Research Terms of Reference

Assessment on accessibility to sufficient and quality water in water-stressed areas in Libya.
[LBY2201]
Libya

[22/03/2022]
[2]

REACH Informing more effective humanitarian action

1. Executive Summary

Country of intervention	Libya					
Type of Emergency	□	Natural disaster	X	Conflict	□	Other *(specify)*
Type of Crisis	□	Sudden onset	□	Slow onset	X	Protracted
Mandating Body/ Agency	European Civil protection and Humanitarian aid Operations (ECHO)					
IMPACT Project Code	*14ARW*					
Overall Research Timeframe *(from research design to final outputs / M&E)*	01/02/2022 to 30/05/2022					
Research Timeframe *Add planned deadlines (for first cycle if more than 1)*	1. training: 23/02/2022			6. Preliminary presentation: 22/04/2022		
	2. Start collect data: 07/03/2022			7. Outputs sent for validation: 20/04/2022		
	3. Data collected: 24/03/2022			8. Outputs published: 29/04/2022		
	4. Data analysed: 08/04/2022			9. Final presentation: 29/04/2022		
	5. Data sent for validation: 18/04/2022					
Number of assessments	X	Single assessment (one cycle)				
	□	Multi assessment (more than one cycle) *[Describe here the frequency of the cycle]*				

Humanitarian milestones *Specify **what** will the assessment inform and **when** e.g. The shelter cluster will use this data to draft its Revised Flash Appeal;*	**Milestone**		**Deadline**
	□	Donor plan/strategy	_ _/_ _/_ _ _ _
	□	Inter-cluster plan/strategy	_ _/_ _/_ _ _ _
	X	Cluster plan/strategy	31/03/2022
	□	NGO platform plan/strategy	_ _/_ _/_ _ _ _
	□	Other (Specify):	_ _/_ _/_ _ _ _

Audience Type & Dissemination *Specify **who** will the assessment inform and **how** you will disseminate to inform the audience*	**Audience type**	**Dissemination**
	X Strategic	**X** General Product Mailing (e.g. mail to NGO consortium; HCT participants; Donors)
	X Programmatic	X Cluster Mailing (Education, Shelter and WASH) and presentation of findings at next cluster meeting
	□ Operational	X Presentation of findings (e.g. at HCT meeting; Cluster meeting)
	□ [Other, Specify]	

			X Website Dissemination (Relief Web & REACH Resource Centre) □ [Other, Specify]	
Detailed dissemination plan required	□	Yes	X	No
General Objective	The research aims to provide a comprehensive and updated overview on the water situation in Libya by exploring water availability issues at a national scale, the climate change impact and the human factors causing water scarcity. It will also explore households' ability to have access to sufficient and quality water resources in the municipalities of Derna, Sebha and Sirt.			
Specific Objective(s)	1. Provide an overview of the water availability in Libya by mapping the main sources of water (groundwater and surface water) 2. Map and analyse the state of water-related infrastructure[1] after 10 years of endemic conflicts and social instability. 3. Assess natural trends such as rainfall, groundwater evolution or Normalized Difference Vegetation Index (NDVI)[2] (natural vegetation "health") as proxies for water availability resources). 4. Assess human factors (conflicts, maintenance of water infrastructures, water use and consumption) causing water stress[3] in Libya. 5. Assess communities' access to water by region and the impact of water scarcity on livehoods. 6. Analyse the modalities of water treatment, the monitoring of the quality of water and households' methods to treat water. 7. Estimate the water quantity used per household and their average water expenditure. 8. Analyse households' satisfaction towards the public water supply system and its maintenance.			
Research Questions	**Part One: Availability and quality of water** 1.1 What are the main water sources in Libya? a) What is the sustainability of each water source in Libya? b) What are the problems and observed climate issues associated with a potential reliance (or over-exploitation of) on groundwater? c) What climate factors influence water availability and quality?			

[1] Water infrastructure refers to a broad term for systems of water supply, treatment, storage, water resource management, flood prevention and hydropower, IGI Global.

[2] The NDVI is a dimensionless index that describes the difference between visible and near-infrared reflectance of vegetation cover and can be used to estimate the density of green on an area of land, sciencedirect, 2018

[3] Water stress occurs when the demand for water exceeds the available amount during a certain period or when poor quality restricts its use. Water stress causes deterioration of fresh water resources in terms of quantity (aquifer over-exploitation, dry rivers, etc.) and quality (eutrophication, organic matter pollution, saline intrusion, etc.), European Environment Agency

	d) What alternative solutions to groundwater have been developed and what are the limits? e) What is the quality of the different water sources? f) How is the quality of water being monitored and how water is being treated by households? g) How satisfied are households with the different water sources? **Part two: Water infrastructures** 1.2 Questions on water infrastructres h) What are the existing water infrastructures in Libya? i) What is the state and sustainability of the various water infrastructures? j) Have there been any security incidents on water infrastructure in the last six months that households are aware of and what have been the consequences on the population's access to water resources? **Part three: Questions on access to water and relation to livelihoods** 1.3 Communities' ability to access safe drinking water and sanitation and impact on livelihoods k) How do communities in diverse areas access water? What are the most reported problems to accessing water? l) What are the vulnerabilities and priority needs of different population groups living in the assessed location(s) with regards to access to water? m) What are the regions most affected by the lack of water resources and what are the main factors that affect people's ability to meet their basic needs? n) What is the impact of water scarcity on livelihood activities in the assessed locations? o) How does water scarcity impact communities, with regards to accessing safe drinking water, sanitation and hygiene? p) How do communities cope with lack of water? q) What is the households' average use of water? **Part four: Questions on water management and households' satisfaction towards public services** r) Are households satisfied with the public water supply and services? s) What is the average water expenditure for households? t) What institutions are responsible for maintaining and upgrading the public water supply system? u) What is the role of local authorities in the provision of water services?
Geographic Coverage	The secondary data analysis will be done nationwide as it will provide a comprehensive overview of water stress issues in Libya and will assess the climate and human (mainly conflicts) factors that affect the water supply in Libya. A first round of the Key Informant Interviews will also assess the water situation at a national scale. This will allow to have a broad analysis of the causes and consequences of water scarcity in Libya, the usage and the availability of the different water sources as well as the factors affecting the water supply system.

	The second round of the Key Informant Interviews (with municipal actors and community leaders) and the households surveys will be carried out at a local level in three different municipalities from each region (Sebha in the South, Derna in the East and Sirt in the West). The final geographic coverage has been determined based on a secondary data review, the analysis of the 2021 Libyan MSNA findings, the identification of municipalities with lack of WASH assistance and the inputs and priorities of the Libya WASH sector. The approach of combining a nationwide with a local and more in depth analysis will allow to have a broad overview on the diversity of issues faced in Libya in terms of water availibility and accessibility and highlight the specific needs of the population most affected by the effects of water scarcity.
Secondary data sources	**Resources about the general context:** 1. IHE delft institute for water education, From water scarcity to water security in Libya, 2018 2. Arab Reform Initiative, Water Politics in Libya: A Crisis of Management, not Scarcity, 2021/06/29 3. Wolrd Resources Institute, 17 Countries, Home to One-Quarter of the World's Population, Face Extremely High Water Stress, 2019/08/06 4. Proceedings, Water Resources and Desalination in Libya, 2018 5. General Water Authority, Country case study – National water policy review, and management of water scarcity in the Libyan Arab Jamahiriya 6. Reuters, In battle for Libya's oil, water becomes a casualty, 2019/07/02 7. MDPI, Groundwater Overexploitation and Seawater Intrusion in Coastal Areas of Arid and Semi-Arid Regions, 2018 8. UNICEF, Assessment of water supply systems and institutions in Libya, 07/2021 9. MEWINA, Libya water sector M&E rapid assessment report, 04/2021 **Key secondary data sources that will be analysed and used for this assessment will encompass:** • Scientific papers ○ Cos, J., Doblas-Reyes, F., Jury, M., Marcos, R., Bretonnière, P.-A., and Samsó, M.: The Mediterranean climate change hotspot in the CMIP5 and CMIP6 projections, Earth Syst. Dynam., 13, 321–340, https://doi.org/10.5194/esd-13-321-2022, 2022 ○ Zittis, G., Bruggeman, A., & Lelieveld, J. (2021). Revisiting future extreme precipitation trends in the Mediterranean. Weather and climate extremes, 34, 100380. https://doi.org/10.1016/j.wace.2021.100380 • Remote Sensing and GIS resources ○ Jean-Francois Pekel, Andrew Cottam, Noel Gorelick, Alan S. Belward, High-resolution mapping of global surface water and its long-term changes. Nature 540, 418-422 (2016). (doi:10.1038/nature20584) • News reports on the following topics: ○ Impact of conflicts on water infrastructures and the water supply system. ○ Water management issues. ○ Political decisions affecting the water supply in Libya. ○ Climatic factors causing water scarcity. ○ Communities coping strategies to have access to sufficient and quality water. • ACLED data https://acleddata.com/

	• Review of the findings of the 2021 Libyan MSNA[4] on insufficient access to water and diversity of water sources. • Information provided by public insitutions and main actors of water management (The General Water Authority, ministries…) on water sources, water availability, water infrastructures, water public policies.					
Population(s) *Select all that apply*	□	IDPs in camp		□	IDPs in informal sites	
		IDPs in host communities			IDPs [Other, Specify]	
	□	Refugees in camp		□	Refugees in informal sites	
		Refugees in host communities		□	Refugees [Other, Specify]	
		Host communities		X	Libyan population	
Stratification *Libyan population*	X	Geographical #:3 baladiyas (Sirt, Sebha and Derna) Population size per strata is known? X Yes □ No	□	Group #: _ _ _ Population size per strata is known? □ Yes □ No	□	*[Other Specify]* #: _ _ Population size per strata is known? □ Yes □ No
Data collection tool(s)	X	Structured (Quantitative)		X	Semi-structured (Qualitative)	
	Sampling method			**Data collection method**		
Structured data collection tool # 1 *Select sampling and data collection method and specify target # interviews*	□ Purposive X Probability / Simple random □ Probability / Stratified simple random □ Probability / Cluster sampling □ Probability / Stratified cluster sampling □ [Other, Specify]			□ Key informant interview (Target #):_ _ _ _ _ □ Group discussion (Target #):_ _ _ _ _ X Household interview (Target #): 301[5] □ Individual interview (Target #):_ _ _ _ _ □ Direct observations (Target #):_ _ _ _ _ □ [Other, Specify] (Target #):_ _ _ _ _		
Semi-structured data collection tool (s) # 1 *6 Key Informant Interviews with representatives of national water management institutions and WASH experts.*	X Purposive Snowballing □ [Other, Specify]			X Key informant interview (Target #): 6 □ Individual interview (Target #):_ _ _ _ _ □ Focus group discussion (Target #):_ _ _ _ _ □ [Other, Specify] (Target #):_ _ _ _ _		
Semi-structured data collection tool (s) # 2 *18 Key Informant Interviews in Sebha, Derna and Sirt with municipal actors and community leaders.*	□X Purposive □ Snowballing □ [Other, Specify]			□ Key informant interview (Target #): 18 (6 KIIs per municipality) □ Individual interview (Target #):_ _ _ _ _ □ Focus group discussion (Target #):_ _ _ _ _ □ [Other, Specify] (Target #):_ _ _ _ _		
Target level of precision if probability sampling	95% level of confidence			10+/- % margin of error		
Data management platform(s)	X	IMPACT		□	UNHCR	

[4] Multi-Sector Needs Assessment: Libyan Population, REACH Resource Center, May 2021

[5] Sample sizes are determined at baladiya-level and distributed among muhallas proportionally. A 5% buffer has been added. In Derna, a total of 102 surveys will be carried out. In Sebha, 100 and in Sirt 99. In Derna, 5 muhallas will be covered, in Sebha, 6 muhallas and in Sirt, 7 muhallas. If the sample is less than 3 at the muhalla level, the muhalla has not been taken into consideration.

	□	[Other, Specify]				
Expected ouput type(s)	□	Situation overview #: _ _	X □	Report #: 1		Profile
	X	Presentation (Preliminary findings) #: 1	X	Presentation (Final) #: 1	□	Factsheet #: _ _
	□	Interactive dashboard #:_	□	Webmap #: _ _	X	Map #: As needed
	□	[Other, Specify] #: _ _				
Access	X	Public (available on REACH resource center and other humanitarian platforms)				
	□	Restricted (bilateral dissemination only upon agreed dissemination list, no publication on REACH or other platforms)				
Visibility *Specify which* ***logos*** *should be on outputs*	***REACH***					
	Donor: *ECHO*					
	Coordination Framework: *Libya WASH sector*					
	Partners: *NA*					

2. Rationale

2.1. Background:

According to the National Water Stress Rankings of the World Resources Institute, Libya is among the top 10 countries with extreme high-water stress[6]. Groundwater is the main source of water in Libya, particularly since the Man-Made River Project (MRRP) and its water pipeline network, covering a total of 4000 kilometres, have become the main source of water. The MRRP provides over 90% of Libya's water. However, the overexploitation of groundwater mostly to meet irrigation demands has negative impacts on access to sufficient and quality water resources. The Northern region of the country is particularly affected by the deterioration of the underground water due to intensive agricultural activities in coastal plains but also to the concentration of the population as well as the improvement of the standard of living in this region. Water resources from underground water in the Northwest of Libya, particularly in Tripoli, are for example contaminated in the form of saltwater intrusion[7].

Moreover, the armed conflict since 2011 makes the situation even more fragile, as water became a target for attacks in the context of the ongoing political division between the Western and the Eastern factions[8]. Conflicts and the fragile political situation have also weakened the country's administrations and hindered the development of sustainable public policies. The development of an institutional framework and a clear strategy related to the local water sector as well as the protection and maintenance of water infrastructure thus remain major challenges.

This research will provide a detailed understanding of the water situation in Libya, focusing on availability and accessibility of water. In this sense, it will provide a multi-layered snapshot of the water situation in Libya, which may highlight underrated gaps or unknown needs, show opportunities and, in any case, offer an accurate picture on the subject. The research will also raise awareness on the human and natural factors positively or negatively affecting availability and accessibility of water in Libya. Also, it will allow a better understanding of the functioning and access of households to the public water supply system. This will include an analysis of the water services provided by public institutions, households' satisfaction in terms of access to quality and sufficient water and their water expenditure.

[6] World Resources Institute, 17 Countries, Home to One-Quarter of the World's Population, Face Extremely High Water Stress, 2019/08/06
[7] MDPI, Groundwater Overexploitation and Seawater Intrusion in Coastal Areas of Arid and Semi-Arid Regions, 2018
[8] Reuters, In battle for Libya's oil, water becomes a casualty, 2019/07/02

2.2. Intended impact:

This assessment will help shed light on how certain human and climatic factors have affected the ability of populations to access water resources. Although scientific research works on the evolvement of the quality and availability of water resource exist, analyzing for instance the impact of groundwater exploitation, salinization, and pollution of aquifers, no previous assessments have adopted a localized approach that can highlight the specific needs, challenges and alternatives undertaken by the population to cope with the lack and the deterioration of water resources. UNICEF has also published in 2021 an "Assessment of water supply systems and institutions in Libya" focusing on the functioning of water supply systems and the management of water infrastructure in four different municipalities: Benghazi, Abu Saleem in Tripoli, Az-Zintaan and Tawergha. REACH will closely coordinate with UNICEF in a collaborative way to identify remaining information gaps.

