Shahid Chamran University of Ahvaz

Irrigation Sciences and Engineering (JISE)
Vol. 48, No. 4, Winter 2026, p. 117-132

Research Paper

Journal homepage: https://jise.scu.ac.ir

Environmental Water Diplomacy between Iran and Turkey: Challenges and Strategic Priorities

Fatemeh Lashkari[1], Mir Mehrdad Mirsanjari[2*] and Fatemeh Mohammadyari[3]

1- M.Sc. of Environmental Sciences and Engineering, Land Assessment and Planning, Department of Environmental Sciences and Engineering, Faculty of Natural Resources and Environment, Malayer University, Malayer, Iran
2- Corresponding Author, Department of Environmental Sciences and Engineering, Faculty of Natural Resources and Environment, Malayer University, Malayer, Iran. (mmmirsanjari@malayeru.ac.ir).*
3. Department of Environmental Engineering, Faculty of Natural Resources and Earth Sciences, Shahrekord University, Shahrekord, Iran.

ARTICLE INFO

Artlcle history:
Received: 23 August 2025
Revised: 24 October 2025
Accepted: 11 November 2025
Available online: 04 January 2026

Keywords:
Environmental Water Diplomacy, Sustainable Development Goals, Hydropolitics, Transboundary Rivers, Environmental strategies.

TO CITE THIS ARTICLE:

Lashkari, F., Mirsanjari, M. M., Mmohammadyari, F. 2026. 'Environmental Water Diplomacy between Iran and Turkey: Challenges and Strategic Priorities', *Irrigation Sciences and Engineering*, 48(4), pp. 117-132. doi: 10.22055/jise.2025.50717.2184.

Abstract

This study investigates the challenges and strategic priorities of environmental water diplomacy in the transboundary river basins shared between Iran and Turkey. Given Iran's significant dependence on inflowing rivers particularly the Aras and Tigris–Euphrates systems and the profound hydrological, ecological, and socio-economic impacts of Turkey's large-scale dam projects (notably GAP and DAP), effective diplomatic engagement over shared water resources has become a critical component of Iran's environmental and national security policy. To address this complex issue, a two-stage analytical framework was employed. First, a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis was conducted to identify key internal and external factors shaping Iran's hydropolitical position vis-à-vis Turkey. This process yielded five core strategic directions. Second, the Analytic Hierarchy Process (AHP) was applied to prioritize these strategies based on structured pairwise comparisons by 15 domain experts from Bu-Ali Sina, Malayer, and Ilam Universities, selected through purposive sampling for their expertise in environmental diplomacy, hydropolitics, and transboundary water governance. The results reveal a clear preference for inward-oriented institutional strengthening: the highest-priority strategy (weight = 0.532) emphasizes the principled implementation of national land-use planning through the integration of skilled, committed professionals into regional and national decision-making bodies. In contrast, externally focused initiatives such as concluding internationally monitored security and economic agreements with Turkey received the lowest priority (weight = 0.029). Overall, the findings indicate that Iran's prevailing approach aligns with a defensive strategic posture, prioritizing domestic resilience, scientific governance, and border-region capacity-building over confrontational or high-stakes bilateral arrangements. The study concludes that sustainable water diplomacy in this context hinges not on external pressure alone, but on robust internal reforms, evidence-based spatial planning, and investment in local knowledge economies. These insights offer actionable guidance for policymakers seeking to navigate transboundary water tensions while advancing the Sustainable Development Goals and regional environmental security.

Introduction

Water scarcity, exacerbated by climate change and growing demand, has intensified geopolitical tensions over transboundary freshwater resources (Kummu et al., 2016; IPCC, 2019; Gleeson et al., 2020). In arid and

 DOI: 10.22055/jise.2025.50717.2184

semi-arid regions such as West Asia, shared river basins particularly the Tigris-Euphrates and Aras have become focal points of hydropolitical contestation. This context underscores the urgent need for environmental water diplomacy: a strategic framework that integrates diplomatic engagement, scientific cooperation, and legal norms to manage shared waters sustainably and peacefully. While these global issues underscore the urgency of international and regional cooperation, they are paradoxically accompanied by a growing disregard for international agreements and an increasingly prominent role for geopolitics (Eilstrup-Sangiovanni and Hofmann, 2020). These shifts collectively highlight the need for new forms of diplomacy capable of navigating the complex and evolving landscape of foreign policy, particularly where climate change intersects with critical resources such as energy, food, and water (Council of the European Union, 2018 and 2020). Water stands as the most vital natural resource for human societies, transcending national boundaries and being relatively straightforward to quantify. Its transboundary nature often politicizes its use and allocation, prompting the development of diverse cooperative arrangements, especially within river basins shared by multiple countries (McCracken and Wolf, 2019).

