

Achieving Water Sustainability in Algeria: A Review of SDG 6 Indicators and National Policies

تحقيق استدامة المياه في الجزائر: مراجعة لمؤشرات الهدف السادس من أهداف التنمية المستدامة والسياسات الوطنية

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ملخص:

تستعرض الدراسة التقدّم الذي أحرزته الجزائر نحو تحقيق الهدف السادس من أهداف التنمية المستدامة (SDG 6) المتعلق بالمياه والصرف الصحي. تبيّن النتائج أن الجزائر حققت تغطية شبيهة شاملة لمياه الشرب في المدن وتحسّناً ملحوظاً في خدمات الصرف الصحي، لكنها ما زالت تواجه تحديات هيكلية مثل ضعف كفاءة استخدام المياه، وتدهور جودة الموارد، وتأثيرات التغير المناخي. تعتمد الاستراتيجية الوطنية للمياه (2030) على تحلية المياه، إعادة الاستخدام، والحوكمة المتكاملة، مع تركيز متزايد على الإدارة المستدامة والابتكار التقني. وتوصي الدراسة بتعزيز التنسيق المؤسسي، ترشيد الاستهلاك، وتوسيع المشاركة المجتمعية لضمان الأمن المائي بحلول عام 2030.

الكلمات المفتاحية: استدامة المياه؛ الجزائر؛ الهدف السادس للتنمية المستدامة؛ إدارة المياه؛ التغير المناخي.

Abstract :

This paper reviews Algeria's progress toward achieving Sustainable Development Goal 6 (SDG 6) on water and sanitation. It analyzes national indicators, policies, and institutional frameworks to assess achievements and remaining challenges. The findings show that Algeria has achieved near-universal access to drinking water and notable improvements in sanitation coverage, yet faces persistent issues related to water efficiency, resource quality, and climate stress. The study highlights the role of the National Water Strategy 2030 in promoting desalination, wastewater reuse, and integrated water resources management as key pillars for achieving long-term water sustainability.

Key words: Water sustainability; Algeria; SDG 6; Water management; Climate change

Introduction and Problem Statement

Water is a strategic and vital resource that underpins human, economic, and social development. It plays a crucial role in achieving food, health, and economic security. Accordingly, the United Nations' 2030 Agenda for Sustainable Development designates Goal 6 to ensuring the availability and sustainable management of water and sanitation for all (United Nations, 2015). This goal is widely regarded as one of the most interconnected Sustainable Development Goals (SDGs), given its direct links to public health, education, the environment, and social and economic stability (UN-Water, 2024).

The importance of this goal is particularly evident in the Algerian context. Located in a semi-arid region, Algeria's average renewable water resources do not exceed 300 cubic meters per person per year—one of the lowest rates globally (FAO & UNEP, 2023). The country also exhibits significant regional disparities in water distribution: most surface water resources are concentrated in the north, while the central and southern regions suffer from acute groundwater scarcity. This imbalance makes the management of this scarce resource a strategic challenge closely tied to national water security (FAO & UNDP, 2023). Therefore, achieving Goal 6 is not merely an international development commitment but an existential imperative to ensure sustainable development in a country characterized by limited resources and growing demand.

In this regard, Algeria represents a unique case within the Arab region, having made notable progress in expanding access to basic water and sanitation services over the past two decades. This progress is largely attributed to major investments and multiple government programs. However, such quantitative advancement is accompanied by persistent structural challenges related to service quality, resource efficiency, and long-term sustainability—particularly in the context of rapid environmental and climatic changes (Rapport National Volontaire, 2019).

Accordingly, this study seeks to answer the following research question:

To what extent has Algeria succeeded in achieving Sustainable Development Goal 6 (SDG6), and what are the key challenges it faces in reaching its targets by 2030?

To address this question, the study analyzes SDG6 indicators reported in the United Nations database (SDG6Data.org, 2024) and links them to national policies outlined in the 2019 Voluntary National Report. Comparative insights are also drawn from regional and international benchmarks, particularly the SDG Index (2016–2017) and the Arab Region SDG Index (2019)

2- Research Methodology

This study adopts a comparative analytical approach, interpreting quantitative indicators in light of the political and institutional frameworks governing water resource management in Algeria. The methodology combines descriptive and analytical dimensions to assess both progress and challenges related to Sustainable Development Goal 6 (SDG6).

