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FROM COLONIAL LEGACIES TO CLIMATE STRESS: PROSPECTS OF WATER JUSTICE IN ALGERIA

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About the study

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Introduction

Water scarcity is a pivotal issue in Algeria, which ranks as the 30th most water-stressed country globally. It stems from a convergence of geographical, historical, and demographic factors.

Today, over 80% of the country, which spans 2.38 million km^2 excluding inland water bodies, consists of semi-arid and arid zones of the Sahara Desert.[1] It is home to 47 million people, with 90% residing in the northern 10% of the territory.[2] Although mostly arid, Algeria features diverse landscapes, including green coastal plains, chains of rocky mountains, and extensive wetland areas. It relies on various unevenly distributed freshwater resources, including surface water from rivers and dams and groundwater drawn from shallow and deep aquifers.[3]

Understanding Algeria's water landscape requires looking equally into its environmental history and its current policies, which are deeply influenced by its colonial past. During the French rule (1830-1962), water infrastructure, such as dams and irrigation networks, was developed primarily to serve settler populations and agricultural production at the expense of local communities. Though largely unknown and understudied, the ecological and sociopolitical harms of colonial times persist in various forms in the present day. Coupled with modern challenges – climate change, a booming population, and industrial, domestic and agricultural pollution – they continue to affect water availability and management.

Algeria's water governance is grounded in its 2020 Constitution and 2005 Water Law. Water is recognized as a public good under Articles 14 and 20 of the constitution, while Article 63 affirms the right to access safe drinking water, charging the state with ensuring its availability and safeguarding it for future generations.[4]

Law No. 05-12 of 4 August 2005, "On the Use, Management, and Sustainable Development of Water Resources as a National Public Good", guarantees the right to access safe drinking water and sanitation under Articles 2 and 3.[5] It promotes integrated water resources management (IWRM) and regulates water use across sectors, emphasizing sustainability, pollution prevention, and stakeholder participation.

Algeria aligns with the Sustainable Development Goals (SDGs) of the UN 2030 Agenda, and pursues the realization of SDG 6: access to water and sanitation for all. The country committed to the UN 2030 Agenda from its adoption by the UN General Assembly in 2015, embedding SDGs in the constitution and key national regulations.[6] It also boosted public spending in the sector, investing over USD45 billion in water infrastructure in the period from 2000 to 2025.

However, realizing water justice is a bigger challenge. It requires not only equitable access (distributive justice), but also accountability and citizens' participation in policymaking (procedural justice) and repair processes (restorative justice). Fostering water justice in Algeria must therefore contend not only with physical scarcity and environmental stress, but also with historical and political structures that have shaped access and control over this essential resource. More than 60 years after becoming independent, the country still navigates the debris of 132 years of colonial occupation. It also faces, as other countries of the global south do, local policy gaps and the resurgence of foreign economic imperialism, which was once considered a relic of the past.

1 The Convention on Biological Diversity states: "Inland waters include lakes, rivers, ponds, streams, groundwater, springs, cave waters, floodplains, as well as bogs, marshes and swamps." Convention on Biological Diversity, "Inland Waters Biodiversity – What is it?", 29 January 2008, available at https://www.cbd.int/waters/inland-waters

2 "Politique Nationale de Population" (French), UNFPA Algeria, 4 July 2024, available at https://algeria.unfpa.org/fr/news/politique-nationale-de-population-début-des-travaux

3 "Algeria", UNDP Climate Change Adaptation, available at https://www.adaptation-undp.org/explore/arab-states/algeria

4 Constitution of Algeria (French), Journal Officiel de la Republique Algerienne No. 82, 30 December 2020, available at https://www.joradp.dz/TRV/FConsti.pdf (Constitution of Algeria, 2020)

5 "Water Law 05-12 of 4 August 2005" (French), Journal Officiel de la Republique Algerienne No. 60, available at https://faolex.fao.org/docs/pdf/alg54287.pdf (Water Law 05-12, 2005)

6 Algeria ODD voluntary progress report (2019, Ministry of Foreign Affairs, available at https://hlpf.un.org/sites/default/files/vnrs/2021/23441MAE_rapport_2019_complet.pdf (Ministry of Foreign Affairs, 2019)

Scope and Methodology

This paper explores the historical, social, environmental, and economic challenges facing access to water in Algeria. It examines the colonial roots of environmental decline and water scarcity, and current policy frameworks and supply strategies. By addressing critical issues such as access, affordability, conservation, and pollution, the study highlights successes, failures, and opportunities to strengthen water governance and achieve water justice. It also considers social groups that benefit from or are negatively impacted by water scarcity or existing policies.

Drawing on research and critical analysis, this report proposes actionable strategies through which various actors, particularly civil society, can advance water justice. It is based on interviews and consultations with 30 experts. Field visits in Algiers and western and southern Algeria offered opportunities to engage with policymakers, professionals, and civil society representatives and gain valuable insight into their experiences, perspectives, and efforts to spark change. The research faced certain limitations, primarily the scarcity of recent, reliable, and publicly available data.

Colonial Roots of Environmental Decline and Water Scarcity

Nineteenth-century European colonialism produced enduring environmental degradation in the territories under its control. In Algeria, the appropriation and management of land, forests, and water resources – legitimized through discourses of modernity – facilitated the consolidation and expansion of the colonial state.

Forest exploitation and degradation

Algerian forests and plains suffered immensely from the scorched-earth policy used by the French army as a counterinsurgency tactic during the decades-long conquest that began in 1830 and the Algerian Liberation War (1954-1962). During the conquest, the policy led to the deliberate burning of villages that resisted or harbored rebels, or were suspected of sympathizing with them, and the destruction of any resource that might be useful to the rebels, including crops and water supplies.

On the onset of the Algerian Liberation War, the French air force deployed napalm incendiary bombs over a large area, particularly in northern mountainous and forested areas where national liberation fighters were located, in a blatant violation of the Geneva Conventions.[7] It referred to napalm as “special canisters” and called the destruction of more than 8,000 villages a “pacification of the population”. Napalm instantly ignites the surface on which it spreads, making it particularly destructive in woodlands. Vast areas of countryside, hills, and forests were destroyed, including in the Aurès mountains, the Constantinois and the Kabylie regions in eastern Algeria, and in the Trara mountains in the west.

Throughout the colonial era, Algerian forests were heavily exploited to supply cork and timber for shipbuilding and other industrial purposes. Intensive logging took place in the entire Atlas coastal belt, and particularly in the Edough massif near Annaba.[8] It is estimated that up to 2.6 million of 5 million hectares of forest disappeared in Algeria between 1830 and 1962 due to colonial logging, grazing expansion, fires, and concession-based extraction, amounting to 52% of Algeria’s total

7 Raphaëlle Branche, “France-Algérie, deux siècles d’histoire: Quand l’armée française ‘pacifiait’ au napalm” (French), Orient XXI, 25 May 2022, available at https://orientxxi.info/magazine/quand-l-armee-francaise-pacifiait-au-napalm,5638

8 David Prochaska, Making Algeria French: Colonialism in Bone, 1870-1920, Cambridge University Press, 1990, available at https://vdoc.pub/documents/making-algeria-french-colonialism-in-bone-1870-1920-6kiv00i32f10?

forest surface area.[9]

Land grabbing and intensive agriculture

Before colonization, Arabs, Berbers, and Turks developed various hydraulic systems, from basic canals to complex aqueducts and dams. These were modified during the French era to redirect water resources toward settlers – portrayed as heirs to the Roman empire – whose duty was to "raise Algeria from a fallen state and return her to her past glory".[10] This rhetoric was supported by a wide range of colonial scientific works that legitimized the control of water to counter desertification, improve agriculture and health, and "civilize" the colony, while also promoting the intellectual inferiority of Algerians in justification for their removal from the best lands. By the 1850s, French settlers and companies had appropriated the best-irrigated and most fertile agricultural lands in Algeria.[11]

Intensive agriculture led to soil degradation and a surge in livestock caused overgrazing, further damaging forests and hindering their natural regeneration. The 1881 "Code de l'indigénat" criminalized indigenous land use and methods and permitted the seizure of native lands. The Great Depression of 1929, which affected both Europe and its colonies until the Second World War, deepened the crisis. More land was appropriated in response to plummeting prices; agricultural activity intensified; and the hydrocarbon industry expanded rapidly.

All this permanently impacted water resources. Healthy streams, soil, and forests play a crucial role in regulating the water cycle and protecting its quality. Forests capture and filter rainwater, replenishing aquifers, removing certain pollutants, and limiting runoff. Colonial practices have thrown off this balance by changing land tenure, prioritizing resource extraction over local needs, and locking the country in water-intensive industries from oil and gas to intensive agriculture. This has accelerated desertification and water scarcity.[12]

Urban segregation

In cities, entire neighborhoods and parts of the Arab and Ottoman water infrastructure were razed to develop French military and residential infrastructure, leaving local populations without access to private or public water (wells and water fountains).[13] By the 1860s, there was clear segregation between the European and Algerian areas in cities, with the former benefiting from the Arab and Ottoman infrastructure and the French extensions, while the latter were left with a few wells and water carrying. Water carriers were common during the colonial era; they sold water to indigenous populations who had no or limited access to it.

Water became increasingly associated with sanitation, hygiene, and public health. In Algiers, access to water was restricted as part of a broader push to create a "clean", "modern city" and replace a "backward Arab town". This narrative deliberately ignored existing water systems developed since the 16th century that had supplied Algiers with a sophisticated network of aqueducts, wells, and fountains; these had provided around 77 liters of water per person per day, and early colonial projects only modified or repaired them.[14] As a comparison, in 1860 in Paris, water availability was only about 14 liters per person per day.[15]

In 1863, a sénatus-consulte (decree of the senate) mandated the disintegration of Algerian

9 Saifi Merdas, Tewfik Mostephaoui, and Mohamed Belhamara, "Reforestation in Algeria: History, current practice and future perspectives," Reforesta Vol.3, 2017, pp.116-124, available at https://www.researchgate.net/publication/318299119_Reforestation_in_Algeria_History_current_practice_and_future_perspectives

10 Diana K. Davis, "Eco-Governance in French Algeria: Environmental History, Policy and Colonial Administration", Journal of the Western Society for French History, Vol.32, 2004, available at http://hdl.handle.net/2027/spo.0642292.0032.019

11 Brock Cutler, Imperial Thirst: Water and Colonial Administration in Algeria, 1840-1880, University of California, Irvine, 2010 (Cutler, Imperial Thirst).

12 Diana K. Davis, "Desert 'Wastes' of the Maghreb: Desertification Narratives in French Colonial Environmental History of North Africa", Cultural Geographies, Vol.11 no.4, October 2004, pp.359-387, https://journals.sagepub.com/doi/10.1191/1474474004eu313oa

13 René Lespès, "Alger : étude de géographie et d'histoire urbaines" (French), 1930, available at https://1886.u-bordeaux-montaigne.fr/s/1886/item/440379#?c=0&m=0&s=0&cv=0&xywh=-1259%2C-161%2C3293%2C3193

14 Cutler, Imperial Thirst.

15 Sabine Barles, "Urban metabolism and river systems: an historical perspective – Paris and the Seine, 1790–1970", Hydrology and Earth System Sciences Discussions, Vol.4, pp. 1845-1878, available at https://hess.copernicus.org/preprints/4/1845/2007/hessd-4-1845-2007-print.pdf

collective land ownership for the benefit of French settlers.[16] It coincided with years of drought. In the following years, famine and disease broke out in the countryside among the Algerian population, particularly in the period 1866-1868, massively pushing Algerians toward coastal cities and leading to water shortages. "Unhygienic Arabs were flowing into town every day", reported Le Courrier de l'Algérie, "and the mayor is not provisioning the city with extra water, even though more would obviously be needed to keep the city salubrious in the face of this wave of immigration".[17]

By 1868, destitution, thirst, and the spread of epidemic diseases were forcing more Algerians to migrate to urban centers. To keep them out, authorities established camps outside city boundaries and guarded wells to prevent water contamination by Algerians.

In the camps, homeless and starving Algerians could receive basic food and water rations in exchange for a full day's labor. The jobs assigned to them included constructing roads, dams, and irrigation systems. Although these infrastructures are products of Algerian labor, they constitute colonial legacies because they were used to exploit and control both natural resources and local populations. In addition, although dams provide critical water storage, they alter natural flow patterns, degrade river ecosystems, reduce water quantity and quality downstream, shrink wetlands, and dry up sections of the river.

Nuclear tests

France conducted nuclear tests in Algeria between 1960 and 1966 in its quest to become a global nuclear power. Seventeen bombs – four atmospheric and 13 underground – were detonated in the towns of Reggane and In Eker in the Sahara, resulting in widespread and long-term radioactive contamination. These tests created a destructive legacy with severe and lasting impacts on water resources.

The first detonation, codenamed Blue Jerboa, was three times more powerful than the atomic bomb dropped on Nagasaki, Japan, in 1945. While thousands of French soldiers and engineers were involved in and impacted by the tests, the radioactive fallout affected tens of thousands of Algerians, including the local Tuareg population, communities across north and west Africa, and the entire Sahel region.[18] The contamination permanently damaged soils, surface and groundwater sources, including foggaras – traditional underground irrigation systems specific to the region that draw water from shallow aquifers. Vast areas of once-fertile lands that had supported entire communities were abandoned due to their toxicity, leading to the collapse of local livelihoods and to displacement.