Diplomatic efforts have proven particularly effective in resolving land-based water disputes, especially within transboundary river basins. These efforts are often referred to interchangeably as “water diplomacy,” “blue diplomacy,” or “hydro-diplomacy,” reflecting their shared emphasis on cooperative and strategic engagement over shared water resources (MacKay and Collins, 2025). Over the past decade, water diplomacy has garnered increasing attention in both academic research and policy discourse. It reflects a growing awareness of the inherently political nature of transboundary water governance as an aspect not fully captured by the terms “transboundary water management” or “water cooperation.” Rather than relying solely on state-centric explanations, water diplomacy seeks to understand the practices employed by diplomats and other actors engaged in transboundary water cooperation across multiple levels. Most definitions emphasize negotiation as a central component of water diplomacy, particularly in the prevention, mitigation, and resolution of disputes over shared water resources (Sehring et al 2022; Sehring et al 2023).

Water diplomacy is the capacity of beneficiary countries to manage shared waters to achieve a stable political situation, meaning that transboundary and international water resources are used sustainably without any tension or conflict between the riparian countries. Due to constant flow of water from one location or country to another, and also the presence of political borders of different countries along the path of water flows, some disputes, negotiations, and collaborations on the management of these shared resources have emerged within the framework of the foreign policy of the world’s nations, becoming known as “water diplomacy”.Water diplomacy is an emerging as a strategic framework for addressing the political dimensions of transboundary water cooperation and for linking water issues to broader regional collaboration, geopolitical dynamics, and foreign policy agendas. The central argument is that diplomacy as a well-established mechanism through which states engage, collaborate, and exert influence across various diplomatic tracks (Marks and Freema, 2020) can offer additional tools for managing water-related tensions and fostering cooperation among countries that share water bodies. As such, water diplomacy has gained traction both within policymaking circles (Pohl et al., 2014; Council of the European Union, 2018) and among academic communities (Grech-Madin et al., 2018). Water is not only for development, but in today’s world facing the challenge of water scarcity, it is considered a key instrument for securing national interests. In this context, each country’s public diplomacy must evolve into an integrated and inseparable assessment of policies related to water, development, and diplomacy. Water diplomacy focuses on various issues, including the vital nature of water as a resource, virtual

water, water conflicts, international water law, and transboundary water management.

Water diplomacy is crucial for realizing the United Nations' 2030 Agenda for Sustainable Development to implement a global security system. The United Nations has identified water challenges as one of the most significant global issues. As projected, by 2030, the increasing effects of climate change and the lack of sufficient freshwater could lead to substantial human migrations, potentially involving up to 700 million people. By 2040, 25 percent of children under the age of 18 worldwide will face severe shortages of fresh water. Increased water pollution, including chemicals and solid waste, causes many infectious diseases, leading to the rapid spread of microbial contamination among people, impacting entire ecosystems and directly influencing international security policies and structures. In this regard, to prevent these occurrences, implementing a new approach in water diplomacy, presented as part of modern diplomacy, can play a significant role (Klimes et al., 2019). Water diplomacy, as an international network of cooperation, assists governmental and non-governmental actors for water and the promotion of peace in the world (Cuppari, et al., 2017). Actors involved in water diplomacy can build trust and facilitate related processes through joint capacity-building initiatives, collaborative knowledge generation, networking activities, facilitation, and mediation. These efforts contribute to more inclusive and resilient frameworks for transboundary water governance (Niemann et al., 2018; Karjalainen, 2020). Water diplomacy has the potential to become an effective platform for international collaboration in addressing many current and future global water challenges. In fact, water diplomacy is a vital instrument for implementing the Sustainable Development Goals, combining proactive and reactive measures, as well as mediation and the implementation of solutions, which is crucial for regional and global security (Krzymowski, 2021).

