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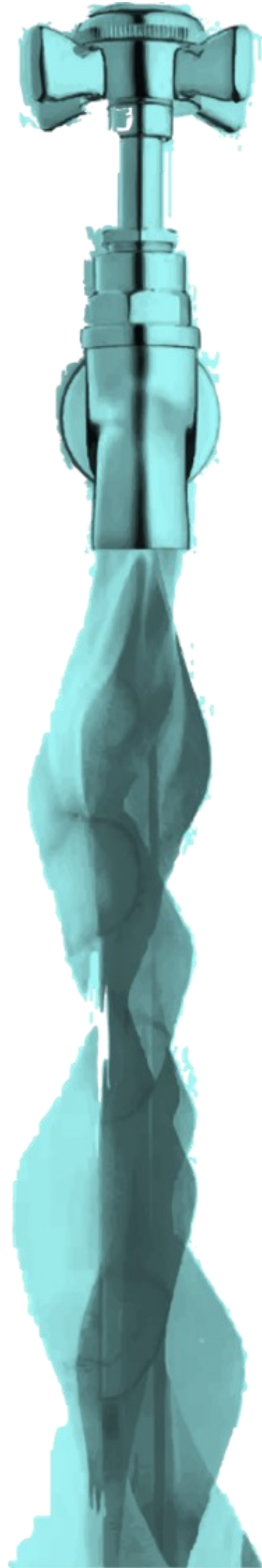
# Resilience - Oriented Indicators Overview

## Yemen Water Sector Performance Indicators

of The Water and Sanitation Local Corporations in  
Aden, Sana'a, Ibb, Taiz, Hodeidah, Dhamar, Mukalla and Seyoun

4<sup>th</sup> Quarter

October–December 2021



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## List of Abbreviation

<b>BOD</b>	Biological Oxygen Demand
<b>GIZ</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
<b>GIZ-IDWS</b>	GIZ project 'Institutional Development of the Water Sector'
<b>LCs</b>	Water Supply and Sanitation Local Corporations
<b>MWE</b>	Ministry of Water and Environment
<b>NWRA</b>	National Water Resource Authority
<b>PDA</b>	Personal Digital Assistant
<b>WASH</b>	Water, Sanitation and Hygiene
<b>WWTPs</b>	Wastewater Treatment Plant





# 1 Overview

The urban population in Yemen is supplied with drinking water through multiple water supply systems. Most systems are public and managed through the Water and Sanitation Local Corporations (LCs) and their affiliated Water Utilities (WUs) and branch offices. Other systems are private, like water tanker suppliers. Sewerage networks are available and cover only a certain percentage of the population. All LCs differ significantly in terms of size, organizational setup, and operating environments. However, they all share one major challenge—that is, expanding access to appropriate levels of services to their growing urban populations.

Since 2015, the situation in Yemen has been drastically exacerbated by the conflict and its repercussions. As a result, the LCs are operating under different institutional, administrative, operational, and financial conditions. They encounter several challenges in securing an enabling environment for service quality improvement, cost recovery, and financial sustainability. In addition, network rehabilitation and extension projects funded by the government and/or donor organizations have been suspended or completely terminated due to the protracted crisis.

Given the significant impact of water and wastewater services on the population's life and public health, ensuring financial sustainability and good service quality is crucial. Hence, the LCs ability to provide acceptable services depends on a range of factors, such as adequate infrastructure, access to energy and consumables, qualified personnel, and efficient financial and performance-oriented management. Likewise, the current situation confirms that conflict and fragility can be extremely disruptive to these interrelated elements and that the quality of service delivery could be degraded to a point of no return or perpetuate a 'vicious cycle' of managerial, financial, and operational deficiencies, which, in due course, leads to customers' dissatisfaction with the services they receive, and low revenue collection due to their unwillingness to pay for those services, which, sooner or later, undermines the resilience of the service delivery and providers.

One of the utmost consequences of poor sanitation and low access to clean drinking water have had catastrophic hygiene and health effects by forcing most of the urban population to rely on unsecured alternative water supplies, making them susceptible to water-borne diseases. The outbreak of cholera, on the other hand, has placed a burden on the social responsibility and mandate of the LCs. Yemen also reported its first case of COVID-19 in April 2020, and the severity of the current response to COVID-19 posed grave detrimental impacts on WASH service provision and sustainability, which are vital to disease prevention and core to survival and protection. To confront and mitigate further severity of pandemics, the Yemen WASH Cluster and the other humanitarian societies have mobilized all possible resources to support the resilience of the LCs with urgent operational measures to secure the continuity of safe drinking water supply and wastewater treatment.

Improving the performance of LCs is challenging because the problems they face are multidimensional. Problems associated with dysfunctional and intricate business processes cannot be overcome solely by short-term emergency measures. Achieving resilient and sustained service delivery requires a framework that integrates institutional measures with short/mid/long-term investments to shift from crisis management to strategic and performance improvement planning.





## Performance Monitoring Methodology

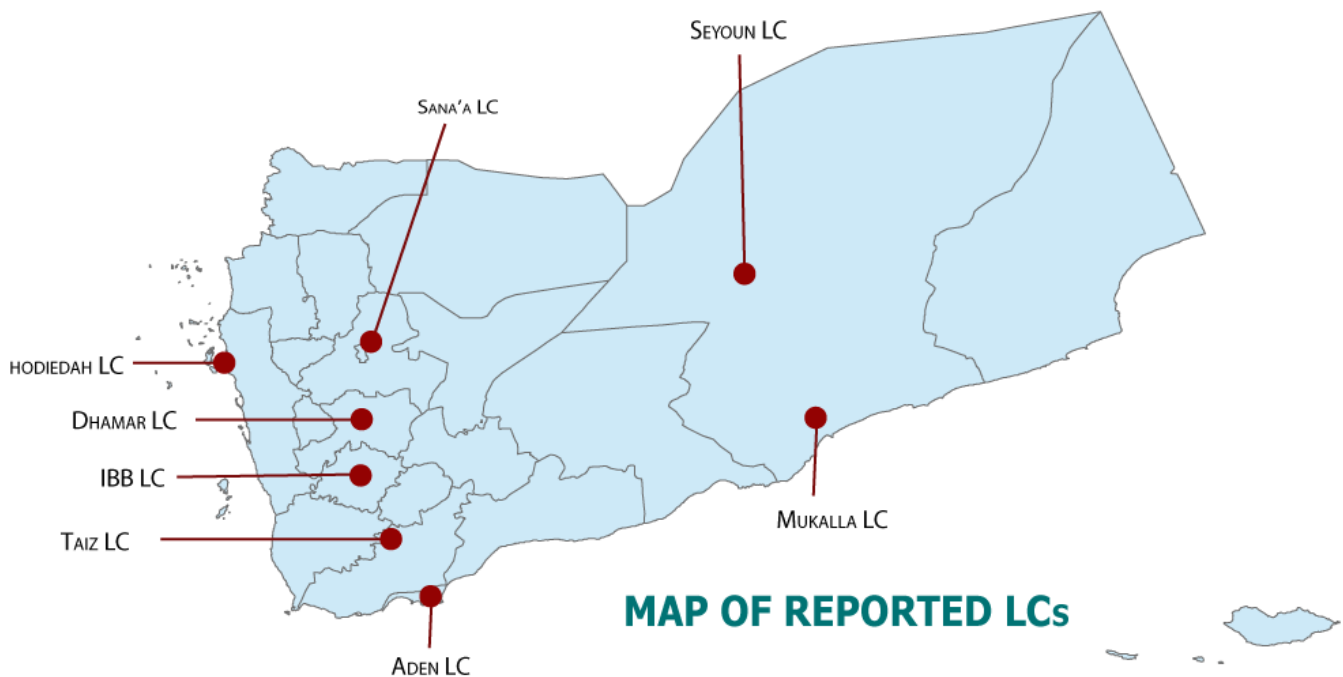
Since the conflict broke out in late March 2015, the Ministry of Water and Environment (MWE) with the assistance of the GIZ Water Sector Program (GIZ-IDWS), has initiated a quarterly-basis performance monitoring reports of 5 selected LCs serving in metropolitan cities of Sana'a, Aden, Taiz, Hodeidah and Ibb, including three additional LCs (Mukalla, Seyoun, and Dhamar) that have been recently included in the monitoring process as of 2021.

These reports are based on performance indicators (PIs) that are commonly used for the urban water sector to assess the systems in terms of efficiency and effectiveness and are oriented on the guidelines of the 'Performance Indicators for Water Supply Services - Manual of Best Practice Series' of the International Water Association (IWA). The conceptual structure of the monitoring is divided into four indicator groups: Quality of service, technical, operational, and financial performance.

In view of the given conflict situation in Yemen, 23 indicators were selected that allow a cross-comparison between the LCs according to the availability of data. In addition, further reviews were integrated in 2019, summing up from 23 to 39 resilience-oriented PIs adapted to fit with the contextual situation, and

monitoring purposes and constitute a valuable reference for the evaluation of performance and the impact of relevant sector interventions.

This report covers the period from October to December 2021, together with a brief technical analysis of key indicators on different indicator groups of performance of each reported LC. The reporting exercise should not be perceived only as unilateral monitoring by GIZ-IDWS. The process was carried out with data submitted and signed by the LCs' management through appointed focal points. Many clarifications were sought on the data provided, especially for consistency and reliability of data and indicators. In some instances, estimates were given by the LCs in the absence or lack of systematic information. Nevertheless, the GIZ-IDWS team made every effort to improve data quality by validation, analysis, and subsequently, reviewing the results, if necessary, with the LCs for further quality assurance; thus, the data finally presented is the best that could be obtained in the circumstances. The data variables obtained after this quality review and used to determine the PIs can be viewed in the table in the *Annex 1 Resilience Emergency Indicators Sheet*.





