



STAGE TWO

Yemen Water Sector

Managerial, Financial, Human Resource, Operational Structures
Assessment of Twelve Water Corporations, and their Affiliated Utilities



The Stage Two Report

The Stage Two Report is a continuance to the water sector actors referenced in the Stage One Report. It consists of a series of likely scenarios that would address areas of inevitability across 12 LCs, branch offices and associated utilities immediately after the armed conflict would end; and for a period of two to three years.

The scenarios are structured on post conflict experiences, the observations, conclusions and recommendations from the Stage I Report, and on practicalities for resource mobilization. In the case of the buildings and structures scenarios, it was largely determined that more data is needed and verification of most details is required. This will enable conceptual undertakings of short-term priority packages to be formulated for implementation in the post conflict period.

In terms of the water supply and wastewater equipment and supplies required for rebuilding and repairing LCs assets, these details have been documented in a parallel assessment carried out by the German Bank for Reconstruction (KfW), and can be seen in the Water Crisis Program Yemen (WCPY) Technical Needs Assessment Report of 2015.

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Technical Co-Operation (TC) Human Resources

1. Introduction

Armed conflicts cause people undue hardships. These circumstances mean for some that they will: move from their family houses to other locations in the country; move outside the country to seek shelter, safer environment and employment; stay with the family in their house and wait out the conflict; some unfortunately become casualties of the war-like conditions.

Immediately after the conflict ceases, it will not be known who will stay in their job with the LC or utility, who will return and who will not. There will be a hiatus period where unofficial news and heresy will prevail, but for planning purposes, the staffing numbers will be a guesstimate scenario.

The mobilisation of a workforce is of the utmost importance to rebuilding the water and sanitation sector. A very positive base to build on post-conflict is the fact that during the armed conflict, the LCs, their branch offices and associated utilities have maintained a skeleton staff. In most cases they have been working for long periods without regular salaries and the appropriate recognition.

2. Remuneration

In this regard, it is key that financial support be sought to enable the LCs and associated utilities to initially pay basic salaries, or incentives or commissions to staff and workers for up to two years. Given the data provided by LCs in Stage One, weak revenue collection has affected the ability of most of LCs to pay basic salaries.

The estimated amounts for each LC, branch office and/or utility are shown in the table over the page. The staff numbers and salary figures are based on 2014/15 data. The projected monthly salaries for two years are based on an average increase of 5%. It can be seen from the table that there is a wide variance in salaries, as well as total payroll figures in relationship to the number of staff. The average total number of employees per LC is 644, based on 12 LCs, 6 branch offices and 5 utilities. The lowest average salary per staff member is in Abyan at 31,510.629 YR (\$120 US) per month. The highest average salary per staff member is in Ibb at 121,074 YR (\$480 US) per month.

The total amount required for salaries, incentives and/or commissions for each of two years is 9,285,000,000 YR. (\$37 million US) using an official exchange rate (May 10/2016) of 250 YR to \$1 US. For a two-year stabilisation period, a maximum total of \$74 million US is foreseen.

It is recommended that relevant financial support for each of the referenced Stage One LCs, branch offices and associated utilities be sought on individual or collective arrangements for financing institutions.

2014/15		YEAR 1	YEAR 2	YEAR 1 & 2	
LC-BRANCH OFFICE-UTILITY	STAFF ON PAYROLL	MONTHLY SALARY TOTAL (YR)	MONTHLY TOTAL (YR)	MONTHLY TOTAL (YR)	TOTAL SALARIES REQUIRED FOR TWO YEARS (YR)
ABYAN LC	243	7,657,083	8,000,000	8,000,000	192,000,000
ADEN LC	1,940	228,739,583	240,000,000	240,000,000	5,760,000,000
AMRAN LC	118	9,870,095	10,000,000	10,000,000	240,000,000
DHAMAR LC	330	26,680,042	28,000,000	28,000,000	672,000,000
HADRAMOUT – AL MUKALLA LC	1,229	66,545,000	68,000,000	68,000,000	1,632,000,000
Al Shehr Utility	Inc.	–	–	–	–
HAJJAH LC	140	14,539,033	15,500,000	15,500,000	372,000,000
Harad Branch	22	1,782,736	2,000,000	2,000,000	48,000,000
Abs Branch	54	3,310,021	4,000,000	4,000,000	96,000,000
Kahlan Afar Branch	19	1,072,307	1,400,000	1,400,000	33,600,000
Mabian Branch	56	3,328,841	4,000,000	4,000,000	96,000,000
HODAYDAH LC	808	68,669,196	70,000,000	70,000,000	1,680,000,000
Zabid Utility	65	–	–	–	–
Al Mansouriah Utility	32	2,019,145	2,350,000	2,350,000	56,400,000
Bajil Utility	81	4,362,703	4,750,000	4,750,000	114,000,000
Bait Al Faqih Utility	76	5,352,227	5,750,000	5,750,000	138,000,000
IBB LC	246	29,784,263	31,000,000	31,000,000	744,000,000
LAHIJ LC	323	20,000,000	21,500,000	21,500,000	516,000,000
SA'ADA LC	74	6,416,247	7,000,000	7,000,000	168,000,000
SANA'A LC	1,513	174,053,705	178,000,000	178,000,000	4,272,000,000
TAIZ LC	761	65,874,445	67,000,000	67,000,000	1,608,000,000
Mukha Branch	36	3,452,770	3,750,000	3,750,000	90,000,000
Al Turbah Branch	35	1,430,526	1,750,000	1,750,000	42,000,000
TOTALS	8,201	744,939,803	773,750,000	773,750,000	18,570,000,000

