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## Strategic Analysis of Water Resources Management in Iraq

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### Abstract

*Purpose: The research seeks to adopt a strategic analysis of the management of water resources in Iraq according to the emerging circumstances and changes in light of the transformation of water resources from abundance to scarcity. Methodology: The approach used in this study is the analytical approach, which is considered one of the specialized approaches used in detailing scientific studies and research, and then referring to the analysis based on lists of semi-structured personal interviews that resulted from the workshops held with the concerned managers and experts in the Ministry of Water Resources as they are The entity closest to the subject in question by adopting internal and external environmental factors to result in its analysis of the gap in the light of which these factors will be arranged and classified. Findings: The strategic analysis must be based on solid and accurate information that harmonizes to give a clear description of the internal and external environments, as the results revealed that there is a large gap in the political, economic, environmental, and social factors. Research, Practical & Social implications: The research is characterized by the fact that the analysis will be according to the current stage in light of the emerging conditions and challenges facing water resources in Iraq, and it will be a window for researchers to start a strategy based on this analysis so that the goals are achievable. Originality/ value: It will focus on understanding the environmental conditions and factors that surround water resources and that need serious confrontation by all stakeholders due to the connection of water to human life and the various political, economic, social, health, and environmental fields.*

**Keywords:** *strategic management, strategic analysis, water resources, water policy, riparian countries, strategic gap.*

### Introduction

The issue of water has taken a large place in the writings of researchers and decision-makers, especially in arid and semi-arid regions, for many reasons, including what is related to the scarcity of this resource, which is matched by an increase in demand with the increasing number of people and the rise in their standard of living, so that the need for water increases more in addition to its use in the fields of agriculture and industry (Al-Janabi et al., 2022; Ru & Fang, 2023). And household needs, which makes it a necessary element in the life of societies. Water resources, especially those shared by more than one country, are a source of conflict and tension between countries, for example (Senegal and Mauritania. the Diama Dam on the Senegal River, Slovakia and Hungary. a confrontation on the Danube River, Ukraine and Russia (Al-Janabi & Mhaibes, 2019). the Crimean Canal, Turkey, Iraq and Syria. the Tigris and Euphrates rivers; Ethiopia and Egypt (MHAIBES & Mahmood, 2020). the Renaissance Dam

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and the regional crisis; India and Pakistan and the dispute over the Indus River; China, Laos, Vietnam and the dams built on the Mekong River; Canada and the United States and the Columbia River Treaty that will be in Danger, as some provisions of the agreement expire in 2024) and other episodes of tension due to water, which will constitute the largest and most important part in the field of global conflict (Aidi et al., 2023; Krustiyati et al., 2022). The transformation of Iraq from an abundance of water to its scarcity was a natural result of an increase in population numbers and an increase in the need to secure water, food, and energy in the domestic, agricultural, and industrial fields, in addition to climatic factors such as (drought, lack of rain and global warming) that directly affected the amount of water, as well as the competition of the riparian countries to monopolize shares Water in the upstream countries through huge irrigation projects that contradict international norms and traditions by ensuring fair shares of countries in the shared international rivers (Maseer et al., 2022). Iraq is one of the countries that has been facing this problem for decades and is expected to continue for the coming years in the absence of successful strategic management that includes the development of available water resources and good management for that. The research paths will take multiple and diverse dimensions and form a broad ground that cannot be overlooked for any axis related to the above research topic (Al-tae & Flayyih, 2023; Zhang et al., 2023). The water problem lies in the imbalance between the available water resources and the increasing demand for them, and the continuation of this deficit in the water balance leads to impeding development (Talab & Flayyih, 2023; My et al., 2022)

The importance of the research is reflected in an appropriate strategic analysis of water resources management in Iraq and addressing the above problem in light of the accelerating circumstances and changes in an environment characterized by complexity and high dynamism; It can be identified through the following question: What is the role of strategic analysis of the internal and external environment in the appropriate strategic management? The research will seek to achieve several objectives, including identifying water resources and the challenges they face, taking into account the analysis of the internal and external environments by focusing on the factors (political, governmental, technical, economic, social, environmental, and legal). As for the importance of the research, it lies in dealing with the most dangerous and important files, which is water resources, because it is related to health, social, economic, environmental, and even political factors in humans and societies in general, especially Iraq, which has reached the water poverty line and in light of these accelerating environmental changes. Scientific and objective strategy.