Estimates suggest that up to 42,000 Algerians died due to the nuclear tests; some experts, like Professor Abdul Kadhim al-Aboudi, a nuclear physics professor at the University of Oran and a member of Algeria's Commission for the Protection of Memory, place the death toll as high as 60,000.[19] Tens of thousands suffered long-term health consequences such as cancer, respiratory illnesses, and congenital deformities due to radiation exposure.

Sixty-five years later, opacity continues to surround the tests. France has declined to take responsibility for the human and environmental damages, nor will it agree to declassify documents; disclose the locations of buried radioactive waste, which continues to pose a long-term threat; decontaminate the areas; or compensate people and communities affected.[20] In 2023, France had compensated 1,015 victims of its nuclear activities worldwide: 607 from metropolitan France, 417 from Polynesia, and only two from Algeria. The Algerian state argues the tests qualify as an ecocide due to the extent and persistence of the damage and its transgenerational

16 Michael Brett, Legislating for Inequality in Algeria: The Senatus-Consulte of 14 July 1865, Bulletin of the School of Oriental and African Studies, Vol.51, no.3, 1988, pp.440-461, available at https://www.jstor.org/stable/617008; Claude Collot, Les Institutions de l'Algérie durant la période coloniale (1830-1962), OPU, Alger 1987, Edition du CNRS Paris 1988.

17 Stephen Roberts, The History of French Colonial Policy, 1870-1925, Vol. 1, Studies in Economics and Political Science, 1929, available at https://archive.org/details/in.ernet.dli.2015.84402

18 Samira Elsaidi, "'The day the desert wind cried': French nuclear tests cast long shadow in Libyan Sahara", Middle East Eye, 29 January 2023, available at https://www.middleeasteye.net/news/france-libya-algeria-nuclear-tests-still-haunt-desert-cried

19 Yaqin Husamuddin, "Algeria's agony lives on decades after French nuclear tests", The New Arab, 16 February 2015, available at https://www.newarab.com/analysis/algerias-agony-lives-decades-after-french-nuclear-tests

20 Basma El Atti, "65 years after France turned their land into a nuclear test site, Algerians seek justice", The New Arab, 20 February 2025, available at https://www.newarab.com/news/algerians-seek-overdue-justice-colonial-french-nuclear-tests

effects, and calls on France to disclose information on and decontaminate the sites.[21]

Without full disclosure, it is impossible to fully assess damages and reparations, though some experts have tried.[22] On 13 September 2024, a group of UN experts, including the UN Special Rapporteur on Toxics and Human Rights, working under a mandate from the UN Human Rights Council, raised these questions in letters sent to the governments of France and Algeria, but had received no answers at the time of writing this report.[23]

Thus, colonial warfare, dispossession, exploitation, and nuclear tests not only caused irreversible harm to the environment but also severed bonds between people and land. They have led to a significant loss of ancestral agricultural knowledge and practices. Hills and mountains, once integral to daily life, became synonymous with fear and death due to the atrocities committed there. To this date, women in remote areas remain reluctant to enter forests despite the resources they hold that are needed to make a living.

Post-independence

Social and economic policies in post-1962 independent Algeria aimed to reverse colonial policies, yet they were influenced by them. Like many countries in the region, Algeria's economy, society, landscape, and environment are shaped by this era's legacies, as well as modern political and economic dependencies.

In the Sahara, French nuclear activities continued until 1967 as part of the Evian Accords. There, water resources fueled the expansion of the oil and gas industry that had been developed in the 1950s, and which remains central to the Algerian economy.

Post-independence years were also characterized by a rural exodus. Algerian populations in camps and impoverished areas rushed toward cities that the French population (pieds-noirs) had left. During the war for independence, a third to a half of the 11 million Algerian people had been forcibly displaced and distributed over 2,000 "camps de regroupement", which were in practice concentration and experimentation camps.[24]

The war's most horrific crimes had taken place in the mountains, hills, and villages. Understandably, cities were very attractive to millions of poor Algerians in camps or from traditionally deprived rural areas. The cities, however, were not prepared for this influx, which only intensified in the following years and decades. From 11 million in 1962, the population grew to 19 million in 1979 (a 60% increase) and is around 47 million today. Population censuses show that the urban population was 31% of the total population in 1966.[25] This figure grew to 41% in 1977, around 50% in 1987, and 75% today.[26]

The cities were not prepared and lacked the experience to maintain and repair water infrastructure. This, combined with the massive postwar influx of people from rural areas, led to significant deterioration of the infrastructure over time. Water demand surged in overpopulated neighborhoods, and urban centers expanded beyond cities to build on fertile agricultural land.

Water policies in the following decades focused on building water supply and sanitation networks that until then had only covered major cities – namely, the European zones. Policies also aimed to increase the number of dams and infrastructure that would drain rainwater toward them. Algeria has at least 86 dams today; a dozen date from its colonial era, and the rest were built after 1962. However, their development was rooted in colonial-era thinking that perceived large dams as the only way to manage water resources, despite their high costs, technical limitations, and significant environmental

21 Ezzedine Ghlamallah, "Essais nucléaires dans le Sahara algérien : L'écocide oublié de la France" (French), EL Moudjahid, 23 May 2025, available at https://www.elmoudjahid.dz/fr/dossier/essais-nucleaires-dans-le-sahara-algerien-l-ecocide-oublie-de-la-france-235109

22 Aicha Merabet, "ENTRETIEN. Colonisation : 'Pourquoi la France doit indemniser l'Algérie'" (French), TSA, 22 December 2020, available at https://www.tsa-algerie.com/entretien-colonisation-pourquoi-la-france-doit-indemniser-lalgerie/

23 Rachid Aouine, "Unveiling a hidden tragedy: the devastating legacy of French nuclear testing in Algeria", War Resisters' International, 6 January 2025, available at https://wri-irg.org/en/story/2025/unveiling-hidden-tragedy-devastating-legacy-french-nuclear-testing-algeria

24 Fabien Sacriste, Les camps de regroupement en Algérie. Une histoire des déplacements forcés (1954-1962) (French), Les Presses de Sciences Po, Paris, 2022, available at https://journals.openedition.org/lectures/54829

25 Omar Bessaoud, "L'Algérie agricole et rurale 60 ans après: de la décolonisation au modèle concessionaire" (French), Insanyat, Vol. 100, 2023, pp. 13-46, available at https://doi.org/10.4000/insaniyat.29128

26 World Bank, urban population, Algeria https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=DZ.

drawbacks (such as siltation, evaporation, pollution, and disruption to water flow and biodiversity). Dams, while central to storing water, also became a source of transboundary tensions throughout the region: they were developed at the expense of more sustainable and ecologically sound solutions such as water reuse, urban collection systems, and indigenous water management systems that nourish rather than drain the land. It is worth noting that in post-independence years, French companies supported the development of the Algerian water sector as they enjoyed privileged access to the market; this privilege has diminished in recent years, due to high tariffs and international competition.[27]

In the agricultural sector, land reforms started in the early 1960s with the establishment of a self-management system, a highly decentralized system of agricultural cooperatives managed by farmers and workers. In 1971, the Agrarian Revolution replaced this system, which was considered ineffective, with a centralized planning and management system that yielded poor outcomes, resulting in chronic shortages of basic food products throughout the 1980s.

In the early 1990s, the sector was liberalized, paving the way for a series of reforms, including the National Plan for Agricultural Development and the Agricultural and Rural Renewal Policy initiated in 2009, which aimed to increase agricultural production, promote self-sufficiency, and expand the area of arable land. This was accomplished through land reclamation in the north and the development of agriculture in Saharan regions, where land, sun, and water are plentiful, though water resources there are mostly nonrenewable. Intensive agriculture and monocultures continued to be favored at the expense of diverse and sustainable local cultures – such as varieties of wheat, barley, fodder, fruit, and other fresh produce – contributing further to land erosion.

Post-independence years also saw the launch in the 1970s of a long-term afforestation program to combat desertification.[28] Millions of trees were planted on a 1,500km strip from the east to the west of the country, protecting the steppe from the advancing desert. These efforts inspired Africa's Great Green Wall, an initiative to counter desertification in the Sahara and the Sahel launched by the African Union in 2007.

In 2019, Algeria launched a new Plan National de Reboisement (National Reforestation Plan), aiming to plant 43 million trees (one for each citizen) and to expand the country's green dams by 10%. The National Agency for Dams and Transfers plants along watercourses that supply dams and reservoirs, and the national oil company Sonatrach has pledged to plant 420 million trees across the country in the coming years at an estimated cost of USD1 billion.[29]

Water Supply Strategies for Growing Needs

In recent decades, Algeria has experienced a marked decline in rainfall, which has also become more seasonal and delayed, posing a serious threat to natural vegetation and agricultural productivity. Vast regions are undergoing significant aridification. Groundwater reserves in the western Tafna basin have diminished, leading to severe water shortages. Similar challenges affect northeastern areas, where forests were lost to wildfires during the summers of 2021 and 2023. Climate projections suggest that precipitation levels could decline by an additional 20% by 2050.

Inversely, water demand has quadrupled in the past four decades, leading to regional disparities and

27 Fatma Haouari, "L'Algérie envisage de renoncer à la société française Suez" (French), Maghreb Info, 2 January 2021, available at https://www.maghrebinfo.dz/2021/01/02/lalgerie-envisage-de-renoncer-a-la-societe-francaise-suez/

28 Saifi Merdas, Nouar Boulghorba, Fattoum Lakhdari, Green dam in Algeria as a tool to combat desertification, Planet@Risk, Global Risk Forum, Davos 2015, available at https://www.researchgate.net/publication/273286423_The_Green_Dam_in_Algeria_as_a_tool_to_combat_desertification

29 "Sonatrach Launches Ambitious Project to Plant 420 Million Trees", Algeria News Gate, 12 December 2024, available at https://www.algerianewsgate.com/post/sonatrach-launches-ambitious-project-to-plant-420-million-trees; "Forum de l'économie durable: Bouzred réaffirme l'engagement de l'Algérie à atteindre les objectifs de développement durable" (French), Radio Algérienne, 28 June 2025, available at https://news.radioalgerie.dz/fr/node/67050 (Bouzred, 2025)

competition among major domestic, agricultural, and industrial users.[30] Per capita annual water availability has fallen below 500m^3, the World Bank's threshold for absolute water scarcity.[31] With the population currently at 47 million and projected to exceed 70 million by 2050, pressure on water resources is mounting. Thus, ensuring access to safe drinking is the government's number one priority.

Though its share reportedly dropped from 80% in 1975 to 60% or less in 2019, agriculture is Algeria's biggest water consumer and a growing sector.[32] In its November 2024 economic update, the World Bank announced Algeria's economy had grown by 3.9% in the first half of 2024 compared to the same period in 2023, citing among key factors a more resilient agricultural sector.[33]

The industrial sector comes third after agricultural and domestic usage. Hydrocarbons, which account for 90% of the country's total exports and 60% of its resources, make up the biggest industry and rely heavily on water.[34] Water is also needed in other key sectors, including agribusiness, fertilizers, steel and mining, construction materials, automotive, beverages, and pharmaceuticals.[35]

Domestic water supply in Algeria primarily comes from surface water, much of which is stored in the country's 86 dams.[36] Both surface and groundwater are vital for irrigation in the northern regions, while southern regions rely primarily on groundwater and water transfers. For centuries, shallow aquifers (tissembat and foggaras, distribution and underground water-gallery systems) have provided the main water resources for consumption and irrigation of small-scale agriculture. Today, large-scale agriculture is being developed in the Sahara, requiring drilling into deep, nonrenewable aquifers. Water is mainly extracted using boreholes and treated in demineralization plants due to its high salinity levels. Overall, the country has over 123,000 wells. While exact withdrawal volumes are unknown, falling groundwater levels signal overexploitation.[37] This poses a serious threat to the aquifers' sustainability and water security.

To meet growing demand, Algeria's water policy in the past two decades has prioritized the development of new resources over wastewater reuse, with the biggest investments in building dams and developing seawater desalination plants – a sector that has rapidly grown in more recent years as a response to water shortages. The country has some 25 operating desalination plants built along the 2,000km Mediterranean coastline, with capacities ranging from 5,000m^3 to 500,000m^3 per day.[38] In January 2025, the government announced that 31 plants would be in operation by the end of 2025.[39]

While a sense of urgency is driving the scale and pace of desalination plant construction, the policy is crucial to ensuring a reliable and sufficient drinking water supply. It also plays a vital role in reducing dependence on dwindling surface water and the overexploitation of nonrenewable groundwater. By freeing up substantial water resources for agriculture and other sectors, this strategy supports both food sovereignty and broader economic diversification. However, although it is necessary to

30 The World Bank, Algeria water withdrawals 1980-2020, available at https://data.worldbank.org/indicator/ER.H2O.FWTL.K3?end=2022&locations=DZ&start=1980 (WBG,2026)

31 "Etude d'évaluation du secteur de l'eau en Algérie" (French), Bureau d'Etude PROGRESS, December 2016, available at https://projet.oss-online.org/maghreb-eau/sites/default/files/2020-01/Rapport-GIZ-Final_ALGERIE_0%20%283%29.pdf. (Projet CREM, 2016)

32 "Water Use in Algeria", Fanack, 30 July 2019, available at https://water.fanack.com/algeria/water-use/ ("Water Use in Algeria", Fanack).