On top of that, the attacks on water infrastructures have been relatively recent. According to the ACLED data, the highest number of assaults was recorded in 2018 and 2019 and given the continuous evolution of the factors affecting the supply of sufficient and quality water, information gaps exist in terms of the impact of the conflicts on water infrastructures and consequently on accessibility to water resources of the Libyan population for drinking or domestic uses that this assessment will intend to fill.

In the light of the above, REACH, in collaboration with the Libya WASH cluster, will conduct an assessment on water scarcity in Libya. The assessment is intended to support the WASH sector response in Libya and its assessment strategy, including by triggering reflection on the potential alternatives that can be undertaken to mitigate the risk of water distress in Libya. Indeed, the implementation of alternative techniques to groundwater such as desalination or sewage water treatment will also be explored as well as the challenges encountered to diversify water sources.

Links will also be explored with national stakeholders such as the General Water Authority, Authorities of Implementation and Management of Water Utilization of the MMRP (Man-Made River Project), General Company of Water Desalination, General Water Supply and Sewerage Company, General Environment Authority) to share the key findings of the assessment that can be used to better shape inclusive public policies in terms of management of water resources and better understand households' needs regarding their access to sufficient quality water. Key findings will also be shared with municipal actors in the assessed locations involved in water management issues to help better understand households' needs regarding their access to sufficient quality water.

3. Methodology

3.1 Methodology overview

The assessment will include four main data collection methods:

1) Review of secondary data through GIS and remote sensing techniques:

The secondary data analysis will explore the following topics:

i. Underground water: information on underground water collected through Gravity Recovery and Climate Experiment (GRACE) technology[9] and information provided by the WASH sector partners and relevant public institutions (on annual discharge, known reserves, rhythm of depletion, annual recharge, etc.)
ii. Surface water (particularly most frequent surface water infrastructures in Libya, such as dams)
iii. Precipitation trends

[9] Gravity Recovery and Climate Experiment (GRACE) NASA´s mission overview

iv. Potentially other indicators such as NDVI, relative humidity or potential evaporation (thus exploring the relationship between water and temperature)

2) **Mapping of water infrastructures,** based on secondary data analysis, carried out by REACH GIS team and through materials provided by WASH Sector partners and potentially the Libyan public authorities responsible for the development, management and monitoring of water resources and policies. This activity will encompass I) mapping infrastructures such as desalination plants in the coast as well as the GMMR (Man-Made River) reservoirs, pipes and ii) analysis of their current state and functionality.

3) **Household surveys** focusing on access to water (including by investigating water usage and expenditures) and the challenges faced by households in accessing water resources. This activity will seek to provide a deepened understanding of the causes of water stress and its impact on livelihoods; it will also explore the actions undertaken by households to cope with the lack of water resources. Data collection under this component will be carried out by REACH partner Civil Society Organisations (CSOs) in February-March 2022 in Derna, Sirt and Sebha. The sampling frame is based on population data from the 2020 UNFPA population projections, while specific displacement figures were drawn from population figures presented in Round 39 of IOM-DTM (October-November 2021). Sample sizes are determined at baladiya-level and distributed among muhallas based on the population distribution in the 2017 UNFPA population dataset. This dataset is used as it is the latest dataset that contains muhalla-level population size data. The 2020 UNFPA dataset contains data at baladiya-level only. A 5% buffer has also been added. The sample size has 95% confidence level and 10% margin of error. Data collection will be done in-person by enumerators. The questions will be displayed through the survey platform KoBo Toolbox, a free, open-source tool for mobile data collection which uses XLSForm.

4) **Semi-structured key informant interviews (KIIs)** with national level experts, representatives of public institutions responsible for water management (General Water Authority, Authorities of Implementation and Management of Water Utilization of the MMRP, General Company of Water Desalination, General Water Supply and Sewerage Company, General Environment Authority) and other relevant stakeholders knowledgeable of the water resources' management and policies' issues, identified in coordination with the WASH cluster, as well as community leaders and municipal actors involved in the management of public water distribution points. Data collection under this component will be carried out by REACH staff between March and April 2022; the interviews with community leaders and municipal actors will take place in Derna, Sebha and Sirt. The KIIs will be conducted by the field staff using a semi-structured interview tool. REACH will use its liaison officers to ensure communication with relevant municipal authorities. 6 KIIs will be done at national level with national level experts and representatives of public institutions and respondents will be identified in coordination with the WASH sector and REACH field staff. 18 KIIs will be conducted with city-level municipal authorities, including municipal council members, and municipal government administrators as well as with community leaders. Semi-structured qualitative KIIs will be recorded using pen and paper (if in person) and subsequently transcribed in the respective interview guideline in Word that is formatted according to a template that enables auto coding in NVivo, to facilitate the qualitative data analysis.

3.2 Population of interest

3.2.1 Geographical area assessed

The geographical area of interest for the assessment varies across the different components. On one hand, all secondary data analysis based on the review of key scientific papers as well as GIS and remote sensing research methods (components 1 and 2 above) will adopt a nationwide scale. This analysis will give an overview of the general water situation in Libya and will particularly provide key information on water availability in Libya through the review of climatic factors as well as human factors such as attacks on water infrastructures.

On the other hand, primary data collection will only take place in three baladiyas, Sebha, Derna, Sirt (administrative level 2), which have been determined through the analysis of the MSNA 2021[10] findings and in consultation with the WASH sector.

This preliminary selection aims at identifying the municipalities that are the most exposed to water scarcity issues and that had less access to WASH assistance services in 2021. The data related to access to WASH assistance has been provided by the WASH sector.

MSNA indicators used to identify the municipalities the most affected by water accessibility issues are:

- % of household with access to sufficient water for drinking uses.
- % of household relying on public network as the main source of water.
- Consistency of access to water from the public network by the household within the last 7 days.

The selection of the assessed municipalities relies on these criteria:

- Population mostly relying on public network and reporting having rarely or never access to the public network water supply system within the last 7 days.
- Population reporting not having sufficient water for drinking uses.

3.2.2 Population assessed

In terms of the population of interest, the assessment will cover:

- Libyan households in municipalities that have been identified as most affected by water accessibility issues based on MSNA 2021 and that have less access to WASH assistance services. I
- Key stakeholders responsible for the development, management and monitoring of water resources and policies (at a local and national level):
  - General Company for Water and Wastewater (GCWW)
  - General Desalination Company (GDC)
  - Man-made River Project Execution and Management Authority (MMRA)
  - Municipal staff.
- Community leaders knowledgeable of the water supply system in the assessed baladiyas (Sebha, Derna and Sirt)

3.2.3 Unit of measurement

Secondary data:

Climatic factors that have an impact on water availability:

- Precipitation and temperature trends from 1990 to 2020[11].
- Groundwater evolution from 2011 and 2021 according to the available data from GRACE technology[12].

Mapping of water infrastructures:

- Functional infrastructures
- Damaged infrastructures
- Infrastructures under restoration

[10] Multi-Sector Needs Assessment: Libyan Population, REACH Resource Centre, May 2021

[11] "The Normals are 30-year averages of key climate observations made at weather stations and corrected for bad or missing values and station changes over time. From the daily weather report to seasonal forecasts, the Normals are the basis for judging how temperature, rainfall, and other climate conditions compare to what's normal for a given location in today's climate", climate.gov

[12] GRACE technology, NASA official website

Primary data:

- Household surveys: households.
- KIIs: technical area (availability of water sources, water management issues, water supply system, climate change effects on water stress, impacts of security incidents on water and electricity infrastructures) and geographical area of expertise at Baladiya level (Sebha, Derna and Sirt).

Methodology

PHASE 1: Secondary data analysis

Purpose and content:
Secondary data analysis will first analyse **the climatic factors that have an impact on water availability,** such as precipitation trends and temperature changes. Data from different sources (CHIRPS, ERA5, etc.) will be analysed (using Google Earth Engine, R, QGIS) to detect patterns or changes that can impact water availability. Regarding precipitation, beyond annual values evolution, attention will be paid to changes in the monthly distribution. The relationship between water and temperature will be also looked at through indicators such as relative humidity or potential evaporation.

Information on potential changes in surface water, though possibly not very meaningful in Libya, is available in datasets such as the Global Surface Water Explorer. This will be accompanied by a review of academic publications.

Secondary data analysis will also serve to produce **a mapping of water infrastructure** (such as desalination plants in coastal areas as well as the MMR reservoirs, pipes) and an analysis of their current state. Information on water infrastructure will be collected through OpenStreetMap data and the review of secondary data from public institutions.

Finally, the review of Armed Conflict Location & Event Data Project (ACLED)[13] data will help identify attacks on water infrastructure and will be used for the mapping to provide accurate information on infrastructure functionality. ACLED is a disaggregated data collection, analysis, and crisis mapping project. It collects real-time data on the locations, dates, actors, fatalities, and types of all reported political violence and protest events around the world. ACLED data will be used to identify attacks on water infrastructure (and potentially on electricity infrastructures as it may also affect water supply) since the outbreak of the conflicts in Libya in 2011. The analysis of ACLED data will also help identify the locations mostly affected by these attacks as well as the type of attacks. The collected information can then feed into the water infrastructures mapping to provide information on their current state.

Key secondary data sources used for this assessment will encompass:

- Scientific papers:
  - El-Tantawi, Attia Mahmoud Mohammed. 2005. Climate Change in Libya and desertification of Jifara Plain: Using Geographical Information System and Remote Sensing Techniques. PhD Dissertation. University of Mainz, http://www.secheresse.info/spip.php?article2695
- Remote Sensing and GIS resources:
  - GRACE, ERA5, ERA5L, MODIS, CHIRPS datasets in Google Earth Engine.
- News reports:

[13] ACLED official website

  - World Bank (2014) Turn Down the Heat: Confronting the New Climate Normal. Washington, DC: World Bank. Licence: CC BY-NC-ND 3.0 IGO. http://documents.worldbank.org/curated/en/317301468242098870/Main-report
- ACLED data:
  - https://acleddata.com/
- Review of the findings of the 2021 Libyan MSNA on insufficient access to water and diversity of water sources.
- Reports published by public institutions and main actors of water management (The General Water Authority, ministries, General Company for Water and Wastewater (GCWW), General Desalination Company (GDC), Man-made River Project Execution and Management Authority (MMRA).

The results stemming from the secondary data analysis will complement and triangulate primary data and findings. Analysis of secondary data will take place between January and March 2022.

PHASE 2: Households surveys

Purpose, content and data collection process:

This phase will collect household information about i) water sources (including quality and quantity considerations) and water usage; ; ii) the challenges faced by households to access sufficient and adequate water resources; iii) the actions undertaken by households to cope with the potential difficulties to meet their basic needs requiring usage of water; iv) the impact of water stress on livelihoods; and v) households' experience with public water management and services (water expenditure, maintenance issues, public institutions' role in maintaining and upgrading the public water supply system).

Data collection will be carried out during the month of March 2022 and will be done in-person through REACH partner CSOs. Data will be collected by means of a structured survey, drawing upon the tool used for a similar data collection exercise by REACH Iraq mission[14] and reviewed and adapted to the Libyan context in collaboration with the Libya WASH sector. The questions will be displayed through the Kobo toolbox platform, a free, open-source tool for mobile data collection which uses XLSForm. Surveys will be uploaded to REACH servers daily. It should be noted that due to the unreliable internet connection in certain parts of Libya, this daily uploading is expected to be time-consuming and may occasionally lead to delays in the REACH team's receipt of new data. The interviewer will read the questions from KoBo to the respondent and enter the respondent's answers directly into the smartphone KoBo application.

Data collection / Debriefing of enumerators**:**
Before data collection starts, enumerators will receive comprehensive training facilitated by REACH and conducted by the data collection organization's focal point. The focal points will have received training directly from REACH. The overall training process will consist of the following steps:

a. At least one focal point per organization will attend an in-person training conducted by REACH field staff. The training will encompass the following modules:
   i. Scope, content, and methodology of the assessment.
   ii. Ethics of data collection: The guiding principles of 'do no harm', confidentiality, and respect will be presented during the training. Cultural and gender considerations, and how to deal with these dynamics during interviews, will also be discussed. Focal points will be trained on how to obtain the informed consent of all respondents prior to conducting the interview. Enumerators will be

[14] REACH resource center, REACH Iraq mission

reminded to respect both the voluntariness and gratuitousness of participants, as well as the respondent's anonymity.

iii. Techniques of data collection: Household surveys.

iv. Content of the different tools: all focal points and enumerators will be provided with explanations on the reasons and intentions for the inclusion of certain questions, nuances of vocabulary and wording, and referral pathways.

b. Focal points will then relay the training received to their enumerators in live sessions. Training materials will be provided to aid the training. Whenever possible, REACH staff will attend these trainings to ensure all topics are covered.

Sampling

Household surveys will be conducted in three different municipalities, expected one from each region (East, West, South). Municipalities will be selected through the analysis of 2021 Libyan MNSA data but also in a collaborative way with the WASH sector partners to identify locations of particular interest for the sector in terms of WASH assistance. The selection of municipalities will be done following these criteria (MSNA indicators):

- Consistency of access to water from the public network.
- Capacity of households to have access to sufficient drinking water.
- Households relying on unimproved sources[15] of water.

The sample sizes per baladiyas are calculated using simple random sample calculations, with 95% confidence interval and 10% margin of error. A 5% buffer has been added to ensure that level of representation is reached. The sampling frame is based on population data from the 2020 UNFPA population projections (| United Nations Population Fund (unfpa.org). Sample sizes are determined at baladiya-level and distributed proportionally among muhallas (administrative level 4) based on the population distribution in the 2017 UNFPA population dataset. This dataset is used as it is the latest dataset that contains muhalla-level population size data. The 2020 UNFPA dataset contains data at baladiya-level only. Findings will be considered representative at baladiya level.

The sampling per muhallas is as follows:

Sebha	Number of surveys	Sirt	Number of surveys	Derna	Number of surveys
Al Minshiyah	11	Al Jazeera	30	El Bilad	20
El Jadida	11	Alkarzabiya	7	Abu Mansour	11
El Kahira	10	El Gharbiyat	8	Alajabilh	21
Gardah	17	El Manara	16	Maghar	20
Mahdia	10	El Zaafaran	14	Essahel Asharqi	30
Sakra	7	Nasser	15		
Thanawiya	11	Tilal	9		
Hajara	13				
Abdelkafi	10				

[15] "Improved drinking-water sources are defined as those that are likely to be protected from outside contamination, and from faecal matter in particular. Improved water sources include household connections, public standpipes, boreholes, protected dug wells, protected springs and rainwater collection. Unimproved water sources include unprotected wells, unprotected springs, surface water (e.g. river, dam or lake), vendor-provided water, bottled water (unless water for other uses is available from an improved source) and tanker truck-provided water." World Health Organization.

Analysis

Findings of the household surveys will mainly respond to the following research questions:

- Have there been any attacks on water infrastructure that households are aware of and what have been the consequences on the population's access to water resources?
- How do households in diverse areas access water? What are the most reported problems to accessing water?
- What are the vulnerabilities and priority needs of different population groups (Libyans and non-Libyans) living in the assessed location(s) with regards to access to water?
- What are the regions most affected by the lack of water resources and what are the main factors that affect people's ability to meet their basic needs?
- How does water scarcity impact households, with regards to accessing safe drinking water, sanitation and hygiene?
- How do households cope with lack of water?