Studies conducted in this field include the work of Samei et al. (2020), which addressed a model of regional cooperation based on water diplomacy (a case study of Iran, Turkey, and Iraq). This study was conducted using an analytical-descriptive method. Based on the findings, the necessity of the importance of diplomacy should be given even greater attention. Furthermore, Zaki and Najafi (2020) evaluated Iran's hydropolitical strategies regarding the Arvandrud. In this regard, they gathered the opinions of experts on the environmental factors influencing the hydropolitics of the Arvandrud and prioritized these opinions using SWOT matrix analysis and the Analytic Hierarchy Process (AHP) method. Based on the results, cooperation among the three countries of Iran, Iraq, and Turkey regarding the proper use of the Arvandrud will lead to peace and stability in the region and prevent any future conflicts between Iran and Iraq. Keskinen et al. (2021) also conducted a study on the pathways of water diplomacy to understand water diplomacy actions in shared waters. To this end, they examined the literature, comparatively analyzed water diplomacy approaches, and conducted interviews with selected water diplomacy actors to investigate various dimensions of this issue. Based on the results, this approach, by distinguishing between water-focused and diplomacy-focused activities, as well as considering related tensions and actions, has the potential to support water diplomacy processes. Additionally, Kavianirad et al. (2022) conducted research titled "Water Diplomacy Role in Easing Iran-Iraq Hydropolitical Tensions." The aim of this research was to identify the driving forces effective in transforming hydropolitical tensions into water cooperation between Iran and Iraq. The results of this research indicated that water diplomacy plays a strategic role in reducing hydropolitical tensions.

Iran is situated in an arid, semi-arid, and water-scarce geographical location. Its unique topography and position on the outer edges of mountain ranges have led to increased rainfall in these areas. Consequently, a significant portion of Iran's population, human settlements, and fertile agricultural regions are located in the peripheral areas of the country

 DOI: 10.22055/jise.2025.50717.2184

and in proximity to neighboring countries. This has resulted in the dependence of Iranian residents' livelihoods on transboundary water resources. On the other hand, the topography of the country in the western regions has led to a significant volume of water flowing out of Iran and into Iraq, and this is where environmental water diplomacy gains meaning and importance in Iran. Adopting water diplomacy in Iran, considering transboundary resources such as inflow and outflow rivers like the Tigris-Euphrates with Iraq and Turkey; the Kura-Aras with Turkey, Armenia, and the Republic of Azerbaijan; the Atrak with Turkmenistan; the Karakum with Turkmenistan and Afghanistan; the Petergan-Khaf with Afghanistan; the Hamuon-Helmand with Afghanistan and Pakistan; and the Hamoun Mashkil and Rabach-Bahu Kalat with Pakistan, is a necessary and unavoidable matter given our country's geographical situation.

Based on international treaties, no country is allowed to take control of the water resources of international and shared rivers between neighbors. This important point has been explicitly, clearly, and specifically emphasized in the treaties of the United Nations, The Hague, Paris, Geneva, Barcelona, Madrid, and others. The intensification of the water scarcity crisis in the new century underscores the necessity of pursuing "water diplomacy" more prominently in the international arena. Neighboring countries typically share waterways such as rivers, lakes, and seas. Based on multilateral treaties and agreements governing such nations, there should be a mutual understanding and agreement, operating through a clear and specific mechanism, for the joint utilization of these shared waterways for purposes such as agricultural development and the provision of drinking water. From this perspective, the Islamic Republic of Iran shares waterways with Iraq, Turkey, the Republic of Azerbaijan, Armenia, and Afghanistan among its neighbors. However, we are currently witnessing the trampling of the legal rights of countries and existing treaties (Ghaznafarzadeh Kapte, 2018). Turkey has historically emphasized the principle of territorial sovereignty in its water policy, asserting primary rights over rivers originating within its borders (Hekmat Ara, 2022). This stance, reflected in large-scale infrastructure projects such as the Southeastern Anatolia Project (GAP) and the Aras Basin Development Plan (DAP), has raised concerns among downstream states including Iran regarding reduced water flows, ecological degradation, and transboundary equity. While upstream actions by Turkey significantly affect water availability in Iran, domestic water governance challenges including inefficient irrigation practices, over-extraction of groundwater, and fragmented institutional oversight also constrain Iran's capacity to respond effectively to transboundary pressures. A comprehensive hydropolitical strategy must therefore address both external and internal dimensions of water security. Turkey's mega-dam construction projects, aimed at building 22 dams and 19 power plants on the Tigris and Euphrates rivers, have been significantly effective in exacerbating the water scarcity crisis in neighboring countries, ranging from the Republic of Azerbaijan to the Islamic Republic of Iran, Iraq, and Syria, as well as reducing their water rights and damaging the environment of Iran and its neighbors. From this perspective, if Turkey's behavior and dam construction projects (Karakurt, GAP, DAP, and the Ten Mega-Projects) continue, it will cause the closure of river basins to neighboring countries.

