Finance and Business Economics Review | **Volume 6 /Number 1/April 2022/p 370-381**

Analyzing Water Resources in the Arab World: The Next Economic Danger

Nabila BADIS[*1], Karim ZERMANE [2]

[1]Abbes LAGHROUR University, Khenchela, Algeria, badis.nabila@univ-khenchela.dz
[2]Abbes LAGHROUR University, Khenchela, Algeria, zermane.karim@univ-khenchela.dz

***Received**: 05/02/2022* ***Accepted**: 30/03/2022* ***Published**: 15/04/2022*

Abstract:

This study aims to clarify the limited water resources in the Arab world, and the characteristics that make them require great security. Studies conducted by specialized Arab and regional organizations have unanimously agreed that the Arab region will face a large water deficit in the future medium term. Therefore, we recommend that the current available water resources should be counted in terms of their sources, the volume of supply and demand for them, to determine the water gap, the search for the impact of government spending on water resources and the feasibility of water investments in the face of the increasing demand.

Keywords: water resources, Arab world, economic danger.

(JEL) Classification : Q20 ،Q25

1. INTRODUCTION:

Water is one of the most important factors that must be sufficiently available to provide the necessary and sufficient food, especially in dry and semi-arid regions, as is the case in the Arab countries that suffer from the scarcity of this sensitive natural resource. These countries depend on supplying the agricultural sector with the water it needs on surface water. Basically, while countries with less precipitation use their groundwater reserves.

Water sources differ from Arab countries. Some countries, such as Egypt and Iraq, depend mainly on surface water from large international rivers. Other countries, such as Yemen, Djibouti and the Gulf Cooperation Council states, depend almost entirely on groundwater and seawater desalination, while others use a mixture of surface and groundwater.

Accordingly, the research problem can be crystallized into the following fundamental question: **What is the reality of water resources in Arab countries and what are their prospects for sustainable development?**

And if both industry and agriculture require water resources as one of the basic productive inputs and in light of the population increase and the urgent need to provide food, then water scarcity has become an obsession for many decision-makers, as it constitutes one of the obstacles to economic development and threats to social stability.

The Arab countries and North African countries are among the countries that have become suffering from the problems of this vital resource. Before the seventies, problems related to water were

[*] Corresponding author

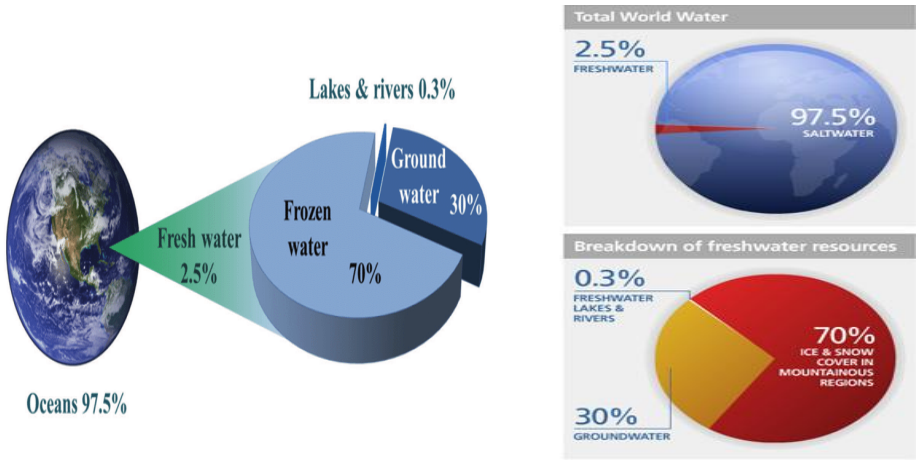
not raised, but with the continuous population increase and the accompanying economic and social development, the talk has recently become about water scarcity, its causes and effects.

2. RELATED WORK:

Frozen water represent 70% of the total fresh water in the form of ice cover in the southern regions, the Antarctic regions and the Arctic, the remainder is in the form of moisture or deep groundwater, of which 1% is used by humans, corresponding to 200,000 km3, 30% of fresh water is stored In the underground world, with a depth of 2000 m, freshwater lakes account for 0.3%, equivalent to 105,000 km3.

