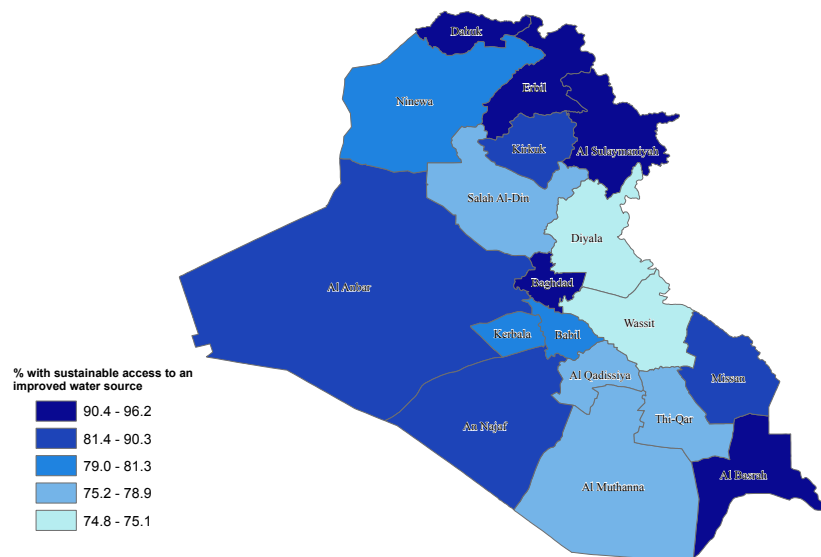


INTRODUCTION

The combination of climate change, population growth, and limited environmental awareness effectively limits water resource management in Iraq. In addition, the destruction of vital infrastructure, as a consequence of conflict, and a lack of capital investments have resulted in the deprivation of many Iraqis from access to potable water and basic sanitation facilities. According to a 2012 UNICEF report, 91 percent of the population has access to potable water with significant differences among governorates and between urban and rural areas. For example, in rural areas, only 77 percent of the population has access to improved drinking water sources compared to 98 percent in urban areas. Furthermore, 6.2 percent of the population does not use an improved sanitation facility. Poor drinking water and sanitation has increased the risk of waterborne diseases especially among vulnerable groups such as children and women.

Water and its management needs to be prioritised by the Government of Iraq (GoI) since it plays a key role in the sustainable development of the country and is fundamental to eradicating poverty and hunger (MDG1), reducing child mortality (MDG4), ensuring environmental sustainability (MDG7), and contributing to the achievement of all the MDGs.



Joint Analysis and Policy Unit (JAPU)

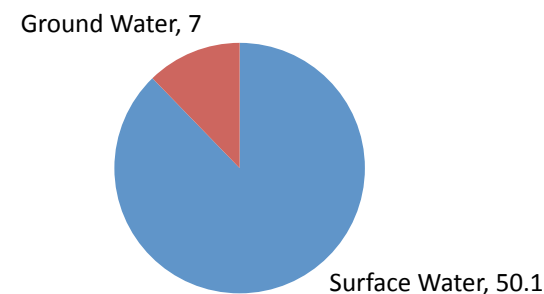
PERCENTAGE OF POPULATION WITH SUSTAINABLE ACCESS TO AN IMPROVED WATER SOURCE

WATER QUANTITY

Covering an area of 126,900km² and 177,600km² respectively, the Tigris and the Euphrates Rivers are the primary sources of surface water in Iraq. Historically, the rivers played a central role in sustaining Iraq and contributed to the birth and development of flourishing civilizations in the Fertile Crescent. In the last few years, however, water levels in Iraq's rivers have rapidly decreased to less than a third of their normal capacity. Water levels may fall further in the coming years due to declining precipitation,

gradual desertification, and upstream water use and damming. The long-term average annual precipitation in Iraq is equal to 216mm per year with high variability across time and governorate. In 2011, 507.4mm of water fell in Suleimaniyah while only 65.3mm fell in Basrah. Lakes, reservoirs, and minor rivers are also experiencing diminished levels of water. If present conditions remain unchanged, Iraq will experience a water shortage of over 33 million cubic meters a year by 2015.

