Introduction

Iraq is one of the countries that is significantly affected by the ongoing drought with obvious changes in climatic and meteorological conditions (low rainfall and increase in average temperatures) in the Middle East and North Africa region. Almost all the country water resources are transboundary rivers. These rivers are affected by extensive water infrastructure projects in Turkey, Iran and Syria.

In Turkey alone, the Great Anatolia project (GAP project) has caused extensive utilization of Tigris and Euphrates rivers causing significant cuts in the water shares of Iraq\(^1\). On other hand, Iran is utilizing the small rivers’ tributaries without coordination with Iraq. In the southern governorates of Iraq, most of the small rivers and irrigation canals dried up in the 2018 summer. The country therefore has reduced its agriculture plan to 55% of the previous year. Moreover, because of the limited fresh water revenues, the Ministry of Water Resources reduced the amount of water released from the key dam’s reservoirs of the country as a water conservation measurement.

As a result of the water-saving strategy, the governments of the southern part of the country have lost the capacity to deliver safe freshwater to the population in those governorates\(^2\). Basra province has been tagged as the most affected province in Iraq due to the water crisis. 90% of the population has lost access to safe freshwater during the summer of

SUMMARY

Home to over than 4.5 million people, Basra is one of the worst affected governorates by the water scarcity crisis striking Iraq and MENA region at large. Located at the tail end of the Tigris and Euphrates rivers, Basra is the furthest downstream governorate in Iraq receiving water from upstream riparian states. Due to the compounded effect of issues including reduced river flows and others, Basra is witnessing a sharp decline in drinking water supply to people that has taken a heavy toll on stability across the country.

UNICEF has a track record of working with the Basra Water Directorate, NGOs (e.g. Al Sistani foundation), and the public sector (the South Oil Company) to provide emergency assistance. In 2018 this included: suppling replacements pumps and spare parts at the intake and treatment plant; chlorination and water testing equipment; water trucking to schools; hygiene campaigns; rehabilitation of the wastewater treatment plant. UNICEF and the Iraqi government are working together to ensure that safely managed water is provided to Basra population. A multi-term intervention strategy is prepared and implementation started since the first week of the crisis.
2018 because of Basra’s geographical location within Iraq, as it is considered as the last point in the country reached by the Euphrates and Tigris rivers. During the period August and October 2018, 100,000 cases of water-related disease have been recorded in Basra. In ThiQar governorate (200 Km north of Basra), 1,000 families have fled their homes because of the drought in the iconic marshland in south ThiQar. Moreover, freshwater is trucked by water authorities to two districts in Qadisiya because the water stream is not reaching the districts of Afak and Noufar anymore.

The four years fighting against ISIS in Iraq have also contributed to increasing water scarcity. As oil prices plunged, the government of Iraq experienced significant challenges sustaining funds for operation and maintenance of the water treatment infrastructure. It is reported by the local water authorities in the governorates of Basra, ThiQar, Qadisiya and Muthana that O&M funds were close to zero during the relatively long war. Therefore, the maintenance of the water treatment infrastructure was minimized. It is observed by UNICEF that many of the water treatment facilities are aged, degraded or eroded and as a result the water produced is not meeting the Iraqi drinking water guidelines. Water production for the drinking and domestic uses sector is conventional in Iraq. Safely managed water planning in terms of infrastructure development, maintenance, management, and financial, are all bottlenecks.

The drinking water sector is theoretically subsidized by the mainly oil-funded federal budget. Drinking water and domestic water are subject to oil prices in Iraq in general and in Basra specifically. The poorly managed and developed water infrastructure has led to an increase in the role of the private sector in sustaining water supplies. In Basra alone, there are around 300 small scale, privately-owned and managed water desalination units. Notably, most of these units are unlicensed and unauthorized. Also, they use unlicensed and unauthorized trucks to distribute water among the communities in Basra. The government of Iraq is constructing a mega RO plant in Basra to improve the access to safe water. By the end of September 2019, 600,000 cubic meters of clean water will be pumped to the city water distribution network. UNICEF is working with the Iraqi government to strengthen its capacity to respond to the water crisis and to move forward toward achieving the Sustainable Development Goals (SDGs). UNICEF Iraq has prepared a strategy and started implementing the strategic plan in partnership with the Iraqi government at federal and local levels, with close coordination with communities in Basra governorate and all the affected communities in the south of Iraq.