Accordingly, the research presents a scientific approach based on a theoretical framework, approximate concepts, and previous studies, from which it proceeds to adopt a solid analysis method and an extensive study of relevant concepts and terms, defining them and distinguishing between them (strategic management, strategic analysis) and then the conclusions that will result from this research, which we hope will contribute to Addressing the problem strategically and being an added link that can help researchers complete the series of studying strategies for the subject under study.

Water resources are among the most dangerous and important files because they are linked to health, social, economic, environmental and even political factors in humans and societies in general, especially Iraq, which has reached the water poverty line. The problem of water resources is global, but in Iraq, it represents a complex crisis, and therefore the strategic analysis (deep and accurate) in understanding it will be the solid ground for launching treatments. The problem of the study lies in the fact that Iraq faces a great challenge in the water file by shifting from managing abundance to managing scarcity to managing drought for many reasons, the

most important of which is the water policy of the riparian countries with Iraq (Turkey, Syria, Iran) by establishing huge irrigation schemes that negatively affected Low water revenues entering Iraq and climatic changes represented by desertification, drought, lack of rain and global warming, as well as misuse and great waste in water management internally, in addition to the adoption of traditional methods of irrigation.

## Literature Review

The study Ashour et al, (2009) showed that the water resources system in Egypt consists of many components and systems that include social, economic and environmental aspects. Treated sewage in agricultural work. The study showed that the per capita share of water per year decreased from an average of 1000 m<sup>3</sup> per year to less than 500 m<sup>3</sup> per year. This figure, according to international standards, indicates the limit of water poverty, which requires rapid action to confront this negative event and find strategies to deal with this command. A study (Ali, 2010; Wiryawan, 2023) showed that there is a water gap that increases continuously with the increase of the population and their waste of it, in addition to the uses of the various agricultural, industrial and service sectors and the lack of use of modern irrigation techniques and means, which caused the loss of large quantities of water, and in return for that a diminishing supply due to water and economic policies. For the upstream countries in the upper reaches of the two rivers, which include huge irrigation projects, to tighten control over most of the rivers' imports, and then an increasing decrease in Iraq's water revenues. To confront this problem, the researcher proposed a national strategy represented in a package of administrative, technical, technological, economic, political and legal policies at the local level and with the riparian countries in the upper basins. The two rivers. The study (Fadhil, 2015) showed the significant decline in water resources for Iraq and its pollution, and the weakness in dealing with regulating Iraq's water shares with the riparian countries (Turkey, Syria, Iran). as well as indicating the weakness of Iraqi laws and legislation concerned with preserving this vital resource, the absence of integrated water management, and the lack of the seriousness of its pricing, which led to great waste, in addition to a decrease in water supply due to climate changes, global warming, drought, and desertification. Therefore, it is necessary to adopt strategic planning that includes a set of administrative, economic, technical, technological and legal policies at each local and external level. A study reported by (Ahmed, 2016) states that bridging the widening gap between Iraq's water needs and meeting its requirements for the various sectors that use water and the alarming decline in freshwater revenues, which is considered one of the biggest challenges facing the country. During the next few years, water imports will decrease dramatically. This is mainly due to the expansion of the operational and construction plans of the neighboring countries bordering the Tigris and Euphrates River basins (Turkey, Syria and Iran). especially in the absence of permanent and binding water-sharing agreements, as well as climate change and other factors, which require a transition from the traditional management of water resources. The strategy of integrated management of water resources to achieve sustainable development to avoid the risk of water shortage in the future. The reason for focusing on the agricultural sector in this study is that it is the largest consumer of water resources in Iraq, and to achieve sustainable development of water resources; priority must be given to this sector through the implementation of systematic and gradual plans for comprehensive procedures and reforms to achieve the optimal use of water resources in the agricultural sector, which is considered a focus one of the axes of sustainable development with its components (social, economic and environmental) and an important factor in facing the repercussions of the water crisis expected in the coming years. As for (Hussein, 2017; Salouhi

