanitation; lack of knowledge for sanitation and hygiene; lack of study opportunities for rural water supply
	Lack of competent skills in the subject at top and relevant government posts; lack of strategy to protect existing infrastructure; lack of necessary knowledge to adequately protect the resources
Nepal	Capacity assessment; quality training; sector collaboration/coordination and policies
	Knowledge of using chlorine concentration in water; documentation of local disaster events; linkage of climate change and impact on groundwater level
	Lack of institutional strength for climate adaptability in water supply system; rapport building of service provider with other stakeholders; quality assurance and control
	Lack of operational skills for lift water schemes; lack of maintenance skills for delivery network and infrastructures; lack of governance system of water systems
	Quality water supply; lack of knowledge on use of clean water; lack of resources to access clean water for all
	Smart technologies to provide safe water from existing water supply schemes; lack of knowledge on climate change and its impact on WASH; knowledge and awareness on water quality test
	Technical skills; lack of knowledge on climate adaptability; poor infrastructure
	Water safety and quality expert; sustainability; operation and maintenance management
	Water safety plan; operation and maintenance; lack of addressing the climate change issue
Nicaragua	Calidad; infraestructura ; Promoción
	Habilidades técnicas; Uso de herramientas tecnológicas; Dominio de problemática del agua
Niger	manque de compétance pour la connaissnace et mise en valeur des ressources en eau ; manque de capacité technique de mobilisation des ressources en eau; gouvernance adapté à une gestion intégrée des ressources en eau intégrant le changement climatique
Nigeria	Adequate monitoring facilities; continuous sensitizing of rural users of water facilities; low level of manpower
	Financial discipline and management; WASH project design and implementation; commercial and billing system deficiencies
	Good data; equipment; technical skills
	Lack of commitment from the beneficiaries for sustainability; inconsistency in implementation of government policies; lack of capital to support water supply technology

	Lack of funds; choice of technology (e.g., solar, generator, or electricity); lack of knowledge on climate adaptation
	Lack of knowledge on water quality
	Lack of maintenance on rural water infrastructure due to lack of sustainable funds; lack of power supply to power water facilities in rural communities; adapting technology in line with local content or lack of training of personnel to adapt to technology provided
	Lack of middle level manpower; institutions for training students in the water sector lack basic equipment and laboratories for water quality tests; most water boreholes do not indicate if the water is treated from source
	Lack of technical knowledge for the installation and maintenance of solar water systems; safe security system to avoid water system from theft; expensive initial cost of installation of solar water systems
	Lack of water safety planning; lack of climate adaptability knowledge; lack of sufficient skilled manpower
	Maintenance culture to rehabilitation borehole; lack of source or fuel to power the borehole, etc.; lack of technical knowledge on well development
	Sustainability; funding; policy implementation
	Poor knowledge of technology; low skills in project management; poor leadership skills
	Training and knowledge capacity development for water management; technical skills; equipment to convey and supply water and management
	Unclear understanding and delineation of the role of communities in rural water services; paucity of data on appropriate service delivery management models; weak institutional behavior towards sustainable service post-external support
	WASH programs; behavioral changes; water quality
	Water point chlorination; water quality Testing and monitoring
Pakistan	Clean and safe drinking water; lack of resilience; contamination
	Government linkages of local community; inclusive and sustainable WASH services; decision making including diverse communities
	Lack of knowledge on options for access to water and sanitation in which households can invest themselves (as opposed to relying on government/NGOs to provide); practical (field) experience of graduates in the day-to-day life of rural households; lack of awareness on the importance and potential of household water treatment options
	Means for sustainability; land use planning; WASH entrepreneur
Palau	Water supply; lack of knowledge regarding clean as safe water; capacity to buy clean water
Papua New Guinea	Technical expertise on simple hydro system of water supply; poor governance of resources and funds; maintenance of water supply and ownership by the communities
Peru	Lack of operator capacities; difficulties in service supervision; financing all the costs required for service provision
Rwanda	Lack of knowledge on WASH issues by local communities; lack of technical support to grassroots organizations; lack of financial support to local communities