WATER AVAILABILITY 2009-2010 (MILLION M3)*

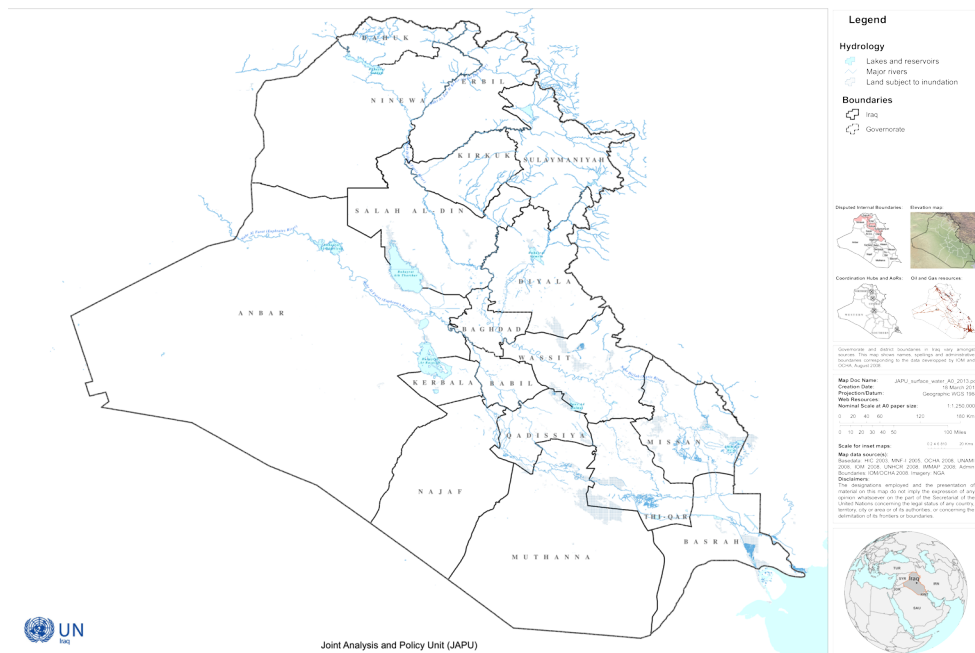


* source: Priority and Sustainable Development Indicators in Iraq

WATER QUALITY

In Iraq, the quality of water used for drinking and agriculture is poor and violates both Iraqi National Standards and World Health Organization guidelines. In 2010, the Biochemical Oxygen Demand (BOD) representing the degree of water pollution by organic materials—was equal to 36.2 mg/L, more than three times the national limit of 10 mg/L, indicating an alarming increase in water pollution (in 2005, the BOD was between 1.04-12.12). The Total Dissolved Salts (TDS) in the Euphrates' river water increased from 457 parts per million (ppm) in the 1980s to 1200ppm in 2009 reflecting a

IRAQ - RIVERS AND SURFACE WATER MAP



quick deterioration of incoming water. As reported by IOM in 2012, high pollution and salinity had devastating effects on livestock, agriculture, and fishing in the Muthanna, Misran Basra, and Wasit governorates.

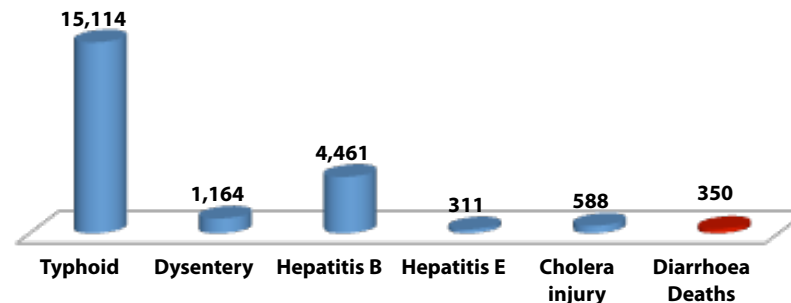
According to UNICEF’s Multiple Indicator Cluster Survey 2011 , in 27 percent of households tested there were no traces of chlorine in the water and in 15 percent the concentration of chlorine was below 0.5ppm - the standard considered necessary to prevent waterborne diseases.

People who depend on polluted water sources are exposed to a high risk of water-related health issues such as dehydration, diarrhoea, and skin infections. Total number of diarrhoea cases registered in hospitals during

2011 reached to 1,058,217 of which 350 died. The consumption of water from unimproved sources together with the use of untreated water in agriculture was responsible for many cases of watery diarrhoea reported in Erbil, Babil, Salah Al Din, and Diyala, while the Dokan River was the likely source of cholera outbreaks in Suleimaniyah (266 cases confirmed) and Kirkuk (160 cases confirmed) in October 2012 .

The deterioration in water quality and the associated growing number of waterborne diseases calls for the development of a national water quality management strategy aimed at strengthening the coordination and collaboration among the various stakeholders, enforcement of monitoring standards, and reporting of water quality information.

