

Water Governance In Algeria as a National Strategy for Developing Agricultural Production

Ameur DEBAA *

Djillali LIABES University, Sidi Bel Abbès, Algeria

debaaameur31@gmail.com

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Abstract: Water resources (water) in Algeria are of great Importance, due to its scarcity, on the national economy, In this contest, Algerian has sought to develop strategic policies to develop this resource, protect it from scarcity, and make optional use of it in the agricultural sector to achieve self-sufficiency of the national economy, and this is In line with the strategic choice of the country's higher authorities to move towards digitization and modernization of the public water facility in light of the environmental and security challenges.

Keywords: Resource, Water, national economy, strategic, Algeria.

***Corresponding author: Ameur DEBAA**

Introduction:

Algeria is characterized by its vast area and noticeable climatic and geographical diversity from north to south, with an imbalance in population distribution and differences in population density. It also boasts significant potential in the fields of water and irrigation, in addition to considerable groundwater resources in the depths of the Sahara. However, water in Algeria is considered a scarce resource, presenting a challenge in meeting the increasing demand for water resources.

Water is one of the natural resources that no society, whether advanced or underdeveloped, can do without. The adequacy of water in terms of quantity and quality is a major issue that currently concerns countries around the world. Water scarcity represents a significant obstacle to many developmental activities in Algeria. Despite its diverse water sources and its geographical location, the water problem is one of the most serious challenges to its economic growth. Rapid population growth and the increasing pace of economic development have put additional pressure on water resources.

The issue of rationalizing water resources in Algeria and linking it to the agricultural sector and food security has become a priority and concern for the government and national policies. National water resources necessitate the optimal utilization of this precious resource within a well-defined national strategy to achieve agricultural sustainability and attain levels of self-sufficiency in food and food security. This is through the governance of this precious resource to improve and develop national agricultural production rates and boost economic growth. The pivotal importance of water resources for agriculture in Algeria, especially in light of the relative scarcity of these resources, calls for appropriate attention to analysis, study, and research into all issues and aspects that could contribute to the development and maintenance of these resources. This includes achieving the highest possible levels of rationalization and efficiency in water use for irrigated agriculture, enhancing the use of modern irrigation methods, developing field irrigation, and employing agricultural weather monitoring to increase usage efficiency.

Problem Statement:

How does water governance contribute to the development and enhancement of agricultural production in Algeria?

To answer this issue, we have divided our discussion into three axes:

I. Rationalizing the Use and Exploitation of Water Resources in Algeria

Algeria is moving swiftly to prepare its general water strategy, including its traditional and non-traditional resources, as well as their quantities and demand levels. Reorganizing this strategy is imperative due to climatic feedback, along with the reality of tap water shortages for citizens. Additionally, the economic takeoff that Algeria has been pursuing for years requires sustainable water resources for sectors like agriculture, industry, and renewable energies.

In this context, the latest issue of the Official Gazette published an executive decree for the establishment of the National Agency for Seawater Desalination, a field that authorities have repeatedly emphasized as crucial to compensate for the decreasing rainfall year after year, and to meet the increasing demand, particularly from the agricultural sector. Thus, it has

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become necessary to establish an effective general water policy capable of mobilizing and utilizing new management mechanisms to enable Algeria to achieve water security.¹

Strategic expert Mohamed Cherif Darouri in this regard states that “water security is the main pillar for achieving food security. Algeria, like other countries around the world, suffers from the necessities of climate change, such as drought, desertification, lack of rainfall, and unexpected weather fluctuations, which require strategies for food security.”²

He added that Algeria cannot export desalinated water for at least the next 5 to 7 years, especially since there is a genuine start to developing the agricultural sector, which requires abundant water. This is coupled with the mobilization of many large public and private companies and factories, all of which contribute to Algeria’s industrial dynamism and require water.³

Furthermore, the national strategy to develop the renewable energy sector, which consumes a significant amount of water, emphasizes the primary goal of establishing seawater desalination plants to achieve self-sufficiency for ordinary citizens and then address the needs of water-dependent economic sectors.

Legal expert in water affairs, Makki Massahl, explained that “the establishment of the National Agency for Seawater Desalination and placing it under the supervision of the Ministry of Energy indicates a reorganization of Algeria’s water supply strategy due to the shortage in ‘water provision,’ through a shift towards new non-traditional water resources alongside the treatment of used water.”

He added that Algeria will ensure 60% of the water consumption needs of citizens in the northern regions by 2030 through seawater desalination projects.⁴

Regarding the possibility of Algeria exporting desalinated water, Massahl emphasized that “this issue is not currently considered. The goal today is to prepare a general strategy for water and its traditional and non-traditional resources, their quantities, and demand levels.”