33 "Algeria Economic Update: A Holistic Framework for Sustained Export Growth", The World Bank, Fall 2024, available at https://documents1.worldbank.org/curated/en/099930211152479893/pdf/IDU1f891179419c0714a221881a19eadef572688.pdf ("Algeria Economic Update", World Bank).

34 "Algérie: analyse des risques économiques et politiques" (French), Coface for Trade, last updated March 2025, available at https://www.coface.fr/actualites-economie-conseils/tableau-de-bord-des-risques-economiques/fiches-risques-pays/algerie (COFACE, 2025)

35 Matthiew Goosen, "Top Five Mineral Resources in Algeria", Energy Capital & Power, 27 December 2024, available at https://energycapitalpower.com/top-5-mineral-resources-in-algeria/ (Goosen, 2024)

36 Cyril Fourneris, "The challenges and successes of Algeria's water supply industry", Africanews, last updated 13 August 2024, available at https://www.africanews.com/2022/10/31/the-challenges-and-successes-of-algerias-water-supply-industry (Fourneris, 2024)

37 "Hydrogeology of Algeria", BGS Earthwise, available at https://earthwise.bgs.ac.uk/index.php/Hydrogeology_of_Algeria ("Hydrogeology of Algeria", Wikipedia)

38 Kamel Benelkadi, "Stations de dessalement de l'eau de mer (SDEM): Mise en service à partir de février 2025" (French), El Watan, 22 December 2024, available at https://elwatan.dz/stations-de-dessalement-de-leau-de-mer-sdem-mise-en-service-a-partir-de-fevrier-2025/ (Benelkadi, 2025)

39 Ali Amzal, "Dessalement de l'eau de mer: 31 usines seront opérationnelles" (French), L'expression, 8 January 2025, available at https://www.lexpressiondz.com/nationale/31-usines-seront-operationnelles-389467 (Amzal, 2025)

rapidly mobilize the vast amounts of much-needed potable water, desalination has highly negative environmental and economic consequences, including toxicity to marine life from high salinity and dissolved chemicals.

As a result, wastewater reuse is gaining traction, with increased investments to modernize plants and build new ones. Obstacles include largely dated infrastructure (62% of wastewater treatment plants are over 15 years old) and the cost of new equipment required for tertiary treatment – treatment beyond the primary and secondary levels: fine filtration, advanced disinfection, nutrient removal – that is necessary to ensure water is potable and fit for agricultural use.[40]

Today, large cities benefit from the most advanced technologies, while highlands, remote, and desert areas rely on more basic, easy-to-maintain ones. Indeed, the costs of building and operating tertiary treatment systems – machinery, energy, chemicals, and qualified personnel – are substantial. Maintenance is often underfunded, leading to declining water quality over time and raising health and safety risks for the domestic sector and irrigation. At 15%, reuse of treated wastewater in Algeria remains low.

Hence, reinforcing capacity and improving monitoring and transparency are key to building public trust, increasing acceptance, and lowering uptake barriers from all sectors. The national strategy pursues wastewater treatment and reuse, with a goal to repurpose 60% of treated wastewater for irrigation by 2030.[41]

Access and Affordability

Ensuring access and affordability of water are priorities actively pursued by the government. According to the World Bank, 94.7% of the Algerian population had access to basic drinking water in 2022.[42] The national connection rate to drinking water systems is 98%.[43] These figures are significant, considering the country's vastness. However, access to a public water supply network does not always guarantee continuous provision, which remains intermittent across the country. Water shortages are frequent during summers, and have a considerable impact on water service reliability and access to water overall.

People and activities are concentrated in the north of the country, including around 90% of the population, most economic activities (excluding the hydrocarbon industry), and dams and seawater desalination plants. Desalinated seawater is supplied from the coast to municipalities located up to approximately 150km inland. An analysis of desalination plants' commissioning dates in light of preexisting dam infrastructure reveals no pattern of deliberate regional marginalization. The most densely populated areas, particularly those surrounding the capital and those not sufficiently supplied by dams, were naturally prioritized.

While eastern regions, including the Kabylie, were not prioritized for seawater desalination projects, they were among the first to benefit from major dam infrastructure – such as the Beni Haroun Dam (Algeria's largest), as well as the Koudiet Acerdoune and Taksebt dams. To meet rising demand and strengthen water supply in these areas, several projects are currently in the pipeline, including the construction of a new desalination plant (Iflissen), the interconnection of existing dams, and the development of two additional dams (Sidi Khelifa and Souk N'Tletha).

Furthermore, the country has tens of regional or cross-country water transfer systems, including Beni Haroun and al-Tarf Souk Ahras in the east and the Mostaganem–Arzew-Oran and the Chott El

40 Rezzoug, T.Merzougui, A. Bouchiba, Wastewater treatment technologies and challenges in Algeria and their future prospects?, Discover, 2025 ("Wastewater treatment technologies and challenges in Algeria and their future prospects?", 2025)

41 Cherif Lahdiri, "Sécheresse et dérèglement climatique: L'Algérie face au défi de la sécurité hydrique" (French), El Watan, 9 February 2025, available at https://elwatan-dz.com/secheresse-et-dereglement-climatique-lalgerie-face-au-defi-de-la-securite-hydrique (Lahdiri, 2025)

42 "Percentage of people with access to basic drinking water, sanitation services, or hygiene", World Bank Group, 2022, available at https://scorecard.worldbank.org/en/data/indicator-detail/SH_H2O_STA_HYGN_TO?orgCode=ALL&refareatype=COUNTRY&refarea-code=MA%7CTN%7CDZ&age=_T&disability=_T&sex=_T

43 "L'Algérie assure sa sécurité hydrique avec des réalisations majeures", APS, 7 July 2025, available at https://www.aps.dz/fr/economie/habi-tat-et-infrastructure/md33ncgi-l-algerie-renforce-sa-securite-hydri-que-avec-des-realisations-majeures

Gharbi in the west.[44] The longest lies in the Sahara, transferring groundwater extracted from the nonrenewable Continental Interlayer aquifer in In Salah to Tamanrasset over a distance of 750km, a project completed for USD2.5 billion.

Some of these projects may raise questions about their cost-effectiveness and sustainability in relation to declining rainfall and the low renewability of groundwater. However, they do demonstrate significant efforts to address social concerns and guarantee access to water. In this context, report from the UN Environment Programme (UNEP) and the UN Economic and Social Commission for Western Africa (ESCWA) in 2024 on the implementation of IWRM in the Arab region highlighted "Algeria's best practices in the sector, particularly its hydraulic solidarity program that aims to enforce sustainable and equitable water allocation and distribution among users across the country and under which water is conveyed from areas of hydraulic surplus to regions of water paucity".[45] The UNEP-ESCWA report ranked Algeria medium-high in a group of eight MENA countries that could reach the target of implementing IWRM nationally if their efforts were sustained and more focused. It also highlighted that "experience from Algeria could inform lessons learned at the subregional level, with the country pioneering progress on the operationalization of management instruments in the Maghreb subgroup".

However, climate change and population growth place great strain on both water resources and service delivery. Drought, evaporation, and sedimentation have reduced the reliability of dams, contributing to chronic water shortages, which are particularly acute and prolonged in some regions during the summer months.[46]

After the western Tafna basin experienced a sharp decline in rainfall, riots erupted in the summer of 2024 when the Bakhadda dam, which provides water for the western city of Tiaret, dried up, and residents were forced to queue to access water. Across the country, households have adopted a range of coping strategies, including purchasing and storing water in cisterns, constructing underground storage systems, and relying on bulk and bottled water.[47]

In remote towns and villages, many residents have turned to wells, deepening or drilling new ones even within private properties to maintain access to water. This has contributed to unequal water distribution and raised growing concerns over unregulated water withdrawals. The government nevertheless pursues its policy of granting well-drilling permits with a dual objective: guaranteeing access to water and, through registration, mapping, and monitoring wells to curb illegal drilling and unaccounted-for extraction.

Water demand is driven by a fast-growing population. There are early signs of a stabilizing population with the number of births falling below the symbolic bar of 900,000 for the first time in 2023, and the launch of family planning programs to curb long-term growth in water demand.[48] However, demand is expected to rise in the coming years and decades, signaling the crucial need for desalinated seawater to meet it.

Highly Affordable Water Prices

Executive Decree No. 05-13 of 9 January 2005 aimed to narrow the gap between the actual cost of water production and service operation and the prices charged to consumers. The pricing structure was revised to include two components: a fixed fee to cover network-related costs and a variable, consumption-based fee. Rates vary according to four user categories: residential, administrations,

44 "Grands Transferts d'eau, de nouveaux barrages… L'Algérie renforce sa sécurité hydrique" (French), Algeria Invest, 30 November 2024, available at https://www.algeriainvest.com/fr/premium-news/grands-transferts-deau-de-nouveaux-barrages-lalgerie-renforce-sa-securite-hydrique

45 Ziad Khayat et al, IWRM Arab region, UNEP-ESCWA, June 2025, available at https://www.unescwa.org/publications/2024-progress-report-implementation-integrated-water-resources-management-arab-region (Khayat et al, 2025)

46 H.A., "15 barrages sur 80 ont atteint 100% de remplissage" (French), Le Jeune Indépendent, 16 April 2018, available at https://www.jeune-independant.net/15-barrages-sur-80-ont-atteint-100-de-remplissage

47 "Façades des immeubles en Algérie: après les paraboles, les citernes" (French), TSA, 2 June 2023, available at https://www.tsa-algerie.com/facades-des-immeubles-en-algerie-apres-les-paraboles-les-citernes/

48 Francis Noude, "Maghreb: baisse des natalités et explosion de divorces dans ce pays" (French), La Nouvelle Tribune, 14 July 2024, available at https://lanouvelletribune.info/2024/07/maghreb-baisse-des-natalites-et-explosion-de-divorces-dans-ce-pays/; "Espacement des naissances recommandé en Algérie: Plus de 50 millions d'habitants en 2030" (French), La Patrie News, 9 December 2022, available at https://lapatrienews.dz/espacement-des-naissances-recommande-en-algerie-plus-de-50-millions-dhabitants-en-2030/

artisans and services, and the industrial and tourism sectors.[49] Agricultural water prices are fixed by a series of decrees adopted in 1998, 2005, and 2007.

Table 1: Current water tariffs in Algerian dinars, excluding tax[50]

			Potable Water	Sanitation	Potable Water	Sanitation
User category	Tranches, by m^3		Tariff (dinars per m^3)		Subscription	
Households	1st	0-25	6.30	2.35	240	60
	2nd	26-55	20.48	7.64		
	3rd	56-82	34.65	12.93		
	4th	83+	40.95	15.28		
Administrations	Unique tranche		34.65	12.93	450	60
Artisans						
Services						
Industrial units	Unique tranche		40.95	15.28	4,500	2,100
Tourism units						

Note: 10 Algerian dinars is approximately USD0.08.

Residential water tariffs differ slightly across five designated zones – Algiers, Oran, Constantine, Chlef, and Ouargla – but remain largely uniform nationwide. Desalination has emerged as a low-cost industry, producing potable water for 100-160 dinars per m^3 (about USD0.77 to USD1.23, excluding distribution costs).[51] At 6.3 dinars per m^3 (about USD0.05), water is subsidized at more than 95%. Agricultural water is even lower, sold for only 2.5 dinars per m^3 (about USD0.02). Furthermore, to support agriculture and irrigation, the government has accelerated the approval of drilling permits for farmers and subsidizes up to 80% of the construction of certain types of water storage basins.

Last updated in 2005, these rates no longer represent the actual production or distribution costs, resulting in all categories of users being heavily subsidized regardless of the real cost of the water they consume. While poor households clearly benefit from the lowest price in the first tranche (0-25m^3 per month), the value in absolute figures of the subsidy they capture is relatively small compared to large users: wealthy households with high water use, farms, businesses, and industries. In addition, households in underserved areas often rely on tanker water or bottled water, paying far more per cubic meter than network users. Costs to develop private storage systems or drilling wells, as well as the time spent fetching water, are hidden coping costs with clear implications regarding water justice.

Tariffs applied to industries, although higher in the upper block, are still far below water's real production costs (100-160 dinars per m^3 for desalination), which means that high-volume users capture the biggest share of the subsidy. Water-intensive industries, such as steel and cement, benefit disproportionately. For agriculture, the effect is even stronger, with water costing only 2.5 dinars m^3. Therefore, large farms and agro-industrial actors are capturing most of the subsidy, not smallholders.

One nuance in this picture is the fact that small users still benefit from almost free water. In addition, UNEP and ESCWA found in their 2024 report that significant progress had been made in Algeria regarding water revenue collection from users in the

49 "Coût des facteurs de l'Algérie" (French), Agence Algérienne de Promotion de l'Investissement, available at https://aapi.dz/cout-des-facteurs-de-lalgerie/

50 Executive Decree 05-13 of 9 January 2005.

51 Naïma Benouaret, "L'Algérie parmi les plus grands producteurs: Dessalement en Méditerranée" (French), El Watan, 1 March 2025, available at https://elwatan.dz/lalgerie-parmi-les-plus-grands-producteurs-dessalement-en-mediterranee/

industrial and service sectors.[52]

It is nonetheless safe to say that although water is highly affordable for all categories, in absolute figures, it benefits large users and farmers the most. The existing policy, while ensuring access and affordability, poses risks to the sustainability of water resources by encouraging overextraction and overuse, with implications when considering the long-term justice concerns explained below.

