

Title: Arab Water Security: Between Challenges and the Failures of Its Realization

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Abstract

Through this intervention, we seek to study the reality of the water crisis in the Arab world, as achieving water security in the Arab world is hampered by several natural, human, and even political problems, and this is what threatens the individual's right to water in the Arab world, in addition to studying the required strategies for the Arab world. In managing the water crisis, through several requirements for this, the issue of Arab water security is of great importance to all local and international actors, and therefore this study aims to become familiar with the problem of Arab water security, the obstacles that prevent it from being achieved, and what the countries of the Arab world must adopt. In order to achieve this and preserve this vital wealth, these countries must be more stringent and resolute in the strategies adopted in order to be at the required level and to a high degree of achieving water security for every citizen in all Arab lands without exception.

Water is an indispensable natural resource in various aspects of life, and its uses are multiple, especially with the increase in population and the development in the industrial and agricultural fields. Achieving water security has become of great importance throughout the world, and this is no less important in the Arab world, especially with the reality of the water crisis in the Arab countries.

The per capita share of water in the Arab world is decreasing day by day, and this is what studies prove and the reality increases. We see an imbalance between the demand for water and its provision in all fields, that is, the weakness of meeting water needs in the Arab world, which led to the failure to achieve water security in the Arab world.

Keywords: Water security, The Arab world, Problems, Strategies, Climate, Integrated water management, Cooperation.

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Introduction

This issue is of great importance, as access to water is an inherent human right that has been recognized by international charters and national laws. Otherwise, it is a violation of this right, especially in light of a number of challenges facing the Arab world.

Therefore, this study aims not only to identify the problems and obstacles to achieving water security in the Arab world, but also to find solutions and draw attention to strategies that would provide water needs in the Arab world.

From the above, we refer to the following problem:

What are the obstacles to achieving Arab water security? And how can these obstacles be overcome and overcome?

In order to systematically answer this problem, we have adopted the following plan:

The first requirement: The challenges of achieving water security in the Arab world

The second requirement: Indicators of failure to achieve water security in the Arab world.

The first requirement: The challenges of achieving water security in the Arab world

The Arab world lacks its water security due to several problems and challenges, as these problems are divided into human and natural (Section I), and water problems between upstream and downstream countries that threaten Arab water security (Section II).

Section I: Human and Natural Problems

Through this section, we will clarify the problems that threaten Arab water security, represented first by human threats, and secondly by natural threats.

Human Threats:

A- The rise in the population in the Arab world:

With the population growth in the Arab world increasing² by almost 3% annually, the demand for water has increased, and it has been mainly met

by traditional methods used in water, which leads to an increase in the severity of this problem, and to a decrease in the share of the Arab citizen of the available⁴ fresh water continuously. It is expected that the population in the Arab world may reach in 2025 about 450 million people⁵, and therefore the rapid population growth will lead to pressure on water resources and an imbalance between the available resources and the demand for them⁶.

B- Pollution:

Water pollution in the Arab world and the deterioration of water quality are due to agricultural uses of pesticides⁷ and fertilizers. The irrational use of fertilizers and pesticides leads to many environmental and health risks and threats. In recent years, the consumption of chemical fertilizers in the Arab world has increased significantly. It is known that phosphate and nitrogen fertilizers contribute to the loss of surface water, as crops benefit only 50% of them, and take the rest of them to wastewater and rivers⁸.

Water pollution is also linked to the factor of industrial institutions,⁹ as some Arab countries dump their liquid industrial waste into rivers, as in Iraq, Egypt, Jordan, Syria and Morocco. In Egypt, for example, 50% of the liquid waste resulting from industrial waste is dumped into the Nile River and its channels, and 19% of these waste is

⁴ Diaa Abdel Mohsen Mohamed, op. Cit., P. 167.

⁵ Adnan Abbas Humaidan, Khalaf Matar Al-Jarad, Arab Water Security and the Water Issue in the Arab World (Statistical, Population and Political Economic Study of the Reality of the Development of the Water Issue and its Prospects in the Arab World and its Implications for Arab Water Security), Damascus University Journal of Economic and Legal Sciences, Volume 22, Issue 2, 2006, p. 18.