Data from the **household surveys** will be collected via the KoBo Toolbox platform, using the ODK Android application. Survey data will be uploaded from the field and stored on the KoBo server. Data checking and cleaning will take place daily during the period of data collection, and will include the identification of outliers, correct categorization of "other" responses, and the removal and / or replacement of incomplete or inaccurate records. Hence, the data cleaning checks will be done in alignment with the IMPACT Data Cleaning Minimum Standards Checklist. Data cleaning and checking will also entail the deletion of surveys which contain discrepancies that cannot be corrected. All changes to the dataset will be documented in a data cleaning long maintained in excel and published alongside the final clean dataset. Data checking will be systematized through a script produced in R. The Assessment Officer will identify any issues in ongoing data collection whilst checking and cleaning data, reach out to the designated contacts for enumerator teams and work through them to try and resolve any contradictory or problematic data points.

The quantitative component will be conducted using KOBO. To harmonize the separate methods and analysis components, analysis workshops will be organized between the Assessment Officer and the GIS officer to cross check and consolidate findings and identify potential information gaps that need to be addressed in discussions with field staff and enumerators. Analysis will be carried out by the Assessment Officer, following thorough data cleaning and translation by the Project Officer. Results will be calculated in percentages and stratified by baladiya. The qualitative component will be used to contextualize the quantitative findings and to identify or substantiate discrepancies across the different assessed areas.

PHASE 3: Key informant interviews

Purpose and content:

During this phase, KIIs with national stakeholders responsible for the management of water sources and infrastructures, WASH experts, municipal actors and community leaders will be conducted to provide in depth contextual and technical information to complement the data collected via the secondary data analysis carried out by the GIS team but also explore the existing gaps in terms of water resources management and provide accurate findings that could trigger the reflection on potential alternatives to cope with water stress issues in coordination with the WASH sector members.

More specifically, KIIs will focus on the following dimensions:

Water sources and their sustainability: Data collected through KIIs will allow an analysis of the water situation at a national level through interviews with WASH experts (representatives of national stakeholders of responsible for the development, management and monitoring of water resources, WASH national or international specialists knowledgeable of the water situation and issues in Libya, researchers). In a second step, KIIs will be administered in three different municipalities with municipal actors from the Eastern, Western and Southern region selected

through the analysis of WASH indicators of the 2021 MSNA data. These interviews will provide an analysis of the local dynamics in terms of access to water and will be complementary to the household surveys. KIIs (both at national and local level) will then provide information about i) the access to different water sources and their use by the population but also about ii) factors that determine the use of certain water source over another and iii) the sustainability of each main source by analysing its inherent issues.

Water infrastructure and impact of conflicts on their functionality: KIIs, whether conducted at the national or local level, will provide an analysis of the management and sustainability of water infrastructure in Libya. KIIs will also examine the impact of 10 years of endemic conflicts and social instability as well as the instrumentalization of water as a weapon of war on water infrastructure and the capacity to provide sufficient and quality water to the population. In addition to political factors, socio-economic factors that could lead to difficulties in protecting and maintaining water infrastructure will be taken into consideration.

The first round of the Key informant interviews with WASH experts and representatives from national institutions responsible for the development, monitoring and management of water resources will also question water related issues at national scale to be able to identify the major challenges faced by the Libyan population to meet their water needs and analyse the sustainability of the different water sources.

A second phase of the key informant interviews will be done at municipal level and will target municipal actors and community / religious leaders. These interviews will provide an in depth understanding of the management of water resources at a local level and will also help understand the issues faced by the population to access sufficient and quality water.

A semi-structured interview guideline will be developed for the Key Informant Interviews. One tool will be developed for each profile:

- A tool for representatives of national water management institutions and WASH experts.
- A tool for municipal actors and community actors.

Data collection will be done in person through REACH field staff and will be carried out in March and April 2022. REACH field staff will be briefed on the scope, objectives of the assessment, the tool, and the expected timeline for data collection through a training done by the REACH assessment officer. REACH Assessment Officer in Tunis will be responsible for general data collection monitoring, supervision and data processing.

Sampling:

The sampling of the key informants will be done purposively. REACH will be closely coordinating with the WASH sector partners to identify representatives from public institutions responsible for the management of water resources in Libya and WASH experts knowledgeable of the water scarcity problematics in the country. REACH field staff will contribute and will also liaise with REACH local partners to interview municipal actors involved in the local management of the water supply system and community leaders able to provide valuable information on the availability and quality of water.

KIIs at national level:

KI profiles	Number of interviews
National institutions representatives (General Water Authority, Authorities of Implementation and Management of Water Utilization of the MMRP, General Company of Water Desalination, General Water Supply and Sewerage Company, General Environment Authority)	3
WASH specialists	3

KIIs at municipal level:

KIs profiles	Derna	Sirt	Sebha
Municipal actors (responsible for water distribution points)	3	3	3
Community / religious leaders	3	3	3

Analysis:

Findings of the KIIs will mainly respond to these following research questions:

- What is the sustainability of each water source in Libya?
- What are the problems associated with a potential reliance on groundwater?
- What alternative solutions to groundwater have been developed and what are the limits?
- What has been the impact of conflict on infrastructure and has conflict directly affected people's ability to access water?
- What are the regions most affected by the lack of water resources and what are the main factors that affect people's ability to meet their basic needs?
- How does water scarcity impact communities, with regards to accessing safe drinking water, sanitation and hygiene?

Qualitative data from the **KIIs** will be collected by REACH field staff using Word documents. REACH field staff will be responsible for sending finalised transcripts to the Assessment Officer, who will ensure that all qualitative data is translated into English and that the data is reviewed for quality as it comes in, so that timely feedback can be provided to the field teams if needed. Review of qualitative data will be done in alignment with the IMPACT Minimum Standard Checklist for Semi-Structured (Qualitative) Data Processing and Analysis. To contextualize qualitative data collection and verify submitted data, enumerators will be asked to fill in and submit a debriefing form after conducting qualitative interviews (KIIs). The enumerator debriefing will also facilitate follow-ups during data cleaning.

To ensure relevance of data and facilitate timely follow-ups if necessary, REACH field staff will submit collected data within three days after data collection (if the internet connection allows it).

The Assessment Officer will be responsible for analysing the qualitative data. As a first layer of analysis, the Assessment Officer will use the data saturation and analysis grid to record all discussion topics and points on an ongoing basis. Once data collection has been completed, key findings will be developed based on the identified topics and points. A second layer of qualitative analysis will be done through NVivo. NVivo allows for thematic coding within and across transcripts to identify key trends across population groups and locations (a code being a word or phrase that summarises or captures the essence of a portion of data). For this analysis, the data saturation and analysis grid will be used to form the initial codebook, facilitating further analysis as needed. The Nvivo analysis will result in the construction of a data saturation grid exported to Excel, which identifies the type and frequency of themes arising in qualitative interviews and monitors the level of saturation for each theme.

4. Key ethical considerations and related risks

The proposed research design meets / does not meet the following criteria:

The proposed research design…	*Yes/ No*	*Details if no (including mitigation)*
… Has been coordinated with relevant stakeholders to **avoid unnecessary duplication** of data collection efforts?	Yes	

… **Respects respondents, their rights and dignity** (*specifically by: seeking informed consent, designing length of survey/ discussion while being considerate of participants' time, ensuring accurate reporting of information provided*)?	Yes	
… Does not **expose data collectors to any risks as a direct result** of participation in data collection?	Yes	
… Does not **expose respondents / their communities to any risks as a direct result** of participation in data collection?	Yes	
… Does not involve **collecting information on specific topics which may be stressful and/ or re-traumatising** for research participants (both respondents and data collectors)?	Yes	
… Does not involve **data collection with minors** i.e. anyone less than 18 years old?	Yes	
… Does not involve **data collection with other vulnerable groups** e.g. persons with disabilities, victims/ survivors of protection incidents, etc.?	Yes	
… Follows IMPACT SOPs for management of **personally identifiable information**?	Yes	

5. Roles and responsibilities

Table 3: Description of roles and responsibilities

Task Description	*Responsible*	*Accountable*	*Consulted*	*Informed*
Research design	Assessment officer, GIS officer	Assessment Manager	Cluster Coordinator, HQ Research design and data unit (RDDU)	Country coordinator
Supervising data collection	Assessment officer	Assessment Manager	GIS officer	Cluster Coordinator
Data processing (checking, cleaning)	Assessment officer	Assessment Manager	GIS officer, RDDU	Cluster Coordinator
Data analysis	Assessment officer, GIS officer	Assessment Manager	Cluster coordinator, RDDU	
Output production	Assessment officer, GIS officer	Assessment Manager	HQ reporting unit	Cluster Coordinator
Dissemination	Assessment officer	Assessment Manager	GIS officer, HQ Research department, HQ	Cluster Coordinator

			Communication department	
Monitoring & Evaluation	Assessment officer	Assessment Manager	GIS officer, HQ Research department	Cluster Coordinator
Lessons learned	Assessment officer	Assessment Manager	GIS officer, HQ Research department	Cluster Coordinator

6. Monitoring & Evaluation Plan

IMPACT Objective	External M&E Indicator	Internal M&E Indicator	Focal point	Tool	Will indicator be tracked?
Humanitarian stakeholders are accessing IMPACT products	Number of humanitarian organisations accessing IMPACT services/products Number of individuals accessing IMPACT services/products	# of downloads of x product from Resource Center	Country request to HQ	User_log	X Yes
		# of downloads of x product from Relief Web	Country request to HQ		X Yes
		# of downloads of x product from Country level platforms	Country team		X Yes
		# of page clicks on x product from REACH global newsletter	Country request to HQ		X Yes
		# of page clicks on x product from country newsletter, sendingBlue, bit.ly	Country team		X Yes
		# of visits to x webmap/x dashboard	Country request to HQ		
IMPACT activities contribute to better program implementation and coordination of the humanitarian response	Number of humanitarian organisations utilizing IMPACT services/products	# references in HPC documents (HNO, SRP, Flash appeals, Cluster/sector strategies)	Country team	Reference_log	Libya WASH sector strategy
		# references in single agency documents			
Humanitarian stakeholders are using IMPACT products	Humanitarian actors use IMPACT evidence/products as a basis for decision making, aid planning and delivery Number of humanitarian	Perceived relevance of IMPACT country-programs	Country team	Usage_Feedback *and* Usage_Survey template	Usage survey to be conducted at the end of the research cycle related to all outputs, targeting at least 20 partners
		Perceived usefulness and influence of IMPACT outputs			
		Recommendations to strengthen IMPACT programs			
		Perceived capacity of IMPACT staff			
		Perceived quality of outputs/programs			

	documents (HNO, HRP, cluster/agency strategic plans, etc.) directly informed by IMPACT products	Recommendations to strengthen IMPACT programs			
Humanitarian stakeholders are engaged in IMPACT programs throughout the research cycle	Number and/or percentage of humanitarian organizations directly contributing to IMPACT programs *(providing resources, participating to presentations, etc.)*	# of organisations providing resources (i.e.staff, vehicles, meeting space, budget, etc.) for activity implementation	Country team	Engagement _log	X Yes
		# of organisations/clusters inputting in research design and joint analysis			X Yes
		# of organisations/clusters attending briefings on findings;			X Yes

Annex 1: Data analysis plan (quantitative tool)

Research questions	#	Data collection method	Indicator Group/ Sector	Indicator/ Variable	Questionnaire question	Instructions	Questionnaire responses	Data collection level	Sampling	Disaggregation variable(s)
Filled by enumerator	1.1	Household interview	Meta data	Enumerator's organization	Please select your organization	select one	Athar Lifemakers LibAid	Household	Probabilist	Baladiya
	1.2	Household interview	Meta data	Enumerator contact	Please record your enumerator number	integer	integer	Household	Probabilist	Baladiya
	1.3	Household interview	Biodata	Assessed municipality	What is the name of the Baladiya where the interview takes place?	select one	Sirt Ghat Derna	Household	Probabilist	Baladiya
	1.4	Household interview	Biodata	Assessed Muhalla	What is the name of the muhalla where the interview takes place?	select one	Eljebilah Almaghar Abu Mansour Al Sahil Al Bilad Al Awinat Ghat Al barkat Al Jazeera Alkarzabiya El gharbiyat El Manara El zaafaran Nasser Tilal	Household	Probabilist	Baladiya
Informed consent	2	Household interview	Metadata	Consent	Hello, my name is __. I am working with REACH on a survey that is being facilitated by ACTED, an international organization based in Libya. We are conducting a survey on households' access to water resources in Libya. This interview takes approximately 30 minutes. Your answers will remain anonymous and no personally identifiable information about you will be shared. Your participation is voluntary and you are free to withdraw at any moment during the survey. Are you willing to participate?	select one	Yes No (End of survey)	Household	Probabilist	Baladiya
	3.1	Household interview	Biodata	HoHH	Are you the head of household?	select one	Yes No	Household	Probabilist	Baladiya
	3.2	Household interview	Meta data	Consent	Are you willing and able to respond to the questions on behalf of the household?	select one End survey if the person is not willing respond on behalf or his/her household	Yes No	Household	Probabilist	Baladiya

Household composition	3.3	Household interview	Biodata	Respondent age	What is your age?	select one End survey if the person is below 18 years old	Less than 18 years old 18 to 24 years old 25 to 34 years old 35 to 44 years old 45 to 60 years old	Household	Probabilist	Baladiya
	3.4	Household interview	Biodata	HoHH age	What is the age of the head of household?	select one	Less than 18 years old 18 to 24 years old 25 to 34 years old 35 to 44 years old 45 to 60 years old More than 60 years old	Household	Probabilist	Baladiya
	3.5	Household interview	Biodata - displacement	Displacement status	Please describe how you came to reside in this muhallah.	select one	I have lived in this muhallah all my life (resident; no displacement) I am originally from another area, but had to relocate due to conflict (IDP) I am originally from this muhallha, but I previoulsy had to relocate due to conflict and recently moved back (returnee) I am originally from another area in Libya, but relocated to this area due to conflict or other stress factors like natural disasters (IDP) I am originally from another area in Libya, but relocated to this area by choice other prefer not to answer	Household	Probabilist	Baladiya
	3.6	Household interview	Biodata - displacement	Displacement status	If other, please specify:	text	text	Household	Probabilist	Baladiya
	3.7	Household interview	Biodata	HoHH gender	What is the gender of the head of household?	Select one	Male Female	Household	Probabilist	Baladiya
	3.8	Household interview	Biodata - household members	# of household members'	How many members are there in your household (including you)?	Integer .> 0 and .<50	Integer	Household	Probabilist	Baladiya
	3.9	Household interview	Biodata - household members	% of households hosting people in their dwelling	Are there people being hosted permanently in this house?	select one	Yes No	Household	Probabilist	Baladiya
	3.10	Household interview	Biodata - household members	# of people hosted in the dwelling	How many people are being hosted	Integer .> 0 and .<50	integer	Household	Probabilist	Baladiya
	3.11	Household interview	Biodata - household members	% of households hosted in the dwelling	Is your household being hosted in this dwelling?	select one	Yes No	Household	Probabilist	Baladiya
	3.12	Household interview	Biodata - household members	Status of household's occupancy	What is the status of your household's occupancy of this dwelling?	Select one	Owned/purchased Rented Granted by organisations/authorities with permission Granted by relatives/family with permission Granted by others with permission Squatted without permission Other (specify)	Household	Probabilist	Baladiya
	3.13	Household interview	Biodata - household members	Status of household's occupancy	If other, please specify	Text	Text	Household	Probabilist	Baladiya