Given the inherent complexity of water-related challenges and the interconnected nature of hydrological systems, institutionalized cooperation among riparian states supported by the active participation of all water users is essential for the effective joint management of shared water resources and for the prevention and resolution of conflicts (Honkonen and Lipponen, 2018). Water diplomacy, in the form of a correct, intelligent, and at the same time flexible approach, will be the best solution to claim Iran's water rights from Turkey. This is because if Iran, instead of pursuing water diplomacy and creating joint diplomatic movements with other neighbors, wants to use legal leverage to pressure Turkey,

it will not only fail to achieve its rights but will also create further challenges in its relations with Ankara. Therefore, to prevent a rift in relations with a key neighbor like Turkey, peaceful methods centered on water diplomacy should be employed. This approach would not only reduce the costs of achieving Iran's rights but would also undoubtedly be a shorter path to realizing the country's entitlements. Environmental diplomacy and the clarification of water's role as a key factor in the relations between Turkey and Iran, along with a perspective on Iran's future environmental situation, further highlight the necessity of this study. In this context, the present research was conducted with the aim of evaluating the challenges of modern environmental water diplomacy between Turkey and Iran using a novel approach.

Materials and Methods

The study area

The study area in the present research encompasses the transboundary rivers of Turkey and Iran. Due to its geographical location, Turkey possesses numerous natural and artificial rivers and lakes. Some of these rivers, originating in Turkey, flow into Iran, including the Tigris and Euphrates. The Euphrates River originates in the Taurus Mountains of the Anatolian region and, after joining the Tigris River in the Arvandrud, flows into the Persian Gulf. The next river is the Aras River, which originates from the Erzurum region of Anatolian Turkey. This river flows across the border of Turkey, Nakhchivan, Jolfa, and Armenia, and after crossing the Iranian border, enters the Republic of Azerbaijan, where it joins the Kura River and eventually flows into the Caspian Sea. The Aras River forms part of the international boundary between Iran and the Republic of Azerbaijan, a demarcation established by the 1828 Treaty of Turkmenchay following the Russo-Persian War. The river originates in eastern Turkey, flows through Armenia and the Nakhchivan exclave of Azerbaijan, and then delineates the Iran–Azerbaijan border before joining the Kura River and emptying into the Caspian Sea. Turkey's extensive dam construction on these rivers causes and will cause crises and environmental destruction in these regions, both currently and in the near futurethe Aras River was designated as the border between Iran and Syria. Turkey's extensive dam construction on these rivers causes and will cause crises and environmental destruction in these regions, both currently and in the near future (Hekmat Ara, 2022)

Research Method

The present study is descriptive and analytical in terms of research methodology. After reviewing an extensive literature, examination of scientific documents, and considering the influential factors of the internal environment (strengths and weaknesses) and the external environment (opportunities and threats), along with the opinions and perspectives of relevant experts and specialists, the SWOT (Strengths, Weaknesses, Opportunities, and Threats) matrix analysis method was employed. This method was used to determine our country's strategy and to propose effective hydropolitical strategies for Iran in the transboundary river basins. Following the implementation of the SWOT analysis, the obtained strategies were prioritized using the Analytic Hierarchy Process (AHP).

SWOT analysis serves as a strategic planning and management tool. Despite its simplicity, it offers a robust framework for evaluating internal strengths and weaknesses, as well as external opportunities and threats (Gurl and Merba, 2017). The Analytic Hierarchy Process (AHP) is a quantitative, multi-criteria decision-making approach that relies on pairwise comparisons. Developed by Saaty in the 1970s, AHP has since been extensively researched and applied across various domains. By systematically assessing multiple factors, it facilitates decision-making in complex scenarios. This methodology has found widespread application globally in sectors such as business, education, and public administration (Ha-Vikström & Takala, 2016). The prioritization of alternatives in AHP is derived from a pairwise comparison matrix, as illustrated in Table (1) (Saaty, 1977).