Three primary sources were utilized:

1. SDG6Data.org (2024) — the global database for measuring Goal 6 indicators and providing international benchmarks.
2. The Voluntary National Report (Rapport National Volontaire, 2019) — which presents Algeria’s achievements and institutional efforts toward implementing the Sustainable Development Goals.
3. The SDG Index reports (2016–2017) and the Arab Region SDG Index (2019) — used to establish regional and international comparisons (Sachs et al., 2016; Arab Region SDG Index, 2019).

The methodological framework focuses on the following key dimensions of SDG6:

- Access to safely managed drinking water services for all citizens (SDG 6.1);
- Access to safely managed sanitation services (SDG 6.2);
- Water treatment and reuse to enhance sustainability (SDG 6.3);
- Improving water use efficiency and monitoring water stress indicators (SDG 6.4);
- Water governance and integrated resource management (SDG 6.5);
- Protecting water quality and reducing pollution (SDG 6.3 & 6.6);
- Sustainable management of surface and groundwater resources (SDG 6.5 & 6.6);

- Monitoring and tracking SDG6 indicators to evaluate the effectiveness of national policies and interventions (SDG6Data.org, 2024; Rapport National Volontaire, 2019).

This multidimensional approach allows for a comprehensive understanding of Algeria's performance in achieving SDG6, highlighting the interplay between quantitative outcomes, institutional frameworks, and strategic policy orientations.

3- Access to Safely Managed Drinking Water (Indicator 6.1.1)

Algeria ranks among the Arab countries that have achieved remarkable progress in providing access to drinking water over recent decades. According to SDG6Data.org (2024), approximately 69% of the population has access to safely managed drinking water services, while 92% have access to improved water sources.

These figures indicate that quantitative coverage is nearly universal at the national level, with access in urban areas reaching 99.6% compared to 98.2% in rural areas. This reflects the success of national public policies in expanding water infrastructure, even in remote regions (Rapport National Volontaire, 2019).

Several major government programs have contributed to this achievement, including the National Program for Supplying Cities with Drinking Water, seawater desalination projects in coastal cities, and large-scale water transfer projects such as diverting water from the BENI HAROUN Dam and KEDDIA ASREDOUN Dam to support the highlands and interior regions (Ministère des Ressources en Eau, 2022)..

3-1 Service Quality

Despite the wide coverage achieved, the main challenge remains ensuring water quality and supply continuity. Reports from UN-Water and the WHO–UNICEF Joint Monitoring Programme (JMP) indicate that water in some municipalities is subject to microbiological fluctuations, particularly the presence of *E. coli*, due to aging networks or insufficient monitoring.

According to the Voluntary National Report (2019), 88.6% of water in urban areas met health safety standards compared to 74.9% in rural areas. This disparity highlights a persistent qualitative gap despite the high overall coverage. To address this, authorities have strengthened water quality monitoring through regional laboratories and smart

remote-control systems, while expanding the use of chlorine and ozone-based treatment technologies at production plants.

3-2 Cost and Financial Sustainability

The cost of accessing drinking water in Algeria remains among the lowest in the region due to substantial government subsidies (Ministère des Ressources en Eau, 2022). While this policy ensures social equity, it creates challenges for the financial sustainability of public water utilities, as current tariffs cover only a fraction of operation and maintenance costs.

National and international experts have therefore recommended reforming the progressive pricing system to preserve the social nature of the service while promoting rational water use and reducing losses—currently estimated at 30–35% of national production (FAO, AQUASTAT 2023).

3-3 Future Investments

To enhance national water security, Algeria continues to expand investments in desalination, water reuse, dam construction, and network modernization as part of its long-term strategy for sustainable water management. The National Water Strategy (2021–2030) targets a desalinated-water production capacity of 3.5 million m³ per day by 2030, while rehabilitating existing infrastructure and integrating smart monitoring systems to improve efficiency and reduce water losses.

In addition to these strategic orientations, the Algerian government has committed substantial financial resources to the development of the water sector. According to official reports, nearly 900 billion Algerian dinars ($\approx$ 6.6 billion USD) have been allocated to major water-infrastructure programs, including new dams, desalination plants, groundwater development, and wastewater-treatment facilities (Ministère des Ressources en Eau, 2022).

