

# GLOBAL INFORMATION SOCIETY WATCH 2020

*Technology, the environment and  
a sustainable world: Responses from  
the global South*



ASSOCIATION FOR PROGRESSIVE COMMUNICATIONS (APC)  
AND SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY (SIDA)

## Global Information Society Watch 2020

Technology, the environment and a sustainable world: Responses from the global South

### Operational team

Valeria Betancourt (APC)

Alan Finlay (APC)

Maja Romano (APC)

### Project coordination team

Valeria Betancourt (APC)

Cathy Chen (APC)

Flavia Fascendini (APC)

Alan Finlay (APC)

Leila Nachawati (APC)

Lori Nordstrom (APC)

Maja Romano (APC)

### GISWatch 2020 advisory committee

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Florencia Roveri (Nodo TAU)

Y. Z. Yaú (CITAD)

Joan Carling (Indigenous Peoples Rights International)

### Project coordinator

Maja Romano (APC)

### Editor

Alan Finlay (APC)

### Assistant editor and proofreading

Lori Nordstrom (APC)

### Publication production support

Cathy Chen (APC)

### Graphic design

Monocromo

### Cover illustration

Matías Bervejillo



APC would like to thank the Swedish International Development Cooperation Agency (Sida) for their support for Global Information Society Watch 2020.

Published by APC

2021

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Global Information Society Watch 2020 – web and e-book

ISBN 978-92-95113-40-4

APC-202104-CIPP-R-EN-DIGITAL-330

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# TUNISIA

## WATER SCARCITY IN TUNISIA: ENVIRONMENTAL ACTIVISM, SUSTAINABLE DEVELOPMENT AND TECHNOLOGY



Yosr Jouini  
@thisisyosr

### Introduction

Throughout history, water scarcity and concerns over its unequal distribution within the country have shaped Tunisia's political, economic and social life. During the Roman period, a temple of water and a 123-kilometre aqueduct were constructed to transfer water from a spring located in the region of Zaghuan to the city of Carthage. In the early eighth century, Aghlabids engineered various water works and stored water in big basins to supply the newly founded town of Kairouan, located within a semi-arid region, prone to drought, without any nearby rivers or natural water sources.<sup>1</sup> In the 1960s and 1970s, bringing potable water and electricity to people was a symbol of modernity and a source of government legitimacy that helped reinforce the social contract between citizens and the state.<sup>2</sup>

The scarcity of water still concerns Tunisians today, since it is required for development in all social and economic sectors. In this report, I contextualise the debate concerning water scarcity in Tunisia in recent years. I cover how the internet has been used to mobilise for the environmental causes in the country and then expand the discussion to highlight the use of information and communications technologies (ICTs) to respond to this challenge.

### Context

According to the World Resources Institute's water stress index, a measure of competition and depletion of surface water in 167 countries, Tunisia ranks among the top 33 countries to face extreme water

stress by 2040.<sup>3</sup> With less than 450 cubic metres per inhabitant per year, this share is expected to decrease over the next decade to less than 350 cubic metres per year. For reference, when annual water supplies drop below 1,000 cubic metres per person, the population faces water scarcity, and below 500 cubic metres, "absolute scarcity".<sup>4</sup>

In addition to its water resources being characterised by scarcity and a pronounced irregularity, Tunisia faces a range of challenges related to water due to climate change, pollution, population growth, urbanisation and mismanagement. The water-related risks include floods and drought periods as well as water-borne diseases. In 2018, torrential rains and flooding in the northeastern region killed at least four people and damaged infrastructure and properties.<sup>5</sup> Due to important losses among farmers affected by drought between 2016 and 2017, the government allocated an emergency fund to support the agriculture sector. The majority of prediction models envisage an increase in drought in the country over the next decades.<sup>6</sup> And even though the overall epidemiologic situation in the country is reassuring, in June 2020, health units confirmed around 450 cases of people in the south of the country suffering from typhoid fever, with potential causes being water or food contamination.