KEY POINTS

- UNICEF is working to reduce morbidity and mortality among affected children and their families in high risk communities / institutions within Basra Governorate to ensure access to timely sufficient and safe water and sanitation services through:
  - WASH stop-gap interventions, rehabilitation and upgrading of WASH infrastructure, and O&M of WASH systems in place;
  - Enhancing water quality monitoring from source up to end-user, and support provision of purification materials;
  - Supporting local authorities in water management by implementing the WASH Bottleneck Analysis Tool and updating master plans;
  - Establishing a coordination cell in Basra for the first time to coordinate the planning and the implementation of the different implementing partners;
  - Upgrading water systems in affected schools and provision of emergency safe drinking water;
  - Public awareness raising, by disseminating messages on water handling, conservation and hygiene practices.
Description of Intervention

Basra is one of 18 Iraq governments receiving the lowest fresh water share in Iraq. Fresh water is supplied to Basra from two resources. The first one is Al Badaah canal with design capacity of 15 CMS and current operation capacity of maximum 7.5 CMS. This canal was built in 1995 and operationalized in 1997. The idea of the canal is to transport fresh water to mega pumping stations that can feed all the water projects in Basra with fresh water. Approximately 90% of the main water treatment projects are installed at Shat Al Arab river sides. Most of these projects were designed and installed a long time ago. At the time of construction, Shatt AL Arab river’s water was considered fresh. Starting from the 1990’s the salinity of the river increased because of the Arab gulf tide and ebb. The Iraqi government at that time decided to construct an alternative resource to allow the water treatment project to operate using dual resources instead of relying on only Shat Al Arab river. This alternative was represented by Al Badaah fresh water canal and R-Zero pumping station. By using about 5 major transportation pipelines, R-Zero pumps fresh water to eight major water treatment projects in Shat Al Arab, after which no major development was brought to Basra.

With the population growth and increasing salinity of Shat AL Arab due to the tide and ebb phenomena, the major eight water treatment plants have failed to fit the purpose of supplying safely managed water to the Basra population. Notably in 2018, fresh water supplies from the Tigris River were reduced by 1/3 of the quantity received in the previous year, allowing the Arab gulf saline tide to reach north Basra and causing a significant increase in water salinity. It was reported by the Basra water directorate that the river salinity in north Basra reached 18,000 ppm and in south Basra reaching 28,000. Basra received in August 2018 the lowest share of fresh water among the four southern governorates. Figure 1 shows the distribution of the fresh water between the southern provinces.

**Figure 1. Fresh water available per province in southern Iraq during the crises in August 2018.**

The two above figures explain the fresh water distribution in the south of Iraq. Those figures reflect the water scarcity and the poor water quality in the Shat Al Arab and Euphrates rivers, leaving the Tigris River as the main and only supply of fresh water. In addition to the share of fresh water Basra received from Badaah, there is also another fresh quantity coming from Qalat Salih in Missan governorate. The water amount from this regulator is between 50-75 CMS, however, it became wholly less reliable when it could not push the saline tide, which came back with a high flow rate from the Arab Gulf. The tide and ebb flow rate inshore Basra is an estimate. Basra did not benefit from this quantity all over the summer 2018 and therefore R-Zero became the only fresh water supply to Basra.

Basra water projects in general are aged projects. Because of the federal cuts to O&M
funds, many of the projects have not been maintained since 2014, causing them to operate in low capacity. R-Zero pumping station has been operating on 40% of its design capacity because of the low fresh water revenues (about 4 CMS in July 2018) and the accumulated mechanical parts failures, including pumps. On the other hand, all the water treatment plants in Basra are experiencing the same problem. Accumulated mechanical parts failures and aging filtration media are causing significant decreases in produced water quality and quantity.