## Emergency Water Sector Performance Indicators

A broad range of indicators was selected on the basis of their usefulness in capturing resilience performance differences in the key priority themes of the urban water sector. However, it was necessary to translate them into corresponding performance categories and indicators as shown below:



### a. Service Coverage, Service Levels and Quality - Piped Water Supply

1. Total population in service area (capita)
2. Number of IDPs in service area (capita)
3. Number of water connections (No.)
4. Number of population served through water supply network (capita)
5. Water supply service coverage = population served through water supply network vs total population in service area (%)
6. Number of service days of piped water supply
7. Number of residual chlorine samples taken (No./month)
8. Number of residual chlorine samples according to standards (No./month)
9. Proportion of bacteriological quality samples of distributed water according to standards = Number of residual chlorine samples according to standards per total number of samples taken (%)



### b. Service Coverage and Quality - Sewerage

10. Number of population served with sewerage connections (capita)
11. Number of sewerage connections (No.)
12. Sewerage connection coverage = population served through sewerage network vs total population in service area (%)
13. Number of BOD-samples of effluent of WWTP taken per month (No./month)
14. Number of BOD-samples of effluent of WWTP according to standards per month (No./month)
15. Proportion of effluent quality samples of wastewater treatment plants according to standards = Number of BOD samples according to standards per total number of samples taken (%)
16. Average BOD value of raw influent at WWTP (mg BOD<sub>5</sub>/l)
17. Average BOD value of treated effluent at WWTP (mg BOD<sub>5</sub>/l)
18. Treatment efficiency of WWTP regarding



### c. Production and consumption

19. Total quantity of water produced (/month)
20. Per capita quantity of water produced (l/cap/day)
21. Storage capacity (m<sup>3</sup>)
22. Storage capacity share per capita (l/cap)
23. Energy costs per m<sup>3</sup> water produced (YER/)
24. Effluent produced (m<sup>3</sup>/month)
25. Effluent produced (l/cap/day)
26. Effluent treated in wastewater treatment plant (m<sup>3</sup>/month)



### d. Performance of Pumps and Generators

27. Total number of main pumps for the water supply system (No.)
28. Number of functional pumps in service (No.)
29. Number of working hours of all operating pumps of the water supply system (h/month)
30. Number of main functional pumps failures due to technical reasons (No./month)
31. Number of working generators in the operation of pumps (No.)
32. Number of working hours of all operating generators used to run the functional pumps of the water supply system (h/month)



### e. Financial Sustainability

33. Total collected operational revenues (YER/month)
34. Total billed operational revenues (YER/month)
35. Total operational costs (YER/month)
36. Collection efficiency = Collected revenues vs.
37. Actual operational cost coverage (%)
38. Monthly governmental subsidies (YER/month)
39. Percentage of basic monthly salaries paid (%)



# 4 Technical Analysis

## a. Service Coverage, Service Levels and Quality - Piped Water Supply

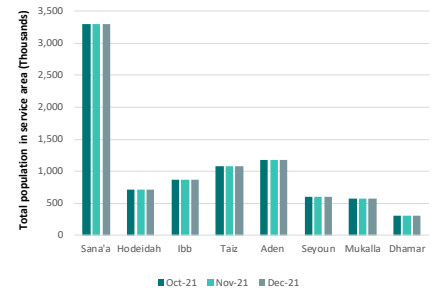
### Water supply service coverage

The service coverage (%) indicator aims to demonstrate the physical water accessibility of the resident population that are connected to the distribution system, expressed as a percentage of the total population in the served area. Its evaluation usually depends on whether the population data are up-to-date and accurate, therefore the estimation is relatively easy if the LC has a good record of customers. However, it must be stressed that this procedure is accompanied by high uncertainties. Since accurate records of connections (e.g., household, commercial, industrial) to the water system typically transform into inhabitants using average household dimension. This is particularly problematic in regions with significant fluctuations of population or a lack of data availability.

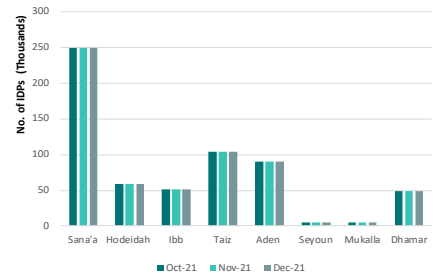
With an average estimate of 55% of the total urban population in the service area of the reported LCs being connected to the public water supply network. However, the most positive tendency remains at the LC of Aden, which has reached the metering level of 85%. Also, improvement of this indicator is seen at the LC of Seyoun 74% (+%). The other LCs serve 60–70% of the residents, namely, Ibb, Dhamar, Hodeidah, and Mukalla. Sana'a is the area with the lowest coverage (34%) whereas Taiz LC reported 52%, claiming to serve households other than those registered customers. It is also interesting to look at the total population in the LCs (Figure 1). Although Sana'a has the lowest service coverage, it is home to by far the largest number of people. Moreover, the three LCs with the lowest service coverage rates are also those with the highest average number of residents per household, Ibb (15 persons/household), Sana'a (12 persons/household), and Taiz (10.5 persons/household). Which means that an increase in connection rates has an exponential impact on the number of people with water access.

The massive influx of internally displaced persons (IDPs; Figure 2) seeking safe areas and shelters in recent years has exacerbated the burden on the LCs to adequately comply with both humanitarian aid efforts and residents' pressing water demands. This is one of the reasons why the coverage figures derived must be seen not as representative but as an orientation, since exact data on the number of inhabitants cannot always be collected. For LCs without data, estimates were made based on values from previous years, considering average population growth. Efforts made by other actors to address service coverage gaps have centered on urgent operation and maintenance (O&M) supplies, with little attention given to rehabilitation or building new infrastructure. However, estimates of finance requirements for water and sanitation expansion point to large funding gaps, and the economic returns appear unattractive for private sector investments. Meanwhile, this encouraged the business of other service providers (such as water trucks) to flourish in tandem or the form of substitutes for the LCs.

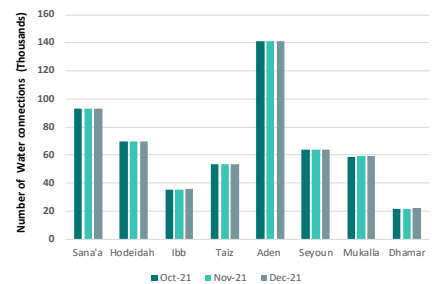
1. Total population in service area (capita)



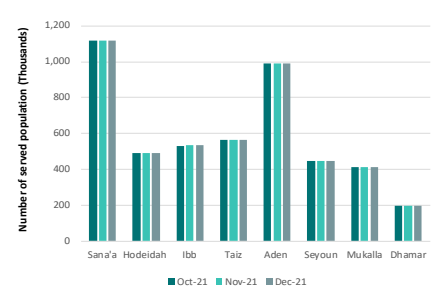
2. Number of IDPs in service area (capita)<sup>1</sup>



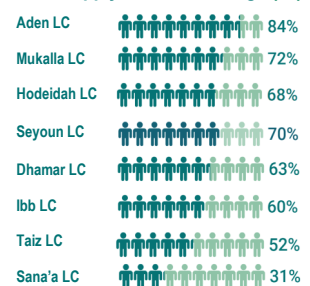
3. Number of water connections (No.)



4. Number of population served through water



5. Water supply service coverage (%)



1. Yemen HNO population dataset, 2021 (<https://data.humdata.org/dataset/yemen>)

### Number of service days of piped water supply

The scarcity of water resources in some areas is one of the reasons water supply susceptible to poorly fulfilling the pressing demands of the served customers. LCs of Sana'a and Taiz, hereby, have the lowest water supply frequency maintained on average at approximately 2-3 times a month. In areas where water supply is maintained on weekly basis, LCs of Mukalla, Ibb and Dhamar are struggling to optimize the services with an average of 10 days per month or at an average rate of two days per week across all served areas. The best performance in terms of supply duration compared to others belongs to the LCs of Aden, Seyoun, and Hodeidah, with an average supply of 30 days per month.

Customers served by intermittent systems are generally not satisfied with the amount of water they receive. Consequently, they try to maximize the amount they draw from the system during supply periods. The amount customers are able to collect depends on their localized pressure conditions. This puts those who are located far away from the main pipelines or at higher altitudes in the service area at a disadvantage. Customers collect and store water when the supply is on to meet their demand through the off-hours. When the supply cycle is short, the majority of customers pursue to draw their entire water demand within this very short period. This results in larger than expected flows in the pipes, causing high pressure losses, which result in low pressures at customers' end connections.

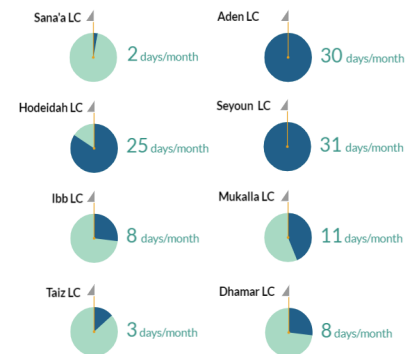
To respond as best they can to satisfy their needs. Customers incur a range of so-called coping costs to deal with interrupted water supply. These costs can relate to the purchase of facilities such as additional tanks to store water, domestic pumps because of low pressures, or the need to purchase alternative water supplies (e.g., private sector). Since the poorest customers can least afford such facilities, they are likely to be disproportionately affected by poor access to the public network.

### Bacteriological quality samples of distributed water

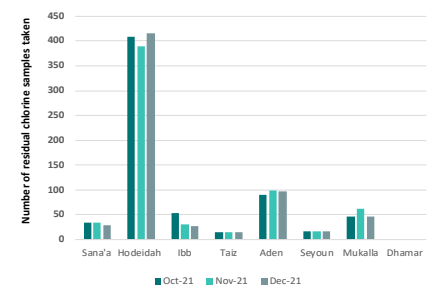
One of the most important indicators of the LCs' performance is undoubtedly the quality of drinking water, which has a special importance as it is directly linked with the consumer's health. Within the framework of performance analysis, this report concentrates on key parameter to evaluate the safety of drinking water supply: compliance with bacteriological and residual chlorine standards. Moreover, it is a priority for the LCs that appropriate procedures are put in place to keep customers informed about the quality of their water supplies in general and to alert them to any particular risk of contamination. There also needs to be reassurance that the procedures for sampling and water quality testing are in line with good practices.

In this quarter, most LCs have shown compliance with bacteriological quality standards of approximately 100% as of Sana'a, Hodeidah, Seyoun, and Aden, and an average of 87% for LCs of Ibb and Mukalla. As for other LCs, Taiz LC has reported 82% despite the water quality treatment facilities (laboratories and equipment) being demolished during the armed clashes in the city and managed to conduct water sample tests either in the labs owned by the National Authority of Water Resources (NWRA Taiz branch) or in Ibb LC. As for Dhamar LC, no data was reported, and this indicates either a lack of infrastructure or routine measurement.

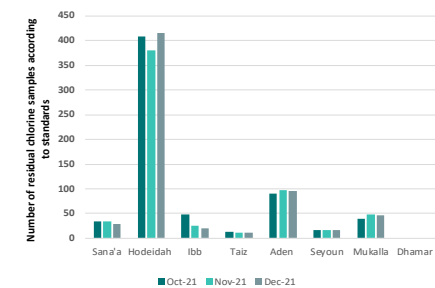
### 6. Number of service days of piped water supply per month (day/month)



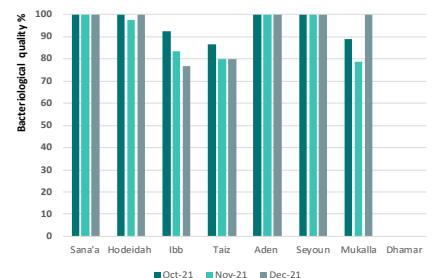
### 7. Number of residual chlorine samples taken (No./month)



### 8. Number of residual chlorine samples according to standards (No./month)



### 9. Proportion of bacteriological quality samples of distributed water according to standards = Number of residual chlorine samples according to standards per total number of



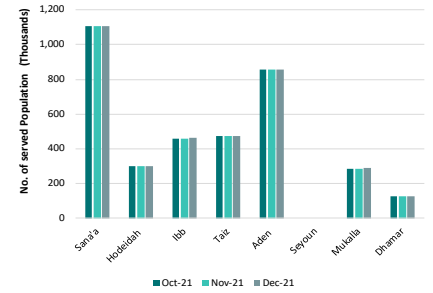
## b. Service Coverage and Quality - Sewerage

During this quarter, the reported LCs maintained almost the same sewerage coverage level, with an average of 45% as in the previous quarters of 2022. The remaining population discards their waste in privately owned cesspits, and it is filtered and absorbed by the soil or pumped out with vacuum trucks, either by the LC or by the private sector without the approved technical standards.