This new agency is considered “a means to implement the national policy in the field of water desalination,” aiming to support national capacities in water production to provide water security, as stated in Executive Decree No. 23-103, signed on March 7 by Prime Minister Ayman Benabderrahmane. In this context, the agency is tasked with constructing, operating, and maintaining desalination plants and related facilities and equipment, performing all actions and operations contributing to this purpose, and conducting all studies and analyses related to water desalination. Additionally, it will place the water produced at desalination plants at the disposal of entities responsible for water distribution.⁵

¹ Asmaa Barahemi, “Algeria Accelerates the Preparation of Its General Water Strategy,” El-Masdar Economic Source, available at: Link: <https://www.elmasdaronline.dz/26/03/2023>, p02.

² Ibid, p03.

³ Algerian News Agency, National Water Strategy 2021-2030, available at Link: <https://www.aps.dz/ar/economie/113614-2021-2030-60>, October 7, 2021, p04.

⁴ Maghrebi Voices, Will Seawater Desalination Solve the Water Resources Shortage Crisis in Algeria? Pulse Website, available at Link: <http://nabd.com>, August 8, 2023, p05.

⁵ Algerian News Agency, op.cit, p19.

II. The Relationship Between Water Governance and Agricultural Production in Algeria

Water resources in Algeria include natural or traditional water resources, such as rainfall, groundwater, and surface water, and non-natural or non-traditional water resources, such as seawater desalination and treated wastewater (recycled sewage water), among other non-traditional sources.

First: The Reality of Water Resources in Algeria

1- Scarce Water Resources:

A- Rainwater:

Algeria has surface and groundwater resources, with rainwater being their main source due to its large geographical area and diverse terrain. Despite this, 85% of these resources are found in the desert region, where rainfall is almost non-existent. Conversely, the northern region has a Mediterranean climate. Rainfall occurs during the autumn and winter seasons, often leading to torrential downpours that cause harmful floods, soil erosion, dam degradation, and minimal soil absorption, with most water flowing into the sea.⁶

B- Groundwater:

According to technical estimates from the National Agency for Water Resources and the Directorate of Hydraulic Structures, Algeria has approximately 1.9 billion cubic meters of groundwater resources under the National Water Plan. Despite surface runoff being irregular in the desert, significant groundwater resources exist in the south, formed over thousands of years, reaching depths of up to 2000 to 300 meters. Currently, Algeria only utilizes about 7.1 billion cubic meters annually, leaving a reserve of 3.3 billion cubic meters for the water needs of the southern population for irrigation, drinking, and other purposes.⁷

C- Surface Water:

Surface water includes all water resources on the earth's surface, including reservoirs and water bodies, with storage capacity not exceeding one million cubic meters, as well as flowing watercourses.

2- Non-Conventional Water Resources:

Due to population growth, limited rainfall due to drought, or high costs of exploiting natural water sources, there is an urgent need to desalinate seawater, treat wastewater, and explore other non-conventional sources.⁸

1- Desalination of Seawater: Collaboration with foreign experts is needed for seawater desalination, involving several international agreements and partnerships.

⁶ Maghribi Khaira, "Economics of Water Resources in Algeria, Analytical Study of Water Resources (Potentials and Challenges)," Bouadex Notebooks Journal, Issue 06, University of Chlef, September 2016, p105.

⁷ Maghribi Khaira, *ibid*, p107.

⁸ *Idem*, p109.

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2- Wastewater Treatment: Despite its low usage in the Arab world, wastewater recycling is being considered.

Facing the Threat of Drought and Climate Change:

Algeria is currently striving to achieve water security and confront risks related to climate change. It possesses surface water reserves estimated at 4 billion cubic meters, in addition to groundwater reserves estimated by some sources at 10,000 cubic meters. Furthermore, Algeria produces desalinated seawater, which represents more than 20% of the national consumption of potable water, with efforts to increase this percentage in the coming years.⁹

Desalination of seawater:

One of the strategies Algeria has implemented to achieve water security is seawater desalination. Algeria is considered a pioneer in this field in the Arab world, following Saudi Arabia and the UAE. In 2020, the government set the goal of the National Water Strategy 2021-2030 to meet up to 60% of the population's drinking water needs through seawater desalination. The government is employing new measures to achieve this goal, especially with several new plants coming into operation.

Self-sufficiency:

Furthermore, the water issue is directly linked to the agricultural sector. Agricultural production in Algeria is significantly affected by rainfall, especially for strategic crops like grains. Algeria aims for self-sufficiency in this sector through a comprehensive national strategy by improving per hectare productivity, increasing irrigated areas, while preserving water resources and avoiding traditional irrigation methods, relying instead on modern technology.