Water Conservation

In the context of worsening water scarcity and where conservation is vital, waste is paradoxically pervasive, driven by low tariffs and other factors.

Waste is inherent to cheap commodities, and water in Algeria is almost free, with heavy subsidies discouraging conservation.[53] Moreover, combined factors, including drying wells, financial incentives, and insufficient oversight, have prompted farmers to drill both legal and illegal wells, as well as deepen existing ones to extract more water.

In 2025, the Ministry of Hydraulics renewed instructions to local authorities to support farmers by continuing to deliver drilling permits for irrigation. Permits are not automatically granted, and help to register and therefore oversee water withdrawals. This ensures water is paid for and helps reduce illegal tapping and overuse.

Obsolescence and poor maintenance of water infrastructure are other causes of water losses. Dams are not drained due to staggering drainage costs, which are higher than building a new dam, so more dams are built. Dam sedimentation and evaporation reduce volumes and affect water quality.

Technical issues combined with demand pressure often led to services being reduced or suspended. Water leakages are also prevalent due to obsolete or damaged water mains. Accidental damage to pipes is a frequent occurrence due to various works – such as water, gas, electricity, and internet – or related to the quality of equipment. For example, iron pipes used in major projects to transfer desalinated water were severely damaged by corrosion, requiring major investments to replace them with PVC pipes. Lack of repairs and poor leak reporting result in large proportions of water being wasted. Locating leaks in colonial-era pipes can be challenging in the absence of pipe route maps, another colonial legacy.

Low levels of wastewater reuse also result in water losses. Overall, only 50% of wastewater in Algeria is treated, a rate that reaches 76% for domestic wastewater.[54] Only 19% of treated water is reused in the agricultural and industrial sectors, with objectives to reach 30% by the end of 2025.[55] The remainder is partially treated or discharged, exacerbating environmental pollution.

Finally, oversight and legal enforcement are poor; despite water being almost free, the water police have a big job curbing illegal tapping, often linked to illegal constructions that are pervasive in rural areas. This results in 20-25% of water being lost, according to the state-owned water company, Algérienne des Eaux (ADE).[56]

In this context, various strategies are adopted to improve water conservation, including:

- Investing heavily in the water sector - over USD40 billion in the period 2000-2020 – to improve IWRM and to build and repair infrastructure, including drinking and wastewater pipes. Establishing committees to monitor the efficacy of public water service delivery.[57]
- Reestablishing the water police to curb illegal water tapping. The water police, whose role is framed by Article 159 of the 2005 Water Law, were officially restored in 2023 after nearly a decade of inactivity, due to the negative

52 Khayat et al, 2025

53 "Water Use in Algeria", Fanack.

54 "Algeria", UN Water, available at https://www.sdg6data.org/en/country-or-area/Algeria#:~:text=SDG%206%20snapshot%20in%20Algeria,Ecosystems

55 Eaux Usées : 601 millions de m³ recyclés, Le Quotidien de Constantine, 27 November 2025, available at : https://lequotidien-deconstantine.dz/?p=3406 ("Eaux Usées : 601 millions de m³ recyclés", 2025)

56 "L'Algérienne Des Eaux (ADE): Lancement d'un programme national de lutte contre le gaspillage d'eau" (French), Ouest Tribune, 23 March 2021, available at https://ouest-tribune.dz/lancement-dun-programme-national-de-lutte-contre-le-gaspillage-deau/

57 Khayat et al, 2025

impacts of water stress and illegal tapping.[58] The police can access public and private hydraulic infrastructure, including farms, which consume nearly two-thirds of water resources. The police can control infrastructure and meters, request relevant permits, and report offenses.

- Boosting seawater desalination to save water from conventional sources.[59]
- Increasing wastewater treatment and reuse for irrigation as an alternative to surface and groundwater, with an objective to reuse 60% of recycled wastewater for irrigation by 2030.
- Restricting water to certain days or hours as a way to regulate the use of water in accordance with Article 91 of the 2005 Water Law, which provides:

  In the event of natural disasters, particularly in drought situations, the water resources administration may take measures to limit or temporarily suspend water use or make requisitions in order to mobilize the water needed to combat disasters and ensure, as a priority, the water supply of populations and the watering of livestock. In 2021, a water rationing plan was formally introduced in Algiers, dividing the city into zones with scheduled water availability. Such plans, necessary during the summer months, exist around the country.

- Considering the use of chemical films and structural modifications to dams.

Awareness campaigns to promote water conservation include:

- TV campaigns by AGIRE, the agency overseeing IWRM.
- Eco'Eau, a national program involving associations, neighborhood committees, local authorities, the media, and a range of partners to combat all forms of water waste, was launched in 2021 by ADE.[60]
- Pari Gagnant (winning bet), an ADE campaign implemented by its 44 agencies aimed at boosting repairs of visible and invisible leaks, saving vast amounts of water.[61]
- ADE campaigns to combat illegal water tapping.
- A 24/7 hotline established by La Société des eaux et de l'assainissement d'Alger (The Algiers Water and Sanitation Company, which ensures continued water supply and sanitation services in Algiers) for users to report water leaks or disconnections, request information on water quality, and submit complaints or suggestions to improve the service.[62]
- Activities for pupils organized by schools following directions from the Ministry of Education to promote water conservation awareness, usually conducted on national or international days dedicated to water or the environment.
- Water conservation campaigns are organized by local authorities in public squares and mosques during Friday prayers.[63]

58 Alvaro Escalonilla, "L'Algérie réinitialise la police de l'eau au risque du stress hydrique" (French), Atalayar, 5 February 2023, available at https://www.atalayar.com/fr/articulo/politique/lalgerie-reinitialise-la-police-de-leau-au-risque-du-stress-hydrique/20230131101526159959.html

59 Najib Drouiche, "Desalination in Algeria: A Lifeline Against Water Scarcity", LinkedIn post, 22 December 2024, available at https://www.linkedin.com/pulse/desalination-algeria-lifeline-against-water-scarcity-nadjib-drouiche-ppf1e/ (Drouiche, 2024)

60 "Lancement d'un programme national de lutte contre le gaspillage d'eau", Ouest Tribune, 23 March 2021, available at https://ouest-tribune.dz/lancement-dun-programme-national-de-lutte-contre-le-gaspillage-deau/

61 Ali Amzal, "Le pari réussi de l'ADE", l'Expression, 5 May 2025, available at https://www.lexpressiondz.com/nationale/le-pari-reussi-de-l-ade-393336

62 R. Ep, "Le Centre d'appel téléphonique joignable 7j/7 à Alger et Tipaza" (French), El Watan, 15 July 2024, available at https://elwatan.dz/le-centre-dappel-de-la-seaal-joignable-7j7-a-alger-et-tipasa/

63 Ahmed Achour, "Avec la participation d'imams, d'artistes et d'influenceurs, SEAAL intensifie ses campagnes de sensibilisation à la rationalisation de la consommation d'eau" (French), Dzair Tube, 4 June 2025, available at https://www.dzair-tube.dz/fr/avec-la-participation-dimams-dartistes-et-dinfluenceurs-seal-intensifie-ses-campagnes-de-sensibilisation-a-la-rationalisation-de-la-consommation-deau-pendant-laid-el-adha/

Water Pollution

Water pollution, prevalent in developing countries with rapid urbanization, presents significant environmental risks to health, the economy, ecosystems, and biodiversity.

Article 21 of the Algerian Constitution states:

> *The State shall strive to guarantee a safe environment to protect individuals and achieve their well-being, improve biodiversity and awareness of environmental risks, make rational use of water, fossil fuels, and other natural resources, and protect the environment's land, sea, and air dimensions, and the implementation of all appropriate measures to suppress pollutants.*

Quality of drinking water

A set of regulations aims to ensure the safety of potable and irrigation water. Article 112 of the 2005 Water Law provides that any entity "supplying water for human consumption is required to ensure this water meets the potability and/or quality standards set by regulation", and Article 114 says "the nature, frequency, and methods of analysis of water produced, treated, stored and distributed for human consumption, as well as the conditions for approval of laboratories required to carry out these analyses, are set by secondary regulation".

The quality of drinking water varies between sources and regions. According to the World Health Organization, UNICEF, and SDG 6 data, around 69% of Algerians have access to safely managed drinking water.[64] However, no indicator is available on the quality of water. Salinity is often reported in drinking water from sea desalination plants, which is otherwise of high quality. Various studies and reports conducted across the country show high levels of salinity, nitrates, fluoride, and heavy metals. Although limited, bacterial contamination has been reported in remote areas' wells and springs. The main sources of water pollution are from domestic, agricultural, and industrial wastewater.

Domestic wastewater

In 1962, only 20% of Algerians were connected to wastewater systems; by 2023, this had risen to 93%. However, many of the 240 treatment plants are outdated – only 207 function, 50 of which are managed by local authorities. Many operate below capacity. As a result, 40-50% of wastewater is untreated or only partially treated, polluting rivers, aquifers, and coastal waters. Overflow is often discharged into the sea, contaminating beaches, while surface runoff further affects rivers and lakes. Although health data is limited, some reports suggest an increase in cancer cases in heavily polluted areas.

The government aims to improve wastewater treatment infrastructure. Its 2024 strategy aims to boost treatment capacity to reuse 60% of treated water for irrigation by 2030. However, high investment costs and the greater urgency of securing a water supply have slowed progress. Other delays stem from poor contractor performance, project execution issues, and shifting priorities at the local level – such as expanding sewage networks or addressing flood risks.

Agriculture and wastewater

Agriculture contributes to pollution through pesticide runoff. It also faces risks from using unfit water for irrigation, especially during droughts. Articles 125-136 of the 2005 Water Law prohibit the use of untreated wastewater for irrigation. Treated wastewater use is strictly regulated by several decrees, including Executive Decree No. 10-23 of 12 January 2010 defining treatment system standards, and the 2 January 2012 decree, which outlines quality requirements across three treatment stages. The third, most advanced stage requires costly equipment and is only implemented in large cities.

Academics and scientists have urged farmers to follow regulations and the government to equip treatment plants with tertiary filtration systems, and currently, researchers at the Ministry of Higher Education and Scientific Research are working on local alternatives to reduce dependence on expensive imports of tertiary filtration equipment.[65]

64 UN SDG6 data : https://www.sdg6data.org/fr/country-or-area/Algeria

65 Mhamed H, "Traitement des eaux usées: La feuille de route mise en place" (French), El Watan, 2 January 2025, available at https://elwatan.dz/traitement-des-eaux-usees-la-feuille-de-route-mise-en-place/

Industrial wastewater

By law, industries must pretreat their water before discharging it. The 2005 Water Law and the 2006 Executive Decree No. 06-125 on the discharge of industrial liquid effluents define the quality standards for discharges and control procedures. Additionally, Articles 56-58 of the decree of 6 January 2002 forbid the dumping of waters containing hydrocarbons or toxic substances in port basins and harbors and charge polluters with cleanup responsibility at their expense.

Finally, the 2003 Environmental Protection Law No. 03-10 bans dumping, immersion, or incineration at sea of materials harmful to public health, marine life, navigation, or maritime activities that degrade the leisure and touristic potential of coastal areas under Article 52. Offenders can face jail terms and substantial fines under Article 90, which are more severe in the cases of recidivism or breaching of international treaties.

Though illegal, discharges of untreated industrial water occur, particularly when wastewater volumes exceed treatment capacity or if technical problems lead to the reduction or suspension of water treatment service. Though data is limited, citizens and media reports have linked disrupted fisheries, marine ecosystem damage, and occurrences of beach pollution to poorly treated industrial and domestic wastewater and called for accountability. However, media reports on environmental accountability are rare, prosecutions for environmental harms are uncommon, and reporting is considered sensitive by the authorities.

Water-intensive and potentially polluting industries in Algeria include mining and cement production. Mining is a key economic sector, with Algeria holding the world's sixth-largest phosphate deposits.[66] In 2024, the country launched a USD7 billion phosphate megaproject in the eastern region of Tebessa, expected to generate tens of thousands of jobs.[67] However, phosphate mining is highly water-intensive and known to release heavy metals and radioactive substances into the environment.

The country also has substantial steel reserves and operates three major steel complexes in the regions of Annaba, Jijel, and Oran. While these projects also promise job creation, the steel industry consumes large volumes of water and generates significant pollution, including wastewater containing suspended solids, heavy metals, ammonia, cyanide, and benzene.[68]

Algeria is also one of the world's largest exporters of clinker, a semi-finished product used in cement manufacturing. The construction sector is central to the economy and supports other industries. Large-scale infrastructure projects, including housing developments, roads, and dams, require substantial water resources for construction and maintenance. As a key driver of economic growth, this sector further exacerbates water stress.

These industries benefit industrial actors and workers; entire regions depend on them. However, their environmental cost may surpass their benefits in the long term, putting local populations and the economy more broadly at risk. Today's winners may be tomorrow's losers if the industries are not developed in a sustainable manner. Importantly, water resources should be protected through policies, and water security tests should be made mandatory, involving a wide range of actors – including local and at-risk groups. Beyond state and corporate actors, responsible planning and production require the participation and oversight of expert groups and civil society organizations (CSOs).