By the end of 2024, Algeria had reached a total desalination capacity of about 3.7 million m³/day, compared with roughly 2.2 million m³/day in 2020, reflecting a notable expansion in both coastal and high-demand regions (UN-Water, 2024; Energy Capital Power, 2024). This achievement marked a major milestone toward the broader goals of the National Water Strategy 2030, particularly in diversifying supply sources and strengthening national water security.

Looking ahead from 2025, the government is entering a new phase of investment. Seven additional large-scale desalination plants are now under design or early construction, together with four new dams—which will bring the total number of national dams to 85 by mid-decade—and the expansion of large water-transfer systems connecting northern reservoirs with interior and high-plateau provinces (Algeria Invest, 2024). Public–private partnerships are being further promoted to accelerate implementation and to mobilize complementary financing. Collectively, these projects aim to diversify Algeria’s water portfolio, reduce pressure on groundwater, and enhance resilience to climate-induced water stress over the remainder of the decade.

Table 1 demonstrates a steady improvement in access to both safely managed and basic drinking-water services across Algeria since 2010. This upward trend reflects the combined impact of sustained public investment, infrastructure modernization, and policy reforms in the water sector. Specifically, between 2010 and 2024, the share of the population benefiting from safely managed drinking-water services rose from 55 % to 69 %, underscoring the long-term results of the government’s commitment to expanding water networks and improving service quality. The continued rollout of new desalination and water-reuse facilities is expected to further consolidate these gains, strengthening progress toward the 2030 targets of Sustainable Development Goal 6.

Table (1)
Indicators of Access to Drinking Water in Algeria (2010–2024)

	Safely Managed Drinking Water (%)			Basic/Improved Drinking Water (%)		
	Rural	Urban	National	Rural	Urban	National
2010	47	58	55	78	90	85
2015	52	63	60	82	93	88
2019	57	68	65	85	96	90
2024	63	72	69	98	99	92
Source: Author’s elaboration based on data from SDG6Data.org (2024)						

4- Safely Managed Sanitation Services (Indicator 6.2.1)

Over the past two decades, Algeria has achieved significant progress in expanding access to sanitation services. Data from SDG6Data.org (2024) show that the share of the population using safely managed sanitation facilities increased from 55% in 2015 to around 62% in 2024. This progress is largely driven by the continued implementation

of the National Sanitation Program, which focuses on extending sewer networks in large and medium-sized cities and building new treatment plants to ensure the safe and sustainable disposal of wastewater.

The Voluntary National Report (2019) indicates that more than 96% of the population uses improved sanitation facilities (sewer networks or sealed pit latrines). This demonstrates the structural efforts undertaken to expand coverage in urban and peri-urban areas. Nevertheless, several rural and remote regions still experience limited connection to public sewer networks—coverage does not exceed 85% in some areas—and part of the population continues to rely on individual systems for wastewater disposal. These practices make such communities more vulnerable to environmental pollution and local health risks.

4-1 Hygiene and Preventive Behaviors

Hygiene constitutes a central dimension of SDG 6.2, as it is closely linked to the prevention of infectious diseases, particularly among children and women. Data from SDG6Data.org (2024) indicate that approximately 75% of Algerian households had access to handwashing facilities equipped with soap and water, exceeding the African average of 58%. Although this represented a marked improvement, it still fell short of the national target of 90% set for 2025, as outlined in the Voluntary National Report (2019).

In this context, public authorities have implemented awareness programs in schools and local communities to promote personal hygiene and healthy practices, in collaboration with the Ministries of Education and Health. The COVID-19 pandemic further reinforced preventive behavior, as public awareness of handwashing and sanitizer use increased significantly, positively influencing public health outcomes.

4-2 Challenges and Prospects

Despite notable progress, Algeria continues to face several interrelated technical and social challenges in achieving universal sanitation and hygiene coverage (SDG6Data.org, 2024). On the technical side, the sanitation infrastructure requires additional investment to rehabilitate aging sewer networks and to enhance the efficiency of wastewater treatment plants, some of which still operate below their designed capacity (Rapport National Volontaire, 2019).