⁶ Ibid., p. 19.

⁷ Ibrahim Ahmed Saeed, Challenges of Arab Water Security, Damascus University Journal, Volume 31, Issue 1 +2, 2015, p. 523.

⁸ Hani Nabil Subhi Sharab, Arab Water Security: The Nile River as a Model, Master Thesis, Faculty of Economics and Administrative Sciences, Al-Azhar University, Gaza, 1436 AH/2015AD, p. 30.

⁹ Ibrahim Ahmed Saeed, op. Cit., P. 523.

² Diaa Abdel Mohsen Mohamed, A Study in Geographic Information Systems, First Edition, Dar Ghida Publishing and Distribution, 2016, p. 167.

³ Peter Rogers, Peter Lydon, Water in the Arab World: Prospects and Prospects for the Future, translated by Shawky Galal, First Edition, Emirates Center for Strategic Studies and Research, 1997, p. 12.

thrown into underground wells. Thus, water quality remains a serious risk¹⁰.

Natural Threats:

A- Threats of climate change:

The dangers of climate change continue to threaten developing countries, especially poor countries, including, of course, the majority of Arab countries, which face in the first place the problems of water scarcity, drought and the increasing deterioration of environmental systems. During the past ten years¹¹, the Arab region has witnessed a significant change in rainfall patterns and a significant decrease in their rates with a significant rise in temperatures and dry climate, which means that the phenomenon of climate impacts has reached Arab countries and regions and is actually present, and in increasing year after year, although the Arab world does not contribute significantly to the phenomenon of greenhouse gas emissions. However, scientific evidence indicates that the Arab world is not protected from the negative effects of climate variables that are the result of this destructive environmental phenomenon¹².

B- Limited Arab water resources:

The Arab region includes 18 of the world's poorest countries in water resources, including 13 countries whose annual per capita water is less than the limit of "extreme water scarcity" of 500m³ per year, namely Bahrain, Qatar, Kuwait, Saudi Arabia, the UAE, Yemen, Jordan, Palestine, Libya, Oman, Djibouti, Tunisia and Algeria, and 5 countries characterized by water scarcity, where per capita water scarcity ranges from 500 to 1000m³ per year, namely Syria, Lebanon, Egypt and Morocco¹³.

In general, the Arab world suffers from a shortage of its water resources as a result of the occurrence of about 80% of its land in arid and semi-arid climatic areas. Its rainfall fluctuates throughout the year, and varies from year to year. The effectiveness of rainfall is weak, as its loss by evaporation reaches about 80%. The Arab world constitutes about 9% of the world's area, and 5% of its population. However, its water resources represent only about 0.74% of the world's renewable water resources¹⁴.

Section II: Water problems between upstream and downstream countries that threaten Arab water security

The headwaters of the main and major rivers in the Arab world, such as the Tigris, the Euphrates and the Nile, are located outside its borders, and are controlled by countries neighboring the Arab countries, such as Ethiopia and Turkey. Various projects are built on the riverbeds that followed them, which are already subject to international agreements, but have been ignored until pressure is put on the Arab countries. Through this section¹⁵, we will clarify the most important axes of the Arab world that suffer from this problem, which are, first, the axis of Syria, Palestine, Jordan, Lebanon and Israel, secondly, the axis of Egypt and Sudan with Ethiopia, and thirdly, the axis of Syria and Iraq with Turkey.

First: Syria-Palestine-Jordan-Lebanon-Israel

For decades, Israel has been leading a conflict with the Arab countries neighboring the Palestinian borders (the West Bank, Gaza, Syria, Lebanon, Jordan and Egypt). It controls 80% of the water in the West Bank and deprives them of their right to water. It also exploits the water of the Jordan¹⁶ River. It was able to divert it with the sup-

¹⁰ Hani Nabil Subhi, op. Cit., P. 30.

¹¹ Saad Najm Al-Nuaimi, Sound Soil, Food and Human Health, Dar Al-Kutub Al-Ilmiyyah, 2021, p. 116.

¹² Omar Kamel Hassan. Towards an Arab Strategy for Water Security. Dar wa Mu'assasat Raslan for Printing, Publishing, and Distribution, Syria, 2008, p. 11.