Finally, operating water supply and sanitation systems is highly energy-intensive. Algeria's climate commitments include reaching 27% renewable energy in electricity generation by 2035 and reducing the water sector's environmental impact by integrating solar power into treatment and desalination plants. Yet progress has been slow due to limited climate finance, continued global dependence on fossil fuels, and the country's reliance on hydrocarbons for revenue.

66 "Phosphate Reserves by Country 2026", World Population Review, 2026, available at https://worldpopulationreview.com/country-rankings/phosphate-reserves-by-country

67 Nicolas Nhede, "Algeria Launches USD7B Phosphate Megaproject", Energy Capital & Power, 20 November 2024, available at https://energycapitalpower.com/algeria-launches-7b-phosphate-megaproject/

68 "Steel Industry Solutions", Veolia, available at https://www.water-technologies.com/industries/primary-metals/steel#:~:text=Water%20Consumption%2C%20Pollution%20and%20Management,-adopted%20to%20reduce%20freshwater%20consumption

Seawater Desalination

Seawater desalination is another concerning source of marine pollution due to the discharge of toxic byproducts such as brine and chemical residues. These increase seawater salinity and decrease oxygen levels, with negative impacts across the marine food chain. Brine discharges also concentrate heavy metals – copper, cadmium, lead, mercury, nickel, chromium, and arsenic – in the marine environment. Additionally, copper and chlorine – used to protect desalination membranes from bacterial growth – further contribute to marine toxicity. Excessive pumping aggravates saltwater intrusion and leads to freshwater degradation. While reverse osmosis is considered the least harmful desalination method, it still carries significant environmental risks to marine ecosystems, fisheries, and tourism, which are vital to coastal communities and have broader national importance.

While desalination is essential, its impacts can and should be managed. Mitigation solutions include technologies to reduce pollutants, infrastructure to dilute brine, and processes to recycle brine for industrial purposes such as extracting salt and minerals. It is paramount to adopt such solutions and create a model for sharing costs between the state, private operators, and consumers. In addition to the costs of producing desalinated water – infrastructure, energy, chemicals, and operating and distribution costs – environmental costs should also be factored into tariffs, particularly those applied to industrial and other large consumers.

Hydrogen's Water Footprint

Growing European demand for natural gas and "green" and "blue" hydrogen has renewed pressure on North African countries to revive fracking, threatening the fragile Albian aquifer and causing alarm among scientists and observers.[69] The industry is banned in several European countries due to its harmful impacts.

In Algeria, water-intensive shale gas exploration or fracking was suspended in 2015 due to its severe environmental and health impacts in the south, including pollution of air, soil, and nonrenewable water sources. Despite expectations of a ban, the 2020 Hydrocarbon Law did not prohibit the practice, leaving the door open for future exploration.

In addition, the EU is actively pushing for North Africa to produce green hydrogen, an energy marketed as clean when powered by renewable energy. This narrative overlooks major practical challenges in terms of the energy and, more worryingly, the water needed to produce hydrogen, regardless of its color. In Algeria, practical challenges include the lack of space for solar energy in the north – where seawater is available – and the nonrenewable water sources in the south, where solar energy could be developed. No offshore wind capacity currently exists in the country.

Even if renewable energy-powered hydrogen production – which is neither the case nor the prospect – the production would still raise environmental concerns. Electrolysis is energy inefficient, generating only about 60kWh of hydrogen from every 100kWh consumed, leading to increased greenhouse gas emissions. It also requires vast amounts of water – using up to 83 liters of seawater per kilogram of hydrogen produced – with concerns over desalination waste and the depletion of scarce water resources.[70]

With tangible risks over competition between sectors like energy and agriculture, the industry poses serious risks to water and food security overall.[71] "Green hydrogen" may be clean and affordable, but only for importing countries. In January 2025, Algeria took a significant step toward hydrogen production by signing a joint declaration of political intent with Austria, Germany, Italy, and Tunisia to develop SoutH2 Corridor, a major infrastructure project that aims to transport up

69 Nick Ferris and Eman Mounir, "How Europe's energy crisis boosted fracking prospects in the Middle East", Energy Monitor, 2 April 2024, available at https://www.energymonitor.ai/industry/how-europes-energy-crisis-boosted-fracking-prospects-in-the-middle-east/#:~:text=Countries%20including%20France%2C%20Germany%20and,as%20in%20the%20transport%20sector

70 Philip Miltrup, "A first look at water demand for green hydrogen and concerns and opportunities with desalination", International PTX Hub, 2 April 2024, available at https://ptx-hub.org/a-first-look-at-water-demand-for-green-hydrogen-and-concerns-and-opportunities-with-desalination/

71 Bart Kolodziejczyk, "Will a transition to a hydrogen economy affect water security?", World Economic Forum, 28 September 2022, available at https://www.weforum.org/stories/2022/09/how-a-transition-to-a-hydrogen-economy-will-affect-water-security/

to 4 million tons of green hydrogen annually from Algeria to central Europe through a 3,300km pipeline network via Tunisia.[72] This raises real concerns, not only regarding colossal investments required to adapt transport infrastructure, but crucially about EU imports of water from water-stressed countries.

The Civic Space

Community participation in public policymaking and citizens' engagement in the public debate remain challenging. While the constitutional and legal frameworks uphold the right to participation, many CSOs face obstacles such as limited organizational capacity, lack of long-term sustainability, and difficulty maintaining inclusive, nonpartisan dialogue.

Civil society continues to rebuild after successive periods of colonial occupation (1830-1962), socialism (1962-1990), and internal conflict (1991-2002). The struggle for freedom against colonialism, imperialism, and Islamism has left profound marks on the country. The Algerian municipal elections of June 1990 were the first pluralist municipal elections in Algerian history. The Islamist party Front Islamique du Salut emerged as a winner, and the country quickly descended into a period of radicalism, obscurantism, and terror that lasted a decade during which the army fought terrorists. This period, during which over 100,000 people lost their lives, revived trauma and scarred individual and collective memories.

Today, people strive for peace, security, and normalcy. Media freedom and the civic space have experienced alternating periods of openness and restrictions linked to social, economic, and political factors, as well as the real or perceived foreign interference through funding media, NGOs, and CSOs pursuing purely political goals. Restrictions adopted as countermeasures include registration hurdles, international funding approvals, security vetting, obstacles to accessing information, and occasional crackdowns on activists. These restrictions put all CSOs and NGOs alike under great financial pressure and weaken their much-needed role in society, creating impacts on these organizations, the social and environmental causes they defend, and the vulnerable groups they support.

While many CSOs have ceased operations, new grassroots movements are emerging, ranging from youth-led initiatives and women's cooperatives to elder-led community structures. These groups, long-established or newly formed, have valuable contributions to make in advancing sustainable water policies and practices. By engaging with local authorities, leading advocacy efforts, and raising public awareness, civil society can play a key role in shaping more resilient water governance.

Elders' structures

Tajmâat, or tribal councils, are prevalent across the country, especially in the Aurès, Kabylie, M'zab, and Hoggar regions. They may have lost their traditional legal and judicial roles, but they continue to play a valuable role in their communities, operating as local authorities on moral conduct, arbitrating community disputes, and handling questions related to land use and water distribution.

The tajmâat appoints key officials, including amins, executive officers in charge of specific matters. For centuries, water amins (oumana' el ma') have overseen the distribution of water from rivers and shallow aquifers, using ancestral systems such as the foggara and tissembat systems. Azzaba is the traditional high council of sages that has governed the Ibadi Mozabite community in Algeria's M'zab Valley for nearly a millennium.

Tribal councils are consulted by communes on infrastructure projects, though their positions are not necessarily followed. In addition, through elders' structures, communities can mobilize funding to finance small-scale projects, such as modular wastewater units. Examples include Tafilelt in Ghardaïa, the first green city in the Algerian desert[73], and the building of joint wastewater treatment plants between Ksours in the region of Adrar, systems that work well and cost up to 15 times less than building a large-scale plant.

72 "L'UE mise sur l'hydrogène algérien : le SoutH2 classé prioritaire par Bruxelles", TSA, 2 December 2025, available at https://www.tsa-algerie.com/lue-mise-sur-lhydrogene-algerien-le-south2-classe-prioritaire-par-bruxelles/

73 "Tafilalet: première ville écologique dans le désert algérien", Middle East Eye, édition française, 15 February 2016, available at : https://www.middleeasteye.net/fr/reportages/tafilalet-premiere-ville-ecologique-dans-le-desert-algerien

These examples highlight the value of local initiative and the role ancestral governance structures can still play to spark positive change.

Local participation, advocacy, and complaint mechanisms.

Local participation is key in shaping local policymaking and in ensuring that national policies address real needs and are not misdirected at the local level. This stands in contrast to top-down policymaking, in which CSOs and local actors may lack the mandate, the capacity, or the opportunity to participate.

Article 17 of the Algerian constitution states that municipalities are the cornerstone of decentralization and the primary space where citizens engage in managing public affairs. Municipal councils meet every two months in public sessions open to all residents of the community, offering them an opportunity to be informed about water-related projects. When a project is approved, or land use is changed, citizens are informed via public posting and can submit questions or objections within 60 days of a decision – a mechanism that reportedly remains largely underused. In this context, a water infrastructure project that is weak, altered, or reduced raises questions on the responsibility of the entity commissioning it, but also on citizens' failure to oppose it. Even well-designed national water policies may not be effectively implemented at the local level without local scrutiny by citizens or structures representing them. Nevertheless, the role of the local committees in monitoring the efficacy of public water service delivery remains of great importance, given the responsibilities of the state in achieving water justice.

The citizens' role in calling for accountability regarding the use of the local budget or polluting activities is an important means of ensuring that water and environmental regulations are enforced and kept at the heart of decentralization.

Advocacy and protests are other key avenues for citizens to express concerns over policies impacting water resources and the environment. A notable example occurred in 2014 and 2015, when large-scale protests erupted in the southern province of In Salah opposing fracking and calling for the cleanup of polluted sites. Despite the subsequent unrest, sustained citizen mobilization led to the suspension of exploration.

Another example relates to protecting fisheries. In 2019, the Algerian environmental network PROBIOM led a successful campaign against offshore oil exploration by BP and Sonatrach, which had begun seismic mapping along the eastern coast around Chetaibi and El Marsa without public consultation or environmental assessments. The campaign against this – which included protests, media outreach, and legal action – ultimately prompted Sonatrach to suspend exploration, apologize publicly, and commit to better transparency. It halted offshore drilling for six years. However, in January 2025, a new agreement between Algerian company ALNAFT and Chevron revived exploration in the same area.[74] This demonstrates that even within a shrinking civic space, a timely and strong campaign can challenge major oil interests, but sustained mobilization is essential to protect and build on such gains.

Environmental activism can be politically sensitive or seen as politically motivated, but most environmental causes are not; many communities, associations, and youth groups work to protect and restore the environment at the local level. However, far more can be done to promote socially responsible behavior regarding waste, pollution, and water conservation. Engaging in dialogue with authorities; petitioning; organizing events, bootcamps, and youth councils; and volunteering to rehabilitate a site are all forms of citizen engagement that can inspire, inform, and improve local and national policymaking.

Citizens can also use complaint mechanisms to voice concerns over water-related issues. These include the wasit, or ombudsman, that citizens can contact via an online form, various hotlines, and online platforms such as Nechki ("I complain"), a platform for citizens who wish to complain about a wide range of social and economic services, including water supply and sanitation. Public administrations and institutions must also provide grievance registers at their premises. Any citizen can contact a deputy in the National Popular Assembly or address

74 "Signature d'un accord entre Alnaft et la société américaine Chevron" (French), Maghreb Info, 23 January 2025, available at https://www.maghrebinfo.dz/2025/01/22/signature-dun-accord-entre-lalnaft-et-la-societe-americaine-chevron/

a complaint to the president of the republic.

Although data is lacking, consultations with local actors indicated that online platforms were popular, but mechanisms to oppose projects and public procurement were seldom used. Ministries and public administrations generally replied to letters and complaints sent to them formally.

Conclusions and Recommendations

Water justice in Algeria is in transition. Water's availability and quality are the result of multiple factors, including colonial harms and legacies, climate change, demographic growth, and environmental degradation. The concept of a "just transition" takes on deeper significance when viewed against the backdrop of man-made water and climate crises, trade imbalances, and poor climate finance. This report highlights water policy's weaknesses and calls for greater citizen participation while recognizing the powerful role of historic and modern dynamics in shaping them and inviting a reflection on water sovereignty.

In this context, frameworks rooted in distributive, procedural, and restorative justice that are focused on reparation and participation while acknowledging both historical and contemporary inequalities offer meaningful and equitable ways forward. Specific conclusions and recommendations are as follows.

1. Colonialism and its legacies have caused significant and lasting damage to the environment in Algeria, contributing greatly to the water scarcity crisis. With the principles of transformative water justice in mind, this should prompt conversations on reparation processes regarding colonial harms, and on future safeguards, especially when considering the development of the water-intensive green hydrogen industry.

2. Under the UN's SDG 6, Algeria aims to ensure access to water for all.[75] High public spending in water supply and sanitation, combined with highly affordable water prices, make Algeria's current water policies resolutely social. They seek, despite climate change and water scarcity, to realize the universal, constitutional, and legal right of every citizen to access safe drinking water. One of their notable aspects is equitable water distribution through transfers from regions of surplus to regions in need, a policy UNEP and ESCWA labeled "hydraulic solidarity". In seeking to realize this solidarity, cost-effectiveness and the protection of scarce water resources should be prioritized.