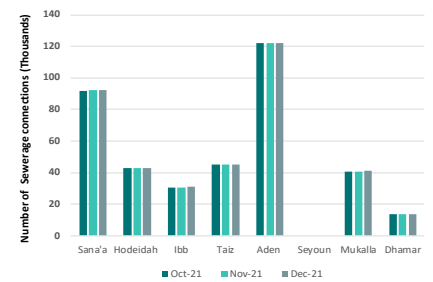
Given high urbanization rates, lack of investment for sewer network expansion and infrastructure rehabilitation, etc. All are representing critical factors that constrain the LCs' ability to effectively collect, treat, dispose and/or reuse wastewater. It is also evident that the amount of sewage that is collected by some Wastewater Treatment Plants (WWTPs) is higher and beyond the design capacity. Therefore, WWTP failures effectively mean that sewage effluent is being discharged without proper treatment into open areas, waterways, and irrigation fields, constituting obvious health risks to residents and huge affected areas.

To demonstrate the wastewater treatment efficiency of the WWTPs, this report depends on the BOD<sub>5</sub> (a measure of organic pollution) of wastewater, since the majority of the WWTPs' laboratories are either not equipped or limited to measure all test parameters. Additionally, the increase in BOD<sub>5</sub> concentration is an evident implication of water scarcity and low production and supply frequency. In this quarter, the BOD<sub>5</sub> samples tested according to standards by the WWTPs of Sana'a, Hodeidah and Dhamar are 100%, and the treatment efficiency of effluent ranges from 70-86% on average. As for the WWTPs of Aden, Mukalla and Taiz, there have long been no tests for BOD<sub>5</sub> since the laboratories are damaged or out of operation (lacking the requisite equipment and materials).

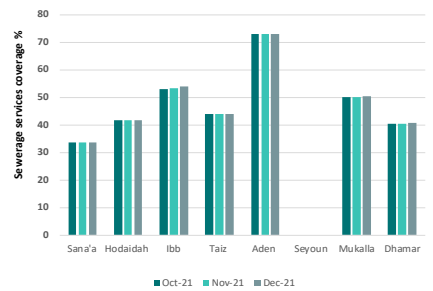
10. Number of population served with sewerage connections (capita)



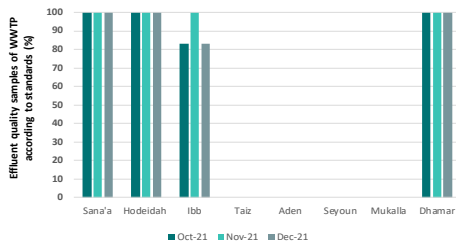
11. Number of sewerage connections (No.)



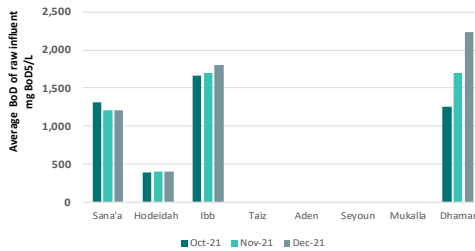
12. Sewerage connection coverage (%)



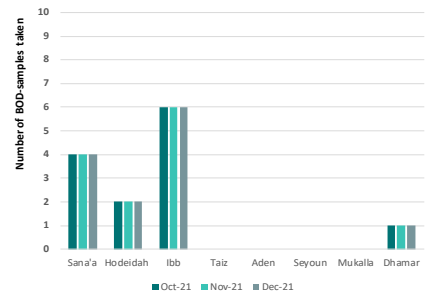
15. Proportion of effluent quality samples of wastewater treatment plants according to standards %



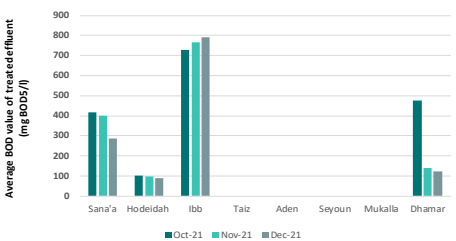
16. Average BOD value of raw influent at WWTP (mg BOD<sub>5</sub>/l)



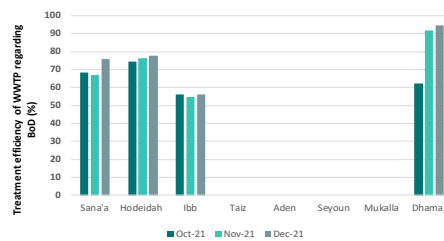
13. Number of BOD-samples of effluent of WWTP taken per month (No./month)



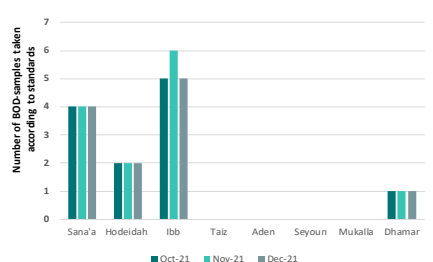
17. Average BOD value of treated effluent at WWTP (mg BOD<sub>5</sub>/l)



18. Treatment efficiency of WWTP regarding BOD<sub>5</sub> (%)



14. Number of BOD-samples of effluent of WWTP according to standards per month (No./month)





### c. Production and Consumption

The production indicators have been used to measure the average daily share per person 'l/c/d' of the total water supplied for distribution. Therefore, the adequacy of demand management as well as the possibility of expanding coverage depends on the availability of sufficient water production capacity in the service area relative to the resident population.

As reported in this quarter, there are significant variations in the amount of water supplied by LCs, which ranges from a minimum of 7 to 132 l/c/d. In southern LCs, the average daily share reached 114 l/d for each person connected in the service area. On the other end, the LCs of Hodeidah and Dhamar have the highest rates in the northern areas with an average of 95 and 54 l/c/d respectively, while Sana'a and Ibb have the lowest at ~ 30 l/c/d, although the situation in Taiz is rather more alarming with an average of 7 l/c/d. These results may undoubtedly be contemplated due to a lack of local water resources and inadequate operating and production capabilities.

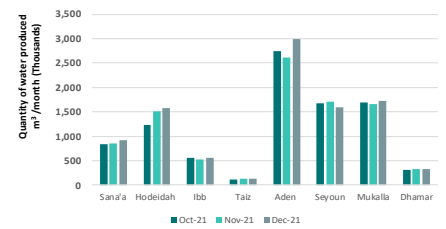
The storage capacity of functional reservoirs indicates sufficient shares per capita with an average of 93 l/cap in the LCs of Aden and Dhamar, including Taiz (with consideration of current supply capacity). Other LCs like Sana'a, Seyoun and Mukalla range from 26-34 l/cap and attention is required to Ibb LC, suffering from acute storage capacity, with 8 liters per capita per day. In this regard, the LCs must plan for the rehabilitation and/or expansion of the storage facilities to secure storage and production capacity, frequent demand for water supply, and the ability to respond effectively to urgent circumstances.

#### Energy costs per m<sup>3</sup> water produced<sup>4</sup>

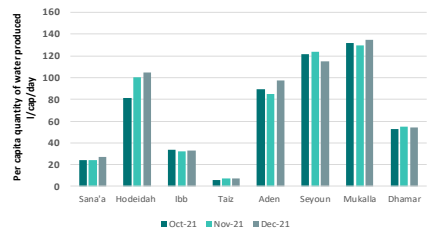
costs incurred by the LCs from those subsidized by the humanitarian organizations. The LCs were, therefore, requested to split and report their energy cost accounts without computing the cost of subsidized fuel as operating costs. For instance, energy costs account for 0% of the total operating costs in the LCs of Taiz and Hodeidah LCs, since fuel is regularly supplied and paid for via the UNICEF.

As a result of the fluctuant supply of fuel subsidies by the international community, several LCs have become largely self-reliant and are forced to shoulder more running costs in addition to other financial obligations. However, depending on the dynamic market prices of fuel in every region, some LCs have recorded substantial variations in energy costs per m<sup>3</sup> of water produced, such as in the LCs of Seyoun and Mukalla with an average of 50 YER/m<sup>3</sup> compared to Ibb and Aden (average 133 YER/m<sup>3</sup>) and Sana'a and Dhamar (average 215 YER/m<sup>3</sup>).

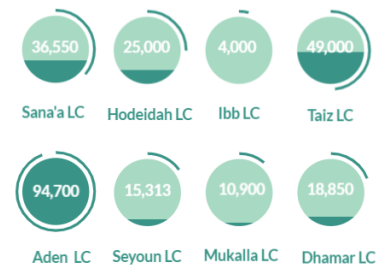
19. Total quantity of water produced (l/ month)<sup>2</sup>



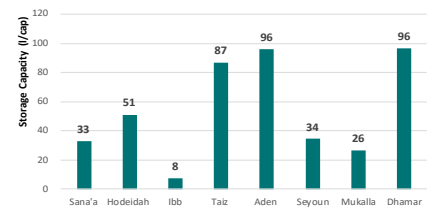
20. Per capita quantity of water produced (l/cap/ day)<sup>3</sup>



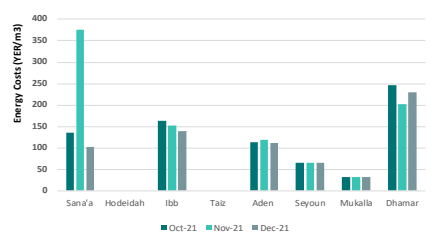
21. Storage capacity (l)



22. Storage capacity share per capita (l/cap)



23. Energy costs per m<sup>3</sup> water produced (YER/m<sup>3</sup>)



2. The water quantity represents the production, not the billed water.

3. The calculation of per capita share of the water produced is based on LCs figures. The water supply provided by the private sector and/or humanitarian agencies was not monitored by the LCs and hence was not calculated in this report.

4. 1 Euro € ≈ 683 YER

1 US \$ ≈ 579 YER (September, 2021)

Source: InfoEuro (<http://ec.europa.eu/budget/graphs/infoeuro.html>)

### Effluent treated in the WWTPs

The treatment efficiency of generated effluent varies among the LCs and depends on the WWTP types and various stages of treatment for processing wastewater before disposal. Additionally, the available figures regarding the inflowing wastewater were estimated by the LCs since all the installed flow meters are either damaged or dysfunctional.

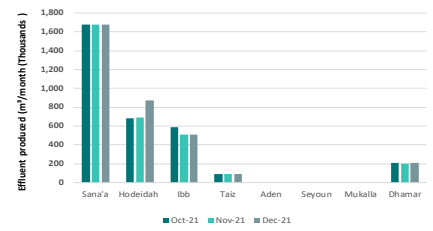
In this quarter, the WWTPs of Sana'a, Hodeidah, Dhamar and Taiz have processed almost 98% of the produced effluent with an average of 51, 83, 55 and 6 l/cap/day respectively. The existing capacity of Ibb WWTP is 5,300 m<sup>3</sup>/day of sewage collection with an average effluent generation of 17,900 m<sup>3</sup>/day, presenting about 70% overload and 57% efficiency of effluent treatment.

The WWTP labs of Aden and Mukalla LCs are out of service, causing the entire termination of regular measurement of treated wastewater and efficiency. Anyhow, mapping existing WWTP operations and particular processes is crucial to outline the current performance and identify the appropriate rehabilitation measures.