At the same time, 90 small rivers discharge sewage directly into Shat Al Arab causing an increase in contamination of the raw water. Poor filtration, high total dissolved salts (TDS) and contamination of the raw water have hindered the chlorination process, as reported by the Water Directorate. Moreover, the distribution network is aged, and leakages are significant, causing the exchange of sewage with clean water in the pipelines.

Basra water distribution networks are inefficient with up to 45% losses. These losses are caused by broken pipes, leaking pumps, and illegal connections. Basra is unable to put in place an effective safe water rationing system. The amount of water pumped by R-Zero project is diffused in an uncontrolled network that was designed as one zone. The one-zone network caused even the safe and fresh water pumps to be mixed with saline water coming from non-R-Zero water sourced stations and then reached the people as saline water. Furthermore, much of the water pumped tariff is not collected, meaning that there is no cost recovery for water services. One example of the illegal connections is that R-Zero pumps 2000 CMH of fresh water to Bardaiya treatment project in Basra city center. Only 800 CMH of that water can reach the project because of the illegal connections.

Multiple stakeholders have jointly responded to the crisis to mitigate the elevated risk of water diarrhea, cholera and other related diseases. UNICEF, the civil society organization represented by Al Sistani Foundation, the public sector (South Oil Company) and the Directorate of Water, are now working together with a clear road map, cooperating to mitigate the issues as follows:

1. UNICEF has contributed immediately by supplying five pumps with capacity of 1000 m³/h and 400 m³/h pumps to replace aged pumps in R-Zero project to deliver fresh water to water treatment plants highly affected by water crises and where high numbers of infected population have been identified. This was achieved in coordination with Al Sistani and responsibilities were shared. Al Sistani supplied and installed 23 more pumps with various capacities to the project.

2. UNICEF has helped the water directorate by sharing the cost of rehabilitation of mechanical parts in three key water treatment projects to improve the quality and quantity of water supplied to Basra population by these projects. This and the above intervention with Al Sistani are targeting 750,000 individuals in Basra province.

3. UNICEF completed water trucking to 70 school buildings in Abu Al Khasib district to
ensure safe water is delivered to the district schools. 70,000 students benefited from the activity over the month of October. 100,000 students and their families are targeted by a Communications for Development (C4D) campaign in the same area on water conservation and general hygiene practices.

4. UNICEF has also shipped chlorination materials and quality testing devices to Basra, to ensure the water quality especially during the cholera season.

5. In the short term, UNICEF is planning to continue contributing to water treatment plant capacity recovery by: supplying more mechanical parts, pipes, and valves and to set R-Zero system under advance control by SCADA system; recovering the filtration capacity in Jubiala, Mouhad and R-zero projects by rehabilitating multimedia filters and precipitation tanks, and installing chlorination devises. At the same time, UNICEF is going to rehabilitate a key wastewater treatment facility (Hamdan) to recover 50% of the design capacity of the project. This will ensure that sewage from Basra city center will be treated in the facility and minimize dumping it to the rivers.

6. For the first time in Iraq, staff from Basra water and wastewater directorates underwent Training of Trainers (T.o.T.) on the WASH bottleneck analysis tool. Four national staff members participated alongside other staff from the neediest provinces in the country to form the base of initiative. The “WASH BAT” experience will be transferred by the trained staff to the water and wastewater sectors and will empower the two key directorates in utilizing advanced WASH planning tools and techniques.

7. UNICEF also focused on establishing a coordination mechanism between the acting counterparts to prioritize implementation, avoid overlap, and to efficiently direct resources. In October 2018, the Basra Water Crisis and Cholera Task Force was formed and led by the deputy governor of Basra. UNICEF designed the task force terms of reference and helped the local government of Basra to select the members of the committee based on experience from other parts of the country.

8. In the medium term, UNICEF is planning to support the water directorate in controlling the water distribution and tariff collection by implementing the following: a Basra water distribution advance rationing and control system, an E-Billing initiative and a water safety plan, along with continued awareness campaigns on water conservation and general hygiene practices, to ensure effective utilization and use of the available water and financial resources.

Figure 3. Student in Abu al Khasib district benefiting from safe water through a water saving tap provided by UNICEF Iraq.