NUMBER OF CASES WITH TRANSITIONAL DISEASES TRANSMITTED THROUGH CONTAMINATED WATER AND FOOD (2012) AND NUMBER OF DIARRHOEA DEATHS. (2011)



WATER WASTE

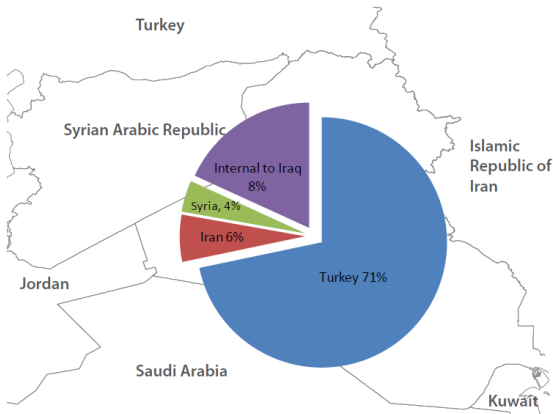
Water tariffs in Iraq are extremely low compared to other countries. The low tariff rate, combined with the lack of awareness of water scarcity, leads to a daily consumption of 392 litres per capita per day that exceeds the international standard of 200 litres. As a consequence of low tariffs, revenues are insufficient to cover the cost of water supply and sanitation, as they cover only 2-5 percent of the costs of operation and maintenance. Metering is not common; thus, the independence of water bills from consumption translates to excessive consumption of domestic water.

A large amount of water is wasted during production. In 2011, the total production exceeded 11,250 litres per day, 10 percent of which was lost and 5 percent distributed for free. Baghdad was the city with the highest losses of water (30 percent of the actual water production in 2011). Additional quantities of water are wasted in rural areas due to the lack of information and training in advanced

irrigation and water treatment systems. A substantial rise in water tariffs should be applied immediately, together with a proper tariff system for irrigation water.

NEED FOR INTERNATIONAL COOPERATION ON WATER

Water scarcity has the potential to increase levels of tribal and ethnic tensions within Iraq. In Baghdad, almost daily incidents of tension or verbal arguments related to water access were reported in 38 different locations. Other water-related conflicts occurred in Kirkuk among Arabs, Turkmen, and Kurds. Moreover, water availability in Iraq is affected by the water projects of Turkey, Iran, and Syria. Therefore, ensuring that Iraq has adequate water supply requires that all countries in the region adopt a diplomatic approach based on mutual interests to reach a fair division of mutual resources through agreements and strategic treaties.

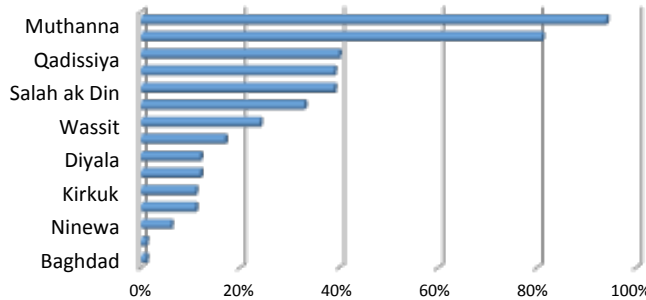


DROUGHT AND MIGRATION

The GoI and the High Level Committee for Disaster Risk Reduction (HLCDRR) have identified drought as one of the most serious crises facing Iraq. In the past decade, the country experienced frequent and harmful droughts, particularly in 2007-2009 and 2010-2011, with devastating socio-economic impacts such as deterioration of livelihoods, a decline in crop production, a rise in unemployment, and an increase in some diseases such as diarrhoea and typhoid. During the droughts of 2007-2009, livestock were decimated and a reduction in crop coverage was affected almost 40 percent of agricultural land. The industrial production, tourism, and energy sectors were also negatively impacted by water scarcity resulting in higher unemployment rates and an increase in poverty, malnutrition, and food insecurity. Drought and the related loss of income is pushing many households to move from dry zones to areas with improved water availability such as cities, a shift that leads to the abandoning of rural areas and worsening

of living conditions in urban zones. According to IOM, in Muthanna and Thi Qar, drought is cited as one of the main reasons for displacement. In Basrah, Missan, and Thi Qar, water scarcity, high salinity, and pollution levels are some of the major factors preventing IDP families from returning to their original communities.