Table 1.1 – LC staffing numbers, 2014/15 salaries and projected salary budgets for post conflict period of 2 years

3. Governance

An LCs corporate governance framework is a mechanism to ensure the strategic guidance of the company, the effective monitoring of management by the board, and the board's accountability to the company and the stakeholders.

To effectively ensure that these principles are implemented, a governance structure and functional operations requires a set of guidelines and principles similar to those published by the OECD in a document entitled "G20/OECD Principles of Corporate Governance." All LCs, branch offices and associated utilities governing bodies should be exposed to a comprehensive good governance coaching programme; one that outlines the governing body's responsibilities, actions, required effectiveness, required efficiencies and overall accountability.

To this end it is recommended that TA packages covering good governance, with a corporate focus, be implemented in the very early stages of post conflict. The packages should consist of:

- An assessment of the governance structure, procedures and processes that are currently in place and the legislative instruments that guide the governing bodies;
- Coaching sessions with senior central and local government officials, subscribers, and other stakeholders to re-establish a functional governance structure
- Incorporate a reporting mechanism that provides the necessary governing body's performance confirmation and results of decision taken.

Level of effort: 100 person days

Estimated Total Cost: \$115 – 120,000 US

4. Management

In a post conflict era, LCs will be facing many common challenges, including financial survival, infrastructure replacement or repair, customer demands, and a workforce expecting remuneration. Effective utility management can help LCs return to some degree of normality, respond to challenges and support LCs in their common mission of being successful service providers. All LC management teams should be exposed to training and coaching involving the following management areas during the post-conflict period.

Product Quality: Be able to produce safe and clean water, and treated effluent in requirements that are consistent with minimum standards and public health needs.

Customer Service/Billing & Collection: Provide reliable and affordable services in line with customer basic needs. Prepare timely and accurate bills and ensure efficient collection of revenues.

Employee and Leadership: Retain a workforce that is adaptive, safe working and motivated. Establish a participatory, collaborative organization dedicated to continual learning and improvement. Ensure employee institutional knowledge is retained and improved upon over time. Strives to create a well-coordinated management team. Practice appropriate human resource management and development methods.

Operational Optimization: Ensure cost-effective and reliable, performance improvements in all facets of LCs operations. Minimizes resource use, loss, and impacts from day-to-day operations.

Financial Viability: Understand the full life-cycle cost of the utility and establish and maintain an effective balance between long-term debt, asset values, operations and maintenance expenditures, and operating revenues. Ensures water tariffs are adequate to recover O&M costs. Understand the condition of and costs associated with critical infrastructure assets. Assure asset repair, rehabilitation, and replacement efforts are coordinated within the community to minimize disruptions and other negative consequences.

Operational Resiliency: Ensures utility leadership and staff work together to anticipate and avoid problems. Prepare Business Continuity scenarios and plans.

To this end it is recommended that TA packages covering sound utility management practices be implemented in the very early stages of post conflict. The package should consist of:

- Preparation of a Utility Management Training intervention including learning materials, intervention evaluation criteria, and follow-up strategies;
- Training and coaching sessions with senior LC, branch office, utility managers and line supervisors for the preparation of agile business continuity plans
- Monitoring and comprehensive training evaluations:
 - at the point of delivery;
 - determining learning that took place;
 - changes in behaviour; and
 - performance in the work place.

Level of effort: 150 person days

Estimated cost: \$140 – 160,000 US

5. LC Training Role

Apart from increasing the capacity of the LCs governance and management team, the organisations themselves will need to enhance their training function within the HR management unit. This function should not be focused on presenting and/or delivering training interventions, but more on the tasks that are allied to planning, arranging, coordinating and evaluating training interventions given by training providers and the respective impacts on performance.

It is recommended that TA packages covering the organisation and operationalisation of a training function be implemented in the very early stages of post conflict. The package should consist of:

- Development of operational frameworks for a training function;
- Training and coaching sessions in developing competencies in training needs assessments, plans and objectives, outlines and evaluations;
- Launching a reporting mechanism that provides the necessary feedback on the training function performance.