& Al-Bakri, 2022). his study focused on the lack of water resource revenues, given that Iraq is an estuary country and the sources of its rivers are outside its borders with the direct impact of the policy of the water source countries, in addition to the population increase and the need for use in the field of agriculture, industry and energy, which cast a shadow on food and national security. The study turned to the fact that water cheapness is one of the factors that led to the imbalance of water security in Iraq, and its result is waste, misuse, and a defect in the application of economic dependencies for water uses. can be applied in Iraq. The study of (Goheri et al., 2017; Alqasa & Afaneh, 2022) how reported that the researchers focused on the possible scenario, which is based on external factors and influences, as the Zayandeh-Rud River basin in Iran will face an increase in temporally heterogeneous temperatures as well as a decrease in precipitation, which will reduce water supplies by mid-century, as the analytical system model was used for strategies to adapt to changing conditions, and the results indicate that infrastructure improvements, strict management of water demand, for example (replacing crops with a high demand for water such as rice, corn, and alfalfa with less consuming crops). and identifying organizational priorities based on the ecosystem, complemented by oversupply, can temporarily relieve water stress in the basin. As for the study (Myrzahmetove et al., 2018; McNabb & DeVito, 2022). some proposals were presented to implement the integrated water resources management strategy for the Republic of Kazakhstan. In a clear reference to achieving a qualitatively new situation for the water sector and for the main components of the state's water policy at the current stage, as well as the mechanisms and stages of its implementation, the study states that optimal solutions to water problems in Kazakhstan can only be achieved by applying the principles of integrated water resources management and ensuring the unity of development and use. and protection within the framework of fair and equitable access to water. Integrated water resources management is a process that promotes the coordinated development and management of water, land and other resources to maximize social and economic well-being on an equitable basis without harming the resilience of vital ecosystems. Plans for integrated water resources management and efficient use of water are considered a starting point for sustainable development; The implementation of the integrated water resources management plan and water use efficiency will ensure the implementation of a long-term water policy for the state to protect the legitimate rights and interests of citizens and economic entities, to ensure the water security of the state. As for the study (Dan Yan, et al, 2018; Du et al., 2022). it focused on the challenges represented by climate change and social and economic development that will affect the availability and use of water in the Pearl River basin in China (which is the third largest river in it). This can lead to conflicts over water resources among water users and cause water shortages in the dry season. To assess this, the researchers, after analysis and exploration, identified four different water allocation strategies. These water allocation strategies gave priority to (upstream water use, Pearl River Delta water use, irrigation water use, and industrial water use) respectively. The impact of the four strategies on water use and related economic output was assessed under different water availability and use scenarios. But all four water allocation strategies are insufficient to solve the water scarcity in this river. The economic losses vary, which calls for continuous improvement of the strategies in question. The results show that future water use is much higher than the water supply through large-scale increases. The expansion and development of irrigation and industrial projects upstream will affect the water revenues of the areas below. Regarding water scarcity in the municipality of Dili, Timor-Leste, a study (Atakeleb, et al., 2020; Hussein et al., 2023) showed that there are many factors in the water system in Dili that are responsible for the problem of water scarcity in the city. Thus, there is a need for strategic plans that can be used as guidelines for improving its water system. This study aimed to formulate a strategic

plan for managing water resources in Dili. The process began by identifying the external and internal factors. A quantitative analytical hierarchy process was used for score weighting at the input stage. The alternative strategies were formulated using the strengths, weaknesses, opportunities and threats (SWOT) matrix, where the quantitative strategic planning matrix was used to choose the priority strategy in the decision-making stage. Based on the results, a total of 13 internal and 13 external factors were identified, while five alternative strategies were formulated. Moreover, the strategy chosen as a priority for implementation was characterized by the ability to develop the infrastructure for water resource management in Dili, as well as improve the performance of the water supply system in meeting the demand for water in urban areas. Then this study comes to (Dajun Shen, 2020) discusses the most stringent water resource management strategy. The strategy aims to establish a modern system for managing water resources by implementing three red lines for managing water resources (The first red line for the development of water resources is the implementation of total control over the volume of use, the second red line for water use efficiency is through controlling water waste, and the third red line is controlling pollutants in water bodies). After developing the strategy, a series of policy documents were issued. To support implementation, there are four annual evaluations conducted.