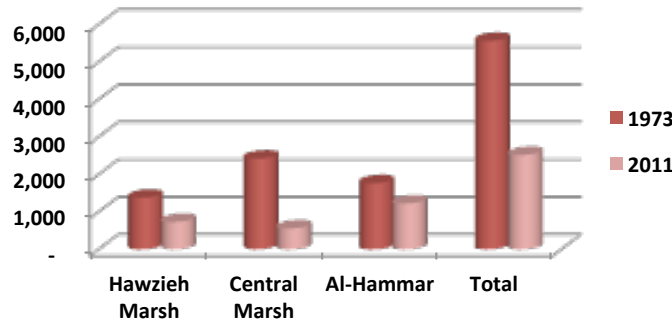
PERCENTAGE OF IDPS CITING DROUGHT AS A REASON FOR DISPLACEMENT FROM THE GOVERNORATE OF ORIGIN



MARSHLANDS

The Marshlands in southern Iraq the largest wetlands in west Eurasia — played a vital role in the economic and social advancement of the people of Iraq by providing freshwater and livelihoods for nearly half a million Iraqis. However, between the 1970s and 2003, over 90 percent of the original Marshlands area was drained or damaged due to regular over-exploitation and lack of coordinated management. Water quality in many marsh areas is generally unsafe for human use, and it is also less suitable for agriculture and other economic uses due to its pollution and salinity. As a consequence, more than 90 percent of marsh inhabitants have fled, leaving only 20,000 people who remain exposed to the risk of poverty and malnutrition. The Marshlands future

MARSHLANDS SIZE IN KM2, 1973-2011



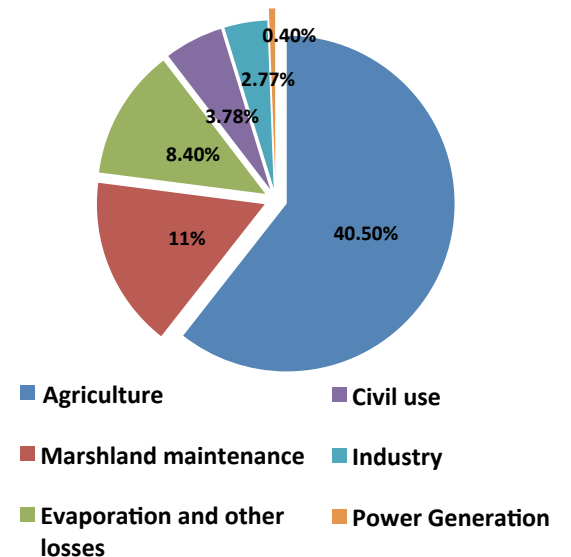
FUTURE CHALLENGES

Climate change will significantly affect rainfall patterns and temperature in Iraq, increasing the country's vulnerability to drought and environmental challenges. The flow of the Tigris and the Euphrates is expected to decrease further by 2025, with the Euphrates declining by more than 50 percent and the Tigris by more than 25 percent. The effects of water scarcity will vary by region, with some regions suffering more from recurrent droughts and water shortages. The trends

strictly depends on the ability of the GoI to manage water resources and cope with climate change. Currently, the Ministry of Water Resources' goal of restoring the Marshlands to 75 percent of their original size seems to be realistically achievable.

of population growth and increasing urbanization will lead to a rise in water consumption and increased pressure on urban water systems. Moreover, oil production in Iraq is expected to grow in the next few years resulting in higher water requirements. Increased competition for water use is expected in various industries including agriculture (which currently uses 34.8 million m3/year), petroleum, sanitation, hydro-electrical production, and environmental (e.g. Marshlands restoration). If left unaddressed, the constant decline of and rising pressure on the water supply will lead to increased vulnerability and insecurity. Such a scenario requires more sustainable management of water resources, a more effective domestic irrigation system as well as the introduction of the 'polluter pays principle', which entails improved water pricing policies and new regulatory measures.

2015 FORECAST FOR WATER REQUIRMENTS BY SECTOR (BILLION M3)



GOVERNMENT AND UN RESPONSE

The GoI and the Kurdistan Region Government (KRG) are aware of the degradation of Iraq's natural resources and ecosystems; however, concrete actions to address the issue remain uncoordinated and limited at the local and national level mainly due to divergent ministerial interests in water resources .

The Ministry of Water Resources (MoWR) is struggling to balance the competing needs of water for irrigation, drinking, industry, and hydropower production, while meeting environmental requirements, including the restoration of the Marshlands. Programmes to improve water resources include the maintenance and optimization of water facilities and pumping stations, effective water management, and comprehensive research projects that consider the environmental impacts and the needs of the population.