Level of effort: 60 person days

Estimated cost: \$ 60 – 75,000 US

Technical Co-Operation (TC) Institutional Aspects

1. Introduction

To enable the LCs, branch offices and associated utilities to start operational beginnings in a post-conflict environment, the governance and the management teams need to look at the means of stabilizing the LCs and making them more resilient to impromptu changes.

Apart from coaching and training which will provide capacity building for the individuals, organisational development activities will provide the capacity development needs of the LCs themselves. In most instances, an organisational change in the various LCs, branch offices and utilities referenced in the Stage I report will necessitate a review of the business procedures and processes, in terms of:

- regulations, guidelines, policies and strategies;
- management practices and accountabilities;
- financial planning, asset management, accounting principles, procurement and contract management;
- administrative records and archives,
- human resource policies and procedures;
- O & M procedures and processes;
- commercial operations, customer service/care, billing and collection methods and processes.

2. Institutional Summary

The institutional data, information, conclusions and recommendations from the Stage One report are summarized in Table 1.2 in order to present the following:

- A big picture of the organisational development (OD) issues that the LCs, branch offices and utilities need to address;
- Eliminating the duplication of conclusions and recommendations for each entity from the stage I report.

In the following table the left-hand column lists the types of OD tasks envisaged for each LC, branch office or utility. Each task is appropriately assigned to a given LC, branch office or utility by a triangular symbol. Special notations are made in the right hand column such as Aden LC has two Management Boards, why? Ibb LC has a major issue with the location of the current Wastewater Treatment Plant, what option could be available?

Each set of tasks would constitute a required level of effort to be able to establish a complete picture of the circumstances that were and are in place at the various LCs, branch offices and utilities. The level of effort will also indicate, depending on the implementing agency, the financial requirements to conduct the work.

Short-term conceptual technical assistance packages can be formulated as an integral part of Stage Three tasks.

Activities/ Interventions	Local Corporations, Branch Offices and Associated Utilities																Comments					
	Abyan LC	Aden LC	Amran LC	Dhamar LC	Hadramout LC	Al Shehr utility	Hajjah LC	Abs Br. Office	Harad Br. Office	Kahlan Afar Br Off	Mabian Br. Office	Houdaydah LC	Zabid Utility	Al Mansouriah Ut.	Bajil Utility	Bait Al Faqih Ut.		Ibb LC	Lahij LC	Sa'ada LC	Sana'a LC	Taiz LC
Assess Management Board/BoD, Advisory Committee policies, procedures, activities, actions and degree of accountability.	▲	▲			▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		▲	▲	▲	▲	Determine rationale for two management boards in Aden
Determine how and if Strategic and Business Planning procedures and processes are prepared.	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	Including Business Continuity and Resumption Planning
Review the Financial Planning & Management system; assess the methods used in the institutions accounting practices.	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲			▲	▲	▲	▲	
Determine how assets are managed & if a GIS system is used.	▲	▲	▲	▲	▲	▲						▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	
Appraise the Billing & Collections systems and processes – identify constraints.	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	Identify software used for billing
Assess how the customer service/care function was and is operating.	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	Complaints – How are they recorded and resolved
Assess Meter Reading & Logistics management, identify constraints.	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	Identify how meters are read – visual, or electronic
Evaluate the Human Resource Planning, Management and Training policies, procedures, activities, and identify constraints.	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	
Identify staffing numbers and positions, review justifications particularly management positions.	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	
Evaluate the operational capacity in water supply system.	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	
Evaluate operational management capacity operating the wastewater collection and treatment system.		▲			▲		▲					▲					▲		▲	▲	▲	Identify possible options for Ibb WWTP
Determine if zone management & supply scheduling are used.	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	
Assess the O&M management, procedures and processes.	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	
Review the Non-Revenue Water practices and procedures and identify any corrective actions.	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	
Determine what Alternative Energy strategies could be implemented.	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	
Identify what health & safety policies and procedures are in place.	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	
Approximate Level of Effort (person days) anticipated to perform tasks for each LC.	15	20	15	15	20			30						30			10	12	15	20	20	

▲ = Applicable to that particular LC, Branch Office or Utility ^ = Options for relocation of WWTP

Building & Structure Damages

1. Introduction

An assessment of the damages to buildings and structures resulted in a very wide variation of responses from LCs, branch offices and associated utilities. In trying to summarize those various reports, data and information and yet retain a workable situation gave rise to a series of tables.

Each table, which represents an LC, its branch offices and/or its associated utilities contains the areas of damage and quantifiable indicators (additional details will be made available for Stage III work) for conceptual plans to be developed within the context of Stage Three tasks.