Water constitutes 70% of the Earth's surface, 97.5% of which corresponds to 1.4 billion km3 of which are saline, and fresh water represents only 2.5%, corresponding to 35 million km3, (UNEP) which is shown in Figure1:

Fig. (01) : Water in the world



Source: (wordpress)

The world's water is distributed as follows:

Table (01): Distribution of the world's water

The site	Size is 1012 m3	% of the total
Freshwater lakes	125	0.009
Salt lakes and inland lakes	104	0.008
Rivers (average running volume)	125	0.0001
Soil moisture	67	0.005
Ground water (above 4000 m depth)	8350	0.61
Ice	29200	2.14
Water vapor	13	0.001
Oceans	1320000	97.2
Total	**1360000**	**100**

Source: (Knowledge, 2006, p. 398)

It is clear from the table that oceans are the first in terms of the available share of the world's water with a ratio of 97.2, and the lowest share of this is due to rivers (average current volume). (Knowledge, 2006, p. 398)

The geographical nature that characterizes the Arab world has made it one of the poorest regions in the world in terms of water, as it is located in dry and semi-arid regions. According to a report by the League of Arab States, the available amount of water in this region is estimated at 350 billion m3, as the proportions of the Arab world's population vary in Take advantage of the amount of water available.

The problem of water shortage is one of the most important problems facing development, especially in the Arab world, and the problem in the Arab world is not limited to the total volume, but rather to the disparity in the distribution of this resource at the local and regional levels, as one of them expressed that: "The unbalanced balance between water resources and their areas of exploitation, whether in terms of agricultural or demographic, will raise the investment cost to achieve balance, and it is also noted that the imbalance between water resources and the demand for them has led to depleting some of these resources or leaving part of agricultural lands. Without exploitation, studies and reports indicate that there is wastage and waste in the use of the water resources currently available from all sectors that benefit from them, and the irrigation systems currently in use represent the largest source of waste, as their efficiency is estimated at no more than 50%. The waste from the agricultural sector represents 80 million square meters of landfill annually. (The Economics of the Arab World, 2006, p. 265)

In a special reference to the Middle East, "The Middle East region is the poorest inhabited part of the world at all in terms of water resources. Although it includes 5% of the world's population, 85% of it is desert and receives less than 1% of the world's fresh water.

The region witnesses the worst water policies , Which requires an annual economic cost estimated at 1-3% of the gross domestic product. The marine environments, with their huge vital reserves, are the real hope for solving the global food problem.

This is in addition to the fact that water is essential in the production of all kinds of crops, which is indispensable for them. Man and (or) animal. (beatona, 2013)

2.1. Water resources in the Arab region:

The Arab region, as a whole, all regions in the world contain various sources of water wealth, including natural or what is known as traditional sources and some that are not traditional.

- Traditional water sources: It is defined as natural water that can be used without resorting to technology or desalination, from its sources to: (UNESCO, p. 11) Rain: it is the main source of water on the earth's surface

- Surface water: It is the water that flows in rivers and valleys.
- Groundwater: It is the water stored inside the earth's layers.

- Non-conventional water sources: It is the natural or used water that cannot be reused except after subjecting it to the purification or desalination process and mainly represented in:

- Sewage water: It is the used water that comes out of homes, residential and administrative settlements and the like in cities and villages.
- Agricultural drainage water: It is the water that is discharged into agricultural lands.
- Industrial water: In the water that comes out of the factories and that was used in the manufacturing process.
- Salt water.

2.2. The status of rainfall in the Arab region:

Due to the fact that most of the Arab countries are located in the arid and semi-arid region, which is characterized by the scarcity of rain throughout the year, the Arab region has been divided in terms of rainfall as follows:

- About 9.5 million square kilometers of Arab lands, or 67 percent. Rainfall is less than 100 milliliters per year, and some of them have no rain completely. The volume of precipitation in this area of land is estimated at about 330 billion cubic meters annually.
- About 2 million square kilometers of Arab lands, or 15%, the precipitation rate ranges between 100-300 milliliters per year. The volume of precipitation in this region is estimated at about 438 billion cubic meters annually.
- About 18% from the Arab lands, that is, an area estimated at 2.5 million square kilometers, in which precipitation rates exceed 300 milliliters per year and the volume of precipitation therein is estimated at about 1515 billion cubic meters annually.

Rainfall rates in the Arab countries are characterized by fluctuations, as their quantities and intensity vary from year to year and from season to season during the year, and the same variation is recorded between regions within a single country. The maximum rainfall is estimated at about 2000 milliliters in some areas of Yemen and Sudan. While below is zero in desert areas.