Socio-economic background of the household	4.1	Household interview	Biodata - household income	households income over the last 30 days	Can you estimate your household's total income (in LYD) over the last 30 days?	Do not read list Select one	less than 350 LYD between 350 and 550 between 550 and 750 between 750 and 950 between 950 and 1150 between 1150 and 1350 between 1350 and 1550 between 1550 and 1750 between 1750 and 1950 between 1950 and 2150 between 2150 and 2350 More than 2350	Household	Probabilist	Baladiya
	4.2	Household interview	Biodata - household income	households expenditures over the last 30 days	In the last 30 days, could you estimate how much your household spent for in total in LYD?	Integer	Integer	Household	Probabilist	Baladiya
	4.3	Household interview	Biodata - household income	Most common main source of income, by source %	What is your household's main source of income?	select one	Members of the HH are working Savings Humanitarian assistance Government subsidies - social solidarity fund No income source Prefer not to answer	Household	Probabilist	Baladiya
	4.4	Household interview	Biodata - household income	Most common main source of income, by source %	If other, please specify	text	text	Household	Probabilist	Baladiya
	5.1	Household interview	Water usage - water sources of HH	Most common main source of water for drinking, by source %	What is the main source of water used by your household for drinking?	Select multiple	Public network (accessible to the shelter) Tap accessible to the public Borehole Protected well (e.g in your house or in the mosque) unprotected well Bottled water Water trucking Spring Rainwater tank Surface water (river, stream, dam, lake, pond, canal, irrigation channel) Other (specify) Don't know	Household	Probabilist	Baladiya
	5.2	Household interview	Water usage - water sources of HH	Most common main source of water for drinking, by source %	If other, please specify	text	text	Household	Probabilist	Baladiya

5.3	Household interview	Water usage - water sources of HH	reasons why households rely on bottled water as the main source of water	If the main water source is bottled water, why don't you use other sources?	select one	The other sources are not available The quality of water from other sources is bad The other sources are not easily accessible The other sources are more expensive other (specify) Prefer not to anwer	Household	Probabilist	Baladiya
5.4	Household interview	Water usage - water sources of HH	reasons why households rely on bottled water as the main source of water	If other, please specify	text	text	Household	Probabilist	Baladiya
5.5	Household interview	Water usage - water quality	% of households with access to quality water for drinking purposes	Is the quality of the water usually acceptable for drinking?	Select multiple	Yes, acceptable No, unacceptable taste No, unacceptable colour No, unacceptable smell No, contains materials No, other (specify) Don't know	Household	Probabilist	Baladiya
5.6	Household interview	Water usage - water sources of HH	reasons why households rely on bottled water as the	If other, please specify	text	text	Household	Probabilist	Baladiya
5.7	Household interview	Water usage - water quality	% of households that treat the water to make it safer to drink	Does your household treat this water in any way to make it safer to drink?	select multiple	Yes, always treat it before use Yes, sometimes treat it before use No, never treat it before use Don't know	Household	Probabilist	Baladiya
5.8	Household interview	Water usage - water quality	Most common ways to treat the water to make it safer to drink	What does your household usually do to the water to make it safer to drink?	Do not read list Select multiple	Boil it Let it stand and settle Expose it to sunlight Use chlorine or other disinfection products (aquatabs/water purification tablets, PuR or watermaker sachets) Filter it Other (specify) Don't know	Household	Probabilist	Baladiya
5.9	Household interview	Water usage - water quality	Most common ways to treat the water to make it safer	If other, please describe	text	text	Household	Probabilist	Baladiya
5.10	Household interview	Water usage - water sources of HH	Most common water sources used for cooking and preparing food - by source %	What is the main source of water used by your household for cooking and preparing food?	select one	Public network (accessible to the shelter) Tap accessible to the public Borehole Protected well (e.g in your house or in the mosque) unprotected well Bottled water Water trucking Spring Rainwater tank Surface water (river, stream, dam, lake, pond, canal, irrigation channel) Other (specify) Don't know	Household	Probabilist	Baladiya
5.11	Household interview	Water usage - water sources of HH	Most common water sources used for cooking and preparing food - by	If other, please specify	text	text	Household	Probabilist	Baladiya

	5.12	Household interview	Water usage - water quality	% of households with access to quality water for cooking and preparing food	Is the quality of the water usually acceptable for cooking and preparing food?	select multiple	Yes, acceptable No, unacceptable taste No, unacceptable colour No, unacceptable smell No, contains materials No, other (specify) Don't know	Household	Probabilist	Baladiya
	5.13	Household interview	Water usage - water quality	% households that treat water to make it safer to cook and prepare food with?	Does your household treat this water in any way to make it safer to cook and prepare food with?	select one	Yes, always treat it before use Yes, sometimes treat it before use No, never treat it before use Don't know	Household	Probabilist	Baladiya
	5.14	Household interview	Water usage - water quality	Most common way to treat the water to make it safer to cook and prepare food with	What does your household usually do to the water to make it safer to cook and prepare food with?	Select multiple	Boil it Let it stand and settle Expose it to sunlight Use chlorine or other disinfection products (aquatabs/water purification tablets, PuR or watermaker sachets) Filter it Other (specify) Don't know	Household	Probabilist	Baladiya
	5.15	Household interview	Water usage - water quality	Most common way to treat the water to make it safer to cook and prepare food	If other, please describe	text	text	Household	Probabilist	Baladiya
	5.16	Household interview	Water usage - water sources of HH	Most common source of water for personal and bathing, by source %	What is the main source of water used by your household for personal hygiene and bathing?	select one	Public network (accessible to the shelter) Tap accessible to the public Borehole Protected well (e.g in your house or in the mosque) unprotected well Bottled water Water trucking Spring Rainwater tank Surface water (river, stream, dam, lake, pond, canal, irrigation channel) Other (specify)	Household	Probabilist	Baladiya
	5.17	Household interview	Water usage - water sources of HH	Most common source of water for personal and bathing, by source %	If other, please specify	text	text	Household	Probabilist	Baladiya
	5.18	Household interview	Water usage - water quality	% of households with access to quality water for personal hygiene and bathing	Is the quality of the water usually acceptable for personal hygiene and bathing?	Select multiple	Yes, acceptable No, unacceptable taste No, unacceptable colour No, unacceptable smell No, contains materials No, other (specify) Don't know	Household	Probabilist	Baladiya
	5.19	Household interview	Water usage - water sources of HH	reasons why households rely on bottled water as the	If other, please specify	text	text	Household	Probabilist	Baladiya
What are the main sources of water in Libya? What is the quality of the different water sources? How is the quality of water being monitored and how	5.20	Household interview	Water usage - water quality	% of households that treat the water to make it safer to drink	Does your household treat this water in any way to make it safer for personal hygiene and bathing?	select multiple	Yes, always treat it before use Yes, sometimes treat it before use No, never treat it before use Don't know	Household	Probabilist	Baladiya

water is being treated by households?	5.21	Household interview	Water usage - water quality	Most common ways to treat the water to make it safer to drink	What does your household usually do to the water to make it safer for personal hygiene and bathing?	Do not read list Select multiple	Boil it Let it stand and settle Expose it to sunlight Use chlorine or other disinfection products (aquatabs/water purification tablets, PuR or watermaker sachets) Filter it Other (specify) Don't know	Household	Probabilist	Baladiya
	5.22	Household interview	Water usage - water quality	Most common ways to treat the water to make it safer	If other, please describe	text	text	Household	Probabilist	Baladiya
	5.23	Household interview	Water usage - water sources of HH	Most common source of water for washing clothes, by source %	What is the main source of water used by your household for washing clothes?	select one	Public network (accessible to the shelter) Tap accessible to the public Borehole Protected well (e.g in your house or in the mosque) unprotected well Bottled water Water trucking Spring Rainwater tank Surface water (river, stream, dam, lake, pond, canal, irrigation channel) Other (specify)	Household	Probabilist	Baladiya
	5.24	Household interview	Water usage - water sources of HH	Most common source of water for washing clothes, by source %	If other, please specify	text	text	Household	Probabilist	Baladiya
	5.25	Household interview	Water usage - water quality	% of households with access to quality water for washing clothes	Is the quality of the water usually acceptable for washing clothes?	Select multiple	Yes, acceptable No, unacceptable taste No, unacceptable colour No, unacceptable smell No, contains materials No, other (specify) Don't know	Household	Probabilist	Baladiya
	5.26	Household interview	Water usage - water sources of HH	reasons why households rely on bottled water as the	If other, please specify	text	text	Household	Probabilist	Baladiya
	5.27	Household interview	Water usage - water quality	% of households that treat the water to make it safer to drink	Does your household treat this water in any way to make it safer to wash clothes?	select multiple	Yes, always treat it before use Yes, sometimes treat it before use No, never treat it before use Don't know	Household	Probabilist	Baladiya
	5.28	Household interview	Water usage - water quality	Most common ways to treat the water to make it safer to drink	What does your household usually do to the water to make it safer for washing clothes?	Do not read list Select multiple	Boil it Let it stand and settle Expose it to sunlight Use chlorine or other disinfection products (aquatabs/water purification tablets, PuR or watermaker sachets) Filter it Other (specify) Don't know	Household	Probabilist	Baladiya
	5.29	Household interview	Water usage - water quality	Most common ways to treat the water to make it safer	If other, please describe	text	text	Household	Probabilist	Baladiya

5.30	Household interview	Water usage - water sources of HH	Most common source of water for cleaning the house, by source %	What is the main source of water used by your household for cleaning the house?	select one	Public network (accessible to the shelter) Tap accessible to the public Borehole Protected well (e.g in your house or in the mosque) unprotected well Bottled water Water trucking Spring Rainwater tank Surface water (river, stream, dam, lake, pond, canal, irrigation channel)	Household	Probabilist	Baladiya
5.31	Household interview	Water usage - water sources of HH	Most common source of water for cleaning the house, by source %	If other, please specify	text	text	Household	Probabilist	Baladiya
5.32	Household interview	Water usage - water quality	% of households with access to quality water for cleaning the house	Is the quality of the water usually acceptable for cleaning the house?	Select multiple	Yes, acceptable No, unacceptable taste No, unacceptable colour No, unacceptable smell No, contains materials No, other (specify) Don't know	Household	Probabilist	Baladiya
5.33	Household interview	Water usage - water sources of HH	reasons why households rely on bottled water as the	If other, please specify	text	text	Household	Probabilist	Baladiya
5.34	Household interview	Water usage - water quality	% of households that treat the water to make it safer to drink	Does your household treat this water in any way to make it safer for cleaning the house?	select multiple	Yes, always treat it before use Yes, sometimes treat it before use No, never treat it before use Don't know	Household	Probabilist	Baladiya
5.35	Household interview	Water usage - water quality	Most common ways to treat the water to make it safer to drink	What does your household usually do to the water to make it safer to clean the house?	Do not read list Select multiple	Boil it Let it stand and settle Expose it to sunlight Use chlorine or other disinfection products (aquatabs/water purification tablets, PuR or watermaker sachets) Filter it Other (specify) Don't know	Household	Probabilist	Baladiya
5.36	Household interview	Water usage - water quality	Most common ways to treat the water to make it safer	If other, please describe	text	text	Household	Probabilist	Baladiya
5.37	Household interview	Water usage - water sources of HH	% of households engaging in gardening or crop cultivation	Does your household engage in any gardening or crop cultivation?	select one	Yes No	Household	Probabilist	Baladiya

	5.38	Household interview	Water usage - water sources of HH	Most common source of water for gardening or crop cultivation, by source %	What is the main source of water used by your household for gardening and/or growing crops?	select one	Public network (accessible to the shelter) Tap accessible to the public Borehole Protected well (e.g in your house or in the mosque) unprotected well Bottled water Water trucking Spring Rainwater tank Surface water (river, stream, dam, lake, pond, canal, irrigation channel) Other (specify) Don't know	Household	Probabilist	Baladiya
	5.39	Household interview	Water usage - water sources of HH	Most common source of water for gardening or crop cultivation, by source %	If other, please specify	text	text	Household	Probabilist	Baladiya
	6.1	Household interview	Water usage - water availability	Consistency of access to water from the public network, per day	For how many days per week is water from the public network (connected to the shelter) generally available?	select one	Every day (7 days) Most days (4-6 days) Rarely (1-3 days) Not at all (0 days) Don't know Prefer not to answer	Household	Probabilist	Baladiya
	6.2	Household interview	Water usage - water availability	Consistency of access to water from the tap accessible to the public, per day	For how many days per week is water from the tap accessible to the public generally available?	select one	Every day (7 days) Most days (4-6 days) Rarely (1-3 days) Not at all (0 days) Don't know Prefer not to answer	Household	Probabilist	Baladiya
	6.3	Household interview	Water usage - water availability	Consistency of access to water from the borehole, per day	For how many days per week is water from the borehole generally available?	select one	Every day (7 days) Most days (4-6 days) Rarely (1-3 days) Not at all (0 days)	Household	Probabilist	Baladiya
	6.4	Household interview	Water usage - water availability	Consistency of access to water from the protected well (e.g in your house or in the mosque), per day	For how many days per week is water from the protected well (e.g in your house or in the mosque) generally available?	select one	Every day (7 days) Most days (4-6 days) Rarely (1-3 days) Not at all (0 days) Don't know Prefer not to answer	Household	Probabilist	Baladiya
	6.5	Household interview	Water usage - water availability	Consistency of access to water from the unprotected well, per day	For how many days per week is water from the unprotected well generally available?	select one	Every day (7 days) Most days (4-6 days) Rarely (1-3 days) Not at all (0 days) Don't know Prefer not to answer	Household	Probabilist	Baladiya
	6.6	Household interview	Water usage - water availability	Consistency of access to water from water trucking, per day	For how many days per week is water from water trucking generally available?	select one	Every day (7 days) Most days (4-6 days) Rarely (1-3 days) Not at all (0 days) Don't know Prefer not to answer	Household	Probabilist	Baladiya