Where data and information are missing or incomplete, a scenario for further assessment or validation has been recommended.

Types of **Buildings and Structures** included in the tables are:

- | | |
|-------------------------------------|-------------------------------------|
| ■ Main HQ Office Buildings | ■ Workshops |
| ■ Additional Administrative Offices | ■ Laboratory |
| ■ Branch Offices | ■ Guard Rooms |
| ■ Stores Buildings | ■ Pumping Stations |
| ■ Generator Hangars | ■ Reservoirs |
| | ■ Wastewater Treatment Plants/Ponds |

2. ABYAN LC

Table 2.1 Listing of Building and Structure data and information received, what is missing and the conclusions drawn.

Abyan LC Buildings and Structures	Main Office Building (1)	Pumping Stations	Reservoirs (3)	Conclusion for Part A Stage Three Scenario
Completely Destroyed	Yes	No	Yes	<p>With the amount of missing data with which to formulate any type of redevelopment programme and/or cost estimate, an appropriate scenario at this time is as follows:</p> <p>A Technical Assistance package be formulated to conduct a fact-finding estimation/appraisal of the LCs buildings and structures situation. This option takes into account the age of the damages and the fact that operations have continued without a permanent LC office building since 2011. The fact-finding appraisal shall pay particular attention to:</p> <ul style="list-style-type: none"> ■ Determining where and how many of the current staff are working and what office and/or workshop and stores facilities are being used; ■ Identifying how are the O & M operations functioning and what buildings are they using; ■ Estimating, based on information and/or plans of the original main office building, ■ Identifying the office equipment and furnishings, computers, printers, supplies and materials that are needed, ■ Determining the approximate size of the original three reservoirs and explore what possibilities may exist for future construction methods in making them less visible (sunken in the ground); ■ Examining the security fencing and gates to pumping stations and reporting the extent of damage and determining if it needs to be replaced or repaired.
Partial Damage (percentage)	No	No	No	
Building/Structure size and construction type	N	n/a	n/a	
No. of Floors/Levels	N	n/a	n/a	
Functions Performed in the building/structure	N	n/a	n/a	
No. of rooms in the building or structure	Y	N	n/a	
No. of Windows, sizes, and frame material	N	N	n/a	
No. of persons to be working in building or structure	N	N	n/a	
No. of standard doors, sizes and door and frame material	N	N	n/a	
No. of overhead doors, sizes and door material	n/a	N	n/a	
No. & type of stores shelving & bins	n/a	n/a	n/a	
No. of Workshop work stations	n/a	n/a	n/a	
No. of facilities for lifting gear	n/a	n/a	n/a	
No. of Workshop Pits	n/a	n/a	n/a	
Reservoir ground level or raised	n/a	n/a	N	
Reservoir construction material – steel or concrete	n/a	n/a	N	
Laboratory venting system	N	n/a	n/a	
Laboratory work benches – work stations	N	n/a	n/a	
No. and type of property gates	N	N	N	
Length and type of property fence	N	N	N	
No. & type of property lights	N	N	N	
No. & size of treatment ponds	n/a	n/a	n/a	

N = Missing Data; Y = Data on File; n/a = Not Applicable

Level of effort: 15 person days

3. ADEN LC

Table 3.1 Listing of Building and Structure data and information received, what is missing and the conclusions drawn.