Moreover, in the study (Coelho et al., 2022). which relied on international agencies, non-governmental organizations, technical experts, and academia, the need to support water resource planning and strategic environmental assessment processes with indicators that can be used to characterize, evaluate, and monitor water resources against management objectives. As well as the use of indicators for measuring the performance of actions implementing the objectives; on the other hand, it provides simple and useful information to stakeholders. The aim is to involve stakeholders in selecting key indicators to support water resources planning and strategic environmental assessment processes by adapting their indicators to the river basin areas in Portugal and using them in successive sessions and workshops of the planning process as the process included four main stages (collecting, examining, analyzing the appropriate indicators and then a stakeholder workshop, leading to the outputs within a set of appropriate indicators). The researchers worked hard to select 35 key factors by adopting the most relevant factors in the research by the stakeholders in a participatory workshop. Where the final analysis resulted in a group of factors in four axes (resources, social economy, governance, and risks). she explained that this set of key factors might not be able to reach all the goals set for all regions of the river basin. Therefore, it was proposed to add specific indicators to the collection.

## Methodology

The approach followed in this research is the analytical approach, which is considered one of the specialized approaches used in detailing scientific studies and research, in which the researchers clarify the ambiguity of phenomena or problems to confront reality, according to the types of scientific research, in a way that contributes to arranging tasks, then clarifying the reasons, and achieving Results The analytical approach meets the descriptive, directly or indirectly. The descriptive is concerned with adopting a specific phenomenon and formulating the relevant axes in the form of research or expert questions. As for the analytical approach, it completes it to reach more accurate results. By relying on fragmentation, division, evaluation and deep interpretation of the problem in question, in other words, the foundations of the analytical approach complement the procedures of the descriptive approach. As the practical framework of the research, it included semi-structured personal interviews in the manner of the model intentional

sample through workshops that were held with a group of managers and experts in the Ministry of Water Resources (their number is 12 technical, political, legal and administrative personalities) as they are the closest to the subject in question, as they included The following main questions (political and negotiating, governmental, technical, social and environmental, financial and economic, legal) and what resulted from the analysis of their results by diagnosing the gap with strengths, weaknesses, opportunities and threats to produce conclusions.

## **Discussing The Results**

### **Challenges facing water resources in Iraq**

#### **1- Population growth**

The more the population increases, the less the per capita water share, and this coincides with the completion of Turkish projects, as well as the increase in the need for food and the lack of self-sufficiency in it, which makes this a fertile ground for tension and conflict between countries, as both Iraq and Syria were grain-exporting countries Previously, it has now become one of the importing countries after Turkey implemented its water projects, and the decline in water supply in light of the population increase, and expectations indicate an increase in the population in Iraq in 2025 to 48 million people, and then a decrease in the Iraqi per capita share of water, not to mention the poor quality Water and the increase in the percentage of salts and solids, and the establishment of many agricultural and industrial activities on the Tigris and Euphrates basins have exposed the waters of the two rivers to various sources of pollution that affected the water quality (Hussein, 2017).

#### **2- Misuse of water resources**

the multiple uses of water (agricultural, industrial, domestic, etc.) are a major problem that water security suffers from in Iraq. regarding the agricultural sector, it is noted that it is the largest consumer of water, as developed countries consume about (70%) of water for agricultural purposes, while in developing countries, including Iraq, it consumes about (85-95%) and between (5-15%) for purposes Industrial and domestic (Nafie, 2018).

#### **3- Poor management of water resources**

the weakness in the maintenance and management of water resources, the absence of irrigation and drainage projects, the absence of developing and maintaining water resources, and removing bushes from water passages to facilitate the flow of river water to agricultural lands, as well as weak plans for the operation of dams, which affected water storage and its decline in these the dams are at low levels (Ali et al., 2023). and the continuation of the water crisis is associated with the decrease in the water levels of the Tigris and Euphrates rivers as a result of political and environmental factors and the indirect construction of water projects of dams and reservoirs will lead to a decrease in large quantities of water stored in lakes and dams as a result of the continuous increase in the number of the population and then the increase in demand In addition, the government did not allocate sufficient funds for water projects to ensure that the basic needs of the citizen are met, and neglected agriculture in general, which led to Iraq importing all its agricultural crops from abroad (Al-Ali, 2018).

#### **4- Climate changes**

The problem of global warming has worsened since the nineties of the last century as a result of air pollution and the imbalance in the proportions of the components of the gaseous atmosphere



in the upper layers, which led to a rise in the global temperature in general. It was the cause of weather changes and then the movement of winds, which led to more drought and global warming (Nikkeh et al., 2022). This problem is increasing if its causes continue, and the world will witness climatic changes that will have negative and significant effects on the tropical and semi-tropical latitudes and the warm temperate regions, and in these regions, Iraq and its regional surroundings, which represent the sources of the Tigris and Euphrates rivers, will suffer from more droughts, scarcity and fluctuations in the rain (Al-Jawahiry & Al-Shammari, 2009).