From a social and behavioral perspective, certain rural and peri-urban communities remain insufficiently aware of the health and environmental risks associated with unsafe wastewater disposal and the uncontrolled use of treated wastewater in agriculture (FAO & UNDP, 2023).

Addressing these challenges calls for a comprehensive approach that combines infrastructure improvement with public education. This includes integrating water and health education into school curricula, conducting targeted awareness campaigns for vulnerable populations, and strengthening public–private partnerships in wastewater management and reuse, in line with Algeria’s 2030 circular economy vision (Ministère des Ressources en Eau, 2022).

Table (2)

SDG 6.2 Indicators on Sanitation and Hygiene in Algeria.

Observation	Source	Value (2024)	Indicator
Improvement of 7 percentage points since 2015	SDG6Data.org (2024)	62%	Population using safely managed sanitation services
Near-universal coverage in urban areas	Rapport National Volontaire (2019)	96%	Population using improved sanitation facilities
Persistent rural gap	SDG6Data.org (2024)	85% (estimated)	Rural access to sanitation services
Households with handwashing facilities	SDG6Data.org (2024)	75%	Access to hygiene facilities (soap and water)
Continuous progress in wastewater treatment	SDG6Data.org (2024)	76%	Percentage of domestic wastewater treated
Source: Author’s elaboration based on data from SDG6Data.org (2024)			

5- Water Quality, Wastewater Treatment, and Reuse (Indicator 6.3)

Water quality represents a fundamental dimension of both public health and environmental sustainability. In Algeria, it constitutes a critical intersection between quantitative water access and qualitative management challenges. National and international data indicate that the proportion of domestic water meeting microbiological standards ($E. coli < 1/100 \text{ mL}$) has reached approximately 88.6% in

urban areas and 74.9% in rural areas (WHO–UNICEF JMP, 2019; SDG6Data.org, 2024). These figures reveal a persistent quality gap despite widespread access to improved water sources.

The causes of water pollution are multifaceted, encompassing aging distribution networks, frequent leakages, insufficient routine monitoring, and untreated wastewater discharges, along with agricultural and industrial contamination from uncontrolled pesticide and fertilizer use, as well as industrial effluents in certain basins (FAO & UNDP, 2023). Furthermore, climate change and recurrent droughts exacerbate pollutant concentrations in both surface and groundwater, underscoring the urgent need to modernize monitoring and analytical systems for water quality (Rapport National Volontaire, 2019).

5-1 Wastewater Treatment

Algeria has achieved significant progress in wastewater treatment over the past decade. Currently, about 76% of domestic wastewater is safely treated, compared to 55% in 2015 (SDG6Data.org, 2024). This improvement has markedly reduced the discharge of untreated wastewater into natural water bodies, largely due to the construction and expansion of wastewater treatment plants in major provinces under the framework of the National Sanitation Program (Ministère des Ressources en Eau, 2022).

Despite this progress, several technical and institutional challenges persist. Some treatment plants operate below their design capacity or suffer from inadequate maintenance. Additionally, many facilities lack advanced treatment processes such as nutrient or nitrate removal, which limits both the quality of treated water and its potential for reuse (Rapport National Volontaire, 2019). Institutionally, overlapping responsibilities among municipalities, water agencies, and regional authorities hinder maintenance efficiency and optimal resource allocation. Investment disparities are also evident—major projects are concentrated in northern and coastal cities, while interior and southern provinces continue to face a shortage of adequate facilities (FAO & UNDP, 2023).

5-2 Reuse of Treated Wastewater

The reuse of treated wastewater offers a dual strategic benefit: addressing water scarcity while reducing pressure on freshwater resources (COSTEA, 2023). Treated water can be redirected for agricultural, industrial, and municipal purposes, including irrigation,

cooling, and the maintenance of green spaces (FAO & UNDP, 2023). However, actual reuse remains modest—around 10–12%—due to issues related to quality standards, low acceptance among farmers, and limited distribution networks (SDG6Data.org, 2024).

To expand this practice, Algeria needs to strengthen regulatory frameworks, provide financial incentives, and implement technical guidelines ensuring safe reuse. Pilot projects demonstrating the viability and safety of treated wastewater could play a crucial role in improving public confidence and adoption rates (Ministère des Ressources en Eau, 2022).