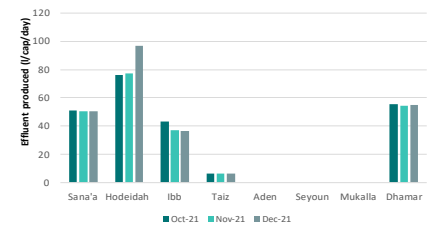
#	WWTP	No. of WWTP	Nominal WWTP capacity m <sup>3</sup> /day	Effluent produced m <sup>3</sup> /day (Q4 2021)	Treatment system
1	Sana'a WWTP	2	50,500	56,000	Activated sludge
2	Ibb WWTP	1	5,300	17,901	Activated sludge
3	Hodeidah WWTP	1	54,000	25,056	Stabilization pond
4	Taiz WWTP	1	17,000	3,000	Oxidation pond
5	Aden WWTP	3	110,000	NA	Stabilization pond
6	Mukalla WWTP	1	15,000	NA	Bio-oxidation pond
7	Seyoun WWTP	Under Construction			
8	Dhamar WWTP	1	12,000	6,833	Stabilization pond

Treatment systems and capacity of the WWTPs

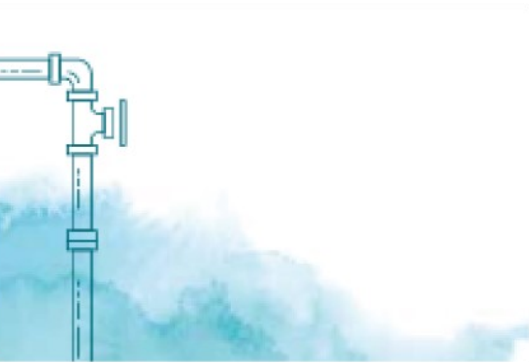
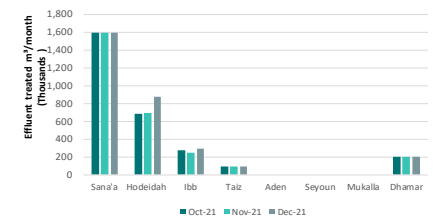
### 24. Effluent produced (m<sup>3</sup>/month)



### 25. Effluent produced (l/cap/day)



### 26. Effluent treated in wastewater treatment plant (m<sup>3</sup>/month)



### d. Performance of pumps and generators

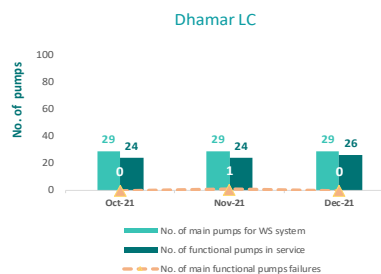
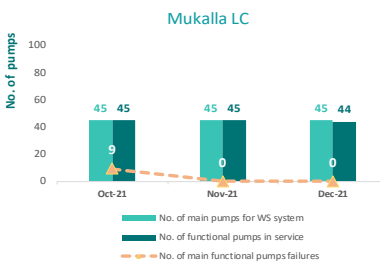
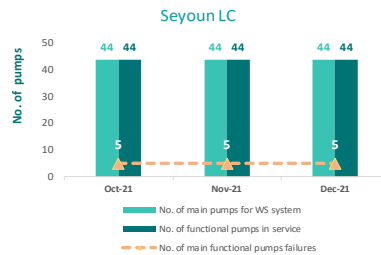
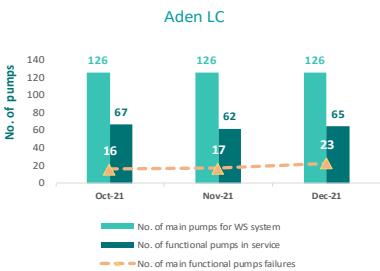
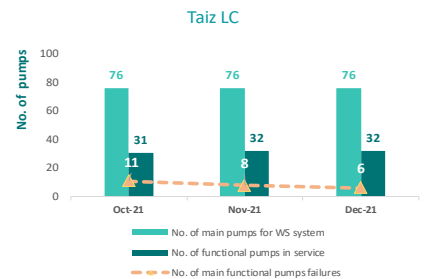
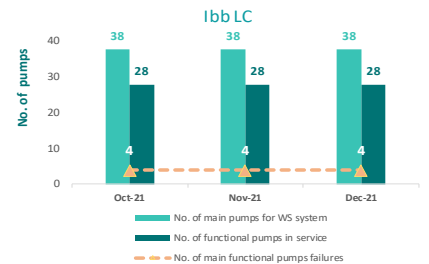
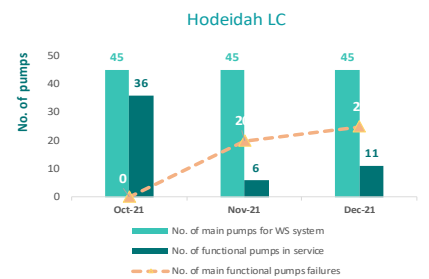
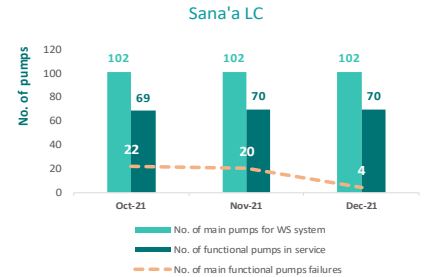
Most LCs have attempted with external fuel subsidies to overcome the power shortage by deploying additional electric generators to maintain the water supply. At the same time, full dependence on standby power has taxed excessive operating expenses beyond the LCs' financial capabilities. The solar water pumping system, on the other hand, has been a paradigm shift in recent years, successfully deployed in some areas to relieve stressful operational costs while generating questions about the future implications of renewable energy use on the local water resources.

Due to a lack of maintenance and frequent pump failures, the majority of LCs were unable to sustain effective pumping operations. In general, the LCs of Seyoun and Mukalla have sustained 100% of their main pumps, followed by the LCs of Sana'a, Hodeidah, Dhamar, Ibb and Aden with an average ranging from 40 to 85%. Due to the safe access and other operational constraints, Taiz LC was unable to considerably improve water production by running just 32 out of 76 of the total main pumps.

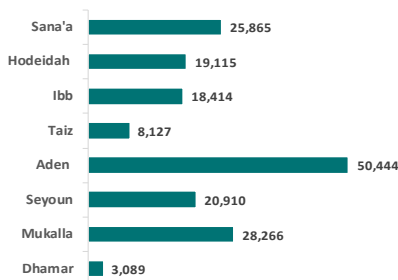
27. Total number of main pumps for the water supply system (No.)<sup>5</sup>

28. Number of functional water pumps in service (No.)

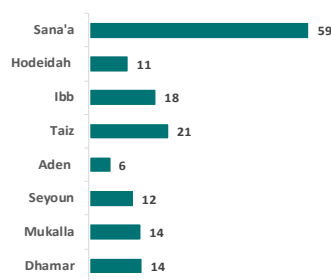
29. Number of main functional pump failures due to technical reasons (No./month)



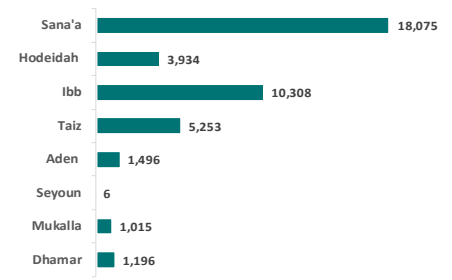
30. Number of working hours of all operating pumps of the water supply system (h/month)



31. Number of working generators in the operation of pumps (No.)



32. Number of working hours of all operating generators (h/month)



5. The number of pumps represent the pumps in well fields and pumping stations.

### e. Financial Viability

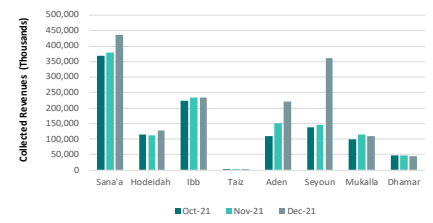
The LCs are typically aware of the distinctions between billing the customers and getting paid. Most of the blame for poor collection efficiency goes to the customers, but the LCs also have responsibility for inadequate services, delayed or incorrect billings, poor customer relation, and belated efforts to collect overdue accounts. Likewise, most of the LCs bear high revenue expenditure due to high operation and maintenance costs of providing the service, while there is low revenue income; hence, cost recovery is low.

As a consequence of ongoing efforts to improve their financial resources, the LCs of Seyoun and Ibb have the highest efficiency in collection rates at an average of 110% and 83%, respectively. For the majority of other LCs, the collection efficiency fluctuates between 30% and 65%, with declined performance observed by Aden LC in this quarter, while the recurring scenario of poor collection efficiency (2%) by Taiz LC openly reveals collapsing management of customers and revenues under the pretext of security unrest in the city.

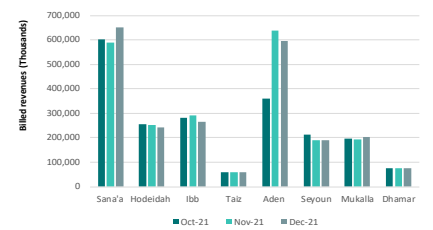
The cost coverage varies significantly in this quarter among the LCs due to differences in operating contexts and various factors contributing to unsatisfactory financial management, such as improper tariff structures and abnormally high energy and staff expenditure. The LC with the best performance is Ibb, where the O&M coverage is at an average of 90%. The results achieved by the LCs of Sana'a, Seyoun, Dhamar, and Hodeidah revealed an average cost coverage of 64% and have ranked these LCs in distress to cover their operating costs. Even though energy and labor costs are heavily subsidized, the LCs of Aden and Taiz continued to be among the worst performers, with averages of 18% and 1%.

These findings seem to indicate that the LCs in question must devote further efforts to improving collection efficiency and tariff structure, as well as reducing water losses and O&M expenses, as a means of achieving financial resilience.

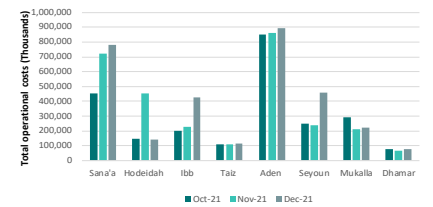
33. Total collected operational revenues (YER/month)<sup>6</sup>



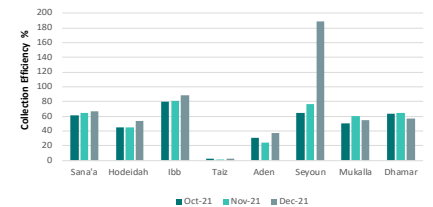
34. Total billed operational revenues (YER/month)



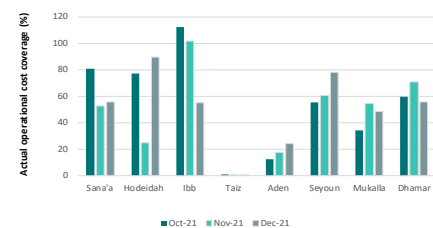
35. Total operational costs (YER/month)



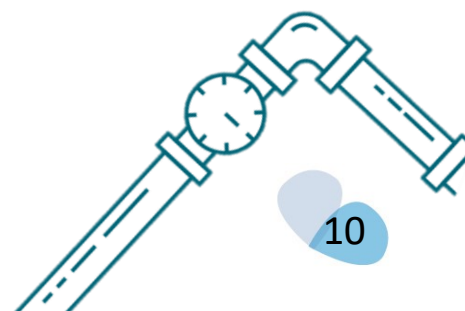
36. Collection efficiency = Collected revenues vs. Billed revenues (%)



37. Actual operational cost coverage (%)



6. Revenues including domestic, commercial & governmental collection



### Monthly governmental subsidies

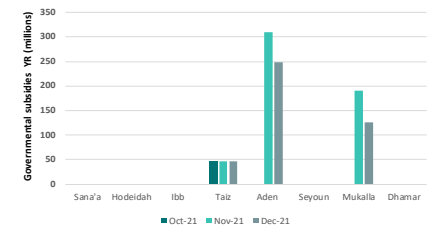
Given the deteriorating economic and financial conditions, the investment support from the government has dropped dramatically since 2015. The LCs of Aden, Mukalla and Taiz are amongst a few public institutions receiving regular monthly allocations in kind of financial subsidies from the Ministry of Finance in Aden to pay basic staff salaries. The other LCs depend merely on water sales.