Aden LC Buildings and Structures	New Office Building	Old Office Building	Stores (6)	Albarzakh Pumping Station & Warehouse	Reservoirs (10)	Laboratory – water	Laboratories – sewerage	Wastewater Treatment Plant/ Ponds	Sewerage Pumping Stations (conflicting numbers)	Conclusion for Part A Stage Three Scenario
Completely Destroyed	No	No	No	No	Yes 2	Yes	Yes	No	?	With a considerable amount of missing data and damage reports, an appropriate scenario at this time is as follows:
Partial Damage (percentage)	Yes	Yes	Yes	Yes	Yes 8	No	Yes	No	?	
Building/Structure size, capacity and construction type	N	N	N	Y	Y	Y	N	No damage reported	N	<p>It is recommended that a TC package be formulated to conduct a two prong approach. One approach would be fact-finding activities for damaged facilities with little or no details and the second approach would be a verification/appraisal approach for those buildings and structures with documented detail. The fact-finding approach shall pay particular attention to:</p> <ul style="list-style-type: none"> ■ Determining where and how many of the current stores staff are working, where they are located and what materials and supplies are on hand. If the six stores buildings are completely destroyed what type of building is being used currently; ■ A number of reservoirs that are identified as being partially damaged; where are they located, are they still functioning, if not, why? what is the extent of the damage and can they be repaired effectively; ■ A number of sewerage pumping stations that are identified as being either destroyed or partially damaged; where are they located, are they still functioning, if not, why? what is the extent of the damage and can they be repaired effectively or do they need replacing; ■ Examining the security fencing, lighting and gates issues in all locations and reporting the extent of damage and determining if it needs to be replaced or repaired. <p>The verification/appraisal approach will review the details provided and prepare a checklist of verifications. In addition a number of small to medium investment packages will be developed at the conceptual level.</p>
No. of Floors/Levels	Y	N	N	Y	n/a	Y	Y		N	
Functions Performed in the building/structure	N	N	n/a	n/a	n/a	Y	Y		n/a	
No. of rooms in the building or structure	N	N	N	Y	n/a	N	N		N	
No. of Windows, sizes, and frame material	Y	N	N	Y	n/a	Y	N		N	
No. of persons to be working in building or structure	N	N	N	Y	n/a	Y	N		N	
No. of standard doors, sizes and door and frame material	Y	N	N	Y	n/a	Y	N		N	
No. of overhead doors, sizes and door material	n/a	n/a	N	N	n/a	n/a	n/a		N	
No. & type of stores shelving & bins	n/a	n/a	N	n/a	n/a	n/a	n/a		n/a	
No. of Workshop work stations	n/a	n/a	n/a	N	n/a	n/a	n/a		N	
No. of facilities for lifting gear	n/a	n/a	N	N	n/a	n/a	n/a		N	
No. of Workshop Pits	n/a	n/a	n/a	n/a	n/a	n/a	n/a		n/a	
Reservoir ground level or raised	n/a	n/a	n/a	n/a	Y	n/a	n/a		n/a	
Reservoir construction material – steel or concrete	n/a	n/a	n/a	n/a	N	n/a	n/a		n/a	
Laboratory venting system	n/a	n/a	n/a	n/a	n/a	Y	N		n/a	
Laboratory work benches – work stations	n/a	n/a	n/a	n/a	n/a	Y	N		n/a	
No. and type of property gates	N	N	N	Y	N	N	N	N		
Length and type of property fence	N	N	N	Y	N	N	N	N		
No. & type of property lights	N	N	N	N	N	N	N	N		
No. & size of treatment ponds	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		

N = Missing Data; Y = Data on File; n/a = Not Applicable

Level of effort: 20 person days

4. HAJJAH LC

Table 4.1 Listing of Building and Structure data and information received, what is missing and the conclusions drawn.

Hajjah LC and Branch Office Buildings and Structures	Abs Branch Office Building	Harad Branch Office Building	Abs Stores	Harad Stores	Abs Workshop	Harad Workshop	Harad Pumping Station	Abs Reservoirs (2)	Harad Reservoir	Conclusion for Part A Stage Three Scenario
Completely Destroyed	Yes	No	Yes	Yes	Yes	?	?	Yes	?	<p>With the amount of missing data with which to formulate any type of redevelopment programme and cost estimates, an appropriate scenario at this time is seen as follows:</p> <p>It is recommended that a TC package be formulated to conduct a fact-finding estimation/appraisal of the LCs buildings and structures situation. This option takes into account the misleading information on buildings being stolen and the absence of any details (dimensions, number of floors, construction types, reservoir construction (metal or concrete) etc. The fact-finding appraisal shall pay particular attention to:</p> <ul style="list-style-type: none"> ■ Determining where and how many of the current staff are working and what office facilities in Abs branch are being used; ■ Estimating, based on information and/or plans of the Abs branch original main office building, the size and type of a building required to accommodate current functions and number of staff; ■ Identifying the office equipment and furnishings, computers, printers, supplies and materials that are needed, ■ Determining the approximate size of the original reservoir No. 1 in Abs branch and explore what possibilities may exist for future construction methods in making them less visible (sunken in the ground); ■ Clarifying the pumping station damage or existence situation in Harad branch; ■ Examining the security fencing and gates to pumping stations and reporting the extent of damage and determining if it needs to be replaced or repaired; ■ Clarifying the damage to the main office building in Harad branch; ■ Determining what has happened to the workshops in both Abs and Harad branches; were they destroyed, damaged or stolen.
Partial Damage (percentage)	No	Yes	No	No	No	?	?	Yes	?	
Building/Structure size, capacity and construction type	N	N	N	N	N	N	N	N	N	
No. of Floors/Levels	N	N	n/a	n/a	n/a	n/a	N	n/a	n/a	
Functions Performed in the building/structure	N	N	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
No. of rooms in the building or structure	N	N	N	N	N	N	N	n/a	n/a	
No. of Windows, sizes, and frame material	N	N	N	N	N	N	N	n/a	n/a	
No. of persons to be working in building or structure	N	N	n/a	n/a	N	N	N	n/a	n/a	
No. of standard doors, sizes and door and frame material	N	N	N	N	N	N	N	n/a	n/a	
No. of overhead doors, sizes and door material	n/a	n/a	N	N	N	N	N	n/a	n/a	
No. & type of stores shelving & bins	n/a	n/a	N	N	n/a	n/a	n/a	n/a	n/a	
No. of Workshop work stations	n/a	n/a	n/a	n/a	N	N	n/a	n/a	n/a	
No. of facilities for lifting gear	n/a	n/a	N	N	N	N	N	n/a	n/a	
No. of Workshop Pits	n/a	n/a	n/a	n/a	N	N	n/a	n/a	n/a	
Reservoir ground level or raised	n/a	n/a	n/a	n/a	n/a	n/a	n/a	N	N	
Reservoir construction material – steel or concrete	n/a	n/a	n/a	n/a	n/a	n/a	n/a	N	N	
Laboratory venting system	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Laboratory work benches – work stations	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
No. and type of property gates	N	N	N	N	N	N	N	N	N	
Length and type of property fence	N	N	N	N	N	N	N	N	N	
No. & type of property lights	N	N	N	N	N	N	N	N	N	
No. & size of treatment ponds	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	