¹³ Boudia, Fatima; Ben Zidan, Fatima Zahra; & Ziani, Zahra. (2019). *Arab Water Security: Between Challenges and Strategies for Realization*. Al-Maqrizi Journal for Economic and Financial Studies, Vol. 3, No. 3, p. 111.

¹⁴ Omar Kamel Hassan, Towards an Arab Strategy for Water Security, Raslan House and Foundation for Printing, Publishing and Distribution, Syria, 2008, p. 11.

¹⁵ Boudia Fatima, Bin Zaidan Fatima Al-Zahra, Zayani Zahra, Arab Water Security between Challenges and Investigation Strategies, Al-Meqrizi Journal of Economic and Financial Studies, Volume 3, Issue 3, 2019, p. 111.

¹⁶ Abdullah Al-Daboubi and a group of authors, Man and the Environment, "Socio-Educational Study, Third Edition, Dar

port of the United States of America in order to deliver water to Tel Aviv in general and to the Negev desert in 1986, although the Security Council issued a resolution prohibiting its diversion in 1953¹⁷.

The issue of water is one of the most contentious issues between Syria and Israel. The Golan not only acquires strategic military and security importance, but also has a major role in the conflict over water with Israel.

Israel has also played a prominent role in depriving Lebanon of exploiting the Litani River during its occupation of the south and is currently trying to obstruct its benefit from the Wazzani River¹⁸.

Second: The axis of Egypt and Sudan with Ethiopia

The Nile River runs through eight countries before it reaches the State of Egypt. According to the 1929 agreement with Britain, which was reviewed in 1959, Egypt has the right to 55 thousand billion cubic meters of Nile water annually. However, with the increase in the population, this percentage no longer covers the needs of Egyptians, which rose in 1998 to 68 thousand billion cubic meters. Moreover, the Nile River countries have always been demanding a review of the agreements inherited from colonialism. Four of them, Ethiopia, Uganda, Rwanda and Tanzania, succeeded in May 2010 in signing the Nile River Basin Initiative in the city of Entebbe in Uganda to re-divide the Nile River waters according to what serves their interests in the absence of Egypt and Sudan¹⁹.

Israel creates problems to prevent the supply and flow of water to Egypt and Sudan. It sent experts to the Nile Basin countries to reduce Egypt's share of the Nile River water in order to bargain with

Egypt over its water share. It also agreed with Ethiopia to build 33 dams on the sources of the Nile in Abyssinia, some of which have already been built²⁰, the most famous of which is the Ethiopian Renaissance Dam, with connections to pipelines in order to exploit the Nile River water that passes through Ethiopia. This made the door of conflict open between the upstream and downstream countries to reach the possibility of war because of water. In addition²¹, Israel also provides technical assistance to the Nile Basin countries until pressure is put on Egypt and Sudan²².

Third: The axis of Syria and Iraq with Turkey

Turkey, Syria and Iraq are the riparian countries of the Euphrates River²³, and the differences that have arisen between these countries over the waters of the Tigris and Euphrates rivers were caused by the competitive projects established by these three countries, especially Turkey in the twentieth century and the second half of it, in order to produce electrical energy and store water in large quantities and use it for irrigation..Etc.²⁴, and Turkey has taken a non-consensual and non-conciliatory position by granting itself the right to use whatever water it wants, and thus it does not respect the rights of other riparian countries, and it does not adhere²⁵ to this. The establishment of such water projects has an impact on the water level of the two rivers, and also affects the amount of water that reaches neighboring countries²⁶.

The second requirement: Indicators of the failure of the Arab world to manage the water crisis and strategies to achieve Arab water security

Al-Mu 'mun Publishing and Distribution, Hashemite Kingdom of Jordan, 1433 AH/2012AD, p. 130.

¹⁷ Fahmy El-Ketout, *The Economic Financial Crisis in Jordan Causes and Consequences*, Now Publishers and Distributors, Amman, 2020, p. 18.

¹⁸ Rashid Farah, *Arab Water Security and Threats to its Safety*, Maarif Magazine, Issue 8, 2010, p. 292, p. 293.