2.3. Surface water:

Rivers and valleys are the main sources of traditional water resources. The total surface water resources in the Arab countries are estimated at 296 billion cubic meters annually. The Arab world extends from the Atlantic Ocean to the Arabian Gulf and from Central Africa to the Mediterranean Sea. This vast area is interspersed with many waterways, some of which originate from within the Arab lands, while most of them originate outside the Arab lands. Among the most famous of these rivers: the Nile, Euphrates, Tigris, Shebeli, Juba, Jordan. (Younssi, 2017, pp. 167-168)

- **The Nile River**: The Nile River is one of the longest rivers in the world, with a length of about 6825 km, with a drainage area of up to 3 square kilometers, the Nile River passes ten countries, Egypt is the downstream country while Sudan is a carrier state, the Nile River is fed by the Blue Nile and its tributaries that come from the plateau It forms between 75 and 80% of the Nile's waters. The White Nile, which originates from the African Great Lakes, supplies the Nile in quantities ranging from 20 to 25%.
- **The Tigris and Euphrates Rivers**: These two rivers share Iraq, Turkey, Syria, Iran and Saudi Arabia. The Euphrates River rises from Turkey, passes through Iraq and Syria, to flow into the Shatt al-Arab, and its length reaches 2880 km. While the Tigris River rises from eastern Anatolia in Turkey to flow into the Shatt al-Arab, after its meeting with the Euphrates River, and its length reaches 1899 km. The country of Iran shares the Tigris River through its tributaries.
- **The Jordan River**: A river that passes through the Levant, its length is about 80 km and the length of its plain is about 360 km and it consists of three tributaries: Banias coming from Syria, the countries coming from northern Palestine, Hasbani coming from Lebanon, and Lake Tiberias, which was formed as a result of the occurrence of the Great Rift Valley. This split formed several seas and other important lakes, through which the tributaries of the Yarmouk River, the Zarqa River, the Kufranja Valley and Goliath flow into it, and the river separates between historical Palestine and Jordan until it empties into the waters of the Dead Sea. And Table N^{o} (02) shows us the most important international rivers that pass through the countries of the Arab region and their origin. (Fund, 2011, p. 50)

Table (02): The surface water resources of international rivers in the Arab region

(The unit is billion square meters)

Country	Internal origin	External origin	Total water resources
Syria	2.8	16	18.8
Iraq	21.8	39	60.8
Jordan	0.1	0.2	0.3
Egypt	0.5	55.5	56
Sudan	6.5	18.5	25
Somalia	3.6	4.5	8.1
Mauritania	0.4	5.4	5.8
Total	**35.7**	**139.1**	**174.8**

Source: (Fund, 2011, p. 50)

2.4. Groundwater:

Large quantities of groundwater are available in the Arab countries, which accumulate in three main basins: Al-Arj in the south of the Atlas Mountains in Algeria and Nubia between Egypt and Sudan and Libya and Disi between Jordan and Saudi Arabia. The volume of groundwater in the Arab countries is estimated at about 7734 One billion cubic meters has been formed over millions of years and is completely unexploited.

Renewable resources are estimated at 42 billion cubic meters annually, of which 35 billion cubic meters can be exploited annually. Most of the groundwater in the Arabian Peninsula and the Maghreb is characterized as medium to high salinity water.

Its use requires the provision of special technologies to utilize it. Ground resources are divided into renewable resources that are fed by rain water annually through the current hydrological cycle, and other non-renewable fossil resources. (Fund, 2011, p. 50) Table N^{o} (03) shows the volume and distribution of groundwater in the Arab region. (The Arab Organization for Agricultural Development, 2005, p. 22)

Table (03): Distribution of groundwater resources in the Arab regions

(the unit is billion m^3)

Territory	Reserve		Annual feeding		Available for exploitation	
	Quantity	%	Quantity	%	Quantity	%
The Arab East	13.3	0.2	8.5	20.2	6.58	18.7
The Arabian Peninsula	361.6	4.7	4.8	11.5	4.71	13.5
The Arab Maghreb	920	11.9	17.4	41.5	15	42.8
Middle Territory	6439	83.2	11.2	26.8	8.75	25
Total	**7733.9**	**100**	**41.9**	**100**	**35.04**	**100**