How do communities in diverse areas access water? What are the most reported problems to accessing water?	6.7	Household interview	Water usage - water availability	Consistency of access to water from the spring, per day	For how many days per week is water from the spring generally available?	select one	Every day (7 days) Most days (4-6 days) Rarely (1-3 days) Not at all (0 days) Don't know Prefer not to answer	Household	Probabilist	Baladiya
	6.8	Household interview	Water usage - water availability	Consistency of access to water from the rainwater tank, per day	For how many days per week is water from the rainwater tank generally available?	select one	Every day (7 days) Most days (4-6 days) Rarely (1-3 days) Not at all (0 days) Don't know Prefer not to answer	Household	Probabilist	Baladiya
	6.9	Household interview	Water usage - water availability	Consistency of access to water from the surface water, per day	For how many days per week is water from	select one	Every day (7 days) Most days (4-6 days) Rarely (1-3 days) Not at all (0 days) Don't know Prefer not to answer	Household	Probabilist	Baladiya
	6.10	Household interview	Water usage - water availability	Consistency of access to water from the public network, per hour	On the days that water from the public network (connected to the shelter) is available, for how many hours per day is it generally available?	integer The number cannot be below 1 or above 24	integer	Household	Probabilist	Baladiya
	6.11	Household interview	Water usage - water availability	Consistency of access to water from the tap accessible to the public, per hour	On the days that water from the tap accessible to the public is available, for how many hours per day is it generally available?	integer The number cannot be below 1 or above 25	integer	Household	Probabilist	Baladiya
	6.12	Household interview	Water usage - water availability	Consistency of access to water from the borehole, per hour	On the days that water from the borehole is available, for how many hours per day is it generally available?	integer The number cannot be below 1 or above 26	integer	Household	Probabilist	Baladiya
	6.13	Household interview	Water usage - water availability	Consistency of access to water from the protected well (e.g in your house or in the mosque), per hour	On the days that water from the protected well (e.g in your house or in the mosque) is available, for how many hours per day is it generally available?	integer The number cannot be below 1 or above 27	integer	Household	Probabilist	Baladiya
	6.14	Household interview	Water usage - water availability	Consistency of access to water from the unprotected well, per hour	On the days that water from the unprotected well is available, for how many hours per day is it generally available?	integer The number cannot be below 1 or above 28	integer	Household	Probabilist	Baladiya
	6.15	Household interview	Water usage - water availability	Consistency of access to water from water trucking, per hour	On the days that water from water trucking is available, for how many hours per day is it generally available?	integer The number cannot be below 1 or above 29	integer	Household	Probabilist	Baladiya
	6.16	Household interview	Water usage - water availability	Consistency of access to water from the spring, per hour	On the days that water from the spring is available, for how many hours per day is it generally available?	integer The number cannot be below 1 or above 30	integer	Household	Probabilist	Baladiya
	6.17	Household interview	Water usage - water availability	Consistency of access to water from the rainwater tank, per hour	On the days that water from the rainwater tank is available, for how many hours per day is it generally available?	integer The number cannot be below 1 or above 31	integer	Household	Probabilist	Baladiya
	6.18	Household interview	Water usage - water availability	Consistency of access to water from the surface water, per hour	On the days that water from surface water sources is available, for how many hours per day is it generally available?	integer The number cannot be below 1 or above 32	integer	Household	Probabilist	Baladiya

What are the vulnerabilities and priority needs of the population living in the assessed location(s) with regards to access to water?	7.1	Household interview	Water usage - water availability	% of households with sufficient access to water resources to be able to meet their needs	Do you have enough water to meet your household needs?	select one	Yes Mostly No	Household	Probabilist	Baladiya
	7.2	Household interview	Water usage - water availability	% of basic needs not satisfied by households	What are the basic needs that are not satisfied?	select one	Drinking Hygiene and sanitation Cooking Washing clothes Other (specify)	Household	Probabilist	Baladiya
	7.3	Household interview	Water usage - water availability	% of basic needs not satisfied by households	If other, please specify	text	text	Household	Probabilist	Baladiya
	7.4	Household interview	Water usage - water availability	Reasons why the household is not able to meet its water needs	What are the main reasons your household is not able to meet its water needs?	select multiple	Water does not come enough hours of the day Amount of water is not enough for household needs The hours water does come are inconvenient (e.g. middle of the night) Water supply is inconsistent Water is too expensive Water quality is poor Water pressure is not high enough/pumps required Water sources are not functioning or closed Water is not available in the shops Not enough tank capacity to store water Waterpoints are difficult to reach (especially for people with disabilities) Some groups (children, women, elderly, ethnic minorities, etc.) do not have access to the water sources Other (please list) Don't know Prefer not to answer	Household	Probabilist	Baladiya
	7.5	Household interview	Water usage - water availability	Reasons why the household is not able to meet its water needs	If other, please specify	text	text	Household	Probabilist	Baladiya
	8.1	Household interview	Water usage - HH satisfaction	Level of satisfaction with the public network (connected to the shelter) as a water source	Overall, how satisfied are you with the public network (connected to the shelter) as a water source?	select one	Very satisfied Somewhat satisfied Neither satisfied nor dissatisfied Somewhat dissatisfied Very dissatisfied	Household	Probabilist	Baladiya
	8.2	Household interview	Water usage - HH satisfaction	Level of satisfaction with the tap accessible as a water source	Overall, how satisfied are you with the tap accessible to the public as a water source?	select one	Very satisfied Somewhat satisfied Neither satisfied nor dissatisfied Somewhat dissatisfied Very dissatisfied	Household	Probabilist	Baladiya
	8.3	Household interview	Water usage - HH satisfaction	Level of satisfaction with the borehole as a water source	Overall, how satisfied are you with the borehole as a water source?	select one	Very satisfied Somewhat satisfied Neither satisfied nor dissatisfied Somewhat dissatisfied Very dissatisfied	Household	Probabilist	Baladiya

How satisfied are households with the different water sources?	8.4	Household interview	Water usage - HH satisfaction	Level of satisfaction with the bottled water as a water source	Overall, how satisfied are you with the bottled water as a water source?	select one	Very satisfied Somewhat satisfied Neither satisfied nor dissatisfied Somewhat dissatisfied Very dissatisfied	Household	Probabilist	Baladiya
	8.5	Household interview	Water usage - HH satisfaction	Level of satisfaction with the protected well (e.g in your house or in the mosque) as a water source	Overall, how satisfied are you with the protected well (e.g in your house or in the mosque) as a water source?	select one	Very satisfied Somewhat satisfied Neither satisfied nor dissatisfied Somewhat dissatisfied Very dissatisfied	Household	Probabilist	Baladiya
	8.6	Household interview	Water usage - HH satisfaction	Level of satisfaction with the unprotected well as a water source	Overall, how satisfied are you with the unprotected well as a water source?	select one	Very satisfied Somewhat satisfied Neither satisfied nor dissatisfied Somewhat dissatisfied Very dissatisfied	Household	Probabilist	Baladiya
	8.7	Household interview	Water usage - HH satisfaction	Level of satisfaction with the water trucking as a water source	Overall, how satisfied are you with the water trucking as a water source?	select one	Very satisfied Somewhat satisfied Neither satisfied nor dissatisfied Somewhat dissatisfied Very dissatisfied	Household	Probabilist	Baladiya
	8.8	Household interview	Water usage - HH satisfaction	Level of satisfaction with the spring as a water source	Overall, how satisfied are you with the spring as a water source?	select one	Very satisfied Somewhat satisfied Neither satisfied nor dissatisfied Somewhat dissatisfied Very dissatisfied	Household	Probabilist	Baladiya
	8.9	Household interview	Water usage - HH satisfaction	Level of satisfaction with the rainwater tank as a water source	Overall, how satisfied are you with the rainwater tank as a water source?	select one	Very satisfied Somewhat satisfied Neither satisfied nor dissatisfied Somewhat dissatisfied Very dissatisfied	Household	Probabilist	Baladiya
	8.10	Household interview	Water usage - HH satisfaction	Level of satisfaction with the surface water as a water source	Overall, how satisfied are you with the surface water sources as a water source?	select one	Very satisfied Somewhat satisfied Neither satisfied nor dissatisfied Somewhat dissatisfied	Household	Probabilist	Baladiya
. How do communities in diverse areas access water? What are the most reported problems to accessing water?	9.1	Household interview	Safe access to water points	% of households facing security risks when accessing water points in the last six months	Did your household face any problems accessing water points in the last six months?	select one	Yes No Don't know Prefer not to answer	Household	Probabilist	Baladiya
	9.2	Household interview	Safe access to water points	Problems faced when accessing water points in the last six months	What problems does your household face accessing water points in the last six months?	select multiple	Some groups do not have access to waterpoints (status problem) Lack of sufficient water points Water points not functioning Waiting time at water points Distance to water points Physical access to water points Lack of water storage containers Don't like taste / quality / etc. Other (specify)	Household	Probabilist	Baladiya
	9.3	Household interview	Safe access to water points	Problems faced when accessing water points in the last six months	If other, please specify:	text	text	Household	Probabilist	Baladiya

	9.4	Household interview	Water usage - accessibility to water sources	Average distance to the main water source	Can you estimate the distance to your main water source?	select one	Very far (>1000 m) Far (501–1000 m) Moderately far (101–500 m) Not far (≤100 m)	Household	Probabilist	Baladiya
How do communities cope with lack of water?	10.1	Household interview	Water usage - water availability	Coping strategies to face lack of water in the last six months	How did you adjust for the lack of water in the last six months?	Select multiple	Reduce drinking water consumption Reduce water consumption for hygiene practices (bathe less, etc.) Fetch water from a safe water point further than the usual one Fetch drinking water from a less desirable/safe water source Other (specify)	Household	Probabilist	Baladiya
	10.2	Household interview	Water usage - water availability	Coping strategies to face lack of water in the last six months	If other, please specify:	text	text	Household	Probabilist	Baladiya
What is the quality of the different water sources?	11.1	Household interview	Water usage - water quality	% of members of the household below the age of 5 years old who had any illness in the past 30 days	Did anyone in your household below the age of 5 years have any illness in the past 30 days?	select one	Yes No Don't know Prefer not to answer	Household	Probabilist	Baladiya
	11.2	Household interview	Water usage - water quality	% of members of the household below the age of 5 years old with water related illnesses symptoms	If yes, what symptoms did they have?	select multiple	Fever Diarrhoea Cough Fast and difficulty breathing Eye infection or red eyes skin infection ear infection Other (specify) Prefer not to answer	Household	Probabilist	Baladiya
	11.3	Household interview	Water usage - water quality	% of members of the household below the age of 5 years old with water related illnesses symptoms	If other, please specify:	text	text	Household	Probabilist	Baladiya
	11.4	Household interview	Water usage - water quality	% of members of the household above the age of 5 years old who had any illness in the past 30 days	Did anyone in your household above the age of 5 years have any illness in the past 30 days?	select one	Yes No Don't know Prefer not to answer	Household	Probabilist	Baladiya
	11.5	Household interview	Water usage - water quality	% of members of the household above the age of 5 years old with water related illnesses symptoms	If yes, what symptoms did they have?	select multiple	Fever Diarrhoea Cough Fast and difficulty breathing Eye infection or red eyes skin infection ear infection Other (specify) Prefer not to answer	Household	Probabilist	Baladiya
	11.6	Household interview	Water usage - water quality	% of members of the household above the age of 5 years old with water related illnesses symptoms	If other, please specify:	text	text	Household	Probabilist	Baladiya

What is the average water expenditure for households?	12.1	Household interview	Water usage - water expenditures	Average expenditure of households spent on water from the public network	Over the past 30 days, how much did you spend on water from the public network (connected to the shelter)?	integer The number entered should not be higher than total expenditure.	integer	Household	Probabilist	Baladiya
	12.2	Household interview	Water usage - water expenditures	Average expenditure of households spent on water from the tap accessible to the public	Over the past 30 days, how much did you spend on water from the tap accessible to the public?	integer The number entered should not be higher than total expenditure.	integer	Household	Probabilist	Baladiya
	12.3	Household interview	Water usage - water expenditures	Average expenditure of households spent on water from the borehole	Over the past 30 days, how much did you spend on water from the borehole?	integer The number entered should not be higher than total expenditure.	integer	Household	Probabilist	Baladiya
	12.4	Household interview	Water usage - water expenditures	Average expenditure of households spent on water from the protected well	Over the past 30 days, how much did you spend on water from the protected well (e.g in your house or in the mosque)?	integer The number entered should not be higher than total expenditure.	integer	Household	Probabilist	Baladiya
	12.5	Household interview	Water usage - water expenditures	Average expenditure of households spent on water from the unprotected well	Over the past 30 days, how much did you spend on water from the unprotected well?	integer The number entered should not be higher than total expenditure.	integer	Household	Probabilist	Baladiya
	12.6	Household interview	Water usage - water expenditures	Average expenditure of households spent on water from the bottled water	Over the past 30 days, how much did you spend on bottled water?	integer The number entered should not be higher than total expenditure.	integer	Household	Probabilist	Baladiya
	12.7	Household interview	Water usage - water expenditures	Average expenditure of households spent on water from the water trucking	Over the past 30 days, how much did you spend on water from the water trucking?	integer The number entered should not be higher than total expenditure.	integer	Household	Probabilist	Baladiya
	12.8	Household interview	Water usage - water expenditures	Average expenditure of households spent on water from the spring	Over the past 30 days, how much did you spend on water from the spring?	integer The number entered should not be higher than total expenditure.	integer	Household	Probabilist	Baladiya
	12.9	Household interview	Water usage - water expenditures	Average expenditure of households spent on water from the rainwater tank	Over the past 30 days, how much did you spend on water from the rainwater tank?	integer The number entered should not be higher than total expenditure.	integer	Household	Probabilist	Baladiya
	12.10	Household interview	Water usage - water expenditures	Average expenditure of households spent on water from the surface water	Over the past 30 days, how much did you spend on water from surface water sources?	integer The number entered should not be higher than total expenditure.	integer	Household	Probabilist	Baladiya
	12.11	Household interview	Water usage - water expenditures	N/A	The expenditure on water exceeds the total expenditure of the household. Please correct the previous answers.	note	N/A		Probabilist	Baladiya

	12.12	Household interview	Water usage - water expenditures	% of households reporting a change in prices of their water source in the last 12 months	Have you noticed a change in price of your water sources in the last 12 months?	select one	yes no Don't know Prefer not to answer		Probabilist	Baladiya
	12.13	Household interview	Water usage - water expenditures	% of households reporting a change in prices of their water source in the last 12 months	Which water source have considerably changed in price in the last 12 months?	select one	Public network (connected to the shelter) Tap accessible to the public Borehole Protected well (e.g. in your house or in the mosque) Unprotected well Bottled water Water trucking Spring Rainwater tank Surface water (river, stream, dam, lake, pond, canal, irrigation channel) Other (specify)		Probabilist	Baladiya
	12.14	Household interview	Water usage - water expenditures	% of households reporting a change in prices of their water source in the last 12	If other, please specify:	text	text		Probabilist	Baladiya
	12.15	Household interview	Water usage - water expenditures	% of households reporting a change in prices of their water source in the last 12 months	What kind of change in prices of water sources have you noticed in the last 12 months?	select one	The prices have increased The prices have decreased The prices stayed the same The water source is free		Probabilist	Baladiya
	12.16	Household interview	Water usage - water expenditures	% of households reporting spending money on water resources rhat should have been used for other basic needs	In the past 30 days, has your household had to spend money (or credit) on water that should have been used for other basic needs?	select one	yes no Don't know Prefer not to answer		Probabilist	Baladiya
	12.17	Household interview	Water usage - water expenditures	% of households negatively affected by water expenditure	Is your current water expenditure negatively affecting your savings?	select one	yes no Don't know Prefer not to answer		Probabilist	Baladiya
	13.1	Household interview	Water usage - quantity of water used	% of households having a water tank	Does your household have (a) water tank(s) (either private or shared)?	select one	Yes No	Household	Probabilist	Baladiya
	13.2	Household interview	Water usage - quantity of water used	# of people sharing the water tank	In total, how many people share the water tank(s) (including you, the members of your household, and the members of other households that use it)?	integer The number should be at least as high as the number of household members.	integer	Household	Probabilist	Baladiya
	13.3	Household interview	Water usage - quantity of water used	Average quantity the water tank holds	Do you know how many litres the water tank(s) hold(s) in total?	select one If the household has more than one tank, please provide the total volume of all the tanks combined. If the respondent does not know the volume of the tank, ask them to check if it is written on the	Yes No	Household	Probabilist	Baladiya