¹⁹ Rabih Zaghoui, *Water Scarcity and Security in the Arab World: Egyptian Water Security as a Model*, *Al-Naqed Journal of Political Studies*, Volume 6, Issue 1, 2022, p. 59, p. 60.

²⁰ Mr. Hamed Al-Saidi, *Sustainable Agriculture of Dry and Irrigated Lands*, First Edition, University Publishing House, Cairo, 2010, p. 158.

²¹ Rabih Zaghoui, op. Cit., P. 60.

²² Mr. Hamed Al-Saidi, op. Cit., P. 159.

²³ Adnan Abbas Humaidan, Khalaf Matar Al-Jarad, op. Cit., P. 23.

²⁴ Sharmali Tasadit, *The Water Crisis and Its Impact on International Relations, Nile Basin Countries as a Model*, Master Thesis, Faculty of Law Ben Aknoun, University of Algiers 1, 2013/2014, p. 45.

²⁵ Adnan Abbas Humaidan, Khalaf Matar Al-Jarad, op. Cit., P. 23.

²⁶ Sharmali Tasadit, op. Cit., P. 45.

In this requirement, we will talk about the indicators of the failure of the Arab world to manage the water crisis (Section I), and then about the strategies of the Arab world to achieve Arab water security (Section II).

Section I: Indicators of the failure of the Arab world to manage the water crisis

Indicators of the failure of the Arab world to manage the water crisis appear through several points such as poor planning, groundwater depletion, lack of Arab cooperation, and the spread of armed conflicts in the Arab world, where we will address these points in detail and in the order mentioned.

First: Poor planning, management and waste

The local threat is represented in the Qatari-Arab water policies related to the exploitation of water in terms of, first, ways of managing water resources, and secondly, how to exploit and preserve them from waste, as this vital wealth is exploited in traditional ways, whether in agriculture, industry or domestic use, as well as primitive water storage methods²⁷.

The deterioration in the Arab water stock, especially groundwater, is due to the nature of the policy pursued by the Arab countries to control water resources and their various uses, a policy that revealed the absence of rational water management and planning, and the absence of consumption plans in the future, and this is what threatens water security in the future²⁸.

Other roots of the Arab water crisis are the high rate of waste in the Arab countries, especially in the use of water for agricultural purposes²⁹.

Also from the absence of water education as a scientific and educational input in our educational curricula, which led to weak water awareness and increased waste in our water resources due to the fragility of their existence and the sensitivity of their permanence³⁰.

Second: Depletion of groundwater reserves

Groundwater accounts for 50% of irrigation sources in Algeria, Morocco, Libya, Yemen and Iran, while it is almost the only source of irrigation for the GCC countries. The Arab countries³¹, especially the Arabian Peninsula and the Maghreb, rely heavily on renewable and non-renewable groundwater resources to meet the increasing demand. The depletion and overexploitation of their³² resources seriously affect the environment. The revolution that took place in³³ the field of groundwater with the use of tube wells and individual automatic pump technology has resulted in the boom of private irrigated agriculture. This revolution in the field of groundwater was a driving force for the increase in agricultural production and exports in many countries such as Saudi Arabia, Syria, Morocco and Tunisia. The expansion of the groundwater irrigation system has witnessed support for preferential government policies and interventions, including support of energy, the exemption of imports from taxes and the complete absence of regulations, and as a result of these policies there has been a depletion of groundwater sources and a high level of inequality in access to water³⁴.

²⁷ Sayyar Zubaydah, Arab Water Security: Reality and Prospects, Journal of Economics and Applied Statistics, Volume 10, Issue 1, 2012, p. 61.

²⁸ Hani Nabil Subhi Sharab, op. Cit., P. 32.

²⁹ Omar Kamel Hassan, Towards an Arab Strategy for Water Security, House of Raslan Foundation for Printing, Publishing and Distribution, 2008, Damascus, p. 20.

According to studies, 15% of irrigation water is lost in distribution networks, 25% in irrigation networks, and 15% in fields. Thus, the average loss of water is estimated at more than 100 billion m³, representing about 65% of the water used for irrigation, see Sayyar Zubaydah, op. Cit., P. 61.