3. The private sector plays a key role in developing water infrastructure, but state control over the strategic water sector constitutes a stable policy that protects citizens' access to water as a public good. Trade unions play a key role in safeguarding this right and should be empowered to continue by their members, national institutions, and sister and umbrella organizations at the national, regional, and international levels.

4. Climate change points to a further projected decline in rainfall, simultaneous with increasing needs, particularly in the agricultural sector. These conditions require much stricter water management policies, including accelerated restoration and better maintenance of water infrastructure, more efficient irrigation, and monitoring and reduction of groundwater extraction. Rainwater harvesting, wastewater treatment, and reuse are crucial water conservation measures. These should form a cornerstone of the government's just water policy.

5. Every source of water is precious, either due to its scarcity or high environmental cost. They must all be protected for current and future generations, as provided in Article 63 of the Algerian constitution. It is therefore urgent to rethink the value of water and the costs of pollution from extractive industries and intensive agriculture, systems that were introduced during colonial times and which are heavily reliant on chemicals and pesticides.[76]

75 Bouzred, 2025

76 Martin Philipp Heger, Lukas Vashold, Anabella Palacios, Mala Alahmadi, Marjory-Anne Bromhead, and Marcelo Acerbi, "Blue Skies, Blue Seas: Air Pollution, Marine Plastics, and Coastal Erosion in the Middle East and North Africa", World Bank Group, 2022, available at https://openknowledge.worldbank.org/server/api/core/bitstreams/9125cb69-90b8-53b0-b645-800b33e9d1ee/content

Ancient and modern sustainable practices are key to rehabilitating the small-scale agriculture that predated colonization, including mobilizing small-scale hydraulics and using diverse, locally native, water-resilient seeds. This would protect water resources and improve soil and water quality, with beneficial impacts on public health. Sustainable cultures can also support thousands of farming families in the mountains, steppes, and oases. Economic revival of these areas would help reverse the rural exodus and curb uncontrolled urbanization.

6. In this context, pricing of agricultural, industrial, and domestic water supply and sanitation should be gradually increased, both as an economic necessity and as a water conservation measure. Gradual increases will avoid sudden surges in the future, though prices should increase more steeply for businesses, industries, and farms to come closer to production costs. Prices should nonetheless remain affordable for every household, consider hidden coping costs, and be degressive for low water users in all sectors – domestic, agricultural, and industrial. Other measures should include:
   - Reflecting water's real production cost in the water bills to foster responsible behavior;
   - Publishing annual subsidy incidence reports to monitor fairness and adjust policies;
   - Involving CSOs in the review of tariffs to enhance transparency, participation, and buy-in;
   - Adopting targeted subsidies for on-farm efficiency and volumetric caps tied to crop water productivity; and
   - Creating a digital well registry and adopting penalties for illegal extraction, as well as amnesty periods for farmers and corporations to adjust and comply.
7. Improving corporate responsibility and accountability is essential to enforce water and environmental regulations and tackle pollution. This requires systematic collection of taxes on industrial activities in line with the "polluter pays" principle, levying significant pollution fines. Industries should be monitored to ensure they treat industrial water discharges, and should be encouraged to contribute to a national environmental fund dedicated to ecosystem restoration.
8. Desertification threatens oases and millions of hectares in the steppe. Forests are permanently exposed to fires and clearing, resulting in further soil degradation. These ecosystems must be protected at all costs. Any strategy to develop Saharan agriculture must consider the severe constraints that characterize these fragile environments and their nonrenewable water resources.
9. Partnerships between universities and industries and research and development are essential for more efficient resource use, treatment, storage, and the reduction of environmental impacts of sea desalination discharges. Limited public data and recent statistics in the sector hinder policy learning and accountability and feed negative perceptions regardless of any progress made. More in-country policy institutes to conduct research, analyze data, and translate information into accessible, reader-friendly materials would support policymaking, as would international partnerships with universities and water and river basin agencies abroad.
10. Spaces for citizens' participation in water policies must be expanded, both at local and national levels, so citizens and CSOs can contribute to and positively influence environmental and water policies. This requires relaxing administrative burdens and easing access to national and international funding. It also requires a rethink of civic engagement in civil society – one that enhances organizational sustainability; focuses on community building and local partnerships; and fosters dialogue and constructive, nonpartisan action.

Annex 1: Mapping Water Resources and Supply Strategies

In recent decades, Algeria has experienced a marked decline in rainfall, which has also become more seasonal and delayed, posing a serious threat to natural vegetation and agricultural productivity. Large areas, particularly in the southwestern and northeastern parts of the country, are undergoing significant aridification. Groundwater reserves in the western Tafna basin have diminished, leading to severe water shortages. Similar challenges affect the northeastern region, where vast forest areas were lost to wildfires during the summers of 2021 and 2023. Climate projections suggest that precipitation levels could decline by an additional 20% by 2050.

Inversely, water demand has nearly quadrupled in the past four decades, leading to regional disparities and competition among major domestic, agricultural, and industrial users.[77] Per capita annual water availability has fallen below 500m^3, the World Bank's threshold for absolute water scarcity.[78] With the population currently at 47 million and projected to exceed 70 million by 2050, pressure on water resources is mounting. Ensuring access to safe drinking is the government's number one priority.

Though its share reportedly dropped from 80% in 1975 to 60% or less in 2019, agriculture is Algeria's biggest water consumer and a growing sector.[79] In its November 2024 economic update, the World Bank announced Algeria's economy had grown by 3.9% in the first half of 2024 compared to the same period in 2023, citing among key factors a more resilient agricultural sector.[80]

The industrial sector comes third after agricultural and domestic usage. Hydrocarbons, which account for 90% of the country's total exports and 60% of its resources, make up the biggest industry and rely heavily on water.[81] Water is also needed in other key national industries, including agrobusiness, fertilizers, steel and mining, construction materials, automotive, paper, electronics, beverage, and pharmaceuticals.[82]

Sources of water in Algeria

The country's conventional water resources are estimated at approximately 19.5 billion m3 annually.[83] About 60% of this comes from renewable surface water across 17 river basins, including coastal, highland, and Saharan areas. The remaining 30% is drawn from groundwater primarily located in Saharan aquifers, which are largely considered nonrenewable due to minimal rainfall.

The replenishment of rivers, aquifers, and dams relies heavily on rainfall, which occurs mainly during the winter months. This seasonal precipitation feeds the country's 86 dams, which have a combined production capacity of 9 billion m^3 per year as of 2024.[84] However, in recent decades, insufficient rainfall has hindered recharge, even of northern aquifers that are typically classified as renewable.

In the Sahara, two major overlapping aquifers – the Complex Terminal and the Continental Interlayer (also known as the Albian reservoir) – form the transboundary North-Western Sahara Aquifer System, the largest of its kind globally, with estimated reserves between 30,000 and 40,000 billion m^3. Roughly 70% of these reserves lie in Algeria; the remainder is divided 20% in Tunisia and 10% in Libya.

Domestic water supply in Algeria primarily comes from surface water, much of which is stored in the country's 86 dams.[85] The largest is the Beni Haroun complex in Mila Province, which has a capacity of 960 million m^3 and supplies drinking and irrigation water to around 4 million people in eastern Algeria. Other significant dams include the Koudiat Acerdoune in Bouira (640 million m^3) and the Taksebt complex in Tizi Ouzou, Kabylie (180 million m^3).

Both surface and groundwater are vital for irrigation in the northern regions. For centuries, shallow aquifers or foggaras (underground water-gallery

77 WBG,2026
78 Projet CREM, 2016
79 "Water Use in Algeria", Fanack.
80 "Algeria Economic Update", World Bank
81 COFACE, 2025
82 Goosen, 2024
83 Drouiche, 2024
84 "Ressouces en eau: Les capacités des barrages portées à 9 milliards de mètres cubes en 2024" (French), El Watan, 30 January 2023, available at https://elwatan-dz.com/ressources-en-eau-les-capacites-des-barrages-portees-a-pres-de-9-milliards-de-metres-cubes-en-2024
85 Fourneris, 2024

systems) were the main infrastructure for irrigating small-scale agriculture. However, in recent years, the promotion of large-scale agriculture, especially in the Sahara, has required drilling into deep, nonrenewable aquifers. Water is mainly extracted using boreholes and treated in demineralization plants due to high salinity levels. Overall, the country has over 123,000 wells. While exact withdrawal volumes are unknown, the measured decline in groundwater levels signals overexploitation.[86] This, combined with widespread unregulated irrigation, poses a serious threat to aquifers' sustainability and water security.

Over the past 25 years, Algeria's water policy has prioritized the development of new resources over reuse and more rational use of conventional sources; the biggest investments addressing growing water demand are for the expansion of seawater desalination. While the sector began developing in the early 2000s, it has accelerated rapidly in recent decades in response to falling rainfall, water shortages, and the need to prevent a looming water crisis.

In a February 2024 hearing, the Minister of Hydraulics, Taha Derbal, announced the government would invest USD5.4 billion to build 11 new desalination plants. Five were commissioned in the wilayas (prefectures) of Oran, Tipasa, Boumerdès, Béjaïa, and El Tarf in 2024 and 2025, increasing production capacity from 2.2 million m3 to 3.7 million m^3 per day and responding to 42% of the country's needs. Another seven would be built between 2025 and 2030 in Tlemcen, Mostaganem, Chlef, Jijel, Skikda, and two plants in Tizi Ouzou. With these, national capacity from desalinated water would reach 5.8 million m^3 per day, and cover 60% of the country's needs in drinking water by 2030.[87] At the time of writing this report, the country counted 25 operating desalination plants built along the 2,000km Mediterranean coastline, with capacities ranging from 5,000m3 to 500,000m3 per day.[88] In January 2025, the government announced that 31 plants would be in operation by the end of 2025.[89]

While a sense of urgency is driving the scale and pace of desalination plant construction, the policy is indeed crucial to ensuring a reliable and sufficient drinking water supply. It also plays a vital role in reducing dependence on dwindling surface water and the overexploitation of nonrenewable groundwater. By freeing up substantial water resources for agriculture and other sectors, this strategy supports both food sovereignty and broader economic diversification.[90] However, even though it is necessary to mobilize rapidly vast amounts of much-needed potable water, desalination also has highly negative environmental and economic consequences, including toxicity to marine life from high salinity and dissolved chemicals.

Long overlooked, wastewater reuse is now gaining renewed attention, with increased investments to modernize existing plants and build new ones. Obstacles include largely dated infrastructure (62% of wastewater treatment plants are over 15 years old) and the cost of new equipment required for the tertiary treatment – that is, treatment beyond primary and secondary levels: fine filtration, advanced disinfection, and nutrient removal – necessary to ensure water is potable and fit for agricultural use.[91] Today, the largest cities and urban centers benefit from advanced and modern technologies, while highlands, remote, and desert areas rely on more basic, easy-to-maintain technologies. Indeed, the costs of building and operating tertiary treatment systems are substantial, including investments in machinery, energy, chemicals, and qualified personnel. In addition, maintenance is often underfunded, leading to degradation of water quality over time and raising health and safety risks for the domestic sector and irrigation. Reuse of treated wastewater in Algeria remains low: less than 19%[92]. Building capacity and improving monitoring and transparency are necessary to build trust, increase acceptance, and lower uptake barriers from all sectors. The national strategy pursues wastewater treatment and reuse, with a goal to repurpose 60% of treated wastewater

86 "Hydrogeology of Algeria", Wikipedia

87 "Algeria plans to invest $5.4 billion in seawater desalination"(French), Agence Ecofin, 14 October 2024, available at https://www.agenceeco-fin.com/gestion-publique/1410-122429-l-algerie-prevoit-d-investir-5-4-milliards-dans-le-dessalement-de-l-eau-de-mer

88 Benelkadi, 2025

89 Amzal, 2025

90 Salima Ettouahria, "Station de dessalement 'Fouka 2': Un renfort stratégique pour l'approvisionnement en eau potable" (French), EL Moudjahid, 22 February 2025, available at https://www.elmoudja-hid.dz/fr/actualite/station-de-dessalement-fouka-2-un-renfort-strategique-pour-l-approvisionnement-en-eau-potable-231188

91 "Wastewater treatment technologies and challenges in Algeria and their future prospects?", 2025

92 "Eaux Usées : 601 millions de m^3 recyclés", 2025

for irrigation by 2030.[93]

Legal and Policy Frameworks

Algeria is engaged in national and international efforts to ensure access to water and sanitation as fundamental human rights and to promote sustainable water management. The legal framework is grounded in the country's 2020 Constitution and the 2005 Water Law, which form the foundation of its national water governance.[94]

Article 63 of the Constitution affirms the right to access safe drinking water and mandates the state to ensure its availability and safeguard water resources for future generations. Water is recognized as a public good under Articles 14 and 20 of the Constitution.

The primary legal instrument governing water resources is Law No. 05-12 of 2005, titled "On the Use, Management, and Sustainable Development of Water Resources as a National Public Good".[95] It guarantees the right to access safe drinking water and sanitation (under Articles 2-3), and describes it as a public service managed by the state and municipalities that can be delegated to public or private entities by regulation or contractual agreements (under Articles 100-101). The law promotes IWRM as one of its main pillars, regulates water use across sectors, and emphasizes sustainability, pollution prevention, and stakeholder participation. It regulates irrigation, withdrawal conditions, concession regimes, and bans the use of untreated wastewater for irrigation (Articles 125-136).