According to a report from the Water Resources Institute, Algeria ranks 27th globally in terms of being most affected by water scarcity. Experts warn that climate change exacerbates the situation, and according to World Bank data, by 2050, the Arab region will suffer the largest economic losses due to water scarcity, estimated between 6 and 14 percent of GDP. Algeria is working proactively to address this challenge now, ensuring water availability, as scarcity will worsen due to increased demand for domestic, industrial, and agricultural needs. Algeria occupies a strategically important position and possesses a vast traditional water wealth, aiming to invest in obtaining other non-traditional sources such as seawater desalination and waste water treatment.¹⁰

III. Achieving Water Security and Self-Sufficiency in Algeria as a National Strategy

First: The Relationship between Water Security and Food Security

Water security, achieved when an individual's annual share of freshwater from renewable sources reaches 1,000 cubic meters, is among the most important indicators of food security. Drought, water scarcity, and pollution are major threats to food security globally, particularly

⁹ Ali Maghaldi, "Algerian Water Security... A Red Line," Echorouk Online Daily, available at: Link: <http://www.ech-chaab.com/ar/%D8%.html>, Article Date: March 27, 2023, p04.

¹⁰ Nahal Douib, "Groundwater Reserves Worry Algeria," Al-NaharAl-Arabi Website, available at: Link: <https://www.annaharar.com/arabic/politics/arabi-world/almaghreb-alarabi/>, Article Date: February 25, 2023.

in the Arab world, where UN estimates indicate over 8.2 million people across 48 countries suffer from water scarcity and shortages.¹¹

The role of water as a determinant of food security is more critical than ever due to declining available water quantities resulting from increased agricultural water consumption worldwide. Given that regular and adequate irrigation is essential for high agricultural productivity, irrigation water is considered one of the scarcest natural agricultural resources. Hence, providing suitable irrigation water is a crucial determinant of food security worldwide. Since most agricultural lands rely on rainfall, food production fluctuates annually based on rainfall variability, with drought playing a significant role in determining the supply of food commodities in many parts of the world.¹²

The issue of water and water security as a determinant of food security is particularly important in Algeria due to its geographical location within arid and semi-arid regions characterized by scarcity of water resources. Algeria is situated in the dry and semi-dry climatic region of the world, hence its share of rainfall is very low. The total volume of available water resources in Algeria is estimated at 17.2 billion cubic meters per year. To exploit this available water wealth, Algerian authorities have implemented several investment projects to harness and mobilize water resources to meet the increasing demand for this vital resource.¹³

Currently, there are 66 completed dams with a total storage capacity estimated at 7.1 billion cubic meters. It is expected that by 2014, the number will increase to 97 dams with a total capacity of around 9.1 billion cubic meters. Additionally, there are 400 utilized water barriers with a capacity of about 47 million cubic meters per year, along with 160 water barriers under construction. Thirteen seawater desalination plants have been established, with a production capacity of 2.26 million cubic meters per day. The government plans to increase the number of desalination plants to 43 by 2019. There are also 36 operating waste water treatment plants, with 34 under construction and 8 undergoing rehabilitation. The filtering capacities for the operating plants reached over 700 million cubic meters annually by the end of 2010, and it is expected to reach 1 billion cubic meters annually by 2014.

All these achievements and water infrastructure facilities have enabled the improvement of public services provided in the fields of drinking water, sanitation, and agricultural irrigation as follows:¹⁴

- Concerning agricultural irrigation, the irrigated large areas currently amount to 227,000 hectares and the irrigated small and medium areas amount to 920,000 hectares, compared to 100,000 hectares and 380,000 hectares respectively in 2003. Despite these positive water indicators and the substantial financial resources allocated, the water resources sector within the framework of the development program 2005-2009 benefited from a financial envelope of 1,079.5 billion Algerian dinars. However, the achieved results remained below the desired or required level, thus Algeria still faces a set of water challenges and challenges.

¹¹ Food and Agriculture Organization of the United Nations, "Water Scarcity - One of the Biggest Challenges of Our Time," Al-NaharAl-Arabi Website, available at Link: <https://www.fao.org/sustainability/news/news/ar/c/1205731>, Article Date: August 21, 2019, p03.

¹² Food and Agriculture Organization of the United Nations, op.cit, p05.

¹³ Farah Rashid, "The Reality of Water Security Requirements in Algeria," Journal of New Economics, Issue 05, 2012, pp09-13.

¹⁴ Boughda Nour El-Houda, "The Role of Efficiency in the Use of Water Resources in Achieving Agricultural Development and Food Security - A Case Study of Algeria -," Unpublished Master's Thesis, University of Ferhat Abbas 1, 2015, pp50-53.