³⁰ Ibrahim Ahmed Saeed, op. Cit., P. 530.

³¹ FAO, Near East and North Africa, Regional Overview of Food Insecurity Sustainable Water Management in Agriculture a Prerequisite for Ending Hunger and Adapting to Climate Change 2016, Cairo 39, 2017, p. 19.

³² See website: available at: <https://www.undp.org>, p. 17.

³³ See website: <https://www.undp.org>, aforementioned website, p. 18

³⁴ FAO, Near East and North Africa, Regional Overview of Food Insecurity Sustainable Water Management in Agriculture a Prerequisite for Ending Hunger and Adapting to Climate Change 2016, Cairo 39, 2017, op. Cit., P. 19.

Third: Absence of Arab cooperation in the field of water security

The threats to water resources are realistic, which requires the Arabs to identify water problems and find solutions to them within the framework of Arab water security. Regardless of the solution of Arab water issues, there is negligence³⁵ due to the dispersion of Arabs, as the availability of water quantities is constantly decreasing while the demand for them increases continuously due to the increase in the population. This is³⁶ all in light of the decline in the cooperation of Arab countries with regard to investment in common water basins, in the field of exchange of experiences and the establishment of specialized water studies and research centers, or in the field of studies³⁷ related to agriculture. This justifies the existence of repeated attacks on transboundary water resources, due to the absence of agreements that clearly regulate each country's share of water passing through its land, or the failure of some countries to implement these agreements and not abide by them³⁸.

Fourth: Armed conflicts in the Arab region

The armed conflict in the Arab world has resulted in the destruction of water and sanitation infrastructure, which has hindered the provision of safe water and sanitation. In Syria, for example, half of the infrastructure has been destroyed or rendered inoperative, with regional supply rates ranging between 5% and 30% of their pre-crisis levels³⁹.

With the presence of Israel in the heart of the Arab world, and the exploitation of Arab waters by armed force supported by Western countries and the United States of America⁴⁰, the Israeli

occupation of the lands of the Arab world hinders access to water resources, and also affects the ability of countries to provide and manage the required water and sanitation services properly, ...This is evident in the occupied Palestinian territories, especially Gaza, where access to basic water and sanitation services is severely restricted due to the military siege imposed and its repercussions with repeated military attacks⁴¹, especially with the recent war since 7 October 2023, in which Israel practices systematic genocide against the Palestinian people in Gaza, as well as the policy of forced displacement by preventing all supplies from reaching civilians and from all necessities of life such as water, food and health supplies.

Section Two: Strategies of the Arab World to Achieve Arab Water Security

Especially with the alliance of countries that aspire together, represented by Israel's ambitions in the waters of the Jordan River, the Yarmouk River and the Litani River, Turkey's ambitions in the waters of the Tigris River and the Euphrates River, Ethiopia's ambitions in the Nile River, and Senegal's ambitions in the Senegal River. These countries that aspire in the water quota of the Arabs opened a new front of the conflict over water, with the aim of subjecting the Arab world to political blackmail from Turkey, Ethiopia, Senegal and Iran and under the guidance of the United States of America, Israel, Britain and France⁴².

First: Integrated and comprehensive Arab water cooperation

The Arab region depends heavily on shared waters. This means that working together is a vital means of implementing water security. States can also benefit from global frameworks or regional means for cooperation. At the global level, there are many legal frameworks for the purposes of managing shared water resources, such as the Convention on the Use of International Watercourses for Non-navigational Purposes, projects related to the articles of the law of transboundary

³⁵ Hani Nabil Subhi Sharab, op. Cit., P. 46.

³⁶ Hani Nabil Subhi Sharab, op. Cit., P. 47.

³⁷ Ibrahim Ahmed Saeed, op. Cit., P. 532.

³⁸ Mohammed Al-Khatib, Mohammed Awad Al-Hazaymeh, Islam and the Issues of the Age, First Edition, Awaj Printing, Publishing and Distribution, Jordan 2013, p. 245.

³⁹ ESCWA, United Nations, Towards Water Security in the Arab Region, Document Code, 19/2SDPD/ESCWA/E, p. 40.