5-3 Environmental Impact and Policy Integration

From an environmental perspective, developing advanced treatment and reuse systems contributes to reducing organic pollution, protecting aquatic ecosystems, and enhancing agricultural water security (UNEP, 2023). These measures align with circular economy principles and the objectives of Algeria’s National Water Strategy 2030, which emphasizes sustainability through integrated water management (Ministère des Ressources en Eau, 2022).

Table (3)

SDG 6.3 Indicators on Water Quality and Wastewater Treatment in Algeria

Indicator / Item	Approx. Value / Status	Source / Note
Proportion of domestic water meeting microbiological standards (urban)	~88.6%	WHO–UNICEF JMP / Rapport 2019
Proportion of domestic water meeting microbiological standards (rural)	~74.9%	WHO–UNICEF JMP / Rapport 2019
Proportion of safely treated wastewater	76% (2024 estimate)	SDG6Data.org (2024)
Proportion of treated wastewater	55%	Historical reference (2015)
Actual reuse of treated wastewater	10–12% (estimated)	COSTEA / National Reports
Expansion of new treatment plants	>200 plants targeted	National Sanitation Program (2019)
Source: Author’s elaboration based on data from SDG6Data.org (2024)		

6- Water Use Efficiency and Water Stress Indicator (Indicator 6.4)

6-1 General Situation

Recent data indicate that Algeria's water-use efficiency is approximately 59%, while its water stress level reaches around 83%, highlighting substantial pressure on available water resources due to rising demand and declining conventional supplies (SDG6Data.org, 2024)

Water use is distributed among sectors as follows: the agricultural sector accounts for 70–75% of total consumption, followed by the domestic sector with around 20%, and the industrial sector with 5–8% (FAO, AQUASTAT, 2023; Ministry of Water Resources, 2024).

The high level of water stress is mainly attributed to limited surface water availability, low groundwater recharge rates, and high evaporation in semi-arid regions. These factors place Algeria above the “very high water stress” threshold (>80%), according to the United Nations classification (UN-Water, 2023).

6-2 Agricultural Sector

Agriculture remains the largest water-consuming sector in Algeria, with irrigation serving as the primary determinant of crop productivity, especially in interior regions. More than 70% of irrigated areas still rely on traditional flood irrigation, while only 30% utilize modern methods such as drip or sprinkler systems, despite national efforts to promote their adoption (FAO, 2023; Rapport Volontaire, 2019).

The government has implemented programs such as converting large-scale irrigated perimeters and promoting water-efficient irrigation systems, targeting around 1.5 million hectares of irrigated land, yet actual implementation remains below expectations (Algérie-Eco, 2022; BNEDER/APS, 2023). Moreover, irrigated agriculture suffers from significant water losses due to leakages, inadequate maintenance of conveyance and distribution networks, and the persistence of traditional farming practices that often neglect principles of water-use efficiency (VitamineDZ, 2017). The reuse of treated wastewater in irrigation offers a promising strategy—particularly in coastal and high-plateau regions—yet its utilization remains limited, at approximately 10–12% of treated volumes, due to technical and regulatory constraints (El-Oued University Review, 2019; LNR-DZ, 2024)

6-3 Industrial Sector

Although industrial water consumption represents less than 8% of total national water use, its environmental footprint is relatively significant, particularly in manufacturing and petrochemical industries located in northern and coastal regions (FAO AQUASTAT, 2023; World Bank, 2022).

The Ministry of Water Resources and Water Security (2024) reports that Algeria has promoted the reuse of treated process water for cooling and cleaning operations. This policy is particularly encouraged in the energy and oil sectors, where major facilities—such as the Skikda and Arzew refineries—have reduced freshwater use by 15–25% through internal recycling systems (APS, 2024; Ministry of Water Resources and Water Security, 2024)

Nevertheless, regulatory and financial challenges persist. Many industrial facilities remain unconnected to monitored wastewater networks, and specialized industrial wastewater treatment plants are still insufficient to meet national needs (World Bank, 2022; FAO AQUASTAT, 2023).