The Water Law established two major planning tools: the National Water Plan (Plan National de l'Eau, established in Articles 59-61) and the water resources development plans (plans directeurs d'aménagement des ressources en eau, established in Articles 56-58).[96] The National Water Plan operates at the national level, while the water resources development plans are specific to a region or river basin and serve as long-term, localized planning instruments. Both national and local plans are updated periodically. The water resources plans are developed and updated by the country's five regional hydrographic basin agencies, which are further divided into territorial delegations that include representatives of the central administration; local authorities; various local actors representing water consumers including chambers of agriculture (made up of local farmers), chambers of commerce (made up of local businesses), and consumer associations; and water management bodies and companies.

Launched in 2011, the National Water Plan set out a twenty-year strategy to modernize Algeria's water supply infrastructure, taking into account economic, financial, and environmental constraints. The plan anticipated a significant rise in water demand. Key components include increasing groundwater extraction, particularly in the south, to support agricultural development; expanding the use of unconventional water sources such as wastewater treatment and seawater desalination, which was previously limited to industrial use; and investing in long-distance water transfers. The plan also emphasizes IWRM, encourages public-private partnerships and capacity building, and establishes a range of public institutions and companies in the water sector.

Algeria's finance laws in recent years have provided major funding to overhaul and expand national water infrastructures, with an emphasis on water supply. The 2025 Finance Law continued to prioritize water desalination as a key to long-term water security.[97] These national regulations and strategies support the implementation of international agreements.

Algeria aligns with the SDGs under the UN 2030 Agenda, and pursues the realization of SDG 6, which aims to ensure access to water and sanitation for all. The country committed to the UN 2030 Agenda from its adoption by the UN General Assembly in 2015, embedding the goals in Algeria's 2016 constitution and key national regulations.[98] The four main pillars of action under SDG 6 are: universal and equitable access to drinking water at an affordable price, improved access to sanitation

93 Lahdiri, 2025

94 Constitution of Algeria, 2020

95 Water Law 05-12, 2005

96 Ourida Talmat Kadi, "Plan National de l'Eau (PNE)" (French), Ministry of Water Resources, 2017, available at https://andp.unescwa.org/sites/default/files/2021-10/11_Prez__PNE_07-2017-modif.pdf

97 Matthew Goosen, "Algeria Commits USD5.4B to Desalination for Long-Term Water Security", Energy Capital & Power, 5 February 2025, available at https://energycapitalpower.com/algeria-commits-5-4b-to-desalination-for-long-term-water-security/

98 Ministry of Foreign Affairs, 2019

and ecosystem protection, improved rational use of water resources, and the development of a strategy for IWRM.

Algeria ratified the Paris Agreement in 2015 and submitted its first intended "Nationally Determined Contribution" in 2016. In 2017, it adopted a national climate plan with 156 measures focused on adaptation, mitigation, and governance, to be implemented by 2030.[99] The contribution is primarily focused on the energy sector with plans to reduce 7% of greenhouse gas emissions by 2030 compared to business as usual, and up to 22% conditional on international aid. The plan also comprises key water-related commitments, including addressing saltwater intrusion, evaluating the impacts of climate change on dams and coastal aquifers, improving irrigation systems, and using geographic information systems to manage droughts and flood risks.

A member of the Ramsar Convention since 1984, Algeria has over 50 internationally recognized wetland sites and has committed to conserving wetlands through various conservation programs. The 2024 joint report by the UN Environment Programme (UNEP) and the UN Economic and Social Commission for Western Africa (ESCWA) on IWRM in the Arab region found important improvements in Algeria since 2017 with regard todisaster preparedness through flood resilience plans and strategies, and protection of ecosystems and biodiversity through the integration of ecosystem-based management approaches, including efforts for wetland preservation.[100]

Transboundary water cooperation includes key partnerships with Tunisia and Libya, particularly through the North-Western Sahara Aquifer System that the countries share, and working with organizations such as the Sahara and Sahel Observatory to promote sustainable groundwater management. In April 2024, the three countries signed an agreement to establish a joint coordination mechanism for managing the shared resource.[101] Algeria also participates in the Arab Water Council, the African Water Vision 2025, and the Union for the Mediterranean Water Agenda, all of which promote sustainable water management in their respective areas.

Finally, the country is a party to the 1973 "International Convention for the Prevention of Pollution from Ships" and the 1976 Barcelona "Convention for the Protection of the Mediterranean Sea Against Pollution", which require Mediterranean countries to cooperate to prevent marine pollution from land- and marine-based sources, including dumping and discharges. Both conventions include "polluter pays" approaches.

Institutional Stakeholders

1. Ministries and public companies

Water policies and programs are centralized with several ministries contributing to their formulation and execution. These ministries closely coordinate with national agencies and public enterprises to ensure integrated management of the country's water resources. Key players include the Ministries of Finance, Agriculture, Energy, Equipment, and the Environment, but the Ministry of Hydraulics (previously known as the Ministry of Water Resources) holds the primary leadership role. It is tasked with directing water resource planning, regulation, infrastructure expansion, and steering national water strategies.

The Ministry of Hydraulics oversees water companies classified as Etablissements à caractère économique et industriel – public entities with administrative and financial autonomy that operate commercially while serving the public interest in key sectors such as water and energy. These public water companies include:

- Algérienne des Eaux (ADE) regulates the water market and produces and distributes some 6 million m^3 of potable water per day to nearly 30

99 "Algeria", Climate Change Knowledge Portal, The World Bank, 2021, available at https://climateknowledgeportal.worldbank.org/country/algeria

100 Khayat et al, 2025

101 "Algérie-Tunisie-Libye: Début de la cérémonie de signature de l'accord portant création d'un mécanisme de concertation sur la gestion des eaux souterraines communes" (French), EL Moudjahid, 24 April 2024, available at https://elmoudjahid.com/fr/actualite/algerie-tunisie-libye-debut-de-la-ceremonie-de-signature-de-l-accord-portant-creation-d-un-mecanisme-de-concertation-sur-la-gestion-des-eaux-souterraines-communes-216945

million people across the country.

- The Société des Eaux et de l'Assainissement d'Alger (Algiers Water and Sanitation Company), SEACO, and SEAOR ensure continued water supply and sanitation services in their respective areas of the Algiers wider region, Constantine, and Oran. They are also tasked with modernizing water infrastructures, which they have conducted through joint ventures with foreign companies.
- The Office national de l'assainissement (National Sanitation Office) is in charge of collecting domestic wastewater, operating wastewater treatment infrastructures, and preventing wastewater pollution.
- The Agence National des Ressources Hydrauliques (National Agency for Hydraulic Resources) is responsible for stocktaking and monitoring the quality and quantity of the country's water resources, including irrigation and groundwater extraction.
- The Agence de Gestion Intégrée des Ressources en Eau (Integrated Water Resources Management Agency) oversees coordinating water information systems and efforts for integrated and sustainable water resource management across the country, developing surveys, and raising awareness about water conservation. The agency is also responsible for the country's five hydrographic basin agencies, which implement the agency's goals in their respective regions: Algiers, Chlef, Constantine, Ouargla/Sahara, and Oran.
- The Agence Nationale des Barrages et des Transfers (National Dams and Water Transfers Agency) plays a central role in managing Algeria's water resources by overseeing the construction, maintenance, and operation of dams and interbasin transfer systems.
- The Office National de l'Irrigation et du Drainage (National Irrigation and Drainage Office) manages large-scale irrigation and drainage infrastructure, playing a key role in supporting agricultural water efficiency and sustainability.
- The Agence Nationale de Dessalement de l'Eau (National Water Desalination Agency), launched in 2023, oversees the production and distribution of desalinated water, the maintenance of infrastructure, as well as monitoring and analysis.

The number of organizations involved reflects the scale of the challenges related to water supply, sanitation, and irrigation across a country spanning more than 2 million km2. A centralized structure under the Ministry of Hydraulics offers the advantage of strong coordination; the participation of numerous actors can complicate decision-making, especially when responsibilities overlap or projects span multiple sectors, as with the development of desalination plants, which requires the participation of various actors from the public and private water, energy, and construction sectors. Ministries and national bodies often reorganize in a bid to simplify operations, but these reshuffles can create confusion for the public and stakeholders alike. In addition, restructuring often faces resistance and is difficult to carry out while addressing urgent water supply needs, requiring stronger planning, resources, and capacity building.

Companies – public and private, domestic and international – are also involved in the development of water infrastructure in Algeria. The private sector is mainly involved in supplying equipment for water infrastructure and distribution in major cities through management contracts. Given the size and complexity of these systems, major national and foreign engineering firms were commissioned to study, design, and monitor the works. However, desalination plants have in recent years been built by state-owned companies, including the Algerian Energy Company (a subsidiary of oil and gas giant Sonatrach), the construction group Cosider, and other national firms with know-how in the energy sector. In addition, efforts are underway to produce equipment locally – including advanced technologies like reverse osmosis membranes – reducing reliance on imports. As of 2025, the integration rate of domestically produced components in seawater desalination plants had reportedly reached 30%.[102] This progress spurs innovation, skill development, job creation, and strengthens national water sovereignty.

102 Usines de dessalement d'eau de mer : le taux d'intégration a atteint 30%, L'Algérie Aujourd'hui, 20 February 2025, available at : https://lalgerieaujourdhui.dz/usines-de-dessalement-deau-de-mer-le-taux-dintegration-a-atteint-les-30/

2. Consultative bodies

The Water Law No. 05-12 of 2005 established a Consultative National Water Council (Conseil national consultatif des ressources en eau), a body tasked with "examining the strategic options and implementation instruments of the national water plan as well as on any water-related issues for which its opinion is requested" (Article 62).[103] It brings together "representatives from administrations, local assemblies, relevant public companies, and professional and/or user associations"(Article 63). Amid the rapid expansion of the water sector, the council convenes high-level meetings involving ministers, representatives from river basin agencies, and experts from leading companies engaged in water infrastructure development – particularly seawater desalination projects. While limited information is publicly available about the council's activities, it appears to function as a coordination platform aimed at facilitating the effective implementation of major projects in the sector. It is unclear whether civil society representatives are included in the council, as provided in Article 63 of the Water Law. The lack of transparency regarding the works and recommendations offered by the council is another issue that merits further scrutiny, given its centrality to water justice.

Another institution, the National Economic, Social, and Environmental Council, acts as an advisory body to the president of the Republic and a platform for civil society participation in national dialogue on economic, social, and environmental development policies.[104] In the past, this council was actively involved in water-related issues, organizing national forums such as the Assises de l'eau (water foundations) to bring together key stakeholders from the water sector to develop strategies for more sustainable, equitable, and resilient water management; it is currently less engaged in this area.

3. Local authorities and decentralization

At the local level, wilayas and assemblées populaires communales (communes or municipalities) are the two authorities with a say on water and sanitation policies. Article 17 of the Algerian constitution provides that "municipalities are the cornerstone of decentralization and the space in which citizens manage public affairs". Article 123 of the Communal Code provides that the municipalities shall ensure, with the assistance of the state's technical departments, the disposal and treatment of wastewater and the collection, transportation, and treatment of solid waste.[105] They are also tasked with fighting water and soil pollution.

The 58 wilayas across the country implement central government policies at the local level. They offer municipalities technical and financial support to commission and monitor feasibility studies and projects; ensure the rational use of water; collect and analyze data on production, storage, and distribution of water for domestic, industrial, and agricultural purposes; and map out water points and the state of surface and groundwater resources.

Water supply and sanitation projects can be commissioned by various entities – including communes (municipalities), wilayas, and state and national agencies – depending on their role and the project's size. While major water supply and sanitation projects, such as dams or water desalination plants, are commissioned by the government and relevant national agencies and companies, communes are responsible for maintaining, repairing, and developing local infrastructure and networks using local resources, which include local taxes, state transfers, loans, and other revenue. Wilayas oversee the spending of government funding.

Commissioning water and sanitation projects and contesting related decisions responds to rules laid out in the public procurement code, which was reformed in 2023 to improve procedure transparency and fight corruption. Public procurement regulations allow any interested party – including residents of areas where projects are developed – to appeal decisions that concern them, regardless of the nature of the project or the entity that commissioned it.

In recent decades, citizens and farmers have increasingly called for a more balanced distribution of power between local and central authorities – demands that have intensified in recent years due to worsening droughts and water shortages.

103 "Executive Decree No. 08-96" (French), 15 March 2008, CNCRE, available at https://faolex.fao.org/docs/pdf/alg78140.pdf

104 Conseil national économique, social et environnemental, missions : https://www.cnese.dz/en/cnese-portal/apropos-cnese

105 Loi 11-10.

However, communal people's assemblies often lack the financial resources, technical expertise, and the autonomy needed to commission, oversee, and manage water projects and services. These limitations, along with overlapping responsibilities – particularly with wilayas and river basin agencies that report to national ministries – can create administrative bottlenecks. In response, the Ministry of Hydraulics has instructed local authorities and the one-stop service desks under their supervision to expedite the processing of water-related projects and well-drilling requests submitted by farmers.