Source: (The Arab Organization for Agricultural Development, 2005, p. 22)

2.5. Wastewater:

The quantities of wastewater in the Arab region are increasing at a successive rate due to the increase in population, the rise in the standard of living, and the accompanying development in the use of water for health purposes, and this has been helped by the spread of awareness of human health in the world as a result of the global efforts in this field. This situation has led to an increase in pressure on Arab water resources, which are originally few, and it has also created a critical environmental situation as a result of the increase in polluted wastewater. Therefore, this situation has required a solution that helps support water resources with the safe disposal of polluted water. Using this water after treatment has become the best solution to increase Arab water resources.

Reuse of agricultural drainage water: As a result of intensive agricultural irrigation by traditional methods, some negative symptoms appeared, including: (UNESCO, pp. 16-17)

- soil waterlogging;
- The high level of water used in irrigated agricultural areas;
- The groundwater level approaches the surface of the earth;
- Soil salinization, which may lead to damage to crops.

Therefore, these concerned irrigated areas are equipped with a network of canals or ditches to drain the redundant agricultural water and divert it to natural waterways.

Usually agricultural drainage water is:

- salty due to evaporation.
- It is loaded with chemicals from pesticides and fertilizers used to treat crops and increase agricultural production.

Interest in agricultural drainage water is still weak at the present time, but its use in the future is necessary, especially in desert areas and areas with little water resources, with the aim of reducing the water deficit that these areas suffer from and meeting their water needs. The available quantities of this water are about 40%.

Industrial wastewater reuse: Some industries consume large quantities of water, and from these industries we mention: the clothing and leather industry, the chemical industries, the paper industry, the extractive industries ... etc. and due to the use of these industries for many chemical components that are toxic and harmful to the environment And to preserve water resources from pollution and to limit the use of natural water in industry, industrial establishments are required to reuse industrial water several times after treating it, which will allow:

- Economy of wastewater in the industrial field.
- Providing additional water resources to meet the increasing demands (domestic, agricultural, industrial, tourism).

2.6. Saline water desalination:

Salt water can be defined as having a salinity that exceeds the maximum limits for drinking, agricultural and industrial uses in the areas concerned. This water is found in underground water reservoirs, lakes and the sea. The salinity of sea water is about 33 g / l, while the groundwater salinity varies from one region to another according to geological and climatic data, but most of it remains less than 8 g / l.

It is difficult to use saline water directly except in special cases such as some industrial uses, and in most cases this water must be desalinated before its use and due to the high costs of the desalination

process, the use of this water is limited to some areas such as industry because it is the most capable of recovering these costs. Saline water resources are considered one of the most important future resources for the following considerations:

- Large quantities that can meet all the needs of different sectors.
- The development of desalination technology and the expected potential of developing energy sources.

The Arab region is one of the most desalinated regions in the world, with Libya and the Arab Gulf states on top. (Economic and Social Commission for Western Asia, 2002, p. 06)

Table (04) : Percentage of desalinated water to total water consumed

Country	Percentage
The United Arab Emirates	33
Bahrain	24
Saudi Arabia	05
Sultanate Of Oman	04
Qatar	33
Kuwait	55

Source: (Economic and Social Commission for Western Asia, 2002, p. 06)

Table N°(04) shows us the ratio of desalinated water to the total consumed water in some Arab Gulf states .

3. IMPROVING WATER EFFICIENCY IN IRRIGATION:

Irrigation is necessary when plants cannot meet all their water needs through natural precipitation. Therefore, ideal irrigation planning aims to bridge the gap between the optimum water needs of the crop and the amount that it can obtain through natural means. Due to the arid, semi-arid and desert conditions prevailing in the Arab region, irrigation is inevitable. Climatic conditions, soil type and composition, plant type and irrigation techniques applied are among the main factors that affect the efficiency and effectiveness of water irrigation practices by making the right decisions related to:

- Type of crop;
- Establish irrigation schedules;
- method of irrigation;
- Soil fertilization measures;
- Source of water.

3.1. Crop water requirements:

Crops differ in terms of their daily water requirements and the length of their total planting period. As a result, crop type is a major factor affecting irrigation water needs. Crops with high daily requirements and long overall planting season require more water than those with lower daily needs and a relatively shorter planting season. Therefore, the essential step in the direction of reducing irrigation water needs is to select crop varieties that require less water but still provide sufficient added value.