### **5- Economic growth**

Water is considered one of the basic needs for all economic activities. With the increase in population, economic growth, and urbanization, in addition to the increase in climate fluctuations, the water demand has increased from the economic sectors, which puts pressure on the available water quantities and hurts current and future water (Abass et al., 2023). Therefore, improving water supplies and managing water resources enhances the economic growth of the country, which necessitates the need for efficient water management that makes it an economic wealth, and following policies represented in rationalizing its consumption by setting pricing that enhances the economic value of water (Al-Ani and Hussein, 2018).

### **6- Legislations and laws**

Iraq is in dire need of water legislation that is characterized by mechanisms that control and regulate water and enhance its efficiency in the allocation and distribution processes while supporting economic tools and applying standards for pollution reduction and environmental assessment, as well as preparing institutional measures for planning programs and determining deterrent penalties and fines against violators (Al-Tahravi, 2006). It is worth noting here that Iraq suffers from some obstacles regarding water legislation, the most important of which is the lack of specialized judicial bodies and the limited experience of the judiciary in technical specializations, as well as the overlapping of jurisdictions of the bodies that enjoy the enforcement of laws (Hadi et al., 2023), in addition to the weakness of legal deterrent penalties and the weakness of the financial and human resources of the competent authorities in enforcing legislation, with a record of weak commitment towards these legislations (ESCWA, 2003).

### **7- The political and security environment**

The tense political situation and the multiplicity of power centers cast a shadow over the general situation in Iraq, especially after 2003, and the state of sectarian entrenchment, followed by political intersections, which led to delaying the wheel of many vital files, including the water file, and this delay can be translated into delaying legislation and laws as well. The executive procedures that include the planning, implementation, and follow-up processes related to water resources and these accumulations were the result of the reality experienced by the water resources in Iraq, which included the lack of revenues, the wrong use, and the expansion of neighboring riparian countries with projects that directly affected Iraq's share of water and the deterioration of its water situation and then the decline of the agricultural and industrial sectors and drinking water and household uses.

### **8- The policy of the riparian countries**

What Turkey, Syria, and Iran are doing in terms of policies and operational plans that include irrigation projects and dams on the Tigris and Euphrates rivers, through which they aim to control the amount of water reaching Iraq, and this, in turn, has directly affected the progress of water resource management plans. Inside Iraq for various uses, which is estimated at 60

billion cubic meters, except for the needs related to maintaining the marshes. Future needs are estimated at (76.952) billion cubic meters in exchange for an increase in the percentage of water deficit, noting that no binding agreement has been reached with the riparian countries (Turkey, Syria, Iran) in which Iraq's share of water is determined (Al-Obeidi, 2010).

### **The average annual and expected imports of the Euphrates River**

**Table (1)** shows the average annual and expected imports of the Euphrates River for the period 2020-2035.

<b>NO.</b>	<b>year</b>	<b>Water imports (billion m3/year)</b>
1	2020	13.84
2	2021	12.47
3	2022	12.48
4	2023	11.03
5	2024	10.56
6	2025	10.59
7	2026	10.17
8	2027	10.07
9	2028	10.38
10	2029	9.93
11	2030	9.42
12	2031	8.05
13	2032	8.71
14	2033	8.42
15	2034	8.04
16	2035	7.83

**Source:** Ibrahim, M. S, Salman, Z. A., 2023, Water in Iraq, a Study in the Constitutional, Legislative and Institutional Dimensions, p. 33.

By looking at Table (4). the rate of Euphrates River imports for the year (2020) was (13.84) billion / m3, which is expected in the year (2035). as it recorded a significant decrease, amounting to (7.83) billion / m3. It means that the amount of decline is approximately (6 billion/m3) at a rate of (0.5 billion/m3) each year, matched by the great need for various sectors with the population increase. The expectation of these figures is matched by an expectation and prediction of drawing more than one future scenario emanating from the information package and in harmony with these outputs for Adapting to rapid changes.