Senegal	compétences techniques; Sensibilisation et informations; Esprits de suivi et d'entretien
	Lack of financial means; lack of supplier or local manufacturer of hydraulic equipment
Somalia	Lack of knowledge and expertise on rural water development; very limited resources or funding for rural water development; lack of awareness or support to climate adaptabilities and Disaster Risk Reduction (DDR) with weak national and state regulations on water
	Limitation of technicians in rural areas; water quality; availability of good materials
	Research; climate change; assessment
South Africa	Technical awareness; facilitation skills; community mobilization
South Sudan	Designing of water network; water quality testing and analysis; underground water management
	Lack of knowledge on sphere principles and minimum standards in the water sector; lack of knowledge on SDG indicators in the water sector; lack of knowledge on maintenance of water sources
	Limited awareness of the existence of innovative, low-cost technologies; lack of local SMEs who know how to produce innovative, low-cost technologies; lack of funds to train local SMEs in innovative technologies
	Management of water resources; water quality; inadequate maintenance skills
	Technical skill; minimal resources and market capacity; unsupportive existing policies
	Technical skills; poor attitudes towards behavior change; poor knowledge on sustainability of WASH services
	Water supply technology; skills; knowledge
Sri Lanka	Lack of awareness/knowledge of the most appropriate technology for different settings; lack of awareness of government officials on different technologies available; lack of awareness of rural communities of alternative technologies
Sudan	Water supply technology and supplies; lack of knowledge; lack of applying an integrated water resources approach
Syrian Arab Republic	Technical skills, especially for staff; technical information; technical equipment
Tajikistan	Competences en matiere de'ingenierie
	Governance; knowledge; operation
Tunisia	Water information systems; water quality safety plans management; water resources governance
Uganda	Design of piped water supply schemes; sustainable aspects; limited funding opportunity
	Initial installation records; maintenance recordkeeping; quality of spares supply and local storage of spare parts
	Lack of knowledge; availability of quality products
	Local data analysis capability; social media/online communication
	Management; technical skills; leadership
	Lack of smart water technologies; lack of knowledge on climate adaptability on water technologies

United Republic of Tanzania	Lack of funds to support the implementation of water projects in rural areas; lack of technology, like a source of power for pumping systems; lack of knowledge in water quality monitoring
	Lack of funds to serve more communities; high cost of solar power for water schemes; transportation to rural areas
	Lack of proper management skills of water projects at the community level; inadequate skilled personnel for sustainable water project maintenance
	Understanding the impact of climate trends on rural water sustainability; mobilization of multistakeholder collaboration for rural water supply; planning with communities for sustainable rural water services
	Water tariff management; water source protection utilizing indigenous knowledge; drinking water quality monitoring
United States of America	Inability to operate complex water treatment systems; failure to provide proper maintenance of infrastructure; failure to properly monitor water quality (raw and treated)
	Lack of knowledge on best practices and training of water treatment; lack of knowledge of the use of local resources; lack of formal education
	Operation and management of systems; developing capacities of service providers; tariff setting and revenue management; water quality and water safety (including Water Safety Planning)
	Public knowledge of the facts and needs of water issues; access to training for high school and college students; school district support to promote the subject matter
Venezuela (Bolivarian Republic of)	Capacitación del manejo del recurso Agua; construcción de un plan de mantenimiento preventivo; asesoría o acompañamiento tecnico por parte de ODS, instituciones del estado
	Falta de conocimiento sobre el cambio climático con prácticas como tala y quema; falta de conocimiento sobre beneficios socioeconómicos de protección de bosques; falta de habilidades técnicas para reforestar y preservar el ciclo del agua usando cultivos como el café y cacao
	Falta de recursos para el plan; falta de capacitación; falta de personal capacitado
	Instrucciones de los insumos; repuestos de los insumos; refuerzo de la información
	Presupuesto; tecnología auto sustentable; seguridad
Yemen	Infrastructure development and maintenance; water quality monitoring and treatment; community engagement and capacity building
	Lack of knowledge on climate change adaptability of solar-powered water supply systems; lack of financial planning for the limited resources available; lack of knowledge on proper procurement procedures of different components of rural water systems
	Lack of technical expertise in climate-resilient water management; inadequate capacity building and community engagement; inconsistent and fragmented governance and funding structures
Zambia	Governance structures including clearly defined roles and responsibilities for key actors; sustainable O&M systems and processes; sustainable financing models
	Institutional technical skills in WASH and sustainability road map on WASH projects; lack of community-based organizations to manage the common good; lack of adequate knowledge on climate change

	Lack of knowledge on financing mechanisms to use in sustaining water quality monitoring in rural areas; lack of skills in water quality monitoring among rural piped water systems management; lack of regulatory exposure from model systems of regulating rural water supply
	Lack of knowledge on how to the source of water; Lack of knowledge on how to store treated water safely; lack of knowledge on how to operate and maintain water sources in a sustainable manner
	Technical skills; financial support; technology
Zimbabwe	Economic crisis; lack of knowledge on climate adaptability; low ground water potential
	Lack of design knowledge and appropriate design software; lack of communication media like design manuals; lack of experienced supervisors
	Lack of knowledge on solar technology on water points
	Lack of support by local government at the district level for community-managed water sources. Communities are left to manage on their own with little or no monitoring. There is no system in place to monitor supply services in the community. There is no life cycle costing for water supply infrastructure. Water point committees raise insufficient fees for O&M and, as a result, are unable to do major replacements (or even minor) of fast waring spares, such as leather cups in B type bush pumps. There is no standalone budget to support O&M at the district or national level.
	Sustainability strategies; resources; water supply technologies