What is the households' average use of water? How do communities cope with lack of water?	13.4	Household interview	Water usage - quantity of water used	Average quantity the water tank holds	Number of litres:	integer The number must be between 50 and 500000	integer	Household	Probabilist	Baladiya
	13.5	Household interview	Water usage - quantity of water used	# of water tanks the household has	How many tanks does the household have?	integer The number must be between 1 and 29	integer	Household	Probabilist	Baladiya
	13.6	Household interview	Water usage - quantity of water used	% of households storing water in the water tank(s)	Does your household store water in your water tank(s)?	select one	Yes No	Household	Probabilist	Baladiya
	13.7	Household interview	Water usage - water sources of HH	% of households storing water. Per water source.	What sources of water are used to fill up the storage tank(s)?	select multiple	Public network (accessible to the shelter) Tap accessible to the public Borehole Protected well (e.g in your house or in the mosque) unprotected well Bottled water Water trucking Spring Rainwater tank Surface water (river, stream, dam, lake, pond, canal, irrigation channel) Other (specify) Don't know	Household	Probabilist	Baladiya
	13.8	Household interview	Water usage - water sources of HH	% of households storing water. Per water source.	If other, please specify	text	text		Probabilist	Baladiya
	13.9	Household interview	Water usage - quantity of water used	Average filling of the water tank from the public network	How many times per month is the water tank(s) filled with water?	integer The number must be between 1 and 49	Integer	Household	Probabilist	Baladiya
	13.10	Household interview	Water usage - quantity of water used	Average usage of water stored in the water tank	To what extent is your water tank(s) usually emptied before it is refilled?	select one	Fully emptied Mostly emptied About half emptied Only a little emptied Don't know	Household	Probabilist	Baladiya
	13.11		Water usage - quantity of water used	Average usage of water stored in the water tank	Do you estimate that the water tank (or water storage system) you currently use is sufficient to store enough water?	select one	Yes No	Household	Probabilist	Baladiya
	13.12	Household interview	Water usage - quantity of water used	Average usage of bottled water	What is the volume (in litres) of the water bottles your household usually buys?	decimal	decimal	Household	Probabilist	Baladiya
	13.13	Household interview	Water usage - quantity of water used	Average usage of bottled water	How many bottles per week does your household usually buy?	integer The number must be between 1 and 999	integer	Household	Probabilist	Baladiya
	13.14	Household interview	Water usage - availability of water	% of households with sufficient access to water from the borehole	Are the water pumps your household use sufficient to be able to store enough water and meet your basic needs?	select one	Yes No		Probabilist	Baladiya

	13.15	Household interview	Water usage - availability of water	% of households with sufficient access to water from the borehole	Are the water pumps your household use functional?	select one	Yes No		Probabilist	Baladiya
	13.16	Household interview	Water usage - connection to the public network	% of households with direct pump connection to the public water supply system	Does your household have a direct pump connection to the public water supply system?	select one	Yes No	Household	Probabilist	Baladiya
How do communities in diverse areas access water? What are the most reported problems to accessing water?	14.1	Household interview	Water usage - accessibility to water sources	Profile (age and gender) of the person responsible for collecting and storing water in the household	Who is generally responsible for collecting and/or storing water in your household?	select one	No specific person Elderly woman (>59 years) Elderly man (>59 years) Adult woman (>15 years) Adult man (>15 years) Girl (<15 years) Boy (<15 years) Don't know Prefer not to answer	Household	Probabilist	Baladiya
What is the households' average use of water?	15.1	Household interview	Water usage - water availability	Quantity of water available per season	Does the quantity of water your household needs vary between summer (May-October) and winter (November-April)?	select one	No Yes, we need some more water in summer Yes, we need a lot more water in summer Yes, we need some more water in winter Yes, we need a lot more water in winter Don't know	Household	Probabilist	Baladiya
	15.2	Household interview	Water usage - water availability	Quantity of water available per season	Does the water source used by your household vary between summer (May-October) and winter (November-april)?	select one	Yes No Don't know Prefer not to answer		Probabilist	Baladiya
	15.3	Household interview	water usage - water consumption	% of househols using water-consuming air coolers in summer	Does your household use water-consuming air coolers in summer?	select one	Yes No Prefer not to answer	Household	Probabilist	Baladiya
	15.4	Household interview	water usage - water consumption	# of coolers used	How many coolers?	integer The number must be between 1 and 49	integer	Household	Probabilist	Baladiya
	15.5	Household interview	water usage - water consumption	Average usage of water-consuming air coolers in the peak of summer, per hour	How many hours per day do you use the water-consuming air coolers in the peak of summer?	integer The number must be between 1 and 24	integer	Household	Probabilist	Baladiya
	16.1	Household interview	Water infrastructures - impact of conflicts	% of households aware of water cuts caused by security incidents in the last six months	Are you aware of any water cuts related to security incidents in the last six months?	select one	Yes No	Household	Probabilist	Baladiya

	16.2	Household interview	Water infrastructures - impact of conflicts	Type of security incidents	If yes, what kind of security incidents?	Select multiple	Water infrastructure attacked by armed groups Water infrastruture personnel abducted /attacked by armed groups Attacks on electricity infrastructure by armed groups Water infrastrcuture vandalized Equipment were stolen (theft of water pumps etc.) Other (specify) I don't know I don't want to answer	Household	Probabilist	Baladiya
	16.3	Household interview	Water infrastructures - impact of conflicts	Type of security incidents	If other, please specify:	text	text		Probabilist	Baladiya
	16.4	Household interview	Water infrastructures - impact of conflicts	Most common consequences of attacks on water infrastructures	What were the consequences of these security incidents on the water infrastructure?	select multiple	water leakage from the infrastructure (loss of large quantity of water) The water infrastructure is not functional anymore The personnel of the infrastructure was dismissed or resigned Increased maintenance issues Constant water cuts from the public network since the attacks Constant power cuts affecting the access to water resources Other (specify) I don't know I don't want to answer	Household	Probabilist	Baladiya
	16.5	Household interview	Water infrastructures - impact of conflicts	Most common consequences of attacks on water infrastructures	If other, please specify:	text	text	Household	Probabilist	Baladiya
	16.6	Household interview	Water infrastructures - impact of conflicts	Most common consequences of the attacks on the population	What were the consequences of these security incidents on the population's access to water resources?	select multiple	Less access to sufficient quantity of water leading to difficulties of the household to meet its water needs Degradation of water quality Increased feeling of insecurity when accessing water from public taps Increased risk to exposure to infectious deseases Prices of other water sources increased Other (specify) I don't know I don't want to answer	Household	Probabilist	Baladiya
	16.7	Household interview	Water infrastructures - impact of conflicts	Most common consequences of the attacks on the population	If other, please specify:	text	text	Household	Probabilist	Baladiya
Have there been any attacks on water infrastructure that households are aware of	16.8	Household interview	Water infrastructures - impact of conflicts	Most common coping strategies to deal with the consequences of the attacks	How did communities cope with the consequences of these attacks?	select multiple	We reduced our water consumption We used water tanks to store bigger quantity of water We developed filtration systems to increase the quality of water We adapted to lower quality water We relied on bottled water Other (specify)	Household	Probabilist	Baladiya

and what have been the consequences on the population's access to water resources?	16.9	Household interview	Water infrastructures - impact of conflicts	Most common coping strategies to deal with the consequences of the	If other, please specify:	text	text	Household	Probabilist	Baladiya
	16.10	Household interview	Water infrastructures - impact of conflicts	# of attacks on water infrastructures on in the last six months	How many security incidents on water infrastructures are you aware of in the assessed Baladiya in the last six months?	select one	No attacks One attack More than one attack More than three attack More than five attack	Household	Probabilist	Baladiya
	16.11	Household interview	Water infrastructures - impact of conflicts	Type of infrastructures damaged due to the attacks	What type of infrastructures were damaged due to the security incidents?	select multiple	boreholes Water pipelines Electricity/ Power infrastructures Sewage network Desalination plants Dams Rainwater tank Dug well Other (specify) I don't know	Household	Probabilist	Baladiya
	16.12	Household interview	Water infrastructures - impact of conflicts	Type of infrastructures damaged due to the attacks	If other, please specify:	text	text	Household	Probabilist	Baladiya
	16.13	Household interview	Water infrastructures - impact of conflicts	% of households reporting that damaged infrastructures have been repaired	Have these damaged water infrastructures been repaired?	select one	Yes No I don't know Prefer not to answer	Household	Probabilist	Baladiya
	16.14	Household interview	Water infrastructures - impact of conflicts	% of households facing security risks when accessing formal water distribution points	Are there any people in your household who do not feel safe when using water distribution points?	select one	Yes No Prefer not to answer	Household	Probabilist	Baladiya
	16.15	Household interview	Water infrastructures - impact of conflicts	Type of security risks faced when accessing formal water distribution points	If yes, who in the household does not feel safe when using water distribution points in this community?	select multiple	women girls men boys Elderly people Internally displaced people returnees refugees and migrants Other (specify)	Household	Probabilist	Baladiya
	16.16	Household interview	Water infrastructures - impact of conflicts	% of households that need to take precautions when accessing water distribution points	Do you need to take any security precautions when accessing water distribution points?	select one	Yes No Prefer not to answer	Household	Probabilist	Baladiya
	16.17	Household interview	Water infrastructures - impact of conflicts	Type of precautions when accessing informal water distribution points	If yes, please specify:	select multiple	Be accompanied by other household members Go to water distribution points at certain hours to avoid incidents Be accompanied by other members of the community Ask anoter community member to transport the water Pay someone to transport the water Other (specify) Prefer not to answer	Household	Probabilist	Baladiya

	16.18	Household interview	Water infrastructures - impact of conflicts	Type of precautions when accessing informal water distribution points	If other, please specify:	text	text		Probabilist	Baladiya
What is the impact of water scarcity on livelihood activities in the assessed locations?	17.1	Household interview	Impact of lack of water resources on livelihoods	Usage of water for livelihood activities	Do your livelihood activities require the regular use of water?	select one	Yes No Prefer not to answer	Household	Probabilist	Baladiya
	17.2	Household interview	Impact of lack of water resources on livelihoods	Most common livelihood activities that require the usage of water	Please specify the type of activities.	select multiple	Farming Cleaning activities (house cleaning, car wash station…) Livestock (animals) feeding Construction Fishing I own or work in a bakery I own or work in a butcher shop Industrial activity I own or work in a restaurant I own or work in a café Other Prefer not to answer	Household	Probabilist	Baladiya
	17.3	Household interview	Impact of lack of water resources on livelihoods	Most common water sources used for livelihood activities	What is the water source used for your livelihood activities?	select multiple	Public network (accessible to the shelter) Tap accessible to the public Borehole Protected well (e.g in your house or in the mosque) unprotected well Bottled water Water trucking Spring Rainwater tank Surface water (river, stream, dam, lake, pond, canal, irrigation channel) Other (specify) Don't know	Household	Probabilist	Baladiya
	17.4	Household interview	Impact of lack of water resources on livelihoods	Most common water sources used for livelihood activities	If other, please specify	text	text	Household	Probabilist	Baladiya
	17.5	Household interview	Impact of lack of water resources on livelihoods	% of households' livelihoods activities affected by water scarcity	Were your livelihood activities directly affected by water scarcity in the last six months?	select one	Yes No Prefer not to answer	Household	Probabilist	Baladiya
	17.6	Household interview	Impact of lack of water resources on livelihoods	Most common consequences of water scarcity on livelihood activities	How were your livelihood activities affected by water scarcity in the last six months?	select multiple	Water scarcity affects the quality of the products i produce The stress in getting enough water affects the way I perform at work It determines the kind of crops cultivated Lack of water decreases the profit i can earn from my livelihood activity I can't keep my workplace clean as i have to be careful of my water consumption I can't properly feed my livestock Prefer not to answer Other	Household	Probabilist	Baladiya
	17.7	Household interview	Impact of lack of water resources on livelihoods	Most common consequences of water scarcity on livelihood	If other please specify	text	text	Household	Probabilist	Baladiya

What are the main sources of water in Libya?	18.1	Household interview	Water supply system - connection to the public network	Status of household's connection to the public water supply system	What is the status of your household's connection to the public water supply system?	select one	Have a permanent subscription Have a temporary or informal subscription Connected but do not have a subscription Share subscription/connection with neighbours Not connected to the municipal water supply Informal connection Don't know Prefer not to answer	Household	Probabilist	Baladiya
	18.2	Household interview	Water supply system - connection to the public network	N/A	You said in a previous question that the public network (connected to the shelter) was one of your main water sources. But in the last question, you said that your household is not connected to the public water supply. Please correct.	note	N/A	Household	Probabilist	Baladiya
How do communities in diverse areas access water? What are the most reported problems to accessing water?	19.1	Household interview	Water supply system - water charges	Reasons why the household shares the connection to public water supply system with neighbours	Why do you share your connection to the public water supply system with your neighbours?	select multiple	Cannot afford the full connection fee and/or municipal water charges The legal status of the property prevents us from subscribing The legal status of the household prevents us from subscribing The paperwork or regulations make it difficult to subscribe The water service is not worth the connection fee and/or municipal water charges The government has a responsibility to provide free water Problems with civil documents Water office staff refused subscription without any explanation Other (specify) Don't know Prefer not to answer	Household	Probabilist	Baladiya
	19.2	Household interview	Water supply system - water charges	Reasons why the household shares the connection to public water supply system with	If other, please specify	text	text	Household	Probabilist	Baladiya

Are households satisfied with the public water supply and services?	20.1	Household interview	Water sources - connection to the public network	Reasons why households are not connected to the public water supply system	Why are you not connected to the public water supply system?	select multiple	The public water supply system is not available near my property House/shelter does not have the facilities to connect to the public water supply system (e.g. pipes and/or tap) Cannot afford the connection fee and/or public water charges The legal status of the property prevents us from connecting/subscribing The legal status of the household prevents us from connecting/subscribing The paperwork or regulations make it difficult to connect/subscribe The water service is not worth the connection fee and/or public water charges Problems with civil documents Water office staff refused connection/subscription without any explanation Other (specify) Don't know Prefer not to answer	Household	Probabilist	Baladiya
	20.2	Household interview	Water sources - connection to the public network	Reasons why households are not connected to the public water supply system	If other, please specify:	text	text	Household	Probabilist	Baladiya
What are the vulnerabilities and priority needs of the population living in the assessed location(s) with regards to access to water?	21.1	Household interview	Water sources - connection to the public network	% of households in need of assistance to subscribe to the public water supply system	Does your household need some type of assistance to subscribe to the public water supply system?	select one	Yes No Prefer not to answer	Household	Probabilist	Baladiya
	21.2	Household interview	Water sources - connection to the public network	Type of assistance	What type of assistance?	select multiple	Assistance with paperwork/regulations Assistance legalising property Assistance obtaining required civil documents Assistance dealing with water office staff Assistance paying connection fee and/or municipal water charges Other (specify) Don't know	Household	Probabilist	Baladiya
	21.3	Household interview	Water sources -	Type of assistance	If other, please specify:	text	text	Household	Probabilist	Baladiya
	22.1	Household interview	Water supply system - water charges	Consistency of the payment of water charges	How regularly does your household pay water charges?	select one	Every time they are due Most of the time About half the time Rarely Never Don't know Prefer not to answer	Household	Probabilist	Baladiya