3.2. Irrigation scheduling:

Setting irrigation dates helps to exclude or reduce situations in which very little or very large quantities of water are used to irrigate crops. The dates are set by all farmers in one way or another. However, determining the appropriate dates for irrigation requires careful control of the time and the

amount of water that the crops are irrigated based on the water content at the level of the plant roots. Direct measurement of the moisture content in the soil is one of the most useful methods of determining irrigation dates. The extent of farmers' ability to use advanced irrigation depends on the availability of water and manpower.

Economic factors, especially the large impact of water availability on production, play a role in determining the dates for advanced irrigation. Crops need different amounts of water at different stages of their growth cycle. The local climatic and soil conditions also affect the provision of water for crops. It should be noted that providing excess water can also have adverse effects because crops cannot use excess water and may be stressed by low oxygen levels in saturated soils. This practice not only wastes water but also increases energy and pumping costs. As a result, it is necessary to plan the irrigation appropriately and to make the amount of supplied water compatible with the water needs of the crop in order to reach the production to an optimum degree and to achieve efficiency in water use and by setting appropriate dates for irrigation. Soil reserves are managed so that an optimal amount is available. Water when plants need it. Setting good dates for irrigation requires knowledge of the following:

- The amount of water a crop requires during different growth cycles;
- Moisture content of soil and the ability of soil to consume water;
- Climatic conditions.

And during the planting phase in the early season, the need for water is usually about 50 ° less than that required in the mid-season stage, where the crop has fully grown and has reached its peak need for water. On the other hand, high demand in the late season is similar to peak demand for freshly harvested crops. It may be less than 75 for dry harvested plants. It is important to consult the relevant authorities to obtain the necessary information regarding the crops and the quantities of water needed for each.

3.3. Soil capacity:

Its ability to hold water between two irrigation or rain events, which is an important factor. Determinants of soil capacity include soil depth, the ratios of different soil particles that make up the soil (soil composition), soil porosity and water tension in the soil. These factors affect the amount of water available to plants and because soil properties change at different depths.

3.4. Prevailing climatic conditions:

Such as local temperature, solar radiation intensity, retained humidity, and wind speed, all of these factors affect the moisture retained in the soil and the speed at which plants lose water through transpiration. The highest crop water requirements are found in hot, sunny, dry and windy places. Therefore, the climatic conditions must be taken into account in order to determine the appropriate dates and quantities of water.

3.5. Close monitoring of water quality:

Close monitoring of water used in irrigation is an essential part of scheduling irrigation and helps in achieving optimum performance, saving water while increasing production. Accurate readings can be obtained through various direct measurement methods available for closed tubes and pipes (ultrasound meters, magnetic flow meters) and for exposed channels (small dams, slopes, drainage standards tables). Indirectly measuring irrigation water use may also provide sufficiently accurate approximate estimates for low costs. Common methods used include the following:

- Measurement of the energy consumed by irrigation pumps;

- Final pressure measurements in sprinkler irrigation;
- Height differences in irrigation basins and tanks,
- Measuring the irrigation time and the size of the irrigation distribution system.

4. RESULT AND DISCUSSION:

The increasing demographic growth in the Arab world has led to the emergence of a water gap between what is available from this resource and the actual needs of it as a result of the continuous increase in the population, especially the residents of major cities in various Arab countries, and sustainable development will only be achieved by seeking to reduce this gap. (Mukhaimer & Hegazy)
The water needs of the Arab agricultural sector were estimated at about 338 billion cubic meters in 2008. In the event that the situation continues as it is, that is, increasing, the number of the population increased by 2.4% annually, and the food gap increased by 10% annually during the period 2000-2008, the Arab region will need To secure approximately 436 billion cubic meters of water in the year 2030

However, the reality of the situation indicates that the available water resources will not be able to meet the food needs regardless of their future development, as the possibility of securing food is estimated at 24% in 2025. On the other hand, the estimates of the Food and Agriculture Organization of the United Nations indicate that rainfall in the Arab region It will decrease by 20% due to accelerated climate change.