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The importance of rationalizing agricultural water uses in achieving food security:

As mentioned earlier, agriculture consumes about 70 percent of the fresh water used in the world, but this percentage can reach over 90 percent in the arid regions of some Arab countries, making it the primary consumer of such water when compared to other uses such as industry. Agricultural use is consumptive, as a significant amount of this water is lost through seepage and evaporation and cannot be reused as in wastewater. However, the importance of this use lies in its connection to food security, as the need for agricultural production increases to meet the food requirements of a growing world population.

Global meetings and publications indicate that there is a universal recognition that the current pattern of water use for irrigation will not continue in the same wasteful manner and with the low efficiency that depletes renewable and non-renewable resources vulnerable to depletion due to pollution and climate change. Although there is also recognition of the increasing need for food and clothing for the world's population as their economic and social standards of living grow, there are many studies, modern technologies, advanced management methods, and water policies that promise the possibility of increasing production and doubling it with the same amount of water currently used if appropriate rationalization steps are followed. However, the road is still long towards reducing water consumption and increasing its yield, especially in countries facing water scarcity.

Efficiency strategy of agricultural irrigation in Algeria to improve food security in the period 2012-2014:

As mentioned earlier, Algeria possesses groundwater resources estimated at about 1.8 billion cubic meters in the north and 60 billion cubic meters in the south, of which only 5 billion cubic meters are used. As for surface water reservoirs, they are confined to a total of 50 dams in operation, characterized by an environmental situation that requires more qualification. However, growth in transit areas has been more modest, accelerating since 2000, rising from 687,620 hectares, or 7.4 percent of the cultivated area in 2004, to 803,880 hectares, or 5.9 percent of the cultivated area in 2006. The efficiency of water use in irrigation in Algeria was estimated at 36 percent during the period from 1995 to 2005.¹⁵

In the context of efforts made by Algeria to develop water resources, within the framework of the agricultural water development strategy to ensure the coherence of measures aimed at providing water around the primary goal of improving food security and preserving natural resources during the period 2012-2014, this program came for several considerations, most notably because Algeria is a desert and semi-desert country due to the scarcity of uneven rainfall distribution, dominance of rainfed agriculture, demographic growth rate leading to increased food needs, limited natural resources. The objectives of the program include:

- Establishing foundations for building an integrated economic strategy to achieve food security.
- Role of scientific research in achieving food security.

¹⁵ Abdelhakim Hedqa, "Algeria Facing Drought," Correspondents of Al Jazeera Net (Economy / Algeria), available at: Link: <https://www.aljazeera.net/ebusiness/2023/5/8, p04>.

- Developing appropriate policies for training and research in the agricultural field and encouraging them by providing water resources.
- Using modern technology to enhance agricultural production.
- Adopting a sustainable agricultural development strategy.
- Increasing agricultural production to meet consumption demands.
- Improving the performance and efficiency of the agricultural sector and increasing agricultural productivity through optimal utilization of productive resources, and increasing the input of various agricultural technological innovations and inventions to enhance Algerian agricultural competitiveness.
- Supporting agricultural investment.

Achieving food security requires a continuous increase in water resources and achieving efficient and optimal use of them, rationalizing water use in the agricultural sector, through developing investments in building dams and reservoirs, digging wells, developing irrigation methods and using the latest technologies, expanding the treatment of sewage, agricultural, and industrial water, in addition to increasing the productivity capacity of desalinated water.

The recent ministerial amendment in Algeria included the establishment of the Ministry of Irrigation, and experts believe that the establishment of this ministry aligns with the state's strategy to address the phenomenon of drought, and prevents any potential water shortages that Algeria may face due to climate change. This change aligns with the president's vision to achieve self-sufficiency and is also linked to a clear vision to avoid any possible shortage in vital resources, thus achieving water and food security in anticipation of any future threats.

Therefore, achieving real development in the agricultural sector requires:

- Water abundance, as part of a national policy on water desalination, aiming to strengthen national capabilities in water production and provide water security.
- Optimal utilization of physical, financial, and human resources to alleviate food shortages, hence achieving food security in Algeria is contingent upon improving the performance of the agricultural sector, increasing agricultural productivity, and achieving sustainable agricultural development.

Challenges facing the national strategy for achieving water security and food self-sufficiency include excessive reliance on hydrocarbon revenues, neglecting other sectors, limited cultivated land, scarcity of water resources, inefficiency of irrigation, limited irrigated land, desertification, and natural drying.

Conclusion:

In conclusion, despite Algeria's material and human resources in the agricultural sector, this sector suffers from a significant deficit in providing healthy food for its citizens and contributing to achieving food security. Hence, good governance of water resources and their judicious exploitation are essential. Developing the agricultural sector requires setting agricultural policies and a national water strategy and using it in the agricultural sector, hence achieving self-sufficiency and overcoming all challenges and obstacles.