### **Average annual and expected imports of the Tigris River:**

**Table (2)** includes the expected annual import rate of the Tigris River and its tributaries for the period 2023-2035.

<b>NO.</b>	<b>year</b>	<b>imports</b>
1	2023	25.80
2	2027	26.11
3	2031	23.68
4	2035	21.7

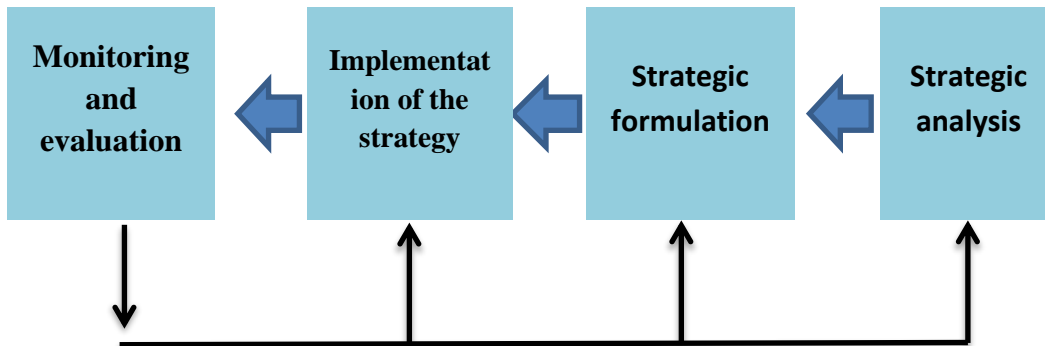
**Source:** Bakkah, H. Ab., 2019, Iraqi water policy to ensure Iraqi water security and address water scarcity, master's thesis, National Defense College, p. 176.



We note that the expected annual rates of imports of the Tigris River every four years decrease significantly except in the year 2027 when it will slightly increase by (0.3) billion / m<sup>3</sup>, but the general index is going downward at a rate of 2 billion / m<sup>3</sup> every four years, which means that uses and various sectors will be affected along the riverbed.

### Strategic management

Defined by (Hitt et al., 2001). a set of decisions, commitments, and procedures that the organization needs to achieve strategic competition or competitive advantage and to achieve profits. The choice of strategic management in the management of water resources lies in its ability to set goals and objectives and determine the appropriate direction in an environment characterized by complexity and high dynamism as well as continuous follow-up and evaluation with an optimal investment of resources as well as support for strategic thinking of decision-makers as it provides opportunities for participation for all levels in industry and decision-making Future decisions that include the best available options (Al-Douri, 2005) Also, strategic management will help managers and workers in a deeper understanding of developments and seize new opportunities through a comprehensive and unified view, as well as the development of work methods and performance standards and a deep and accurate analysis of the internal and external environment (Al-Enizi et al., 2014). Its stages can be explained as follows:



Source: Wheelen, Thomas L.& Hunger, J.David & Hoffman, Alan N.& Bamford, Charles E., 2018, "Strategic Management and Business Policy\_ Globalization, Innovation, and Sustainability," 15th Edition, Pearson, United Kingdom, P.46.

### Strategic analysis

Strategic analysis is an effective tool for reducing the uncertainty gap, simulating rapid developments, adapting to changes in the competitive business environment, and supporting the ability of business organizations to build a distinguished strategic position in the industry (Horn, 1994). It is part of the comprehensive future vision and one of the main pillars of the strategic plans, expressed in evaluating the factors of the two internal environments to determine the strength and capability of the organization and its weaknesses on the one hand and the external environment by identifying opportunities and threats on the other hand (Mondy & Permeaux, 1995) The process of strategic analysis has become an urgent strategic necessity for organizations to find a state of balance between external opportunities and threats on the one hand and the internal capabilities and capabilities that the organization enjoys on the other hand to achieve the strategic goals of the organizations (Al-Douri and Saleh, 2009) The main reason that prompted organizations to carry out strategic analysis is the highly dynamic environment, which makes it difficult for managers to absorb its changes, which will be used as bases for future planning, enabling decision makers to understand and assimilate the

environmental factors that affect organizational performance. To adapt to the changing environment, it maintains the continuity of those strategies and sustains their work, which is essential to ensure the harmony of the organization's strategy with its environment (Sahaf, 2008). The researcher believes that the process of strategic analysis of internal and external environmental factors is summarized in (collecting information, tabulating it, analyzing it, and then classifying it according to the above matrix).