The process of decentralization was relaunched in 2023, resulting in different draft law proposals aiming to redefine the roles and responsibilities of municipalities and wilayas in driving economic, social, and local development in the country. The most recent drafts were submitted in January 2025 to the Algerian parliament's upper house (Conseil de la Nation) following consultations with key legal experts, public administrations, and major political parties.[106] The much-needed reform is complex: it must reflect an array of legal constraints and political views and include robust oversight mechanisms on local decision-making to ensure national policies are adequately implemented locally.

Trade unions

The Algerian trade-union movement is rooted in the country's struggle for independence: it emerged in the 1940s due to long-standing economic exploitation and racial discrimination under colonial rule. The General Union of Algerian Workers was created in 1956 as an independent Algerian union, separate from French-controlled unions. Today, it acts as a union and a national trade union center that brings millions of workers together. With the recognition of union pluralism in 1989, independent unions emerged as a significant force in the 1990s – joining social movements, pushing for democratic reform, and defending workers' rights – with varying margins of freedom and levels of success.

The General Union organizes workers in the water sector, with company branches in all major public water companies, and serves as an umbrella organization to the Fédération nationale des travailleurs de l'hydraulique (National Federation of Hydraulic Workers).[107] The unions, which have a cooperation framework with the Ministry of Hydraulics, voice their concerns over job security, working conditions, and privatization of public water companies, including their acquisition by foreign buyers.[108] Positive outcomes underscore the role of unions in influencing public policies, resisting profit-driven decisions, and protecting water as a public good.

As a social partner, the General Union sits on the board of the National Economic, Social, and Environmental Council, representing workers' voice on a range of labor and social issues, particularly in relation to employment and the social impacts of climate change and water scarcity.[109] The organization also has a long-tradition of cooperation with the International Labour Organization, particularly in organizing the informal sector, climate-proofing the labor market, and enhancing labor regulations.

Since 2016, workers in the construction, public works, and hydraulics sectors affected by extreme temperatures have been eligible for financial compensation from the Caisse Nationale des Congés Payés et du Chômage-Intempéries des Sectors du Bâtiment, des Travaux Publics et de l'Hydraulique (the National Fund for Paid Leave and Weather-related Unemployment in the Construction, Public Works, and Hydraulics Sectors), a body under the Ministry of Labor.[110] Sector regulations allow for coverage of up to 75% of the hourly wage, capped at 200 hours per year (or 40 days), for days lost due to illness or incapacity caused by extreme weather. Initially limited to workers in the southern and eastern wilayas, these benefits were extended nationwide in 2019 and expanded to cover various types of weather-related disruptions,

106 Salima Ettouahria, "Goudjil reçoit le rapport final des avant-projets de loi sur la commune et la wilaya: la décentralisation en marche" (French), El Moujahid, 7 January 2025, available at https://www.elmoudjahid.dz/fr/actualite/goudjil-recoit-le-rapport-final-des-avant-projets-de-loi-sur-la-commune-et-la-wilaya-la-decentralisation-en-marche-228905

107 Ibtissem L., "Ressources en eau: Hasni et le SG de l'UGTA évoquent le rôle des syndicats du secteur" (French), Réveil d'Algérie, 19 October 2021, available at https://reveildalgerie.com/fr/ressources-en-eau-hasni-et-le-sg-de-lugta-evoquent-le-role-des-syndicats-du-secteur/

108 "Hydraulique", Vitaminedz, 28 June 2005, available at https://www.vitaminedz.com/fr/Algerie/hydraulique-48363-Articles-0-0-1.html

109 "Organization and Functioning", Conseil National Economique, Social et Environnemental, available at https://www.cnese.dz/en/cnese-portal/presentation_cnese/organigramme_cnese

110 CACOBATPH I Missions (Arabic), available at https://www.cacobatph.dz/qui-sommes-nous/?lang=fr

including extreme heat, heavy rainfall, and storms.[111] Workers building, maintaining, or repairing water infrastructure benefit from these regulations, which strengthen working conditions, labor standards, and, more broadly, water justice.

Hundreds of projects in progress or completed mean more jobs in the water sector and related sectors, both for public and private companies. As a result of this strategy and others, the country's unemployment rate fell from around 30% in the early 2000s to 12% by 2024. More jobs also mean good news for unions, whose participation in policy formulation may be confined to their mandate, but who have gained strength with more workers and thus increased their capacity to improve the working conditions of their members.

Although up-to-date statistics are limited, women continue to be underrepresented in the water and agriculture sectors, though their presence in technical and leadership positions is increasing. One example is the woman-led National Agency for Dams and Transfers. In broader policy terms, the UNEP and ECSWA report on IWRM in the Arab region states that gender equality policies in Algeria have allowed women to actively partake in intersectoral commissions for national water plans, thus contributing to water management strategies.[112]

4. International partners

Multilateral and bilateral development agencies support projects in the water sector through loans, grants, and technical assistance. Key multilateral donors include the World Bank and the EU, which supported long-term projects focused on water supply, management, and sanitation; and the African Development Bank, the UN Development Programme, and the UNEP, which offer technical assistance for sustainable water management and climate change adaptation to droughts and floods.[113] The International Union for Conservation of Nature has supported watershed restoration and participatory programs with local communities to protect ecosystems. The EU currently supports Algeria's blue economy, with strands on sustainable coastal management, fisheries, and marine depollution.[114] Other projects address nonrevenue water and promote water conservation.[115]

Algeria receives no development aid from France.[116] The leading bilateral aid agency in Algeria is Deutsche Gesellschaft für Internationale Zusammenarbeit, the development agency of the German Ministry for Economic Cooperation and Development. Present in Algeria since the 1970s, it provided long-term technical support to develop the national water strategy, enhanced data collection through geographical information systems (widely used by wilayas and river basin agencies to map out and manage coastal areas), and developed integrated, participatory water management models, particularly in rural areas.[117] A core focus of these programs is to promote more efficient water use by improving system performance, reducing losses, and optimizing distribution. It also supports the development of a green hydrogen industry in Algeria, although there are serious concerns over the disproportionate amount of water and energy needed to produce it.[118]

In the context of mounting climate and water crises, climate finance is vital to building resilience. In the water sector, it can support the restoration of natural ecosystems such as coral reefs, lakes, rivers, and mangroves, and promote more sustainable practices to protect and conserve

111 "CACOBATPH-ONM Signature d'un accord sur les congés en cas de températures extrêmes" (French), Ministry of Work, Employment and Social Security, 28 October 2019, available at https://www.mtess.gov.dz/fr/cacobatph-onm-signature-dun-accord-sur-les-conges-en-cas-de-temperatures-extremes

112 IWRM Progress Report in the Arab region, UNEP-ECSWA, 4 June 2025 (cf. Supra).

113 Country programme document for Algeria 2023-2027, UNDP, available at https://www.undp.org/sites/g/files/zskgke326/files/2023-03/CPD%20Algeria%202023-2027.pdf

114 "Programme Économie Bleue en Algérie", Program webpage, available at https://www.economiebleue.dz/

115 Water produced and treated but lost or unaccounted for – the Water and Environment Support (WES)" project, available at : https://www.wes-med.eu/water-and-environment-support-wes-project-tackles-non-revenue-water-issues-through-a-new-activity-to-allow-better-use-of-scarce-water-resources-in-jordan/

116 "La réponse de l'Agence française de développement à Sarah Knafo" (French), YouTube interview with AFD head Rémy Rioux, Sud Radio, 21 February 2025, available at https://www.youtube.com/watch?v=ZI-3OxZRWXYQ&t=480s

117 GIZ, Algeria Ministry of Water Resources, Progress Consulting. Assessment of the water sector in Algeria, 2016, available at : https://projet.oss-online.org/maghreb-eau/sites/default/files/2020-01/Rapport-GIZ-Final_ALGERIE_0%20%283%29.pdf

118 Abbe Ramanan, "Are Blue and Green Hydrogen Too Water Intensive to Be Sustainable?", Clean Energy Group, 10 September 2024, available at https://www.cleanegroup.org/blue-green-hydrogen-water-intensive/#:~:text=Unsurprisingly%2C%20electrolysis%20is%20very%20water,that%2C%20electrolyzers%20require%20purified%20water

water. Unfortunately, climate finance flowing into and within Algeria remains negligible. In 2019, the Green Climate Fund contributed just USD300,000 to support the implementation of Algeria's National Plan to Combat Climate Change. Several factors help explain this low level of support, such as the relative strength of the Algerian economy. This example also reflects a broader regional trend: indeed, the World Bank has noted that the MENA region is the "smallest recipient of international climate finance worldwide".[119] Similarly, the Organisation for Economic Co-operation and Development reported in 2021 that climate finance directed to the MENA region has peaked at only USD3 billion annually since 2010. Over the past decade, Arab states have received a total of USD34.5 billion in public international climate finance – representing less than 6% of their estimated needs for the coming decade. According to ESCWA, only 4% of climate finance in the region comes from dedicated climate funds.[120]

By comparison, the EU spent €106 billion on environmental action in 2018 alone.[121] Its 2021-2027 budget and the NextGenerationEU recovery instrument amount to around €2 trillion, 30% of which will be spent to fight climate change in Europe.[122] Based on global, nationally determined contributions for 2021-2030, Action Aid estimated that €502 billion per year is needed from international climate finance for mitigation, adaptation, and cross-cutting programs, with another estimated €500 million for loss and damage.[123]

Algeria's water strategy is primarily financed through domestic resources, supported by favorable economic conditions, rather than international aid. The International Monetary Fund projects the country's GDP will surpass USD268.9 billion in 2025, making it the third-largest economy in Africa.[124]

5. Research and policy institutes

Research and forecasting play a vital role in strengthening water strategies and building resilience in the face of both climate change and increasing demand from the domestic, agricultural, and industrial sectors. They are also essential for balancing economic priorities with social and environmental impacts.

Alongside formal consultative bodies on water-related issues, Algeria promotes research and innovation by engaging a broad spectrum of stakeholders. These efforts are spearheaded by the Ministry of Higher Education and Scientific Research through its Agence Thématique de Recherches en Sciences et Technologie (Thematic Agency for Research in Science and Technology).[125] In recent years, the agency has established several thematic research networks focused on key water issues, including water security, seawater desalination and brine management, and hydrogen. These networks are open to scientists, academics, professionals, and civil society members who wish to participate. This model has the potential to branch out as compacts between civil society organizations (CSOs) and universities, sparking discussions and boosting knowledge, capacities, and collaboration with relevant CSOs on hot topics such as nonrevenue water, water-resilience, and the food-water nexus. There is value in branching out and including CSOs in conversations about sustainability and resilience because most adaptation efforts will have to stem from society itself.

Furthermore, assessing the impacts of water policies and anticipating future water needs also requires the publication of recent data and a wider public debate on key issues of interest. Yet recent statistics are often not publicly available. Few are published on the website of the Office national des statistiques (National Statistics Office), and the most recent are only available upon subscription. In addition, some water stakeholders may highlight positive results

119 "Middle East and North Africa Climate Roadmap", World Bank Group, 25 January 2022, available at https://www.worldbank.org/en/region/mena/publication/middle-east-north-africa-climate-roadmap

120 "ESCWA: Arab States need more than $570 billion to finance climate action", ESCWA Press Release, 17 November 2022, available at https://www.unescwa.org/news/escwa-arab-states-need-more-570-billion-finance-climate-action#:~:text=%E2%80%9CA%20mere%204%25%20of%20climate,these%20funds%2C%E2%80%9D%20Dashti%20recommended

121 "How much do governments spend on environmental protection?", Eurostat, 27 February 2020, available at https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20200227-2

122 "Supporting climate action through the EU budget", European Commission, available at https://climate.ec.europa.eu/eu-action/eu-funding-climate-action/supporting-climate-action-through-eu-budget_en

123 European Citizens Summit, Brussels, 24 March 2024.

124 "IMF DataMapper: Datasets: World Economic Outlook (October 2025): GDP, current prices", International Monetary Fund, 2026, available at https://www.imf.org/external/datamapper/NGDPD@WEO/MAR/DZA

125 Main website, Agence Thématique de Recherche en Sciences et Technologie, available at https://atrst.dz/

more often than negative ones due to the stigma attached to negative results.[126] "First-generation" academic reports on water are dated or too technical for the wider public to understand, though reports published in recent years are more readily accessible to the public. Independent publications are often conducted in the framework of foreign-funded projects, leading some policymakers to raise doubts about their objectivity, framing, or the perceptions they promulgate.

As a result, water-related topics remain absent from public debate, even though they should rank highly in it. Rapid urbanization, cities' future livability, greening, sustainable urban planning, innovative water collection systems (such as rooftop and underground), and water-efficient and drought-resistant cultures are examples of urgent questions to tackle in the context of the climate emergency.

There is a need for more policy research grounded within the country, capable of delivering rigorous, evidence-based, and objective analysis. By unpacking complex issues, such policy research can question prevailing assumptions, serve as a platform for innovative thinking, contribute to informed public debate, and provide valuable guidance to governments and other national stakeholders.

126 Main website, Office National des Statistiques, available at http://www.ons.dz/

About the Arab Reform Initiative

The Arab Reform Initiative is an independent Arab think tank working with expert partners in the Middle East and North Africa and beyond to articulate a home-grown agenda for democratic change and social justice. It conducts research and policy analysis and provides a platform for inspirational voices based on the principles of diversity, impartiality, and gender equality.

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