United Nations agencies, funds, and programmes are working together with Iraqi partners to achieve a more efficient and equitable utilization of water resources, to improve access to drinking water and sanitation facilities, and to build capacity for water resource management.

The WHO, UNICEF, UNDP, and UN-HABITAT are supporting the GoI in implementing the Water and Sanitation Master Plan and Capacity Building programme. The WHO has trained laboratory technicians and sanitary inspectors on water quality monitoring and testing and supported the Ministry of Environment in implementing

an environmental and hygiene awareness campaigns. The UNDP is enhancing the institutional structure and capacity of the Ministry of Water Resources by providing intensive state-of-the-art trainings on hydrology, water demand management, geographic information system mapping, and water modelling. UNICEF's projects on water include overseeing the Government's modernization of the water sector via Iraq's Public Sector Modernization programme, implementing a Water and Sanitation Master Plan in Missan governorate, the signing of Memorandums of Understanding with the Salahaddin and Babel governorates to improve waste water management, procuring solar-powered water treatment units for in-need governorates, rehabilitating water networks benefitting over 200,000 deprived people, and providing improved WASH facilities for approximately 93,000 children in over 240 schools across Iraq. IOM, together with the Community Revitalization Initiative, designed several small scale water projects to respond to the priority needs of vulnerable families that suffer from lack of access to adequate source of water. UNESCO, together with the GoI, is implementing an advanced groundwater database (GeoFia) to map the country's underground water resources in response to the lack of reliable information on drought and other water-related issues. Furthermore, UNESCO and UNDP are implementing the "Development of an Integrated National Framework for Drought Risk Management (DRM) in Iraq", a joint-project aimed to create a national framework for a coordinated and multidisciplinary response to drought.

ENDNOTES

1. CSO/KRSO/UNICEF, MULTIPLE INDICATOR CLUSTER SURVEY 2011(MICS2011), FINAL REPORT 2012.
2. CSO, MDGS MONITORING REPORT, 2012.
3. GEOPOLICITY, MANAGING THE TIGRIS EUPHRATES WATERSHED: THE CHALLENGE FACING IRAQ, 2010.
4. HISTORICALLY, THE TIGRIS AND EUPHRATES HAVE BEEN VERY FLUCTUATE IN FLOW RATE BETWEEN DRY YEARS AND WET YEARS. INDEED, LAST FEW YEARS WERE DRY YEARS, BUT THERE ARE FLOODS IN THIS YEAR.
5. FAO, AQUASTAT.
6. CSO, ENVIRONMENTAL SURVEY, 2011.
7. MINISTRY OF WATER RESOURCES.
8. IOM-IRAQ, SPECIAL REPORT – WATER SCARCITY, 2012.
9. CSO/KRSO/UNICEF, MULTIPLE INDICATOR CLUSTER SURVEY 2011(MICS2011), FINAL REPORT 2012.
10. CSO/KRSO/UNICEF, MULTIPLE INDICATOR CLUSTER SURVEY 2011(MICS2011), FINAL REPORT 2012.
11. GOI/KRG/WHO, CHOLERA IN IRAQ, 2012.
12. THE TARIFF FOR WATER IN IRAQ IS US\$ 0.0034/M3.
13. TOTAL IRAQ, KR EXCLUDED.
14. CSO/MINISTRY OF PLANNING, ENVIRONMENTAL SURVEY, 2011.
15. IOM-IRAQ, SPECIAL REPORT – WATER SCARCITY, 2012.
16. IOM-IRAQ, SPECIAL REPORT – WATER SCARCITY, 2012.
17. UNITED NATIONS INTEGRATED WATER TASK FORCE FOR IRAQ, MANAGING CHANGE IN THE MARSHLANDS: IRAQ'S CRITICAL CHALLENGE, 2011.
18. UNITED NATIONS INTEGRATED WATER TASK FORCE FOR IRAQ, MANAGING CHANGE IN THE MARSHLANDS: IRAQ'S CRITICAL CHALLENGE, 2011.
19. CSO/MINISTRY OF PLANNING, PRIORITY ENVIRONMENT AND SUSTAINABLE DEVELOPMENT INDICATORS IN IRAQ, 2011.
20. GEOPOLICITY, MANAGING THE TIGRIS EUPHRATES WATERSHED: THE CHALLENGE FACING IRAQ, 2010.
21. UNAMI, WATER RESOURCE MANAGEMENT WHITE PAPER, 2010.
22. WWW.MOWR.GOV.IQ