### **Strategic gap**

It is a gap between vision and implementation as indicated in the organization's mission, objectives, and strategies. The strategic gap is a threat to current and future performance and affects the efficiency and effectiveness of management. The strategic gap arises from the comparison between the current performance and the level of ambition of the organization's management. Based on this perception, the existence of the gap requires the institution to reconsider its level of ambition to be in line with the initial expectations that were set. If the level of ambition is greater than the available resources and capabilities, then the decision-makers should reconsider the process of choosing the strategy and reviewing the strategic planning to address the gap without resorting to reconsidering the level of ambition or dispensing with some predetermined goals (Idris, 2013).

### **Analyze the results of the interview list**

After completing the discussions and observations of the questions prepared for the semi-structured personal interviews, the interviews and workshops that were held with the specialists in the Ministry of Water Resources were completed, which resulted in results and answers to the questions raised during the meeting, following the method of the model intentional sample, where the questions were divided into axes, the first of which is the political and negotiating one, and the second is the political and negotiating one. The third is the governmental axis; the third is the technical axis; the fourth is the social and environmental axis; the fifth is related to the economic and financial axis; finally, the legal axis. The response weights are divided into seven ranks from (6 to 0). and the highest weight is the phrase (fully documented and fully applied). then it is graded to reach (not documented and not applied). and then we calculate Iterations with weights with mathematical equations to extract the result, then the average, then the percentage, down to the gap that will determine the features of the strength and weakness of the axis and what we conclude from it to help the researcher reach conclusions.

And by presenting the results of the list of semi-structured interviews in the six axes around the topic of the second topic, The table (3) shows the percentages and gaps to extract the total percentage and the total gap for these axes as follows.

**Table (3)** percentages and gaps to extract the total percentage and the total gap

<b>Axis</b>	<b>percentage</b>	<b>gap</b>
The political and negotiating	48%	52%
government hub	67%	33%
technical hub	60%	40%
Environmental and social hub	45%	55%
The financial and economic hub	37%	63%
legal axis	63%	37%
total rate	53%	47%

**Source:** Prepared by the authors (2022).

We note that the highest gap was recorded by the financial and economic axis at (63%). followed by the social and environmental axis with a gap of (55%). the political and negotiating axis at (52%). and the lowest gap than that was obtained by the technical axis with (40%). followed by the legal axis with (37%) and finally the governmental axis with (33%). As for the total rate of percentages for the six axes, it was (53%) and the average of the total gap (47%). It is a gap that needs to be addressed by choosing a strategy that contributes to dissolving it by giving priority to the analysis of the economic and financial pillar, then the social and environmental pillar, then the political and negotiation pillar, as they are the highest gaps and in order. Here we will answer the following question, which is what is the addition the researcher will add to the strategy for water resources, especially since Iraq has a proposed strategy until 2035?

Through the practical framework, we have clarified the factors of the internal and external environment of the subject under study, as follows:

## **Indoor environment**

### **Strengths**

The most prominent strengths can be summed up in the political decision and the national governmental approach to deal with the water file as a national priority and responsibility, with full awareness of the Iraqi negotiator of the impact of the water policy of the riparian countries on water revenues. Despite these all strengths, The Ministry of Water Resources' possession of departments and departments concerned with water resources management, adequate infrastructure, and technical teams specialized in operations, crisis management, and monitoring of violations will contribute to the success of the implementation of plans and programs for this file, as for the strategic plans and follow-up on the level of their implementation with a participatory approach that will help in their success and expose the blind spots to decision makers through the cross-fertilization of ideas. As for the method of stimulation and encouragement for initiatives and ideas related to water resources management, this will encourage creativity and innovation among workers, which contributes to updating strategic management plans and creating collective awareness of the interest in water resources management. In addition to holding educational and awareness workshops with stakeholders, especially farmers, it will support the process of rationalizing the use of water resources, especially since the agricultural sector is the most consuming of them. To ensure the control of the strategic formulation, the legal axis plays a key role in the adequacy of laws and their consistency with the strategic objectives, not to mention their clarity in extracting appropriate instructions from them with the availability of appropriate items to deal with water in times of crisis.