When Tunisia passed a new constitution in 2014, it explicitly included access to drinkable water as a right of every citizen and stated that the conservation and rational use of water is a duty of the state and of society.<sup>7</sup> Even though Tunisia has

1 Omrani, N., & Ouessar, M. (2008). *Historical and contemporary perspectives of water culture in Tunisia*. Institut des Régions Arides. <https://www.idaea.csic.es/meliaproject/sites/default/files/517612-MELIA-Historical-and-contemporary-perspectives-of-water-culture-in-Tunisia.pdf>

2 Malka, H. (2018, 18 June). Water Pressure: Water, Protest, and State Legitimacy in the Maghreb. *Center for Strategic and International Studies*. <https://www.csis.org/analysis/water-pressure-water-protest-and-state-legitimacy-maghreb-o>

3 Maddocks, A., Young, R. S., & Reig, P. (2015, 26 August). Ranking the World's Most Water-Stressed Countries in 2040. *World Resources Institute*. <https://www.wri.org/blog/2015/08/ranking-world-5-most-water-stressed-countries-2040>

4 <https://www.un.org/waterforlifedecade/scarcity.shtml>

5 AFP. (2018, 23 September). Tunisia: Record rainfall causes deadly floods. *Al Jazeera*. <https://www.aljazeera.com/news/2018/09/tunisia-record-rainfall-deadly-floods-180923085352897.html>

6 Nasr, Z., Almohamad, H., Gafrej Lahache, R., Maag, C., & King, L. (2008). Drought modelling under climate change in Tunisia during the 2020 and 2050 periods. In A. López-Francos (Ed.), *Drought management: Scientific and technological innovations*. CIHEAM. [https://www.researchgate.net/publication/317065794\\_Drought\\_modelling\\_under\\_climate\\_change\\_in\\_Tunisia\\_during\\_the\\_2020\\_and\\_2050\\_periods](https://www.researchgate.net/publication/317065794_Drought_modelling_under_climate_change_in_Tunisia_during_the_2020_and_2050_periods)

7 <http://www.legislation.tn/fr/constitution/la-constitution-de-la-r%C3%A9publique-tunisienne>

one of the highest access rates to water supply and sanitation in the Middle East and North Africa, the frequent water shortages make it difficult to secure this right. Essential facilities like hospitals also suffer from these shortages.<sup>8</sup> Consequently, access to water has become an increasingly visible component of socioeconomic demands in the last decade. Throughout June 2020 alone, some 150 protests took place around the country to demand access to water and 50 protests for other environmental issues.<sup>9</sup>

The other concerns over water in Tunisia include the impact of pollution and industrial waste on the environment, the well-being and health of the residents, and the marine ecosystem.<sup>10</sup> The World Wide Fund for Nature stated in the report *Stop the Flood of Plastic* published in June 2019 that in 10 years, all the beaches in Tunisia will be polluted by plastic.<sup>11</sup> To deal with this, the government passed a decree relating to the prohibition of free distribution of single-use plastic bags, whose thickness is less than 40 microns, in public and private commercial spaces and pharmacies. Every year, the Ministry of Health publishes a list of beaches unfit for swimming based on analysis of water samples. The list continues to grow, from 18 in 2018 to 23 in 2020.<sup>12</sup> Citizens criticise the government for not taking serious measures to face the pollution mainly caused by industrial and domestic waste water discharged into the sea. An article in the Tunisian constitution states the following: “The state guarantees the right to a healthy and balanced environment and the right to participate in the protection of the climate. The state shall provide the necessary means to eradicate pollution of the environment.”

The Tunisian coastline is also subject to climate change threats. Almost half of Tunisia’s 670 kilometres of sandy beaches are threatened by coastal

erosion, according to the Tunisian State Agency for Coastal Protection and Planning.<sup>13</sup> This will have repercussions on tourism, agriculture and industry.

### Internet as a mobilisation tool for environmentalist activists

As the space for activism opened up in Tunisia after the 2011 uprising, the number of civil society organisations working on environmental challenges in the country has been on the rise. Furthermore, these environmentalist organisations, which include community groups, have been increasingly using the internet and more particularly social media for their advocacy, such as documenting abuses and broadcasting social protests in relation to water shortages and pollution. In 2018, Mohamed Ousama Houij, a young activist, created a Facebook page to document his 300-kilometre walking journey across coastal Tunisia while picking up plastic waste and broadcasting videos of trash dumped close to the sea by municipal workers and private factories. Mohamed’s journey was widely covered<sup>14</sup> in the national and international media. However, generally, environmental activism does not take up much space in the press. Due to this limitation – and the fact that most media outlets are based in the capital city – the broad-based participatory nature of social media allows activists to bring the environmental issues to the forefront of public discourse, and to mobilise local communities to take action. For example, social media has been used by local organisations like “Stop Pollution”,<sup>15</sup> a youth-led movement focusing on the environmental challenges in Gabes, a city in the south of Tunisia that has historically suffered from pollution due to the local phosphate industry. In its review of environmental justice in Tunisia, the Tunisian Forum for Economic and Social Rights says that in June 2019 it used social media to mobilise residents in the region of Redeyef to protest continuous water shortages and put pressure on the local officials using the slogan “Water is a priority for the inhabitants and not for the phosphate.”<sup>16</sup>