### Percentage of basic monthly salaries paid

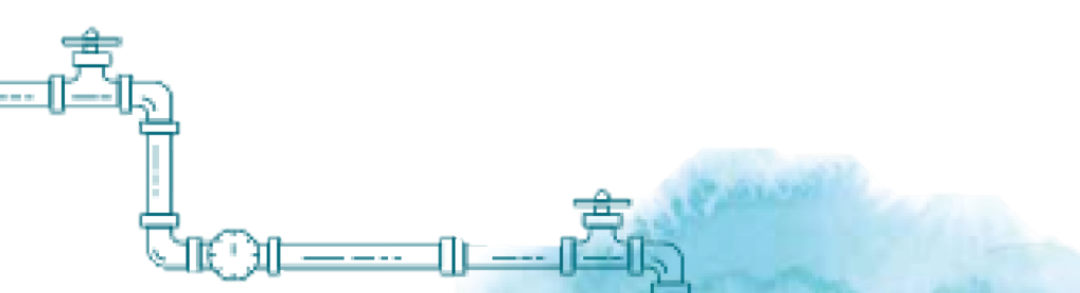
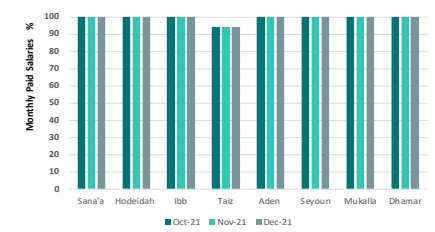
The eventual impact of external support and subsidies has gradually empowered the LCs in managing the salary expenses of employees. It should be noted that payroll is reported for the actual payments received monthly by the employees, regardless of the fact that some LCs reimburse late payments of the basic salaries retroactively.

Though most of the LCs were capable of paying 100% of the base salaries in this quarter, they were frequently in profound distress and vulnerable to securing the salaries and other heavy entitlements under volatile conditions and unpredictable continuity of external assistance.

38. Monthly governmental subsidies (YER/month)



39. Percentage of basic monthly salaries paid (%)





## 5 Resilience factors<sup>7</sup>

Disruptions of water supply and sanitation services can be caused by adverse effects on any one of the components that make up the service: people (e.g., skilled staff), hardware (e.g., infrastructure, equipment), and consumables (e.g., fuel, equipment, spare parts). None of these components are sufficient on their own. Indeed, it is moot to have the spare parts required to repair electric generators, for instance, if the only technical staff able to install them lacks the necessary capacities and skills.

The LCs must increasingly strive to become more resilient and maintain services during and post-conflict. Therefore, they must address long-standing vulnerabilities to mitigate the cumulative effects of the conflict and gradually reduce their dependence on short-term external assistance.

At present, external assistance programs, instead of sporadic crisis interventions, must seek to intervene in technical and investment measures. While these interventions may be essential during relief efforts, the resumption and strengthening of the LCs' capacity are synonymous with building resilience. The resilience allows the LCs to maintain the reliable delivery of services in the short, medium, and long term. The table beside presents the identified resilience factors with their expected impact after implementing related activities.

Main Activity	Resilience Factor	Impact
Technical Assistance – Capacity building	Improve governance and management skills on top level.	<ul style="list-style-type: none"> <li>Support and guide the LC management during the crisis in the decision making of required actions and measures.</li> <li>Enable managers and key staff to prepare and introduce customized policies and procedures to increase the performance of the utility.</li> <li>Enhance the coordination and cooperation among the different stakeholders (donors).</li> <li>Enhance monitoring, evaluation and accountability of the LC to increase the performance.</li> </ul>
Technical Assistance – Capacity building, Financial support, Consultancy support, equipment support	Enhance the work capacity and skills of the employees. Human resource development	<ul style="list-style-type: none"> <li>Operate the utility more efficient and organized.</li> <li>Improve coordination and cooperation among different departments.</li> <li>• Improve and increase the service for customers.</li> <li>• Manage professionally the exceptional work. Environment and the new technologies.</li> <li>• Reduce administrative water losses and increase revenue collection.</li> </ul>
Technical Assistance – Financial support, Awareness building; Coaching, Investments	Strengthen the financial capacity of the utility.	<ul style="list-style-type: none"> <li>Ensure financial means at least to cover the minimum needs for operation of the utility.</li> <li>Enable urgently needed repair and maintenance of the infrastructure.</li> <li>Initiate pro-poor projects.</li> <li>Keep motivated staff.</li> <li>Enhance financial sustainability.</li> </ul>
Technical Assistance – Awareness building, Operation Management Support	Improve customer management and customer relation.	<ul style="list-style-type: none"> <li>Increase service coverage and numbers of customers.</li> <li>Enhance billing and collection procedures.</li> <li>Increase collection efficiency and revenues.</li> <li>Establish good customer relation to improve payment moral.</li> </ul>
Investment – Rehabilitation, Maintenance, Extension	Increase water service coverage and supplied quantities.	<ul style="list-style-type: none"> <li>Increase water availability for urban residents.</li> <li>Improve water supply condition.</li> <li>Reduce physical water losses.</li> <li>Increase number of customers.</li> <li>Improve water quality.</li> </ul>
Investment – Rehabilitation, Maintenance, Extension	Improve and extend sewer system.	<ul style="list-style-type: none"> <li>Improve hygiene and health situation for urban residents.</li> <li>Protect environment and water sources.</li> <li>Increase number of customers.</li> </ul>
Investment	Provide renewable energy system (Photovoltaic).	<ul style="list-style-type: none"> <li>Operate water and sanitation facilities sufficiently.</li> <li>Operate LC offices during working hours.</li> <li>Reduce operation and maintenance costs.</li> </ul>

# Annex 1 Resilience Emergency Indicators Sheet October–December 2021

Urban Water Sector - Sana'a LC, Aden LC, Hodeidah LC, Ibb LC, Taiz LC, Dhamar LC, Mukalla LC and Seyoun LC

No.	Data / Indicator	LC	Unit	1 <sup>st</sup> Q 2021			2 <sup>nd</sup> Q 2021			3 <sup>rd</sup> Q 2021			4 <sup>th</sup> Q 2021		
				Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
1	عدد السكان في المراكز الحضرية المخدومة من قبل مزود الخدمة (شهري في نهاية الشهر)	Sana'a	No.	3,296,342	3,296,342	3,296,342	3,296,342	3,296,342	3,296,342	3,296,342	3,296,342	3,296,342	3,296,342	3,296,342	3,296,342
		Hodeidah		719,146	719,146	719,146	719,146	719,146	719,146	719,146	719,146	719,146	719,146	719,146	719,146
		Ibb		861,770	861,770	861,770	861,770	861,770	861,770	861,770	861,770	861,770	861,770	861,770	861,770
		Taiz		1,074,748	1,074,748	1,074,748	1,074,748	1,074,748	1,074,748	1,074,748	1,074,748	1,074,748	1,074,748	1,074,748	1,074,748
		Aden		1,170,362	1,170,362	1,170,362	1,170,362	1,170,362	1,170,362	1,170,362	1,170,362	1,170,362	1,170,362	1,170,362	1,170,362
		Seyoun		581,969	583,614	585,258	586,903	588,548	590,192	591,837	593,482	595,126	596,771	598,416	600,061
		Mukalla		554,430	555,916	557,402	560,635	562,681	564,727	566,281	569,388	567,835	570,266	571,752	573,239
		Dhamar		301,920	302,549	303,178	303,807	304,436	305,065	305,694	306,323	306,952	307,581	308,210	308,839
2	عدد النزاحين الى مناطق امتياز مزود الخدمة (شهري في نهاية الشهر)	Sana'a	No.	248,967	248,967	248,967	248,967	248,967	248,967	248,967	248,967	248,967	248,967	248,967	248,967
		Hodeidah		58,386	58,386	58,386	58,386	58,386	58,386	58,386	58,386	58,386	58,386	58,386	
		Ibb		51,117	51,117	51,117	51,117	51,117	51,117	51,117	51,117	51,117	51,117	51,117	
		Taiz		103,698	103,698	103,698	103,698	103,698	103,698	103,698	103,698	103,698	103,698	103,698	
		Aden		89,992	89,992	89,992	89,992	89,992	89,992	89,992	89,992	89,992	89,992	89,992	
		Seyoun		4,538	4,538	4,538	4,538	4,538	4,538	4,538	4,538	4,538	4,538	4,538	
		Mukalla		4,405	4,405	4,405	4,405	4,405	4,405	4,405	4,405	4,405	4,405	4,405	
		Dhamar		48,998	48,998	48,998	48,998	48,998	48,998	48,998	48,998	48,998	48,998	48,998	
3	اجمالي عدد توصيلات المياه في نهاية الشهر - يشمل المنزلي، التجاري، والحكومي وغيره	Sana'a	No.	91,741	91,836	91,933	92,027	92,061	92,128	92,186	92,967	93,029	93,122	93,156	93,192
		Hodeidah		69,454	69,515	69,582	69,624	69,641	69,678	69,714	69,770	69,823	69,863	69,915	69,970
		Ibb		34,290	34,451	34,580	34,680	34,752	34,961	35,068	35,223	35,263	35,351	35,520	35,798
		Taiz		53,602	53,611	53,624	53,640	53,645	53,668	53,674	53,693	53,716	53,721	53,738	53,745
		Aden		140,041	140,167	140,428	140,548	140,548	140,728	140,882	141,092	141,217	141,314	141,390	141,417
		Seyoun		56,889	56,973	57,194	57,421	57,551	61,997	62,728	62,929	63,233	63,539	63,723	63,999
		Mukalla		57,226	57,640	57,859	58,027	58,167	58,430	58,501	58,630	58,803	58,926	59,112	59,245
		Dhamar		21,038	21,157	21,241	21,283	21,289	21,365	21,427	21,506	21,609	21,716	21,847	21,994
4	عدد السكان المخدومين بالمياه من قبل مزود الخدمة (شهري في نهاية الشهر)	Sana'a	No.	1,100,892	1,102,032	1,103,196	1,104,324	1,104,732	1,105,536	1,106,232	1,115,604	1,116,348	1,117,464	1,117,872	1,118,304
		Hodeidah		486,178	486,605	487,074	487,368	487,487	487,746	487,998	488,390	488,761	489,041	489,405	489,790
		Ibb		514,350	516,765	518,700	520,200	521,280	524,415	526,020	528,345	528,945	530,265	532,800	536,970
		Taiz		562,821	562,916	563,052	563,220	563,273	563,514	563,577	563,777	564,018	564,071	564,249	564,323
		Aden		980,287	981,169	982,996	983,836	983,836	985,096	986,174	987,644	988,519	989,198	989,730	989,919
		Seyoun		398,223	398,811	400,358	401,947	402,857	433,979	439,096	440,503	442,631	444,773	446,061	447,993
		Mukalla		400,582	403,480	405,013	406,189	407,169	409,010	409,507	410,410	411,621	412,482	413,784	414,715
		Dhamar		189,342	190,413	191,169	191,547	191,601	192,285	192,843	193,554	194,481	195,444	196,623	197,946
5	نسبة عدد السكان المخدومين بالمياه من قبل مزود الخدمة من اجمالي السكان (شهري في نهاية الشهر)	Sana'a	%	33	33	33	34	34	34	34	34	34	34	34	34
		Hodeidah		68	68	68	68	68	68	68	68	68	68	68	
		Ibb		60	60	60	60	60	61	61	61	61	62	62	62
		Taiz		52	52	52	52	52	52	52	52	52	52	53	53
		Aden		84	84	84	84	84	84	84	84	84	85	85	85
		Seyoun		68	68	68	68	68	74	74	74	74	75	75	75
		Mukalla		72	73	73	72	72	72	72	72	72	72	72	72
		Dhamar		63	63	63	63	63	63	63	63	63	64	64	64