N = Missing Data; Y = Data on File; n/a = Not Applicable

Level of effort: 15 person days

5. LAHIJ LC

Table 5.1 Listing of Building and Structure data and information received, what is missing and the conclusions drawn.

Lahij LC Buildings and Structures	Main Office Building (3)	Stores (3)	Pumping Station (3)	Reservoirs (4)	Conclusion for Part A Stage Three Scenario
Completely Destroyed	No	No	No	No	<p>It is recommended that a TC package be formulated to conduct a fact-finding estimation/appraisal of the LCs buildings and structures situation. This option takes into account the lack of information on buildings and the absence of any details (dimensions, number of floors, construction types, reservoir construction (metal or concrete) etc. The fact-finding appraisal shall pay particular attention to:</p> <ul style="list-style-type: none"> ■ Determining where and how many of the current staff are working and what office facilities in Lahij are being used; ■ Clarifying the damage to the main office buildings; ■ Identifying the office equipment and furnishings, computers, printers, supplies and materials that are needed, ■ Determining the damage to the four reservoirs and explore what possibilities may exist for repair or restoration; ■ Clarifying the pumping station damage; ■ Examining the security fencing and gates to pumping stations and reporting the extent of damage and determining if it needs to be replaced or repaired; ■ Determining what has happened to the workshops.
Partial Damage (percentage)	Yes	Yes	Yes	Yes	
Building/Structure size, capacity and construction type	N	N	N	N	
No. of Floors/Levels	N	n/a	n/a	n/a	
Functions Performed in the building/structure	N	n/a	n/a	n/a	
No. of rooms in the building or structure	N	n/a	N	n/a	
No. of Windows, sizes, and frame material	N	N	N	n/a	
No. of persons to be working in building or structure	N	n/a	n/a	n/a	
No. of standard doors, sizes and door and frame material	N	N	N	n/a	
No. of overhead doors, sizes and door material	n/a	N	n/a	n/a	
No. & type of stores shelving & bins	n/a	N	n/a	n/a	
No. of Workshop work stations	n/a	n/a	n/a	n/a	
No. of facilities for lifting gear	n/a	N	N	n/a	
No. of Workshop Pits	n/a	n/a	n/a	n/a	
Reservoir ground level or raised	n/a	n/a	n/a	N	
Reservoir construction material – steel or concrete	n/a	n/a	n/a	N	
Laboratory venting system	n/a	n/a	n/a	n/a	
Laboratory work benches – work stations	n/a	n/a	n/a	n/a	
No. and type of property gates	N	N	N	N	
Length and type of property fence	N	N	N	N	
No. & type of property lights	N	N	N	N	
No. & size of treatment ponds	n/a	n/a	n/a	n/a	

N = Missing Data; Y = Data on File; n/a = Not Applicable

Level of effort: 15 person days

6. SA'ADA LC

Table 6.1 Listing of Building and Structure data and information received, what is missing and the conclusions drawn.