8 Guesmi, K. (2020, 13 March). *ماجلا عاوطن إرا راركت :خ يبيس ليا*. *Mosaïque FM*. <https://www.mosaïquefm.net/ar/تاهج-س-نو-ت-راب-خ/703931/>

9 *Observatoire Social Tunisie*. (2020). *Report of the month June 2020: Social movements, suicides and violence*. FTDES. <https://ftdes.net/rapports/en.juin2020.pdf>

10 Speakman Cordall, S. (2019, 9 July). ‘Inside, the fish are black’: the pollution tainting Tunisian beaches. *The Guardian*. <https://www.theguardian.com/environment/2019/jul/09/pollution-taint-tunisia-beaches>

11 Agence Tunis Afrique Presse. (2020, 26 February). World Wildlife Fund calls on Tunisians to join efforts to ban plastic bags. *TAP*. <https://www.tap.info.tn/en/portal-economy/12370409-world-wildlife-fund>

12 Ngounou, B. (2020, 30 June). TUNISIA: Swimming suspended at 23 beaches due to pollution. *Afrik 21*. <https://www.afrik21.africa/en/tunisia-swimming-suspended-at-23-beaches-due-to-pollution>

13 Foroudi, L. (2020, 19 March). Holding back the tide – sea’s advance threatens Tunisia’s beaches. *Reuters*. <https://www.reuters.com/article/us-tunisia-tourism-climate/holding-back-the-tide-seas-advance-threatens-tunisia-beaches-idUSKBN2160PA>

14 Middle East Eye. (2019, 20 September). Climate change in the Middle East: These young activists are making a difference. *Middle East Eye*. <https://www.middleeasteye.net/news/climate-change-middle-east-activists-fighting>

15 <https://www.facebook.com/StopPollution2>

16 Environmental Justice Department of the Tunisian Forum for Economic and Social Rights. (2020). *Revue de la Justice Environnementale – Mars 2019-Mars 2020*. FTDES. <http://ftdes.net/rapports/Revue-JE-FR-final.pdf>

Due to the COVID-19 sanitary restrictions, “Youth For Climate Tunisia”, a youth-led organisation focused on the preservation of the environment, moved its offline activities online during the quarantine. Its activism included a “digital strike” to call upon those responsible for the environmental situation in Tunisia to launch a serious and immediate implementation of the 2015 Paris Agreement to combat climate change.<sup>17</sup> Supported by other groups, they also launched an online petition calling on the Ministry of Education to integrate climate change education in school curriculums.<sup>18</sup>

### Economic challenges and technological responses

Usually the demands in relation to access to water and the reduction of pollution are accompanied by economic demands, given the high unemployment rates in the country. Tunisia’s economy, however, relies on water-intensive sectors like agriculture, tourism and industries such as mining and textiles. The predicament is mainly due to the development strategies over the years.<sup>19</sup>

For example, the textile and clothing sector in Tunisia is one of the strategic sectors of the national economy: it represents 83% of total exports and is the primary manufacturing sector in Tunisia in terms of employment and the number of enterprises.<sup>20</sup> While the textile sector consumes an important quantity of water, the governorate of Monastir, which is naturally poor in water resources with 51% of its water resources coming from outside the governorate, is one of the most important textile-producing cities in the country.

Today, reducing industrial water consumption in Tunisia has become an urgent matter locally, as well as internationally. For example, the United Nations Industrial Development Organization initiated the Transfer of Environmentally Sound Technologies programme for the southern Mediterranean (MED TEST II) with 26 Tunisian participants, companies in the food, leather, textile, chemical and mechanical sectors.<sup>21</sup> Among the experiences highlighted in the programme is a technical cooperation agreement between a Tunisian jeans manufacturing company and a Spanish company specialised in the development of

sustainable and efficient technologies for fabric and garment finishing. By purchasing two G2 ozone-washing machines and three E-flow nano-bubbles technology machines, the Tunisian jeans manufacturing company is expected to reduce water consumption for washing jeans by 13 litres per piece. The gains from the deployment of the new technology include the reduction of water consumption by 98%, electricity by 47% and chemicals by 50%, and waste elimination and wastewater treatment through a zero discharge process. Such a project will have an important impact if deployed on a national level. For reference, Tunisia’s annual production of denim stands at about 26 million pieces per year – and on average, 10,000 litres of water are needed to make a single pair of jeans.