### **Weaknesses**

Represented by Iraq not having binding negotiating papers for the countries of Upper Mesopotamia. This paragraph is considered one of the weak points because it is the key through which Iraq guarantees its water shares sufficient to meet its needs, in addition to the lack of financial allocations in the federal budget allocated to the Ministry in achieving its strategic plans, as well as the possibility of conducting Water pricing process for different sectors, in addition to Iraq's weak ability to coordinate with superpowers such as (America, Britain, China) to use them as pressure cards on the riparian countries to ensure the success of the negotiation process with the latter and contract with discreet international companies as a strategic partnership for the implementation and maintenance of irrigation projects. It is worth noting the very weak awareness of farmers towards rationalizing the use of water for irrigation

and not wasting it, in addition to the ability of the ministry to invest in water resources and Iraq's dependence on modern global technology while absorbing laws and legislations for everything related to the axes of water resources.

## **External environment**

### **Opportunities**

The factors were the fewest in number, as they included benefiting from international institutions such as (the United Nations) to obtain financial support for the completion and maintenance of projects, the desire of organizations specialized in water affairs to support Iraq in managing its water resources, as well as the wide participation in international conferences interested in preserving resources and sharing them according to customs. International and guarantee of common rights threats: Its paragraphs were more than opportunities, starting with the lack of a real desire of the riparian countries to cooperate with Iraq in its water crisis and the impact of its water policy on the volume of revenues entering Iraq, with an indication of its weak desire regarding water shares, as well as the use of water by the upstream countries as pressure cards on the downstream countries and the site. The geographical location of Iraq being a downstream country and Turkey a source country, in addition to the global water crisis and its scarcity over the years.

The collection, analysis, and identification of the factors of the aforementioned internal and external environments confirmed the availability of strengths more than weaknesses in the internal environment and points of threats more than opportunities for the external environment, which makes the researcher invest strengths in facing threats to weave the formulation of a defense strategy for the period from 2023-2027; According to the results of the analysis environmental.

## **Conclusion**

All of the above studies agreed on the global water crisis for many reasons, the most important of which is the policy of the riparian countries on the common river basin, climate changes, and population increase with an increase in the need for water for purposes (agricultural, industrial and domestic) as well as internal problems related to waste and mismanagement as well as weak laws and instructions, which affected the amount and water quality. The strategic move in the treatments was different in giving priority to the axes, and according to the direction of its researchers, some of them focused on the political and negotiating axis, some of them focused on strict management and studies, and others adopted the path of strategic alternatives by drawing various scenarios to adapt to the accelerating changes in an environment of uncertainty, and others focused on modernity and technology in recreating Considering dealing with water management as well as developing infrastructure. It should be noted that the participatory approach of one of the studies emerged in strategic analysis and evaluation by including stakeholders in the analysis of internal and external factors. A careful and comprehensive strategic analysis of the factors of the internal and external environments is the solid and sober ground for formulating appropriate water strategies. The strategic management of water resources must create a state of balance between supply and demand. The water crisis is global first before it is an Iraqi crisis, as it will constitute the arena of future conflict between countries, especially rivers in which more than one country participates. But the problem in Iraq is complex and has environmental, health, economic, political, and social dimensions. The riparian countries proceed with their water policy by establishing many huge

irrigation projects and expanding them without taking into account the sharing of water and the right to it by international norms, which will affect the future of Iraqi water resources coming from those countries, as well as the endeavor of these countries to use water as a political and economic pressure card on the downstream countries, which will exacerbate the crisis in the future. The actual need for water lies in obtaining it in quantity and quality through the development of the necessary procedures for that, as Iraq suffers from the problem of pollution of the waters of the Tigris and Euphrates rivers due to industrial, agricultural and civil waste, whether in the riparian countries or inside Iraq and along the course of the two rivers with the absence of adequate treatment of these wastes. The continuous increase in the population and the significant decrease in awareness of the Iraqi citizen in their dealings with water and for the various agricultural, industrial, domestic and environmental sectors through mismanagement and excessive use of water resources with the continuous decrease in water revenues will exacerbate the crisis and constitute a real threat shortly.

### Future studies

Presenting the previous global and local studies, as well as the strategic analysis of the reality of water resources in Iraq and the resulting conclusions, will open a window for us toward the content of future studies and how they will deal with the issue of water, which will constitute the arena of future conflict between countries, while giving priority to preserving the quantity and quality of water to meet Different needs through the privatization of the water sector (full or partial privatization) and the activation of investment tools that aim to increase the rate of economic growth, by encouraging the private sector to solve the water problem in reducing pollution, increasing efficiency and raising performance, and the strategic direction describing water as an economic commodity by setting an appropriate price for it will make Its consumption is calculated by consumers, thus ensuring the rationalization of water consumption.

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