What is the average water expenditure for households?	22.2	Household interview	Water supply system - water charges	Most common reasons the household rarely or never pays the water charges	What is the reason your household rarely or never pays the water charges?	select one	Cannot afford them The water service is poor We were never asked to pay any water charges The government has a responsibility to provide free water Payment is difficult due to the required payment method, the paperwork or the staff The water office opening hours and/or staff visiting times are inconvenient There are no consequences for not paying Other (specify) Don't know	Household	Probabilist	Baladiya
	22.3	Household interview	Water supply system - water charges	Most common reasons the household rarely or never pays the water charges	If other, please specify:	text	text	Household	Probabilist	Baladiya
	22.4	Household interview	Water supply system - water charges	Consistency of the payment of water charges	When did your household last pay for water charges?	select one	In the past 2 months Between 2 to 4 months ago Between 4 to 6 months ago Between 6 months and 1 year ago Longer than 1 year ago Don't know Prefer not to answer	Household	Probabilist	Baladiya
	22.5	Household interview	Water supply system - water charges	Most common recipient of the water charges	Who do you pay your water charges to?	select one	General Company for Water and Wastewater (GCWW) General Desalination Company (GDC) Man-made River Project Execution and Management Authority (MMRA) The Municipality I don't pay any water charges Other (specify)	Household	Probabilist	Baladiya
	22.6	Household interview	Water supply system - water charges	Most common recipient of the water charges	If other, please specify:	text	text	Household	Probabilist	Baladiya
	22.7	Household interview	Water supply system - water charges	Average expenditure of households for the last water charges	How much did your household spend for the last water charges?	integer	integer	Household	Probabilist	Baladiya
	22.8	Household interview	Water supply system - water charges	Households' satisfaction level of the water expenditure and the value of the public water service	Do you think the price is worth the public water service provided?	select one	The price is lower than the value of the service The price is about equal to the value of the service The price is higher than the value of the service Don't know Prefer not to answer	Household	Probabilist	Baladiya
	22.9	Household interview	Water supply system - water charges	Households' satisfaction level of the water expenditure and the value of the public water service	If the water service was improved, would you be willing to pay more for the subscription?	select one	Yes No Prefer not to answer I don't know	Household	Probabilist	Baladiya

	22.10	Household interview	Water supply system - water charges	% of households having a water meter	Do you know what a water meter is?	select one Definition: A water meter is a device that measures how much water you use in your house. If you had a water meter, your water charges would be based on the amount of water you use, as measured by your meter.	Yes No	Household	Probabilist	Baladiya
	22.11	Household interview	Water usage - water consumption	% of households having a water meter	Does your household have a water meter?	select one	yes no Don't know Prefer not to answer		Probabilist	Baladiya
	22.12	Household interview	Water usage - water consumption	% of households willing to have a water meter	Would your household be willing to have a water meter installed in your house?	select one	Yes No Prefer not to answer I don't know	Household	Probabilist	Baladiya
	22.13	Household interview	Water supply system - water charges	% of households that received water bills in the last six months	Did you receive any water bills in the last six months?	select one	Yes No Don't know		Probabilist	Baladiya
	22.14	Household interview	Water supply system - water charges	% of households that received water bills in a regular basis in the last six months	How often do you receive water bills?	select one	Every fifteen days Every month Every three months Every six months Every year Other (specify) Don't know		Probabilist	Baladiya
	22.15	Household interview	Water supply system - water charges	% of households that received water bills in the last six months	If other , please specify:	text	text		Probabilist	Baladiya
	23.1	Household interview	Water sources -water services	% of households that encountered problems with the main source of water	Has your household encountered problems (water cuts, leaks, downgrading of the quality of water, unpleasant smell, unsual color) with your main source of water?	select one	Yes No I don't know Prefer not to answer	Household	Probabilist	Baladiya

23.2	Household interview	Water sources -water services	Persons/insitutions the household contacts when encountering problems with the main water source	Whom did your household approach when you encountered problems with your main water source?	select multiple	Nobody Municipal staff A neighbourhood/community representative General Company for Water and Wastewater (GCWW) General Desalination Company (GDC) Man-made River Project Execution and Management Authority (MMRA) NGO A plumber or maintenance worker Other (specify) Don't know Prefer not to answer	Household	Probabilist	Baladiya
23.3	Household interview	Water sources -water	Persons/insitutions the	If other, please specify:	text	text	Household	Probabilist	Baladiya
23.4	Household interview	Water sources -water services	Reasons why the household did not approach anyone	Why did you not approach anyone?	select one	Fear of approaching authorities Fear of approaching other community members Other Prefer not to answer	Household	Probabilist	Baladiya
23.5	Household interview	Water sources -water	Reasons why the	If other, please specify:	text	text	Household	Probabilist	Baladiya
23.6	Household interview	Water sources -water services	% of the complaints considered	Was there action taken based on your complaint?	select one	Yes No I don't know Prefer not to answer	Household	Probabilist	Baladiya
23.7	Household interview	Water sources -water services	Average duration to resolve the complaint	How long did it take to resolve the complaint?	select one	Less than 1 week Between 1 and 4 weeks Between 4 weeks and 6 months Longer than 6 months It was never resolved Don't know Prefer not to answer	Household	Probabilist	Baladiya
23.8	Household interview	Water sources -water services	type of institutions that attended the complaint	Who attended to your complaint?	select multiple	Nobody Municipal staff A neighbourhood/community representative General Company for Water and Wastewater (GCWW) General Desalination Company (GDC) Man-made River Project Execution and Management Authority (MMRA) NGO A plumber or maintenance worker	Household	Probabilist	Baladiya
23.9	Household interview	Water sources -water services	Type of institutions that attended the household complaint	If other, please specify:	text	text	Household	Probabilist	Baladiya
23.10	Household interview	Water sources -water services	Most common complaint about households' main source of water	What is your household's principal/most regular complaint about your main source of water?	select one	inadequate quantity to meet basic household's needs; inadequate quality; irregular supply; the water is nor affordable Water is unfairly distributed Water supply network is often broken/leaking Access to water distribution points can be unsafe for some members of the household other (specify) Don't know Prefer not to answer	Household	Probabilist	Baladiya

	23.11	Household interview	Water sources -water services	Most common complaint about households' main source of water	If other, please specify:	text	text	Household	Probabilist	Baladiya
	23.12	Household interview	Water sources -water services	% of households who have noticed leaks in the public water supply system	Have you noticed leaks in the public water supply system?	select one	Yes No Prefer not to answer	Household	Probabilist	Baladiya
	23.13	Household interview	Water sources -water services	% of households who informed public institutions about the leaks	Have you informed the Municipality or other public institutions (E.g. GCWW) about the leaks?	select one	Yes No Prefer not to answer	Household	Probabilist	Baladiya
	23.14	Household interview	Water sources - water services	Level of satisfaction of the household towards the public water supply system	How do you rate the overall level of service from the public water supply system?	select one	Excellent Good Adequate Poor Very poor Prefer not to answer	Household	Probabilist	Baladiya
	23.15	Household interview	Water sources - water services	Reasons why the public institutions are not able to provide the household with adequate water service	Why do you think public insitutions are not being able to provide your household with adequate water supply service?	select one	Inadequate water at source, Inadequate electricity, Insufficient number of staff, Staff not trained well enough, Lack of financial resources of public structures Lack of concern Water network in disrepair The water network infrastructure is outdated Water network/infrastructure constantly vandalized Other (specify) Don't know Prefer not to answer	Household	Probabilist	Baladiya
What institutions are responsible for maintaining and upgrading the public water supply system? What is the role of local authorities in the provision of water services? Are households satisfied with the public water supply and services?	23.16	Household interview	Water sources - water services	Reasons why the public institutions are not able to provide the household with adequate water service	If other, please specify:	text	text	Household	Probabilist	Baladiya
	23.17	Household interview	Water sources - water services	Regularity rate of the water supply from the public water supply system	How do you rate the current regularity of the water supply from the public water supply system?	select one	Excellent Good Adequate Poor Very poor Prefer not to answer	Household	Probabilist	Baladiya
	23.18	Household interview	Water sources - water services	GCWW's level of receptiveness to complaints	How do you rate the General Company for Water and Wastewater (GCWW) office's receptiveness to complaints?	select one	Excellent Good Adequate Poor Very poor Prefer not to answer	Household	Probabilist	Baladiya
	23.19	Household interview	Water sources - water services	Level of service from the public water supply system compared to other neighborhoods	How do you rate the level of service from the public water supply system in your neighborhood compared to other neighbourhoods?	select one	Excellent Good Adequate Poor	Household	Probabilist	Baladiya

23.20	Household interview	Water sources - water services	Level of service from the public water supply system compared to other neighborhoods	Why is the level of service worse in your neighbourhood compared to other neighbourhoods?	select multiple	Water is supplied for less hours per day A smaller quantity of water is supplied The hours that water is supplied are less convenient Municipal water charges are higher Water quality is poorerWater pressure is lower Water supply infrastructure is poorer/more damaged Less water supply infrastructure available Other (specify) Prefer not to answer	Household	Probabilist	Baladiya
23.21	Household interview	Water sources - water services	Level of service from the public water supply system compared to other neighborhoods	If other, please specify:	text	text	Household	Probabilist	Baladiya
23.22	Household interview	Water sources - water services	Reasons why the level of the service is worse compared to other neighborhoods	Why is the level of service worse in your neighbourhood compared to other neighbourhoods?	text	text	Household	Probabilist	Baladiya
23.23	Household interview	Water sources - water services	Consistency of the payment of water charges	Do you think that the majority of people that use water from the public water supply system pay for it?	select one	Yes No I don't know Prefer not to answer	Household	Probabilist	Baladiya
23.24	Household interview	Water sources - water services	Public insitutions responsiveness to attend to leaks in the public water supply system	Do you think public insitutions attend to water cuts and leaks in the public water supply system in a timely and effective way?	select one	Yes No I don't know Prefer not to answer	Household	Probabilist	Baladiya
23.25	Household interview	Water sources - water services	Public insitutions ability to maintain and upgrade the public water supply system	Do you think public institutions maintain and upgrade the public water supply system on a regular basis?	select one	Yes No I don't know Prefer not to answer	Household	Probabilist	Baladiya
23.26	Household interview	Water sources - water services	Type of public structures responsible for maintaining and upgrading the public water supply system	Which public structure do you think is responsible for maintaining and upgrading the public water supply system?	select one	General Company for Water and Wastewater (GCWW) General Desalination Company (GDC) Man-made River Project Execution and Management Authority (MMRA) NGO The Municipality Private companies A plumber or maintenance worker Other (specify)	Household	Probabilist	Baladiya
23.27	Household interview	Water sources - water services	Type of public structures responsible for maintaining and upgrading the public water supply system	If other, please specify:	text	text	Household	Probabilist	Baladiya
23.28	Household interview	Water sources - water services	% of households trusting public institutions to try to improve the water supply services	Do you trust public insitutions to try to improve water supply services for the inhabitants of your locality?	select one	Yes No I don't know Prefer not to answer	Household	Probabilist	Baladiya
23.29	Household interview	Water sources - water services	Reasons why households do not trust public institutions to try to improve the water supply services	Why not?	text	text	Household	Probabilist	Baladiya

	23.30	Household interview	Water sources - water services	Households participation to improve the water supply services	What are your suggestions or advice to public stakeholders to improve the water supply services?	select multiple	Increase the amount of hours per day that water is supplied, Make the hours when water is supplied more convenient, Improve the quality of the water, Reduce the price of the water service, Increase water pressure Improve existing infrastructure of the water supply system Construct new infrastructure for the water supply system Extend the water supply network into new areas of the city Repair leaks in the water pipes Protect water infrastructures from attacks Other (specify) Don't know Prefer not to answer	Household	Probabilist	Baladiya
	23.31	Household interview	Water sources - water services	Households participation to improve the water supply services	If other, please specify:	text	text	Household	Probabilist	Baladiya
	23.32	Household interview	Water sources - water services	Households participation to improve the water supply services	How can your household help to improve water supply services?	select multiple	Cannot help Pay our bills, Report leaks when discovered, Conserve water Other (specify) Don't know Prefer not to answer	Household	Probabilist	Baladiya
	23.33	Household interview	Water sources - water services	Households participation to improve the water supply services	If other, please specify:	text	text	Household	Probabilist	Baladiya

Annex 2: Data Analysis Plan
(qualitative - local level)

Research questions	#	Sub-Question	Questionnaire QUESTION	Probes	Data collection method	Key disaggregations (Group types)
N/A			Date of interview		KI	
			Enumerator name or code		KI	
			Hello, my name is ${enumerator_name}. I work with ACTED, an international organisation operating in Libya. We are conducting a survey for an assessment that aims to collect information about water availability and households' access to quality and sufficient water resources, so that appropriate help and assistance can be provided in the future. For this, we will be asking you questions about the different water sources used in this baladiya, their sustainability as well as questions on water infrastructures and the public water supply system. Please note that:		KI	
Consent			Do you consent to participate in this survey?		KI	
Biodata			Gender of participant		KI	
			What organisation do you work for?		KI	
			What is your role in this organisation?		KI	
1. What are the main water sources in Libya?	1		What are the main water sources in this municipality used for domestic uses (human consumption)?	select one (or more) of these water sources: Public network, borehole, protected well, unprotected well, spring, rainwater tank, water trucking, bottled water. E.g. Domestic uses include: (drinking, cooking, washing clothes, cleaning the house)	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	2		If the main water source is bottled water for drinking purposes, is it because the other water sources are not good enough in terms of quality or/and are not available?		KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	3		What are the main water sources in this Municipality used for agricultural production?	(E.g. These water sources can be groundwater, surface water, desalinated water, recycled water) If other, please specify.	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)

Libya?	4	Is there any other activity that requires large quantities of water? Could you specify which activities?	(E.g. It could be industrial activities such as textile manufacturing, professional activities requiring the use of cooling systems, oil industry etc.)	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	5	Do water sources differ from one Muhalla to another for domestic uses? If yes, why? If yes, how?	E.g. Domestic uses include: (drinking, cooking, washing clothes, cleaning the house)	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	6	What are the most important uses of water resources in this Baladiya in the last year?	(E.g. It can be domestic use, irrigation purposes, industrial use…)	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	7	Was water constantly available and accessible to households in this baladiya in the last year? Are the water sources regularly used by households always available?	(Are they available every day? Most of the days? Less than 3 days? On the days it's available, is it available at any moment?)	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
2. What is the quality of the different water sources? How is the quality of water being monitored and how water is being treated by households?	8	Do households generally treat the water before they use it? (for drinking and cooking) If yes, why?	If yes, please select: Unacceptable taste Unacceptable colour Unacceptable smell Contains materials	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	9	How, if at all, do households treat water?	What do households do to make it safer to drink? Do they treat it before cooking, washing clothes or cleaning the house? How do they generally treat it (Boil it, Let it stand and settle, Expose it to sunlight, Use chlorine or other disinfection products (aquatabs/water purification tablets, PuR or watermaker sachets), filter it, Use domestic water desalination plant machines)	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	10	Are there any reports of water related illnesses in the last year?	(E.g. symtoms of water-related illnesses can be: fever, Diarrhea, cough, fast and difficult breathing, eye infection or red eyes, skin infection, ear infection) Which population groups are mostly affected? Which regions are mostly affected?	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)