Sa'ada LC Buildings and Structures	Main Office Building	Stores	Generator Buildings	Pumping Station	Reservoirs	Conclusion for Part A Stage Three Scenario
Completely Destroyed	No	Yes	Yes	Yes	Yes	<p>It is recommended that a TC package be formulated to conduct an estimation/appraisal of the LCs buildings and structures situation. This option takes into account the detailed data that is available. The estimation/appraisal shall pay particular attention to:</p> <ul style="list-style-type: none"> ■ Determining the extent of the partial damage to the main office building; ■ Identifying any office equipment and furnishings, computers, printers, supplies and materials that are needed, ■ Examining options for Generator hangar buildings with estimated costs; ■ Examining the extent of the damage to all pumping stations; ■ Review the diesel and water tank damage and look at possible options for improving the security factor (less obvious sunken tanks) of the structures; ■ Review alternate energy sources (solar/wind) for use with pumping stations.
Partial Damage (percentage)	Yes	No	No	No	No	
Building/Structure size, capacity and construction type	N	Y	Y	Y	Y	
No. of Floors/Levels	N	n/a	n/a	n/a	n/a	
Functions Performed in the building/structure	N	n/a	n/a	n/a	n/a	
No. of rooms in the building or structure	N	n/a	n/a	n/a	n/a	
No. of Windows, sizes, and frame material	N	N	N	N	n/a	
No. of persons to be working in building or structure	N	N	N	N	n/a	
No. of standard doors, sizes and door and frame material	N	N	N	N	n/a	
No. of overhead doors, sizes and door material	n/a	N	N	N	n/a	
No. & type of stores shelving & bins	n/a	N	N	N	n/a	
No. of Workshop work stations	n/a	n/a	N	n/a	n/a	
No. of facilities for lifting gear	n/a	n/a	N	n/a	n/a	
No. of Workshop Pits	n/a	n/a	N	n/a	n/a	
Reservoir ground level or raised	n/a	n/a	n/a	n/a	Y	
Reservoir construction material – steel or concrete	n/a	n/a	n/a	n/a	Y	
Laboratory venting system	n/a	n/a	n/a	n/a	n/a	
Laboratory work benches – work stations	n/a	n/a	n/a	n/a	n/a	
No. and type of property gates	N	N	N	N	N	
Length and type of property fence	N	N	N	N	N	
No. & type of property lights	N	N	N	N	N	
No. & size of treatment ponds	n/a	n/a	n/a	n/a	n/a	

N = Missing Data; Y = Data on File; n/a = Not Applicable

Level of effort: 12 person days

7. SANA'A LC

Table 7.1 Listing of Building and Structure data and information received, what is missing and the conclusions drawn.

Sana'a LC Buildings and Structures	Main Office Building	Workshop	Stores	Generator Buildings	Pumping Station	Reservoirs	Conclusion for Part A Stage Three Scenario
Completely Destroyed	No	No	No	No	No	Yes	<p>It is recommended that a TC package be formulated to conduct a two prong approach. One approach would be fact-finding activities for damaged facilities with little or no details and the second approach would be a verification/appraisal approach for those buildings and structures with documented detail. The fact-finding approach shall pay particular attention to:</p> <ul style="list-style-type: none"> Review the window and door damage extent situation in all building and structures Determining where and how many of the current stores are working, where they are located and what materials and supplies are on hand. If the stores buildings are damaged what type of building is being used where only doors and windows are damaged; Review the wastewater treatment plant circumstances as no damage report in terms of buildings and structures was presented; <p>The verification/appraisal approach will review the details provided and prepare a checklist of verifications such as: Location; Building or structure function; Extent of damage; Type and location of damage in the building or structure; Number of windows & external doors and their size, type of material; Extent of internal facilities of a structural nature and the internal situation in the laboratory.</p>
Partial Damage (percentage)	Yes	No	Yes	Yes	Yes	No	
Building/Structure size, capacity and construction type	Y	n/a	N	n/a	n/a	Y	
No. of Floors/Levels	Y	n/a	n/a	n/a	n/a	n/a	
Functions Performed in the building/structure	N	n/a	n/a	n/a	n/a	n/a	
No. of rooms in the building or structure	N	n/a	N	n/a	n/a	n/a	
No. of Windows, sizes, and frame material	Y	n/a	Y	Y	Y	n/a	
No. of persons to be working in building or structure	N	n/a	N	n/a	n/a	n/a	
No. of standard doors, sizes and door and frame material	Y	n/a	Y	n/a	n/a	n/a	
No. of overhead doors, sizes and door material	n/a	n/a	n/a	n/a	n/a	n/a	
No. & type of stores shelving & bins	n/a	n/a	n/a	n/a	n/a	n/a	
No. of Workshop work stations	n/a	n/a	n/a	n/a	n/a	n/a	
No. of facilities for lifting gear	n/a	n/a	n/a	n/a	n/a	n/a	
No. of Workshop Pits	n/a	n/a	n/a	n/a	n/a	n/a	
Reservoir ground level or raised	n/a	n/a	n/a	n/a	n/a	Y	
Reservoir construction material – steel or concrete	n/a	n/a	n/a	n/a	n/a	Y	
Laboratory venting system	n/a	n/a	n/a	n/a	n/a	n/a	
Laboratory work benches – work stations	n/a	n/a	n/a	n/a	n/a	n/a	
No. and type of property gates	N	n/a	N	N	n/a	N	
Length and type of property fence	N	n/a	N	N	n/a	N	
No. & type of property lights	N	n/a	N	N	n/a	N	
No. & size of treatment ponds	n/a	n/a	n/a	n/a	n/a	n/a	

N = Missing Data; Y = Data on File; n/a = Not Applicable

Level of effort: 20 person days

8. TAIZ LC

Table 8.1 Listing of Building and Structure data and information received, what is missing and the conclusions drawn.