The decline in the per capita share of water to less than 1,000 m3 annually, which is known as the water poverty line, shows that the region has been suffering from a clear deficit in its water resources to meet its needs since the end of the last century, as the per capita share is expected to reach less than 500 m3 by the end of the last century The year is 2025. (The Arab Monetary Fund, p. 54)

Table (05): Forecasts of water demand in the Arab countries compared to 2009

(the unit is billion m^3)

Years	Agricultural sector	Domestic & Industrial purposes	Total
2009	338	24	362
2020	369	40	409
2030	378	58	436

Source: (The Arab Center "ACSAD)

Based on these data, the complex water conditions in the Arab countries, which are represented by scarcity of resources from various internal and external sources, underdevelopment of irrigation methods, overexploitation of surface and underground resources, and the expected dangers in light of the environmental and climatic changes that the world is witnessing and their effects on rain rates and river drainage In addition to the dangers facing the shared international waters, it requires formulating a unified Arab strategy and vision, and taking a set of measures to protect Arab water rights, preserve water security and the future of generations.

The most important of these measures include agreeing on specific foundations for the investment of shared water between the Arab countries themselves, drafting Arab agreements that establish agreements with neighboring countries, elaborating detailed studies of common ground basins, rationalizing the use of surface and ground water to achieve a balance between available resources and

water demand, and supporting good relations between Arab countries and countries of the upper streams of shared rivers and underground basins, implementing joint projects with these countries in all fields, encouraging technical cooperation in the field of water research, developing monitoring and control systems and exchanging information, and protecting water resources from pollution, in order to reach an integrated management of shared water resources aiming to achieve Sustainable development for all riparian countries within the framework of final water agreements.

4.1 Rationalizing the consumption of available water resources:

By following several methods such as: raising the efficiency, maintenance and development of water transmission and distribution networks, developing irrigation systems, raising the efficiency of field irrigation, changing the crop composition as well as developing new strains and varieties of crops that consume less water and bear Higher degrees of salinity.

4.2. Development of available resources by taking care of them, such as:

Projects of dams and reservoirs, and reducing water losses through evaporation from the surfaces of tanks and water courses, as well as leakage from water transmission networks.

4.3. Adding new water resources:

The process of rationalizing the use of water in agriculture and transferring water from one region to another, whether within the same country or between two or more countries, contributes to some degree to reducing the problems that we face in the Arab world, mainly represented in the limited water resources, depletion of groundwater and environmental pollution of water.

4.4. Obstacles that limit water consumption rationing:

- The decrease in the prices of irrigation water or the costs of pumping it reduced its importance as an important economic factor of production. This has resulted in wasteful use of water and lack of rationalization of consumption.
- The high costs of local field irrigation systems, especially in small farms, which results in the farmer being unable to improve irrigation methods.
- Lack of basic information on the types of soils that are being exploited and their irrigation-related characteristics that would enable the selection and design of appropriate irrigation systems, and it also includes the absence of information related to the quantities of water to be provided.
- Weak water extension at the level of small farms.
- The absence of deterrent legislation that limits. water waste and encourages water users to rationalize their use.
- The scarcity of water research centers in the Arab countries.
- Cultivation of crops that consume large quantities of water compared to other crops such as the cultivation of wheat in the Kingdom of Saudi Arabia and the cultivation of rice and sugar cane in Egypt, so we find that:
- One ton of wheat, barley and oats needs 700 cubic meters of water annually;
- One cubic ton of sugarcane needs 2,500 cubic meters of water annually;
- One ton of cotton requires 1,300 cubic meters of water.

5. CONCLUSION:

By presenting the various statistics related to financial resources and their various sources, and exposure to the reality of that in the Arab world, and in order to achieve water security for Arab countries,

they can overcome the problems they face as a result of their lack of share of water, which is the geographical location of the most important reasons.

Water is the main pillar on which overall social, economic and urban growth depends, and it is the decisive factor in achieving Arab food security. The studies conducted by specialized Arab and regional organizations have unanimously agreed that the Arab region will face a large water deficit in the future, as its repercussions and indicators have begun to appear.

These measures also include taking effective steps to establish the Arab rights to water in the occupied lands, documenting these rights in the organizations and bodies concerned, especially the United Nations, and giving them priority in any discussions to restore the usurped Arab lands. Consequently, it is necessary to pursue effective water policies that view water as a life and development resource, and depend in managing water demand on an economic and social perspective that takes into account the balance between providing needs and achieving the greatest return on investment of the water resource.