No.	Data / Indicator	LC	Unit	1 <sup>st</sup> Q 2021			2 <sup>nd</sup> Q 2021			3 <sup>rd</sup> Q 2021			4 <sup>th</sup> Q 2021		
				Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
6	عدد ايام تزويد الخدمة خلال الشهر (تزويد المياه من خلال شبكة التوزيع)	Sana'a	No.	2	2	2	2	2	2	2	2	2	2	2	2
		Hodeidah		25	25	25	25	25	25	25	25	25	25	25	25
		Ibb		8	8	8	8	8	8	8	8	10	10	10	10
		Taiz		4	3	2	4	3	4	4	4	4	2	3	3
		Aden		30	30	30	30	30	30	30	30	30	30	30	30
		Seyoun		31	28	31	30	31	30	31	31	30	31	30	31
		Mukalla		13	13	13	11	11	11	11	11	11	11	11	11
		Dhamar		8	8	8	8	8	8	8	8	8	8	8	8
7	اجمالي عدد عينات الكلور المأخوذة من شبكة المياه خلال الشهر	Sana'a	No.	26	39	44	25	47	74	50	24	45	34	34	29
		Hodeidah		464	434	479	450	429	410	399	405	406	409	390	415
		Ibb		75	72	65	77	80	91	88	58	69	52	30	26
		Taiz		15	13	7	14	8	14	15	15	15	15	15	15
		Aden		80	75	90	85	95	85	90	86	92	90	98	96
		Seyoun		16	16	16	16	16	16	16	16	16	16	16	16
		Mukalla		40	25	54	31	30	42	50	46	44	45	61	46
		Dhamar		0	0	0	0	0	0	0	0	0	0	0	0
8	اجمالي عدد عينات الكلور الإيجابية المأخوذة من شبكة المياه والتي تتوافق مع المعايير	Sana'a	No.	26	39	44	25	47	74	50	23	45	34	34	29
		Hodeidah		464	434	479	450	429	410	399	405	406	409	380	415
		Ibb		66	70	58	70	75	80	80	52	58	48	25	20
		Taiz		15	13	7	13	8	12	12	11	14	13	12	12
		Aden		80	75	90	85	95	85	90	86	92	90	98	96
		Seyoun		16	16	16	16	16	16	16	16	16	16	16	16
		Mukalla		38	19	50	27	30	42	48	27	39	40	48	46
		Dhamar		0	0	0	0	0	0	0	0	0	0	0	0
9	درجة نقاوة المياه المزودة بكتريولوجيا	Sana'a	No.	100	100	100	100	100	100	100	96	100	100	100	100
		Hodeidah		100	100	100	100	100	100	100	100	100	100	97	100
		Ibb		88	97	89	91	94	88	91	90	84	92	83	77
		Taiz		100	100	100	93	100	86	80	73	93	87	80	80
		Aden		100	100	100	100	100	100	100	100	100	100	100	100
		Seyoun		100	100	100	100	100	100	100	100	100	100	100	100
		Mukalla		95	76	93	87	100	100	96	59	89	89	79	100
		Dhamar		0	0	0	0	0	0	0	0	0	0	0	0
10	عدد السكان المستخدمين بشبكات الصرف الصحي من قبل مزود الخدمة (شهري في نهاية الشهر)	Sana'a	%	1,090,440	1,093,548	1,095,552	1,097,976	1,098,576	1,100,076	1,101,276	1,102,152	1,103,064	1,104,072	1,104,768	1,106,064
		Hodeidah		298,669	298,942	299,194	299,299	299,369	299,530	299,691	299,957	300,202	300,384	300,615	300,783
		Ibb		437,115	439,770	441,945	443,955	445,050	448,740	451,470	454,920	455,490	457,740	460,500	465,195
		Taiz		473,109	473,162	473,183	473,246	473,246	473,340	473,393	473,487	473,571	473,582	473,687	473,760
		Aden		847,903	848,540	850,115	850,983	850,955	851,802	852,551	853,636	854,308	854,714	855,057	855,239
		Seyoun		-	-	-	-	-	-	-	-	-	-	-	-
		Mukalla		272,174	276,724	277,774	278,488	278,719	280,077	284,305	284,788	285,313	285,551	286,244	287,973
		Dhamar		120,897	121,707	121,932	122,049	122,085	122,670	122,886	123,192	123,876	124,074	124,578	125,289



No.	Data / Indicator	LC	Unit	1 <sup>st</sup> Q 2021			2 <sup>nd</sup> Q 2021			3 <sup>rd</sup> Q 2021			4 <sup>th</sup> Q 2021			
				Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	
11	إجمالي عدد توصيلات الصرف الصحي - يشمل المنزلي، التجاري، والحكومي وغيره	Sana'a	No.	90,870	91,129	91,296	91,498	91,548	91,673	91,773	91,846	91,922	92,006	92,064	92,172	
		Hodeidah		42,667	42,706	42,742	42,757	42,767	42,790	42,813	42,851	42,886	42,912	42,945	42,969	
		Ibb		29,141	29,318	29,463	29,597	29,670	29,916	30,098	30,328	30,366	30,516	30,700	31,013	
		Taiz		45,058	45,063	45,065	45,071	45,071	45,080	45,085	45,094	45,102	45,103	45,113	45,120	
		Aden		121,129	121,220	121,445	121,569	121,565	121,686	121,793	121,948	122,044	122,102	122,151	122,177	
		Seyoun		-	-	-	-	-	-	-	-	-	-	-	-	-
		Mukalla		38,882	39,532	39,682	39,784	39,817	40,011	40,615	40,684	40,759	40,793	40,892	41,139	
		Dhamar		13,433	13,523	13,548	13,561	13,565	13,630	13,654	13,688	13,764	13,786	13,842	13,921	
12	نسبة عدد السكان المخدومين بشبكات الصرف الصحي من قبل مزود الخدمة (شهر في نهاية الشهر)	Sana'a	No.	33	33	33	33	33	33	33	33	33	33	34	34	
		Hodeidah		42	42	42	42	42	42	42	42	42	42	42	42	
		Ibb		51	51	51	52	52	52	52	53	53	53	53	54	
		Taiz		44	44	44	44	44	44	44	44	44	44	44	44	
		Aden		72	73	73	73	73	73	73	73	73	73	73	73	
		Seyoun		-	-	-	-	-	-	-	-	-	-	-	-	
		Mukalla		49	50	50	50	50	50	50	50	50	50	50	50	
		Dhamar		40	40	40	40	40	40	40	40	40	40	40	41	
13	عدد عينات الـ ( بي أو دي ) المجمعة من محطات المعالجة خلال الشهر	Sana'a	No.	4	4	4	4	4	4	4	4	4	4	4	4	
		Hodeidah		6	0	6	6	0	2	2	2	2	2	2	2	
		Ibb		6	6	6	6	6	6	6	6	6	6	6	6	
		Taiz		0	0	0	0	0	0	0	0	0	0	0	0	
		Aden		0	0	0	0	0	0	0	0	0	0	0	0	
		Seyoun		0	0	0	0	0	0	0	0	0	0	0	0	
		Mukalla		0	0	0	0	0	0	0	0	0	0	0	0	
		Dhamar		2	2	2	2	2	2	0	1	1	1	1	1	
14	عدد عينات الـ ( بي أو دي ) المجمعة من محطات المعالجة المطابقة لمعيار التدفق خلال الشهر	Sana'a	No.	4	4	4	4	4	4	4	4	4	4	4	4	
		Hodeidah		6	0	6	6	0	2	2	2	2	2	2	2	
		Ibb		5	5	4	5	5	5	5	5	5	5	6	5	
		Taiz		0	0	0	0	0	0	0	0	0	0	0	0	
		Aden		0	0	0	0	0	0	0	0	0	0	0	0	
		Seyoun		0	0	0	0	0	0	0	0	0	0	0	0	
		Mukalla		0	0	0	0	0	0	0	0	0	0	0	0	
		Dhamar		2	2	2	2	2	2	0	1	1	1	1	1	
15	كفاءة المعالجة في محطات معالجة الصرف الصحي	Sana'a	%	100	100	100	100	100	100	100	100	100	100	100	100	
		Hodeidah		100	-	100	100	-	100	100	100	100	100	100	100	
		Ibb		83	83	67	83	83	83	83	83	83	83	100	83	
		Taiz		-	-	-	-	-	-	-	-	-	-	-	-	
		Aden		-	-	-	-	-	-	-	-	-	-	-	-	
		Seyoun		-	-	-	-	-	-	-	-	-	-	-	-	
		Mukalla		-	-	-	-	-	-	-	-	-	-	-	-	
		Dhamar		100	100	100	100	100	100	-	100	100	100	100	100	