Taiz LC Buildings and Structures	Main Office Building	Water & Sanitation Bldg	First Zone Admin Bldg	Second Zone Admin Bldg	Third Zone Admin Bldg	Workshop	Stores Hangar	Guarding Rooms	Pumping Stations	Laboratory	Reservoirs	Wastewater Treatment Ponds/Plant	Conclusion for Part A Stage Three Scenario
Completely Destroyed	No	Yes 25%	No	No	Yes	50%	No	No	No	Yes	No	No	With the amount of missing data with which to formulate any type of redevelopment programme and cost estimates, an appropriate scenario at this time is seen as follows:
Partial Damage (percentage)	Yes	Yes 75%	Yes	Yes	No	50%	Yes	Yes	Yes	No	Yes	Yes	
Building/Structure size, capacity and construction type	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	N	<p>It is recommended that a TC package be formulated to conduct a fact-finding estimation/appraisal of the LCs buildings and structures situation. This option takes into account the misleading information on buildings being stolen and the absence of any details (dimensions, number of floors, construction types, reservoir construction (metal or concrete) etc. The fact-finding appraisal shall pay particular attention to:</p> <ul style="list-style-type: none"> ■ Determining where and how many of the current staff are working and what office facilities in Abs branch are being used; ■ Estimating, based on information and/or plans of the Abs branch original main office building, the size and type of a building required to accommodate current functions and number of staff; ■ Identifying the office equipment and furnishings, computers, printers, supplies and materials that are needed, ■ Determining the approximate size of the original reservoir No. 1 in Abs branch and explore what possibilities may exist for future construction methods in making them less visible (sunken in the ground); ■ Clarifying the pumping station damage or existence situation in Harad branch; ■ Examining the security fencing and gates to pumping stations and reporting the extent of damage and determining if it needs to be replaced or repaired; ■ Clarifying the damage to the main office building in Harad branch; ■ Determining what has happened to the workshops in both Abs and Harad branches; were they destroyed, damaged or stolen.
No. of Floors/Levels	Y	Y	Y	Y	N	N	n/a	n/a	n/a	N	n/a	N	
Functions Performed in the building/structure	N	N	N	N	N	n/a	n/a	n/a	n/a	n/a	n/a	N	
No. of rooms in the building or structure	N	N	N	N	N	N	N	N	N	N	n/a	N	
No. of Windows, sizes, and frame material	Y	Y	Y	Y	N	N	Y	Y	Y	N	n/a	N	
No. of persons to be working in building or structure	N	N	N	N	N	N	N	N	N	N	n/a	N	
No. of standard doors, sizes and door and frame material	Y	Y	Y	Y	N	N	Y	Y	Y	N	n/a	N	
No. of overhead doors, sizes and door material	n/a	n/a	n/a	n/a	n/a	N	N	n/a	N	n/a	n/a	N	
No. & type of stores shelving & bins	n/a	n/a	n/a	n/a	n/a	n/a	N	n/a	n/a	n/a	n/a	n/a	
No. of Workshop work stations	n/a	n/a	n/a	n/a	n/a	N	n/a	n/a	n/a	n/a	n/a	n/a	
No. of facilities for lifting gear	n/a	n/a	n/a	n/a	n/a	N	n/a	n/a	n/a	n/a	n/a	N	
No. of Workshop Pits	n/a	n/a	n/a	n/a	n/a	N	n/a	n/a	n/a	n/a	n/a	N	
Reservoir ground level or raised	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	N	n/a	
Reservoir construction material – steel or concrete	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	N	n/a	
Laboratory venting system	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	N	n/a	n/a	
Laboratory work benches – work stations	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	N	n/a	n/a	
No. and type of property gates	N	N	N	N	N	N	N	N	N	N	N	N	
Length and type of property fence	N	N	N	N	N	N	N	N	N	N	N	N	
No. & type of property lights	N	N	N	N	N	N	N	N	N	N	N	N	
No. & size of treatment ponds	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	

N = Missing Data; Y = Data on File; n/a = Not Applicable

Level of effort: 20 person days

Published by
Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

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Photo
Cover page: © GIZ/Amal Al-Kibsi

Design and layout
Eva Hofmann, Katrin Straßburger, W4 Büro für Gestaltung, Frankfurt

As at
August 2016

GIZ is responsible for the content of this publication.

On behalf of
Federal Ministry for Economic Cooperation and Development (BMZ)

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