⁴⁰ Adwan Arkan Ibrahim, Syrian-Turkish Relations, Determinants and Issues, Al-Arabi Publishing and Distribution, 2019, p. 109.

⁴¹ ESCWA, United Nations, Orientation towards Water Security in the Arab Region, Document Code, 19/2SDPD/ESCWA/E, op. Cit., P. 41.

⁴² Hani Nabil Subhi Sharab, op. Cit., P. 48.

aquifers, and the UN Economic Commission for Europe Convention on the Protection and Use of Transboundary Watercourses and International Lakes⁴³.

Water authorities should coordinate with the participating countries in a single river basin, or wider, and work to increase social and political awareness, and provide greater support than is currently the case, because this would make the task of experts and water officials more integrated and integrated into national economic planning in general⁴⁴.

Second: Developing scientific research, localization and transfer of technology

Compared to other regions of the world, the Arab world allocates limited resources for research and development, as it spends less than 1% of GDP in the majority of the countries of the region. Most countries use imported technology and little effort is made to localize technological solutions. States must facilitate the adoption, deployment and development of appropriate technology in order to achieve water security through an enabling framework based on cooperation and companies of a local, regional and international nature. Technology must be adapted to the local context, taking into account the available economic⁴⁵, institutional

and human potential. Arab countries should establish modern computerized information processing networks with the required training and development programs for human resources and programs in order to develop a water information base, water management programs, and the timely transfer of information⁴⁶.

Third: Confronting and adapting to the phenomenon of climate change and its impact on water resources

Water management strategies must include climate change in the sense of including all risks resulting from climate change in national and sectoral local development policies and plans and in the field of investment, while seeking to transform them into executive decisions⁴⁷.

The Arab Ministerial Declaration on Climate Change in 2007 highlighted the potential effects of climate change and the need to take urgent measures to achieve sustainable development. After this declaration, the Framework Plan of Action to deal with climate change issues (2010-2020) was developed, which was prepared under the auspices of the League of Arab States and in partnership with Arab regional organizations. The framework aims to enhance the capabilities of various Arab countries to take appropriate measures in the areas of adaptation and mitigation and to deal with climate issues when achieving sustainable development goals in the Arab world⁴⁸.

⁴³ ESCWA, United Nations, Orientation towards Water Security in the Arab Region, Document Code, 19/2SDPD/ESCWA/E, op. Cit., P. 79.

⁴⁴ Peter Rogers, Peter Lydon, p. 18.

Between 1998 and 2002, Algeria, Libya and Tunisia participated in an initial project under the supervision of the inter-governmental organization Sahara and Sahel Observatory, based in Tunisia. This led to the development of a common database and a mathematical model for the aquifer system, which allowed the development of scenarios and simulators. In order to preserve these results and to ensure their updating, the countries agreed to establish a consultation mechanism hosted by the Observatory, signed by the ministers in 2006. This mechanism was established in 2008, including the Council of Ministers from the three countries, and a national agency present in each country, in addition to national committees and specialized task forces. See ESCWA, United Nations, Towards Water Security in the Arab Region, Document Code, 19/2SDPD/ESCWA/E, op. cit., p. 79.

⁴⁵ ESCWA, United Nations, Orientation towards Water Security in the Arab Region, Document Code, 19/2SDPD/ESCWA/E, op. Cit., P. 80.

⁴⁶ Peter Rogers, Peter Lydon, p. 20.

⁴⁷ Manual for the Preparation of Water Strategies and Water Action Plans with Inclusion of the Impact of Climate Change, available on the website:

<https://www.unescwa.org/files/event/materials/18/01/2024/17:49>, p. 80.

⁴⁸ The plan addresses climate impacts and the need for climate-related disaster risk reduction. It emphasizes synergies between climate change adaptation and disaster risk reduction frameworks, and therefore the need to integrate disaster risk reduction into all adaptation-related programmes. It also calls for building and strengthening cooperation with the International Strategy for Disaster Risk Reduction at the national, regional and international levels, and the use of mechanisms and capacities for disaster risk reduction in the planning and implementation of adaptation programmes. See ESCWA, United Nations, 7th Water and Development Report, Cli-

Fourth: Integrated Water Management in the Arab World

The Arab Water Strategy issued by the Council of Arab Ministers of Water to achieve water security in the Arab world is based on facing the future challenges and needs of sustainable development 2010-2030. The priority of this strategy was to promote the application of integrated water resources management so that this problem and the main challenges are addressed by socially and economically effective mechanisms that are fair and environmentally sustainable, and adopt the sustainable development goals, specifically Goal 5 and 6 of them⁴⁹.