No.	Data / Indicator	LC	Unit	1 <sup>st</sup> Q 2021			2 <sup>nd</sup> Q 2021			3 <sup>rd</sup> Q 2021			4 <sup>th</sup> Q 2021		
				Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
16	متوسط قيمة ال ( بي أو دي ) للمياه المتدفقة (الخام) الى محطة معالجة مياه الصرف الصحي Average BOD value of raw influent at WWTP	Sana'a	No.	1,149	1,101	1,268	1,012	1,264	992	1,013	977	1,113	1,310	1,211	1,202
		Hodeidah		400	0	390	390	0	400	390	385	400	390	400	405
		Ibb		1,855	1,804	2,043	1,673	1,727	1,778	1,800	1,893	1,680	1,657	1,698	1,803
		Taiz		0	0	0	0	0	0	0	0	0	0	0	0
		Aden		0	0	0	0	0	0	0	0	0	0	0	0
		Seyoun		-	-	-	-	-	-	-	-	-	-	-	-
		Mukalla		0	0	0	0	0	0	0	0	0	0	0	0
		Dhamar		2,720	2,040	2,965	2,194	2,891	2,080	0	3,945	1,113	1,259	1,701	2,238
17	متوسط قيمة ال ( بي أو دي ) من المياه المعالجة (الخارجة) من محطة معالجة مياه الصرف الصحي Average BOD value of treated effluent at WWTP	Sana'a	No.	515	534	546	353	368	311	337	340	389	416	398	288
		Hodeidah		85	0	80	86	0	89	85	90	93	100	95	90
		Ibb		705	599	655	774	738	746	975	899	720	730	767	790
		Taiz		0	0	0	0	0	0	0	0	0	0	0	0
		Aden		0	0	0	0	0	0	0	0	0	0	0	0
		Seyoun		-	-	-	-	-	-	-	-	-	-	-	-
		Mukalla		0	0	0	0	0	0	0	0	0	0	0	0
		Dhamar		486	364	136	101	231	166	0	273	427	474	140	121
18	كفاءة المعالجة لمحطة مياه الصرف الصحي فيما يخص ال ( بي أو دي ) Treatment efficiency of WWTP regarding BOD	Sana'a	No.	55	51	57	65	71	69	67	65	65	68	67	76
		Hodeidah		79	-	79	78	-	78	78	77	77	74	76	78
		Ibb		62	67	68	54	57	58	46	53	57	56	55	56
		Taiz		0	0	0	0	0	0	0	0	0	0	0	0
		Aden		0	0	0	0	0	0	0	0	0	0	0	0
		Seyoun		-	-	-	-	-	-	-	-	-	-	-	-
		Mukalla		0	0	0	0	0	0	0	0	0	0	0	0
		Dhamar		82	82	95	95	92	92	-	93	62	62	92	95
19	إجمالي كمية المياه المنتجة Total quantity of water produced	Sana'a	No.	1,108,010	1,048,626	1,074,758	1,022,305	650,689	769,805	995,503	946,724	880,436	842,963	846,397	926,813
		Hodeidah		1,142,349	1,024,934	1,168,786	1,188,402	1,164,591	1,168,591	1,187,540	1,296,255	1,244,593	1,229,890	1,519,534	1,585,756
		Ibb		490,696	477,715	487,115	509,211	493,656	490,886	492,096	522,984	569,101	553,067	531,132	553,174
		Taiz		103,159	82,021	48,305	92,138	61,801	94,875	122,208	125,981	128,466	108,306	127,527	133,921
		Aden		3,251,807	2,960,231	2,949,423	2,556,497	2,720,799	2,364,220	2,879,131	2,900,015	2,904,309	2,750,475	2,613,829	3,001,329
		Seyoun		1,540,015	1,490,255	1,721,038	1,804,393	1,815,153	1,955,044	2,012,709	1,998,228	1,897,811	1,678,606	1,709,608	1,600,269
		Mukalla		1,616,611	1,478,478	1,662,817	1,604,174	1,718,210	1,679,291	1,696,449	1,682,732	1,655,999	1,690,218	1,667,798	1,732,751
		Dhamar		300,752	285,907	347,159	328,099	309,063	336,756	335,793	331,844	327,319	318,144	334,086	333,010
20	نصيب الفرد من المياه المنتجة Per capita quantity of water produced	Sana'a	%	34	32	32	31	20	23	29	27	25	24	24	27
		Hodeidah		78	70	80	81	80	80	78	86	82	81	100	104
		Ibb		32	31	31	33	32	31	30	32	35	34	32	33
		Taiz		6	5	3	5	4	6	7	7	7	6	7	8
		Aden		111	101	100	87	92	80	94	95	95	90	85	98
		Seyoun		129	125	143	150	150	150	148	146	138	122	124	115
		Mukalla		135	122	137	132	141	137	134	132	130	132	130	135
		Dhamar		53	50	61	57	54	58	56	55	54	53	55	54

No.	Data / Indicator	LC	Unit	1 <sup>st</sup> Q 2021			2 <sup>nd</sup> Q 2021			3 <sup>rd</sup> Q 2021			4 <sup>th</sup> Q 2021		
				Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
21	Storage capacity الطاقة التخزينية الشبكية المتاحة	Sana'a	No.	36,550	36,550	36,550	36,550	36,550	36,550	36,550	36,550	36,550	36,550	36,550	36,550
		Hodeidah		25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
		Ibb		4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000
		Taiz		49,000	49,000	49,000	49,000	49,000	49,000	49,000	49,000	49,000	49,000	49,000	49,000
		Aden		94,700	94,700	94,700	94,700	94,700	94,700	94,700	94,700	94,700	94,700	94,700	94,700
		Seyoun		15,313	15,313	15,313	4,600	15,313	15,313	15,313	15,313	15,313	15,313	15,313	15,313
		Mukalla		10,900	10,900	10,900	10,900	10,900	10,900	10,900	10,900	10,900	10,900	10,900	10,900
		Dhamar		18,850	18,850	18,850	18,850	18,850	18,850	18,850	18,850	18,850	18,850	18,850	18,850
22	Storage capacity share per capita نصيب الفرد من الطاقة التخزينية المتاحة	Sana'a	No.	33	33	33	33	33	33	33	33	33	33	33	
		Hodeidah		51	51	51	51	51	51	51	51	51	51	51	
		Ibb		8	8	8	8	8	8	8	8	8	8	7	
		Taiz		87	87	87	87	87	87	87	87	87	87	87	
		Aden		97	97	96	96	96	96	96	96	96	96	96	
		Seyoun		38	38	38	11	38	35	35	35	35	34	34	34
		Mukalla		27	27	27	27	27	27	27	27	26	26	26	26
		Dhamar		100	99	99	98	98	98	98	97	97	96	96	95
23	Energy Costs per m <sup>3</sup> water produced تكلفة الطاقة لكل متر مكعب منتج من المياه خلال الشهر	Sana'a	No.	303	312	296	311	266	356	350	231	226	136	375	102
		Hodeidah		0	0	0	0	0	0	0	0	0	0	0	0
		Ibb		132	106	128	160	165	145	146	156	125	164	153	139
		Taiz		0	0	0	0	0	0	0	0	0	0	0	0
		Aden		56	72	86	126	140	148	112	131	128	113	118	112
		Seyoun		65	65	65	65	65	65	65	65	65	65	65	65
		Mukalla		28	30	27	45	43	32	26	40	34	33	32	32
		Dhamar		190	190	190	190	190	190	208	215	211	246	202	230
24	Effluent produced كمية المياه المنتجة (م <sup>3</sup> في الشهر) - المعالجة أو غير المعالجة - التي تنتفخ من محطة معالجة الصرف الصحي	Sana'a	No.	1,680,000	1,680,000	1,680,000	1,680,000	1,680,000	1,680,000	1,680,000	1,680,000	1,680,000	1,680,000	1,680,000	
		Hodeidah		674,900	603,500	789,650	896,750	797,300	808,350	784,550	668,100	979,150	685,950	694,450	874,650
		Ibb		366,678	380,320	455,531	541,798	511,859	493,582	534,592	524,291	542,418	590,145	510,512	510,410
		Taiz		90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000
		Aden		0	0	0	0	0	0	0	0	0	0	0	0
		Seyoun		-	-	-	-	-	-	-	-	-	-	-	-
		Mukalla		0	0	0	0	0	0	0	0	0	0	0	0
		Dhamar		202,106	203,564	202,724	204,493	206,052	203,919	207,777	217,482	208,216	205,862	203,000	206,092
25	Effluent produced كمية المياه المنتجة (لتر / فرد / يوم) - المعالجة أو غير المعالجة - التي تنتفخ من محطة معالجة الصرف الصحي	Sana'a	%	51	51	51	51	51	51	51	51	51	51	51	
		Hodeidah		75	67	88	100	89	90	87	74	109	76	77	97
		Ibb		28	29	34	41	38	37	39	38	40	43	37	37
		Taiz		6	6	6	6	6	6	6	6	6	6	6	6
		Aden		0	0	0	0	0	0	0	0	0	0	0	0
		Seyoun		-	-	-	-	-	-	-	-	-	-	-	-
		Mukalla		0	0	0	0	0	0	0	0	0	0	0	0
		Dhamar		56	56	55	56	56	55	56	59	56	55	54	55

No.	Data / Indicator	LC	Unit	1 <sup>st</sup> Q 2021			2 <sup>nd</sup> Q 2021			3 <sup>rd</sup> Q 2021			4 <sup>th</sup> Q 2021			
				Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	
26	كمية مياه الصرف الصحي المعالجة ( م 3 في الشهر) التي تتدفق من محطة المعالجة  Effluent treated in wastewater treatment plant	Sana'a	No.	1,590,000	1,590,000	1,590,000	1,590,000	1,590,000	1,590,000	1,590,000	1,590,000	1,590,000	1,590,000	1,590,000	1,590,000	
		Hodeidah		674,900	603,500	789,650	896,750	797,300	808,350	784,550	668,100	979,150	685,950	694,450	874,650	
		lbb		252,424	228,193	273,318	293,467	320,987	322,135	307,337	313,375	293,131	274,150	250,156	292,131	
		Taiz		90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000
		Aden		0	0	0	0	0	0	0	0	0	0	0	0	0
		Seyoun		-	-	-	-	-	-	-	-	-	-	-	-	-
		Mukalla		0	0	0	0	0	0	0	0	0	0	0	0	0
		Dhamar		194,922	193,599	189,251	197,896	199,405	197,340	200,851	210,233	204,746	202,431	196,452	199,444	
27	إجمالي عدد المضخات الرئيسية  Total number of main pumps for the water supply system	Sana'a	No.	102	102	102	102	102	102	102	102	102	102	102	102	
		Hodeidah		45	45	45	45	45	45	45	45	45	45	45	45	
		lbb		32	32	32	38	38	38	38	38	38	38	38	38	
		Taiz		76	76	76	76	76	76	76	76	76	76	76	76	
		Aden		126	126	126	126	126	126	126	126	126	126	126	126	
		Seyoun		44	44	44	44	44	44	44	44	44	44	44	44	
		Mukalla		43	43	43	43	44	44	44	44	44	45	45	45	
		Dhamar		29	29	29	29	29	29	29	29	29	29	29	29	
28	عدد المضخات الرئيسية العاملة والتي تضخ المياه خلال الشهر  Number of functional pumps in service	Sana'a	No.	64	67	67	67	64	66	67	65	64	69	70	70	
		Hodeidah		33	35	33	34	34	34	37	37	37	36	6	11	
		lbb		27	27	27	29	28	28	27	29	31	28	28	28	
		Taiz		30	32	15	32	30	31	33	32	32	31	32	32	
		Aden		96	96	96	96	96	96	96	96	96	67	62	65	
		Seyoun		44	44	44	44	44	44	44	44	44	44	44	44	
		Mukalla		43	43	42	43	44	44	44	44	44	45	45	44	
		Dhamar		25	25	25	25	24	24	24	25	25	24	24	26	
29	عدد ساعات عمل (تشغيل) المضخات (كل المضخات العاملة والتي تضخ المياه) في الشهر  Number of working hours of all operating pumps of the water supply system	Sana'a	No.	25,865	25,038	28,991	28,415	26,237	27,296	24,200	25,300	22,845	23,847	24,408	27,770	
		Hodeidah		19,138	17,278	19,115	18,567	17,852	19,685	19,085	19,177	18,341	18,856	19,003	25,409	
		lbb		18,414	13,608	18,414	19,140	19,096	18,480	17,050	19,778	20,460	19,096	18,480	19,096	
		Taiz		9,580	8,127	3,870	7,798	4,049	6,910	9,311	9,515	9,650	8,105	9,016	9,897	
		Aden		54,693	50,248	50,444	44,772	48,102	42,791	43,200	50,150	50,200	42,920	42,500	50,800	
		Seyoun		20,910	20,910	20,910	20,910	20,910	20,910	20,910	20,910	20,910	20,910	20,910	20,910	
		Mukalla		30,014	27,133	28,266	29,154	30,272	22,836	30,976	30,316	30,008	31,095	30,015	31,592	
		Dhamar		3,089	2,802	3,356	2,909	3,196	3,070	5,636	5,691	5,988	5,300	5,760	5,692	
30	عدد الأعطال الناتجة عن أسباب فنية خلال الشهر للمضخات الرئيسية العاملة في ضخ المياه  Number of main functional pumps failures due to technical reasons	Sana'a	%	4	21	26	23	23	31	11	16	21	22	20	4	
		Hodeidah		15	20	16	18	17	16	18	18	16	0	20	25	
		lbb		5	5	5	4	5	5	6	4	2	4	4	4	
		Taiz		6	3	5	8	13	7	9	6	15	11	8	6	
		Aden		1	2	2	7	5	4	0	0	0	16	17	23	
		Seyoun		5	5	5	5	5	5	5	5	5	5	5	5	
		Mukalla		3	2	4	3	5	3	10	8	11	9	0	0	
		Dhamar		0	0	0	0	0	0	0	0	0	0	1	0	