	11		Is the quality of water from the public network being constantly monitored? Which institution(s) is responsible for monitoring the quality of water from the public network?	How exactly is the quality of water being monitored? Which techniques are used to monitor they quality of water? How regularly are those techniques used?	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	12		What are the contributing factors affecting the quality of water?	(E.g. please select one or more of these factors: lack of maintenance of water infrastructures, water infrastrcutructures damaged, contamination of water caused by wastewater overflow, contamination of water caused by industrial or agricultural activities, use of unimproved water sources, seawater intrusion, oil drilling) If other, please specify.	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
3. How do communities cope with lack of water?	13		What issues, if any, do households generally face in accessing water from the public network?	select one (or more): - No pump connection into the house - Bad quality of the water supplied - Irregular supply - High water charges If other, please specify	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	14	N/A	How do households generally cope with difficulties in accessing quality and sufficient water from the public network?	Do they rely on other water sources? If yes, is it provided by public entities or the private sector?		
	15		Are you aware of any security incidents affecting the water supply system that occurred in the last year? How did it affect households' ability to access sufficient and quality water resources?	What security incidents are you aware of? Do you have examples? (E.g. security incidents can include: attacks by armed groups on infrastructures (pipes, desanilination/wastewater plants, personnel abducted/attacked, equipment stolen)	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	16		If yes, how regularly do security incidents on water infrastructures occur? Does this happen more often at certain times of the year? If yes, why?	Select one: - Very often (more than 10 incidents a year) - Often (6-10 incidents a year), - Sometimes (4-5 incidents a year), - Rarely (2-3 incidents a year) - Very rarely (1 incident a year)		
	17		Are you aware of any water outages caused by power cuts in the last six months?	If yes, what's the longest they've lasted during the last six months?	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)

4. What is the state and sustainability of the various water infrastructures? 5. What has been the impact of conflict on infrastructure and has conflict directly affected people's ability to access water?	18	If yes, how regularly do water outages caused by power cuts occur in the last six months?	Select one: - Very often (more than 10 incidents a year) - Often (6-10 incidents a year), - Sometimes (4-5 incidents a year), - Rarely (2-3 incidents a year) - Very rarely (1 incident a year)	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	19	Do electricity cuts affect considerably the water supply and households' ability to have sufficient and quality water?	(E.g. some households use for example electrical pumps to extract water from private wells)	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	20	How, if at all, informal connections to the public water supply system (done by the household without notifying the GCWW) affect water infrastructures' functionality?		KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	21	What measures are in place to protect water infrastructures and to prevent attacks and unofficial connections?	Who developed and implemented these measures? To what purposes? Are they efficient? (E.g. measures can be: protect water infrastructures through armed groups/ security personnel, raise awarness on the impact of attacks on the population, punish perpetrators, construction of water infrastructures in rural areas) If other, please specify.	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	22	Have these water (or electricity) infrastructures been repaired? If yes, who repaired the damaged infrastructures?	(E.g. If yes, please select one or more of these institution that repaired the damaged infrastructrures: General Company for Water and Wastewater (GCWW), municipality, General Desalination Company (GDC), Man-Made River Authority (MRA), International Organization, private company). If other, please specify.	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	23	Does maintenance of water infrastructure (whether damaged because of security incidents or for other reasons) affect the availability of water and households' ability to access sufficient and quality water resources? How exaclty?	Does it affect the quality of water / the regularity of water supply/ access to water points, etc?	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	24	Have there been any development or improvement plans for water infrastructures in the last two years? Are there any development or improvement plans for water infrastructures for the next two years?	Who developed them and who is responsible for implementing and monitoring them? Is it mainly maintenance work or diversifying water sources and developing new infrastructures? What problems these improvement plans are addressing?	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	25	How do households connect to the public water supply system?	What kind of subscription is it? Is it an annual or monthly subscription? Do they usually have an informal connection?	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	26	Are there any measures to prevent informal connections to the public water supply system?	What measures are in place to prevent this? Who implemented them?	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)

6. What institutions are responsible for maintaining and upgrading the public water supply system? 7. What is the role of local authorities in the provision of water services?	27		Do households have to pay water charges? How regularly do they have to pay water charges?	Do households receive water bills? Who are they paying their water charges to? (GCWW, MMRA, municipality, GDC…)	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	28		If households do not pay at all to have access to water from the public network, what do you think are the main reasons for not paying?		KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	29		What are the major issues related to the water supply from the public network?	(eg. there can be leaks, water outages, overflow of wastewater…)	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	30		Who maintains the public water supply system and water infrastructures?	Which institution is responsible for maintaining the public water supply system? Is it done in a regular basis?	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	31		Who do households contact to report issues related to the water supply system?	Select one: - General Company for Water and Wastewater (GCWW) - Municipality - General Desalination Company (GDC)	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	32		What is the process to report issues? Are households satisfied with the maintenance services provided?	Is it done in-person, online or through a hotline? What type of repairs can the GCWW do? Do households have to pay charges for any repairs?	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)
	33		What are the factors that could affect the availability of sufficient and quality water in the next six months in this Baladiya?	What is predicted to happen? What climate factors could potentially affect the water situation in this Baladiya (for example less precipitation, dry period, high temperatures…)? What human factors could affect the supply of quality and sufficient water? (security incidents affecting water infrastructures, increase in prices, etc.)	KI	> City-wide (Assessed Baladiya) (Urban, formal and informal)

Annex 3: Data Analysis Plan
(Qualitative - National level)

Research questions	#	Sub-Question	Questionnaire	Probes	Data collection method	Key disaggregations (Group types)
N/A			Date of interview		KI	N/A
			Enumerator name or code		KI	N/A
			Hello, my name is ${enumerator_name}. I work with ACTED, an international organisation operating in Libya. We are conducting a survey for an assessment that aims to collect information about water availability and households' access to quality and sufficient water resources, so that appropriate help and assistance can be provided in the future. For this, we will be asking you questions about the different water sources used in this baladiya, their sustainability as well as questions on water infrastructures and the public water supply system. Please note that: - There will be no consequences for you if you decide not to answer		KI	N/A
Consent			Do you consent to participate in this survey?		KI	N/A
Biodata			Gender of participant		KI	N/A
			What organisation do you work for?		KI	N/A
			What is your role in this organisation?		KI	N/A
	1		What are the main water sources used for domestic uses (human consumption) in Libya?	select one (or more) of these water sources: Public network, borehole, protected well, unprotected well, spring, rainwater tank, water trucking, bottled water. E.g. Domestic uses include: (drinking, cooking, washing clothes, cleaning the house)	KI	N/A
	2		Do water sources used by households differ from one region to another (East, South, West), according to the availability of the different water sources?	What are the factors affecting the use of a certain water source over another? (E.g. factors can for example be: quality of water, irregular supply, Infrastructure not working/ in maintenance/ damaged, water points not accessible, cost of water sources) Specify if other.	KI	N/A

What are the main water sources in Libya?	3	Groundwater is the main water source in Libya and the Made Men River (MMR) provides over 60% of Libya's water. How do households generally have access to groundwater sources?	(E.g. Water sources from the MMR can include piped connection into house, public tap, unofficial connection to the public network, borehole, protected well, unprotected well) If other, please specify.	KI	N/A
	4	Do households generally pay to have access to water from these sources? How do they pay for it and who do they pay?	Do households receive water bills? Which institution do they pay (General Company for Water and Wastewater (GCWW), municipality, General Desalination Company (GDC), Man-Made River Authority (MRA). How regularly do they pay water charges? (Never, rarely, everytime they are due, most of the time, half of the time)	KI	N/A
	5	If households do not pay at all to have access to water from the public network, what do you think are the main reasons for not paying?		KI	N/A
	6	Are all water sources managed by the public structures?	Please select: Yes No	KI	N/A
How do communities cope with lack of water?	7	What issues, if any, do households generally face in accessing water from the public network?	select one (or more): - No pump connection into the house - Bad quality of the water supplied - Irregular supply - High water charges If other, please specify	KI	N/A
	8	How do households generally cope with difficulties in accessing quality and sufficient water from the public network?	Do they rely on other water sources? If yes, is it provided by public entities or the private sector?	KI	
	9	Are there any sources used by households provided, managed and monitored by the private sector?	Please select: Yes No	KI	

What are the problems associated with a potential reliance on groundwater?	10	Are there mantikas with no or few access to groundwater sources?	Please select: Yes No	KI	N/A
	11	What are the reasons these mantikas don't have any or regular access to groundwater resources?	These can for example be mantikas not served by the MMR pipeline for example or mantikas where other sources are used (desalinated water, recycled water, surface water, water trucking)	KI	
	12	To what purposes groundwater sources are generally used for?	(E.g. please select one or more of these puporses: domestic use, industrial purposes, irrigation purposes) If other, please specify.	KI	N/A
	13	Are there any negative effects already noticed of over-exploitation of groundwater sources?	Negative effects can include: - Degradation of water quality. - Groundwater depletion. - Reliance of households on unimproved (unprotected) water sources. If other, please specify:	KI	
	14	Are there mantikas more affected than others by these effects? Why?		KI	
	15	Is the quality of water from the public network being constantly monitored? Which institution(s) is responsible for monitoring the quality of water from the public network?	How exactly is the quality of water being monitored? Which techniques are used to monitor they quality of water? How regularly are those techniques used?	KI	N/A

What is the quality of the different water sources? How is the quality of water being monitored and how water is being treated by households?	16	N/A	Do households generally treat water before they use it for domestic purposes? (before drinking or cooking)	Yes No E.g. Domestic uses include: (drinking, cooking, washing clothes, cleaning the house)	KI	N/A
	17		If yes, why do they treat it?	Please select one or more: unacceptable taste unacceptable colour unacceptable smell Contains materials	KI	N/A
	18		How, if at all, do households treat water?	What do households do to make it safer to drink? Do they treat it before cooking, washing clothes or cleaning the house? How do they generally treat it (Boil it, Let it stand and settle, Expose it to sunlight, Use chlorine or other disinfection products (aquatabs/water purification tablets, PuR or watermaker sachets), filter it, Use domestic water desalination plant machines)	KI	N/A
	19		What are the contributing factors affecting the quality of water?	(E.g. please select one or more of these factors: lack of maintenance of water infrastructures, water infrastrcutructures damaged, contamination of water caused by wastewater overflow, contamination of water caused by industrial or agricultural activities, use of unimproved water sources, seawater intrusion, oil drilling) If other, please specify.	KI	N/A
	20		Are there any significant reports of water-related illnesses in Libya?	(E.g. symtoms of water-related illnesses can be: fever, Diarrhoea, cough, fast and difficult breathing, eye infection or red eyes, skin infection, ear infection) Which population groups are mostly affected? Which regions are mostly affected?	KI	N/A
	21		Oil revenues are Libya's main source of income. Has oil drilling affected the supply and quality of water? To what extent?	Which are the most affected regions? How exactly does oil drilling affect the quality and supply of water?	KI	N/A

What has been the impact of conflict on infrastructure and has conflict directly affected people's ability to	22		Are you aware of any security incidents affecting the water supply system in Libya in the last six months? Which mantikas are the most affected?	What security incidents are you aware of? Do you have examples? (E.g. security incidents can include: attacks by armed groups on infrastructures (pipes, desanilination/wastewater plants) personnel abducted/attacked, equipment stolen	KI	N/A
	23		If yes, how regularly do security incidents on water infrastructures occur?	Select one: - Very often (more than 10 incidents a year) - Often (6-10 incidents a year), - Sometimes (4-5 incidents a year), - Rarely (2-3 incidents a year) - Very rarely (1 incident a year)	KI	N/A
	24		Are you aware of any water outages caused by power cuts?	Please select: Yes No If yes, what's the longest they've lasted during the last six months?	KI	N/A
	25		If yes, how regularly do water outages caused by power cuts occur in the last year?	Select one: - Very often (more than 10 incidents a year) - Often (6-10 incidents a year), - Sometimes (4-5 incidents a year), - Rarely (2-3 incidents a year) - Very rarely (1 incident a year)	KI	N/A
	26		Did electricity cuts in the last six months affect considerably the water supply and households' ability to have sufficient and quality water? How exaclty?	(E.g. some households use for example electrical pumps to extract water from private wells)	KI	N/A
	27		Did security incidents on water infrastructures affect considerably the water supply and households' ability to have sufficient and quality water in the last six months?	Please select: Yes No If yes, how did security incidents affect the water supply?	KI	N/A

access water?	28	How, if at all, informal connections to the public water supply system (done by the household without notifying the GCWW) affect water infrastructures' functionality?		KI	N/A
	29	How do households connect in an unofficial way to the public network?	(E.g. it can be for example an informal connection to the MMR pumps)	KI	N/A
	30	What measures are in place to protect water infrastructures and to prevent attacks and unofficial connections?	Who developed and implemented these measures? To what purposes? Are they efficient? (E.g. measures can be: protect water infrastructures through armed groups/ security personnel, raise awarness on the impact of attacks on the population, punish perpetrators, construction of water infrastructures in rural areas) If other, please specify	KI	N/A
	31	Have these water (or electricity) infrastructures been repaired? If yes, who repaired the damaged infrastructures?	Please select: Yes No (E.g. If yes, please select one or more of these institution that repaired the damaged infrastructrures: General Company for Water	KI	N/A
	32	Does maintenance of water infrastructure (whether damaged because of security incidents or for other reasons) affect the availability of water and households' ability to access sufficient and quality water resources? How exaclty?	Does it affect the quality of water / the regularity of water supply/ access to water points, etc?	KI	N/A
	33	Have there been any development or improvement plans for water infrastructures in the last two years? Are there any development or improvement plans for water infrastructures for the next two years?	Who developed them and who is responsible for implementing and monitoring them? Is it mainly maintenance work or diversifying water sources and developing new infrastructures? What problems these improvement plans are addressing?	KI	N/A
	34	Groundwater is the main water source in Libya and the MMR provides over 60% of Libya's water. What are the other main water sources used ? To what purposes are they generally used for? Are you aware of any public policies to diversify water sources?	(E.g. These water sources can be surface water, desalinated water, recycled water) If other, please specify.	KI	N/A

What alternative solutions to groundwater have been developed and what are the limits?	35		Are there sources of water, other than groundwater sources, that are used for irrigation purposes? In which mantikas are these other sources used for irrigation purposes?	(E.g. These water sources can be surface water, desalinated water, recycled water) If other, please specify.	KI	N/A
	36		Are there sources of water, other than groundwater sources, that are used for industrial pruposes? In which mantikas are these other sources used for industrial purposes?	(E.g. It could be industrial activities such as textile manufacturing, professional activities requiring the use of cooling systems, oil industry etc.)	KI	N/A
	37		Are there mantikas where recycled water is used? Are you aware of any new public initiatives to develop this water source?	Which are these mantikas and to what purposes is recycled water used for? What institutions are involved to develop this water source? What are the limits of the exploitation of recycled water?	KI	N/A
	38		Are there mantikas where desalinated water is used? Are you aware of any new public initiatives to develop this water source? How different are the prices compared to groundwater sources?	Which are these mantikas and to what purposes is desalinated water used for? What institutions are involved to develop this water source? What are the limits of the exploitation of desalinated water?	KI	N/A
	39		Are there any raising awareness activities on water consumption issues?	What institutions develop these campaigns? Who are their main partners? What messages do they convey? How are they implemented? What is the scale of these activities?	KI	N/A
	40		What are the factors that could affect the availability of sufficient and quality water in the next six months?	What is predicted to happen? What climate factors could potentially affect the water situation in Libya (for example less precipitation, dry period, high temperatures…)? What human factors could affect the supply of quality and sufficient water? (security incidents affecting water infrastructures, increase in prices, etc.)	KI	N/A