Fifth: Institutional and Human Capacity Building

Raising the level of performance in water wealth management is the best solution to stop the internal threat to Arab water security. Building capacity at the community level. Targeting parliamentarians⁵⁰, academics, businessmen, civil society and the media on relevant issues will affect the willingness of all of them to work, support water security priorities and help create momentum for national policies, institutions and development towards achieving this security. Areas of focus can include water conservation and demand management, climate change and adaptation, sustainable water use and management, sustainable consumption and production, wastewater reuse and roles, and the duties and rights of stakeholders⁵¹.

In addition to developing the institutions and forces dedicated to regulating water, the institutions of the water sector must receive their right to attention and support at the governmental and popular levels, and medium and long-term planning should be developed for these institutions, based

on intensive coordination between the managers of the sectors, especially agricultural ones⁵².

Conclusion:

Based on our study, we concluded that Arab water security is threatened by a range of human and natural factors in addition to the ambitions of other countries in the share of Arab countries of water, and this leads us to a number of practical and sustainable conclusions and recommendations to achieve Arab water security.

Results:

- The Arab world suffers from real and realistic challenges that prevent the achievement of water security in all fields, especially with the traditional water management adopted by the Arab countries.
- The failure to build an integrated and comprehensive Arab water system, with the lack of proper management and good planning for water management and distribution in the Arab world increases the threat of water poverty.

Recommendations:

1-Improving the management of existing water resources through three processes:

- Minimize water loss, reduce leakage and repair water networks.
- Reuse of water, not relying entirely on traditional sources of water, and work to establish advanced technologies that provide the required water needs, such as wastewater treatment and use in domestic, agricultural or industrial water needs,
- The development of irrigation systems and the use of modern irrigation systems such as sprinkler and drip irrigation to reduce, while relying on scientific research in this field, which provides a comprehensive study on the budgets of water needs, and water management plans available until compatible with demand.

2- Diversifying water sources: such as using groundwater and rationalizing its use, and desalinating seawater for coastal countries, while benefiting from rainwater by collecting it in reservoirs and dams.

mate Change and Disaster Reduction in the Arab Region, Document Code, E/ESCWA/SDPD/2017/3, p. 35, p. 37.

⁴⁹ ESCWA, United Nations Organization, Report on the Implementation of IWRM in the Arab Region, 2019, P 6.

⁵⁰ Hani Nabil Subhi Sharab, op. Cit., P. 32.

⁵¹ ESCWA, United Nations, 7th Water and Development Report, Climate Change and Disaster Reduction in the Arab Region, Document Code, E/ESCWA/SDPD/2017/3, p. 35, p. 92.

⁵² Peter Rogers, Peter Lydon, p. 18.

3. Strengthening Arab cooperation in this field, within the framework of specific foundations within regional international agreements, exchanging experiences and technology between the countries of the Arab world, developing a unified Arab mechanism for the management of common Arab resources, resolving water disputes by negotiation and peaceful means and for the benefit of all, and joint projects between upstream and downstream countries, so that the rights of the latter to their share of water are preserved.

4. Legislative and institutional reform, by adopting modern legislation that keeps pace with the current water challenges, with the training of technical cadres, strengthening the role of water institutions,

and the role of civil society in planning and implementation.

5. Raising the water awareness of the individual and increasing the culture of the citizen about the importance of water within the framework of educational programs and curricula, and the use of environmental incentives and violations.

6. Protecting water resources from pollution, legally by imposing strict legislative rules on pollution sources, and on other industrial and agricultural establishments, reducing the use of pesticides and replacing them with smart fertilizers, and managing waste, such as preventing the dumping of solid waste near seas and rivers, and preventing the dumping of wastewater in rivers and seas.

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