No.	Data / Indicator	LC	Unit	1 <sup>st</sup> Q 2021			2 <sup>nd</sup> Q 2021			3 <sup>rd</sup> Q 2021			4 <sup>th</sup> Q 2021			
				Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	
31	عدد المولدات العاملة في تشغيل المضخات  Number of working generators in the operation of pumps	Sana'a	No.	55	52	54	56	56	62	64	64	65	64	56	56	
		Hodeidah		15	15	16	16	17	17	16	16	17	14	9	9	
		Ibb		18	18	18	19	19	19	18	19	21	18	18	18	
		Taiz		21	23	7	21	21	21	23	21	21	21	21	21	22
		Aden		6	6	6	6	6	6	6	6	6	6	6	6	6
		Seyoun		12	12	12	12	12	12	12	12	12	12	12	12	12
		Mukalla		14	14	14	14	14	14	14	14	14	14	14	14	14
		Dhamar		10	12	12	11	10	10	12	12	11	15	14	14	
32	عدد ساعات عمل (تشغيل) المولدات (كل المولدات العاملة المستخدمة في تشغيل المضخات لضخ المياه) خلال الشهر  Number of working hours of all operating generators used to run the functional pumps of the water supply system	Sana'a	No.	24,485	23,460	22,422	21,627	14,606	20,673	22,581	20,599	19,308	17,532	17,532	19,161	
		Hodeidah		2,247	2,120	3,021	3,347	4,873	4,438	4,660	5,332	4,825	4,793	2,352	4,657	
		Ibb		11,594	10,821	11,594	11,400	11,191	10,830	11,160	11,191	12,369	10,044	9,720	11,160	
		Taiz		6,265	5,425	1,488	5,616	1,777	4,414	5,646	6,141	6,217	4,638	5,497	5,624	
		Aden		570	929	1,204	1,452	3,646	2,266	1,418	1,362	1,407	1,532	1,472	1,483	
		Seyoun		6	6	6	6	6	6	6	6	6	6	6	6	
		Mukalla		308	475	524	1,662	1,674	1,738	2,082	2,281	2,629	1,554	923	567	
		Dhamar		996	998	1,217	1,434	1,538	1,529	1,792	1,406	1,252	924	1,379	1,283	
33	قيمة الإيرادات الشهرية المحصلة  Total collected operational revenues	Sana'a	No.	317,694,216	285,274,901	288,749,850	251,777,196	256,089,147	329,527,737	297,974,436	388,732,874	365,339,465	369,355,894	380,158,583	436,276,646	
		Hodeidah		86,810,356	79,515,518	87,133,445	69,892,967	63,047,155	89,019,019	95,015,487	111,754,782	106,365,885	113,757,500	112,844,296	128,050,420	
		Ibb		165,411,189	168,164,433	145,028,866	157,159,368	239,690,519	226,856,998	252,325,369	223,552,855	223,846,971	234,456,501	235,320,793		
		Taiz		777,404	534,851	1,154,993	2,353,059	1,646,824	2,125,151	729,213	2,119,352	4,714,317	1,265,509	957,200	985,691	
		Aden		164,928,357	138,459,472	128,395,318	129,308,122	62,232,581	152,806,539	114,081,708	125,804,565	213,286,746	109,399,617	151,351,068	219,745,329	
		Seyoun		93,712,120	98,466,698	126,305,777	82,065,037	70,243,976	158,903,872	84,711,926	143,985,059	125,291,220	137,891,204	146,038,861	360,762,183	
		Mukalla		100,766,264	96,011,388	95,556,277	79,766,593	57,182,720	103,101,028	76,532,072	105,624,702	83,243,235	99,191,773	114,794,840	109,869,802	
		Dhamar		44,855,141	50,925,703	45,210,464	34,922,696	20,021,954	59,973,263	33,769,622	53,629,550	47,923,323	46,991,025	47,874,718	43,061,761	
34	قيمة الإيرادات الشهرية المفوترة (قيمة مبيعات المياه الشهرية المفوترة)  Total billed operational revenues	Sana'a	No.	390,836,239	410,640,910	411,455,685	398,173,200	574,442,628	580,787,827	580,762,303	592,399,413	598,063,771	601,932,781	589,573,210	652,167,102	
		Hodeidah		185,546,936	160,416,170	156,032,894	150,201,800	146,282,380	293,016,046	234,310,787	246,891,295	225,287,619	255,055,152	253,309,019	241,673,821	
		Ibb		204,085,441	185,642,793	180,743,690	212,823,216	269,659,811	286,899,326	270,271,302	259,220,883	268,166,414	280,560,243	289,863,236	266,589,660	
		Taiz		58,619,550	58,619,550	58,619,550	58,619,550	58,619,550	58,619,550	58,619,550	58,619,550	58,619,550	58,619,550	58,619,550	58,619,550	
		Aden		358,621,898	345,409,665	354,232,669	338,683,475	338,171,970	361,880,915	346,256,361	344,625,545	350,869,790	358,572,047	638,508,685	595,774,224	
		Seyoun		141,406,844	170,827,536	176,294,026	193,333,021	194,658,311	201,631,916	212,447,471	214,513,788	233,897,134	213,920,562	191,056,518	191,429,446	
		Mukalla		182,874,398	186,110,009	185,517,372	187,219,773	172,794,050	202,336,362	194,455,497	193,285,089	200,320,040	195,744,127	192,003,355	202,475,941	
		Dhamar		70,441,000	77,076,692	84,913,661	72,008,963	78,998,141	76,156,294	72,744,458	77,772,263	73,894,743	74,591,564	74,343,757	76,253,802	
35	إجمالي التكاليف التشغيلية  Actual operational cost coverage	Sana'a	%	662,320,389	778,045,008	702,250,743	689,810,787	517,782,551	724,044,193	649,187,532	566,704,407	546,453,036	455,607,145	721,183,278	780,680,212	
		Hodeidah		227,121,392	218,383,032	125,796,245	33,403,404	15,530,542	122,874,696	260,141,916	328,467,119	393,673,050	146,898,087	452,844,005	142,370,838	
		Ibb		171,623,882	144,647,529	181,259,457	222,966,239	180,187,286	191,608,683	170,279,732	163,865,472	223,068,343	198,370,462	230,039,400	425,669,958	
		Taiz		109,842,880	102,187,330	90,412,480	87,430,119	75,739,104	93,814,014	101,434,264	106,802,439	106,901,464	108,180,589	112,141,589	113,704,589	
		Aden		706,079,591	742,884,060	792,934,881	866,724,334	911,525,030	901,018,577	838,724,434	935,590,741	919,866,851	851,980,428	860,060,600	892,881,871	
		Seyoun		185,861,623	187,559,688	246,774,342	248,132,923	244,991,868	261,699,310	257,830,973	311,632,358	292,706,416	246,738,734	240,495,005	459,297,736	
		Mukalla		260,335,706	269,845,940	253,259,321	327,768,778	258,163,527	249,350,519	260,105,583	250,040,016	211,828,121	290,184,139	209,794,907	224,748,450	
		Dhamar		56,681,240	54,252,278	56,034,705	55,241,881	59,094,900	62,676,668	69,844,853	71,429,368	69,159,081	78,182,763	67,545,143	76,660,556	

No.	Data / Indicator	LC	Unit	1 <sup>st</sup> Q 2021			2 <sup>nd</sup> Q 2021			3 <sup>rd</sup> Q 2021			4 <sup>th</sup> Q 2021			
				Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	
36	Collection Efficiency = Collected revenues vs Billed revenues	نسبة التحصيل	No.	Sana'a	81	69	70	63	45	57	51	66	61	61	64	67
				Hodeidah	47	50	56	47	43	30	41	45	47	45	45	53
				Ibb	81	91	80	74	89	79	93	86	83	80	81	88
				Taiz	1	1	2	4	3	4	1	4	8	2	2	2
				Aden	46	40	36	38	18	42	33	37	61	31	24	37
				Seyoun	66	58	72	42	36	79	40	67	54	64	76	188
				Mukalla	55	52	52	43	33	51	39	55	42	51	60	54
				Dhamar	64	66	53	48	25	79	46	69	65	63	64	56
37	Actual operational cost coverage	التغطية التشغيلية المحصلة للتكلفة	No.	Sana'a	48	37	41	36	49	46	46	69	67	81	53	56
				Hodeidah	38	36	69	209	406	72	37	34	27	77	25	90
				Ibb	96	116	80	70	133	118	148	136	100	113	102	55
				Taiz	1	1	1	3	2	2	1	2	4	1	1	1
				Aden	23	19	16	15	7	17	14	13	23	13	18	25
				Seyoun	50	52	51	33	29	61	33	46	43	56	61	79
				Mukalla	39	36	38	24	22	41	29	42	39	34	55	49
				Dhamar	79	94	81	63	34	96	48	75	69	60	71	56
38	Monthly governmental subsidies	قيمة الإعانات الحكومية الشهرية لمزود الخدمة	No.	Sana'a	0	0	0	0	0	0	0	0	0	0	0	0
				Hodeidah	0	0	0	0	0	0	0	0	0	0	0	0
				Ibb	0	0	0	0	0	0	0	0	0	0	0	0
				Taiz	46,828,589	46,828,589	46,828,589	46,828,589	46,828,589	46,828,589	46,828,589	46,828,589	46,828,589	46,828,589	46,828,589	46,828,589
				Aden	0	414,052,624	207,026,312	0	414,052,624	207,026,312	0	310,539,468	248,431,574	558,971,042	0	0
				Seyoun	0	0	0	0	0	0	0	0	0	0	0	0
				Mukalla	0	0	0	35,559,400	228,713,252	35,559,400	0	189,976,252	125,267,826	35,559,400	34,559,400	21,118,800
				Dhamar	0	0	0	0	0	0	0	0	0	0	0	0
39	Percentage of basic monthly salaries paid	نسبة الرواتب الأساسية الشهرية المدفوعة للموظفين	No.	Sana'a	100	100	100	100	100	100	100	100	100	100	100	100
				Hodeidah	100	100	100	100	100	100	100	100	100	0	0	0
				Ibb	100	100	100	100	100	100	100	100	100	100	100	100
				Taiz	94	94	94	94	94	94	94	94	94	94	94	94
				Aden	100	100	100	100	100	100	100	100	100	100	100	100
				Seyoun	100	100	100	100	100	100	100	100	100	100	100	100
				Mukalla	100	100	100	100	100	100	100	100	100	100	100	100
				Dhamar	100	100	100	100	100	100	100	100	100	100	100	100

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