Strengthening enforcement mechanisms and creating fiscal incentives for industrial water reuse therefore remain key policy priorities for sustainable water resource management (Benmessaoud & Belaidi, 2023)

6-4 Urban and Domestic Water Use

Average per capita water consumption in Algeria is estimated at around 165 liters per day in major cities, compared to less than 100 liters in interior regions (Rapport Volontaire, 2019; SDG6Data.org, 2024). This consumption pattern is characterized by high distribution losses, ranging between 30–35% of total production, primarily due to aging infrastructure and insufficient maintenance.

Additionally, public awareness of water conservation remains limited, and subsidized water pricing provides little incentive for rational use. To address these issues, public authorities are implementing smart metering systems, leakage detection programs, and national awareness campaigns through schools and media to foster sustainable consumption habits.

6-5 Institutional Framework, Policies, and Improvement Prospects

Algeria's National Water Strategy (2021–2030) aims to achieve a sustainable balance between water supply and demand through three strategic pillars:

- 1- Diversification of water sources, particularly by expanding seawater desalination capacity to 3.5 million m³/day by 2030 and increasing the reuse of treated wastewater;
- 2- Enhancement of water efficiency across all sectors through the promotion of modern irrigation technologies, loss reduction programs, and the deployment of digital monitoring and control systems;
- 3- Reform of water pricing and subsidies to promote social equity while ensuring the financial sustainability of public utilities.

International organizations emphasize the need to strengthen demand-side management through economic instruments, legislative frameworks, and public–private partnerships in mobilizing non-conventional water resources (UN-Water, 2023; FAO, 2024).

Building upon this framework, Algeria continues to face challenges related to governance, technical efficiency, and consumer behavior. Therefore, improving overall water-use performance requires an integrated approach that combines:

- Technological innovation, such as smart irrigation systems, digital metering, and advanced treatment technologies;
- Institutional reform, including clearer delineation of responsibilities, improved inter-agency coordination, and stronger regulatory enforcement;
- Behavioral and economic incentives, such as progressive pricing mechanisms, awareness campaigns, and targeted support programs for farmers and consumers.

This multidimensional policy approach can help reduce pressure on natural water resources, strengthen resilience to water stress, and advance progress toward Sustainable Development Goal 6 (SDG 6) by 2030.

7- Integrated Water Resources Management and Water Governance (Indicator 6.5)

7-1 General Overview

Integrated Water Resources Management (IWRM) represents a cornerstone of efforts to achieve Sustainable Development Goal 6 (SDG6), as it aims to balance human and environmental water needs through coordinated, cross-sectoral planning. According to SDG6Data.org (2024), Algeria's IWRM implementation index stands at approximately 60%, which is above the Arab regional average of 55% (GWP-MED, 2023) yet still below the threshold required for full integration by 2030. This score highlights meaningful institutional progress in legislation and planning, but also underlines persistent coordination challenges among actors at both horizontal and vertical levels.

7-2 Institutional and Legislative Framework

Algeria's water governance system is primarily governed by Water Law No. 05-12 of 2005, which establishes the fundamental principles of integrated and sustainable water management. The law also created several specialized executive bodies, including the National Water Resources Agency (ANRH), the National Agency for Dams and Transfers (ANBT), and River Basin Committees designed to promote local participation in decision-making (Rapport National Volontaire, 2019).

Despite this solid legal foundation, recent assessments indicate limited coordination among these entities. Strategic decisions tend to remain centralized, and local authorities and civil society are still marginally involved in water planning and management (GWP-MED, 2023; UN-Water, 2024). This partial decentralization weakens adaptive management and slows the transition toward inclusive water governance.

7-3 Practical Implementation and Key Challenges

The practical implementation of IWRM in Algeria faces several interrelated obstacles. There is insufficient integration between water, agriculture, and environmental policies, and the absence of a unified national database limits real-time monitoring and informed decision-making (FAO & UNDP, 2023).

Additionally, recurring droughts and growing demands from agricultural and industrial sectors exert increasing pressure on long-term planning. The administrative structure still reflects a degree of centralization, which reduces the responsiveness and efficiency

of major water projects, particularly in groundwater management across interior regions (Rapport National Volontaire, 2019).

7-4 Recent Initiatives and Policy Developments

Recent policy analyses indicate that Algeria’s forthcoming National Water Strategy (2030) seeks to shift from a predominantly supply-oriented management model toward stronger demand-side measures and decentralised water governance (FAO, 2024; UN-Water, 2023).