Due to the importance of shared water resources in the Arab water budget, the importance of water from an external source is growing steadily, as the Nile imports, which are estimated at about 55 billion m3 for Egypt and 18.5 m3 for Sudan at Aswan, constitute about 97% of Egypt's water and 77% of Sudan's water.

The Euphrates and Tigris rivers constitute more than 65% of the waters of Syria and Iraq. The neighboring countries on the tops of the shared waterways have expanded their water projects and increased rates of withdrawal from these sewers, as some of these projects entered into operation and investment in the Tigris, Euphrates and Nile rivers. Other mega projects are expected to enter during the next few years on the Nile River, which will negatively affect the quantity and quality of water supplied to the Arab countries. The Senegal River is also increasing in importance as a major source of water in Mauritania.

A study of country experiences shows that water resource development is fundamentally focused on managing supply, that is, mobilization Water by constructing water installations. This approach is preferred for practical reasons: governments more easily provide budgets for building facilities that are easier to track accounting in comparison to “invisible” actions, such as rationing water or monitoring water extraction.

However, management of water supply cannot, on its own, be able to permanently satisfy the needs of a country: on the one hand, because the exploitation of water capacities has reached a level of saturation, as is the case for Egypt, Libya, and to a lesser extent Tunisia. On the other hand, because the available water resources are on the way to disappearing if they are not protected, as is the case with Morocco. The increase in the severity of water crises is not only caused by the rapid rise in demand, but also by the way water is managed. With strategies and actions to manage demand in order to meet needs sustainably

In Algeria, it is evident from the indicators of water resource development that this country must focus its attention mainly on supply management, with the aim of remedying the delay in mobilizing surface water resources in particular. However, the reality of the country shows that surface water is distributed unevenly between regions of the country.

In addition, groundwater resources, if we exclude a small part of the country in the north, actually suffer from overexploitation. On this basis, Algeria must also take measures to manage supply, which is what it has already embarked on by adopting a new strategy for water management that is mainly based

on the application of progressive tariffs, integrated and participatory management according to the collected basins, in addition to raising the population and raising awareness of the water problem.

Many water strategies have been proposed in the Arab region, such as the Mediterranean Water Strategy according to the Barcelona Agreement for Euro-Mediterranean Cooperation, in addition to the International Hydrological Program supervised by UNESCO and numerous other programs promoted by many regional and international institutions such as the Arab Water Council and the Arab Water Academy. All these initiatives support the realization of the Arab water strategy. (League of Arab States, 2010, p. 07)

In order to achieve sustainable development, it is necessary to act with the various recommendations to assist in the current provision of water in a way that guarantees the share of future generations of it, and we believe that working with the recommendations presented is the basis for the development that must be established on it in order to achieve the necessary water security.

6. Bibliography List:

1. Beatona. (2013). Récupéré sur www.beatona.net.mht
2. Economic and Social Commission for Western Asia. (2002). Managing Water Resources Supply.
3. Fund, A. M. (2011). The Unified Arab Report.
4. Knowledge, E. o. (2006). *The Arab Encyclopedia of Knowledge for Sustainable Development* (éd. 1, Vol. 2). Lebanon: Arab Science Publishers.
5. League of Arab States. (2010, 4). *The Arab Strategy for Water Security in the Arab Region to Meet the Challenges and Outstanding Requirements for Sustainable Development (2020-2030).* Report of the Arab Ministerial Council for Water.
6. Mukhaimer, S., & Hegazy, K. (s.d.). *Water crisis in the Arab region Facts and possible alternatives.* Récupéré sur https://www.alukah.net/culture/0/20982/#ixzz6gLis5OoD
7. The Arab Center "ACSAD. (s.d.). The Arab Organization for Agricultural Development.
8. The Arab Monetary Fund. (s.d.). The Consolidated Economic Report.
9. The Arab Organization for Agricultural Development. (2005). Study of the Evolution of Methods for Recovering the Cost of Access to Irrigation Water in Light of Local and International Developments.
10. The Economics of the Arab World. (2006).
11. UNEP. (s.d.). United Nations Environnent Programme .
12. UNESCO. (s.d.). *Water Resources in the Maghreb and their Uses*.
13. wordpress. (s.d.). Récupéré sur https://kpwateruse.wordpress.com/
14. Younssi, S. (2017). The Water Dilemma in the Arab World. *Journal of Economic Sciences*(18).