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Figure 4. Government employees attending a first-ever WASH BAT workshop, funded any facilitated by UNICEF IRAQ.

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Outcomes

Multiple outcomes are achieved by implementing the multi-layered strategy to help Basra children and their families. For instance:

- Enabling the local authorities in Basra to be able to cope with climate change consequences, including water scarcities, by improving government planning capacity, improving water sourcing capacity, and helping to recover the capacities of key water treatment infrastructure in Basra. UNICEF Iraq is delivering all these components together.

- At the beginning of the water crisis, UNICEF Iraq intervened in a semi-emergency mode by focusing on recovery of water treatment functions, where possible in key water treatment facilities like R-Zero, Al Jubalia, Al Rebat, Al Muhad and Al Hartha. Quick fix interventions were delivered in all these sites by installing new high lift high capacity pumps, fixing others and replacing broken valves and faulty mechanical components. UNICEF has contracted safe water trucking to 159 schools (70 schools buildings) in Basra to ensure a smooth beginning to the school year in the most affected and deprived communities in Abu Al Khasib district in Basra.

The early phase of the intervention has helped some 750,000 individuals in Basra city center and Basra districts to receive safely managed water. Furthermore, around 81,000 students benefited from water trucking and hygiene promotion activities in most affected and deprived communities. Students in the targeted schools benefited from participatory hygiene promotion campaigns focused on maintaining personal hygiene during water shortages and on water conservation. In the same term, UNICEF has focused on improving the coordination between the implementing partners.

While moving to the medium-term section of the Basra Response Plan, the UNICEF WASH team is continuing to support the Iraqi government at federal level and local levels to ensure ongoing capacity building to those in the core of the crisis. The first-ever WASH BAT workshop was conducted to train many of the Iraqi key planning staff in the water and sewage general directorates and local directorates of water and sewage of governornates affected by conflict and water crisis. The aim of the workshop was to enable the Iraqi water authorities to tackle WASH bottlenecks at the early stages of planning cycles. The trained engineers and administrative staff will transfer the knowledge to a wider range of planners and managers at their work stations. UNICEF is planning to ensure the adoption of the WASH BAT tool for planning in all the targeted water directorates. UNICEF will support the targeted directorates to deliver the training sessions and tools validation and to evaluate results achieved out of using it.

At country office level, UNICEF is contributing heavily to the ministerial committee established by the Prime Minister of Iraq to deliver quality results and add value to the ongoing interventions in Basra. UNICEF is providing exceptional technical experience in advisory mode to the ministerial committee. Since UNICEF is key player in the Iraq Cholera Task Force, UNICEF and partners have ensured that extensive assistance is provided to the Health and Water authorities during Cholera outbreaks (2003, 2007, 2008, 2012 and 2015). UNICEF has helped in planning and maintaining the disinfection materials’ availability and accessibility during crises.
Lessons Learned

Basra and other Iraq governorates are experiencing the toughest water scarcity in centuries. The country is heavily relying on conventional water resources that for a long time had been accessible, available in good quantities, and in relative availability everywhere in the geographical area of Iraq. With the shrinkage of the fresh water map for several reasons described in this Field Note, Iraq will need to shift to more advanced water governance. That could be the main topic that needs to be considered by the water authorities and the Iraqi government. Moreover, it could be the most important lesson learned from the water crisis in the south of Iraq. Many challenges are contributing in increasing the severity of the crisis: the need to introduce desalination, for instance, as well as sector financing, decentralization, and the generally unstable political situation are new challenges that the local and federal authorities need more support with. Addressing the limited capacity of staff within water authorities is also a crucial limiting factor in addressing the water scarcity in Basra.

The increasing role of the private sector in sustaining Basra water needs and the role of the communities in addressing the problem are among the key findings and lessons learned. In terms of water governance, Iraq is well recognized in flood management infrastructure. Since the 1950s, several dams and irrigation systems have been established on the Iraqi map to absorb incoming flood waters from upstream countries. With geopolitical changes and rapid economic growth in Turkey, Iran and Syria, and negative effects of climate change, Iraq needs to review the function of its water resource management and infrastructure, including the thousands of kilometers of irrigation canals, protection of water resources, and effective utilization of water for non-domestic uses.