In parallel, Algeria is reinforcing its digital monitoring capacity—for instance, through the FAO/WaPOR remote-sensing initiative—and strengthening partnerships with international organisations to enhance technical and institutional capabilities (FAO, 2024).

Moreover, public authorities have shown growing interest in public–private partnerships (PPPs) for desalination, wastewater reuse, and network maintenance, although comprehensive data on these initiatives remain scarce in the open literature.

7-5 Improvement Prospects

Enhancing the effectiveness of water governance in Algeria requires reinforcing institutional coordination and participatory decision-making. Specifically, it is recommended to:

1. Activate River Basin Committees as genuine platforms for participatory management and local policy input;
2. Modernize data collection and monitoring systems through digital and transparent platforms accessible to multiple stakeholders;
3. Integrate IWRM indicators into regional and local development planning;
4. Strengthen intersectoral coordination among ministries and agencies to harmonize water, agriculture, and environmental policies.

Algeria possesses a robust legislative and institutional foundation, but achieving effective and sustainable water governance will depend on nurturing a culture of transparency, accountability, and cooperation across all governance levels. Such a transition is essential to manage water resources efficiently in the face of climate change, demographic growth, and rising economic demands

8- Protection and Restoration of Water-Related Ecosystems (Indicator 6.6)

8-1 Environmental Situation

The protection of water-related ecosystems is essential for maintaining environmental balance and ensuring the sustainable use of natural resources. Wetlands, rivers, lakes, and groundwater systems serve as vital reservoirs of biodiversity and provide key ecosystem services supporting agriculture, drinking water supply, and climate regulation.

According to SDG6Data.org (2024), Algeria has achieved notable improvement in the proportion of protected aquatic ecosystems, which increased from 37% in 2015 to about 45% in 2023. The Ramsar-designated wetland network has expanded to 59 sites, covering over 2.9 million hectares. However, this quantitative progress often masks qualitative degradation in several sites due to recurring droughts, overexploitation of surface and groundwater, and unregulated urban and agricultural expansion (UNEP, 2023; Rapport National Volontaire, 2019).

8-2 Main Challenges

Algeria faces several interconnected challenges in protecting its water-related ecosystems, including:

- Degradation of wetlands caused by watercourse diversion, unplanned landfilling, and declining groundwater levels;
- Industrial and agricultural pollution from untreated wastewater, excessive fertilizers, and pesticide use;
- Climate change impacts, resulting in a 15–20% reduction in surface runoff over the past two decades (FAO & UNDP, 2023);
- Weak environmental monitoring systems, with observation networks covering only about half of major river basins (GWP-MED, 2023).

These pressures collectively threaten the ecological balance of critical aquatic environments and reduce the resilience of ecosystems to climate variability.

8-3 National Efforts and Policies

Algeria has adopted the National Biodiversity Strategy 2030, which integrates ecological protection goals with sustainable water management principles. The environmental component of the National Water Strategy (SNDE 2030) aims to maintain minimum environmental flow requirements in sensitive basins such as the high plateaus and coastal plains.

Several field programs have been implemented in partnership with UNEP and IUCN to restore degraded wetlands, including Lake Fouba (Guelma) and Guelta El-Qala, while enhancing local community participation in ecosystem monitoring and restoration (UNEP, 2023).

8-4 Integration of Protection and Development

Algeria's emerging water policy promotes the principle of an “ecological water economy”, integrating environmental considerations into agricultural and industrial planning. Recent field initiatives include:

- Rainwater harvesting projects in El Bayadh, Naama, and Biskra, using diversion weirs and small dams to support pastoral agriculture and prevent soil erosion;
- Groundwater recharge programs in Ain Salah, Laghouat, and Djelfa, directing runoff into natural infiltration basins;
- Phreatophyte afforestation using drought-resistant species such as *Tamarix* and *Acacia* in the high plateaus and Saharan Atlas, aimed at stabilizing soils and combating desertification.

These integrated projects contribute to hydrological balance, ecosystem restoration, and climate resilience, reflecting Algeria's shift from symbolic protection measures toward a field-based and integrated management approach consistent with SNDE 2030 and the National Biodiversity Strategy 2030.