Another project that succeeded in reducing its water consumption is ABCO, a producer of canned fish for the local and export market. Thanks to the MED TEST II project, ABCO could also identify savings in energy, water and raw material consumption to an annual value of EUR 84,384 (over USD 100,000). A particularly innovative solution was found for the defrosting of fish. By using an aerosol technology, the annual water consumption used for this process can be reduced by 2,628 cubic metres, saving 20 tonnes of sardines per year lost during the normal defrosting process.<sup>22</sup>

### Local startups providing solutions to the agriculture sector

Tunisia depends heavily on irrigated agriculture, which makes up 30% to 40% of the total agricultural output, and consumes 83% of Tunisia’s available water resources. Responding to the farmers’ need to improve their water management, local startups have been emerging in the field of e-agriculture. One of these startups is SEABEX, an e-monitoring and smart automation system that helps farmers find the right balance of water consumption needed to get better quality and quantity production.<sup>23</sup> The proposed solution uses soil and environmental data gathered using proprietary internet of things (IoT) devices deployed in-field for real-time monitoring and smart control. The real-time geolocated data is related to weather, soil variables, soil composition and soil parameters. Another example is Be Wireless Solutions, a company that proposes a number of solutions including real-time monitoring using IoT sensors deployed for water management. All of this company’s products are produced locally.<sup>24</sup>

17 <https://www.facebook.com/events/1066974740333034>

18 <https://www.sawt.org/petitions/nryd-trby-mnkhy-fy-twans>

19 Malka, H. (2018, 18 June). Op. cit.

20 [http://www.mfcpole.com.tn/En/tunisian-textile-and-clothing-sector\\_11\\_28](http://www.mfcpole.com.tn/En/tunisian-textile-and-clothing-sector_11_28)

21 United Nations Industrial Development Organization. (2018, 22 March). Reducing industrial water consumption in Tunisia. *UNIDO*. <https://www.unido.org/stories/reducing-industrial-water-consumption-tunisia>

22 SwitchMed. (2018). *Tunisia*. <https://switchmed.eu/wp-content/uploads/2020/03/National-Supplement-EN-Tunisia-1.pdf>

23 <https://www.seabex.com>

24 <https://bewireless-solutions.com/presentation-bws>

## Conclusion

Tunisia's efforts to use ICTs in solving its water scarcity problem are still minimal. Data and technology can be crucial assets for water resource management. A succinct analysis of collected data permitting accurate modelling of local hydrological cycles will provide specialists and policy makers the information to improve responses to the need for better urban water management, and natural phenomena such as floods. With better partnerships with local startups, responses to incidents causing water waste can be developed. The communication strategy to raise awareness around water shortages should also be improved, and citizens' protests can be addressed more effectively if proper information is shared with the public.

The case of Tunisia is a particularly interesting one in the arid region as it is one of the countries that has gathered the most important information about its water resources and needs over more than 50 years. Because of this, the country can serve as a model for other countries in the region, given its successes as well as its failures, and its ongoing discussions on the issue during the democratic transition.

## Action steps

The following steps are suggested for the Tunisian government:

- Build and update an open portal that collects data and information, and includes the details of different stakeholders like governmental agencies, universities, research institutions, startups and financing institutions. The portal can be an open database that includes the latest research and studies on the environment, as well as a chance for companies to propose their innovative solutions.
- Develop public-private and public-public partnerships and mechanisms that support initiatives focused on environmental sustainability.
- Encourage and finance research on the environment and climate change. This is one of the government's duties according to the 2014 constitution, as well as a necessity to understand local challenges.
- Adopt a multistakeholder approach in developing emergency funds and in the implementation of plans.

# *Technology, the environment and a sustainable world: Responses from the global South*

The world is facing an unprecedented climate and environmental emergency. Scientists have identified human activity as primarily responsible for the climate crisis, which together with rampant environmental pollution, and the unbridled activities of the extractive and agricultural industries, pose a direct threat to the sustainability of life on this planet.

This edition of Global Information Society Watch (GISWatch) seeks to understand the constructive role that technology can play in confronting the crises. It disrupts the normative understanding of technology being an easy panacea to the planet's environmental challenges and suggests that a nuanced and contextual use of technology is necessary for real sustainability to be achieved. A series of thematic reports frame different aspects of the relationship between digital technology and environmental sustainability from a human rights and social justice perspective, while 46 country and regional reports explore the diverse frontiers where technology meets the needs of both the environment and communities, and where technology itself becomes a challenge to a sustainable future.

GLOBAL INFORMATION SOCIETY WATCH

2020 Report

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