Important developments can be replicated, such as the introduction of advanced water treatment technologies like desalination, and investing heavily on mega desalination projects such as the Al Hartha desalination project (600,000 CMD) and the proposal of five more desalination projects in Basra, with total output of 800,000 CMD. The capacity of the Water Directorate in Basra to sustain the operation and maintenance cost with the present poor cost recovery system and unclear subsidizing regime will be a big challenge over the coming five years. It is remarkable that the water authorities are suffering to cover the O&M costs of the existing conventional system even with relatively cheap O&M costs. Basra and most of the Iraqi governorates are heavily relying on the federal budget to finance the water sector. The contribution of the tariff to sector financing is tiny as compared with the amount of expenses at the present and projected for the future. A metering system is not applied in most of the cities.

Finally, the private sector and non-governmental organizations are playing a significant role, filling the drinking water gap when government projects have failed to do that during the Basra water crisis. However, more efforts are needed to regulate and control the private sector particularly in distribution methods and water quality control. Moreover, private sector donations could be effectively used to address the problems at local levels. UNICEF has observed, for example, that locals were ready to donate to sustain safely managed water supplies in some schools where UNICEF has been trucking water. Through parents and teachers’ associations, they express their readiness to manage supply once UNICEF withdraws. This may represent a new pathway for improving WASH in schools, especially schools in areas affected by water crises.
Next Steps

UNICEF Iraq will continue implementing its plans to help Iraq to overcome the water crisis bottleneck toward achieving the SDGs. The Basra water crisis Response Plan is integrated in both the existing UNICEF Iraq country programme and the next country program. All the planned and ongoing activities are well-designed to achieve dual results by ensuring alignment with progress toward the SDGs and addressing the ongoing water crisis problem. UNICEF will continue in the medium term to invest in water treatment infrastructure capacity recovery. With more focus on quality improvements, UNICEF, in partnership with the Iraqi government and through engagement with the private sector, will do the following: rehabilitate six compact units in R-Zero water treatment project, rehabilitate the Al Mouhad and Al Jubal water treatment projects by rehabilitating aged sedimentation tanks and multimedia filters, by replacing faulty pumps and valves, and by installing new chlorine gas dosing systems. The six months- long intervention will ensure pumping of well treated water to about 750,000 individuals in Basra city center where the highest density of population is living. The intervention will contribute to minimizing the risk of water-borne and water-related disease outbreaks during the coming summer. UNICEF is also targeting a 60% recovery of the wastewater treatment capacity of the Hamdan sewage treatment plan in Basra. The Hamdan project is the only project of its kind in Basra, representing the only functioning sewage facility serving 1,000,000 individuals in Basra city. By completing the intervention, less sewage will be pumped to Shat Al Arab and more communities will benefit from connecting the domestic sewage system to the government sewage collection network, rather than pumping it to open irrigation canals.

During 2019 and beyond, UNICEF will focus on initiatives by which sectoral development can be achieved. Namely, UNICEF will implement water safety plan for Basra in 2019. UNICEF is also working to secure more funds to implement more key activities in Basra and the other southern provinces. The planned activities are as follows: application of the Supervisory Control and Data Acquisition (SCADA) system in R-Zero project; increasing raw water intermediate storing capacity to ensure steady operations; application of an advanced water distribution monitoring and rationing system in Basra; increasing water treatment capacity in R- Zero by 10,000 CMD; application of an e-billing system in Basra; and, application of integrated water resource management in selected district in Basra. UNICEF will also continue supporting schools and primary healthcare centers to cope with the water crises challenges and the community’s needs.
References


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UNICEF’s water, sanitation and hygiene (WASH) country teams work inclusively with governments, civil society partners and donors, to improve WASH services for children and adolescents, and the families and caregivers who support them. UNICEF works in over 100 countries worldwide to improve water and sanitation services, as well as basic hygiene practices. This publication is part of the UNICEF WASH Learning Series, designed to contribute to knowledge of best practice across the UNICEF’s WASH programming. The documents in this series include:

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