8-5 Improvement Prospects

To consolidate progress and ensure long-term ecosystem sustainability, future efforts should prioritize:

1. Establishing a national integrated water–environment monitoring system using satellite imagery and artificial intelligence (AI);
2. Strengthening institutional coordination between the Ministries of Water Resources and Environment to prevent overlapping policies;

3. Incorporating environmental performance indicators into the assessment of dam and irrigation projects;
4. Promoting participatory management approaches involving civil society and local councils in wetland protection and restoration.

By implementing these measures, Algeria can better safeguard its natural water capital and ensure the sustainable provision of ecosystem services, thereby advancing progress toward SDG6 and the broader goals of the 2030 Agenda for Sustainable Development.

9- Conclusion and Overall Assessment of Algeria's Performance in Achieving SDG6

Algeria demonstrates steady progress towards achieving Sustainable Development Goal 6 (SDG 6)—ensuring the availability and sustainable management of water and sanitation for all.

Over the past two decades, the country has attained near-universal access to drinking water in urban areas and achieved a significant expansion of basic services in rural communities, although rural coverage still trails behind in terms of service reliability and continuity (WHO & UNICEF JMP, 2023; World Bank, 2023). Improvements in water-quality monitoring and the rehabilitation of distribution networks have also enhanced the stability of services nationwide.

The implementation of the National Water Strategy, founded upon the principles of Integrated Water Resources Management (IWRM), has facilitated greater investment in water-stressed regions and encouraged a more balanced territorial approach to water planning (Ministry of Water Resources and Water Security, 2024; UN-Water & UNEP-DHI, 2025). These developments illustrate Algeria's institutional commitment to advancing water security within a broader sustainable development framework (ESCWA, 2024).

Nevertheless, several structural and environmental constraints continue to limit progress. Algeria's semi-arid climate, combined with increasing agricultural and industrial water demand, places mounting pressure on its already scarce freshwater resources. Moreover, pollution, aquifer depletion, and climate variability have contributed to the degradation of water-related ecosystems (FAO, 2024; UNEP, 2023).

At the regional level, Algeria performs comparably with most Arab and Maghreb countries regarding institutional arrangements and governance indicators, yet continues to exhibit gaps in water-use efficiency, the mobilisation of non-conventional resources such as desalination and wastewater reuse, and the adoption of digital water-management systems (UN-Water & UNEP-DHI, 2025; FAO, 2024; ESCWA, 2024).

Achieving SDG 6 by 2030 will therefore necessitate the acceleration of governance reforms, enhanced cross-sectoral coordination, and the promotion of technological innovation—emphasising efficiency, sustainability, and transparency rather than the mere quantitative expansion of services. Strengthening monitoring systems and fostering community participation in water management will be crucial to consolidating progress and ensuring long-term resilience (UN-Water, 2023; World Bank, 2022).

9-1 Concluding Assessment and Key Recommendations

Algeria’s progress towards achieving Sustainable Development Goal 6 (SDG 6) demonstrates how strong political commitment can coexist with, and adapt to, complex environmental and economic constraints. The country’s ongoing reforms—centred on integrated water management, technological modernisation, and environmental accountability—highlight its determination to transform water scarcity from a structural limitation into a driver of institutional innovation and sustainable development.

To consolidate and accelerate this progress, the following actions are recommended:

1. **Strengthen water governance** through enhanced coordination among key sectors—agriculture, industry, and environment—and establish a **permanent national mechanism** for monitoring SDG 6 implementation.
2. **Transition from supply-oriented management to demand management** by improving agricultural water-use efficiency, promoting advanced irrigation technologies, and reducing conveyance and distribution losses.
3. **Promote scientific research and technological innovation** in water harvesting, wastewater reuse, groundwater recharge, and the afforestation of degraded areas with phreatophytic species.
4. **Raise public awareness and education** through targeted community programmes and the integration of water sustainability themes into national curricula.

5. **Develop a national digital water-monitoring system** to interlink institutional databases, enhance transparency, and support evidence-based policy-making.

If effectively implemented, these measures can reinforce Algeria's resilience to water stress, strengthen institutional performance, and enable the country not only to achieve SDG 6 by 2030 but also to serve as a regional model of sustainable and adaptive water governance.

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