 DOI: 10.22055/jise.2025.50717.2184

Table 1- Saaty's 9-point scale for pairwise comparisons

Score	Saaty scales
1	Equally important
2	Slightly more important
3	Moderately more important
4	Moderately to strongly more important
5	Strongly more important
6	Strong to very strong importance
7	Very strongly more important
8	Very to extremely strong importance
9	Extremely more important

The integration of SWOT and AHP methodologies was selected to combine qualitative strategic diagnosis with quantitative prioritization. SWOT enables systematic identification of contextual factors influencing Iran's hydropolitical position, while AHP provides a structured, transparent mechanism for weighting expert judgments on strategy importance a widely validated approach in environmental policy and resource management (Saaty, 1977; Ha-Vikström & Takala, 2016).

A purposive sample of 15 experts was selected based on their scholarly expertise in transboundary water governance, environmental diplomacy, and Middle Eastern hydropolitics. While the sample size is modest, it aligns with best practices in expert-based AHP studies, where depth of domain knowledge is prioritized over statistical generalizability (Zaki & Najafi, 2020). Participants included faculty from Bu-Ali Sina, Malayer, and Ilam Universities with peer-reviewed publications on Iran–Turkey water relations. Initially, a questionnaire was distributed to the experts to identify the internal and external factors (strengths, weaknesses, opportunities, threats) related to environmental water diplomacy in the study area. Subsequently, another questionnaire was distributed to estimate the impact coefficient and the importance level of each criterion for the internal and external environments separately. The prioritization of criteria was carried out based on pairwise comparisons using Expert Choice software (Zaki & Najafi, 2020). In the first step, the influential factors of the internal environment (5 strengths and 6 weaknesses) and the external environment (11 opportunities and 9 threats) were questioned (Tables 2 to 4). Then, to score and determine the importance coefficients of the components, closed-ended quantitative analysis questionnaires for the matrix of factors were distributed among the experts, and the importance level and impact coefficient of each factor were determined separately. Content validity was established through iterative review by three senior scholars in environmental policy. Construct validity was supported by factor coherence within SWOT categories. Reliability was assessed via Cronbach's alpha = 0.73, which, while modest, is acceptable for exploratory expert judgment studies in social-ecological systems (Nunnally, 1978), particularly given the heterogeneous nature of diplomatic and environmental criteria. Although the 1997 UN Convention on the Non-Navigational Uses of International Watercourses has not been ratified by Turkey or Iran, its core principles equitable and reasonable utilization and the obligation not to cause significant harm reflect customary international law applicable to all states. Iran could strategically invoke these norms in multilateral forums (e.g., UNEP, OIC) to frame Turkey's dam projects as inconsistent with regional environmental obligations, even in the absence of binding adjudication.

In the next stage, to determine the weight of the layers, the AHP method was initially used. After determining the importance of each parameter based on expert opinions, Expert Choice software was employed.

Results and Discussion

In this study, after distributing questionnaires among experts and professors and examining the internal and external factors (strengths, weaknesses, opportunities, threats) related to environmental water diplomacy in the study area by these individuals, and distributing another questionnaire, the impact coefficient and the level of importance of each criterion for the internal and external environments were estimated separately. The prioritization of criteria was carried out based on pairwise comparisons using Expert Choice software. After collecting the relevant forms, the average of each factor (in the "Impact Level" column) was obtained. Subsequently, each factor was normalized separately, and finally, the score (final weight) of each factor was obtained by multiplying the normalized value of the "Impact Level" column by the value in the "Importance Coefficient" column, as detailed in Table (5).

Table 2- Strengths

Strengths	Importance Level	Impact Coefficient
Bilateral Tendencies and Active Diplomacy		
Meetings Focused on Turkey's Dam Construction		
Actions of Influential NGOs and Campaigns Formed in This Area		
Extensive Media Outreach and Use of the Borderless Cyberspace in This Regard and More Executive Actions		
Allocating the Topic of Turkey's Dam Construction Hydropolitics to Relevant Organizations		
Weaknesses		
Turkey's Exploitation of the Weakness of Neighboring Countries (Turkey, Iraq, Syria, Iran)		
Lack of or Insufficient Appropriate Planning and Policies in Environmental and Natural Resources Management		
Weakness in Iran's Diplomatic Apparatus		
Weakness and Negligence of Responsible Organizations and Departments to Prevent the Implementation of Turkey's Dam Construction Projects		
Lack of Sufficient Specialized Knowledge and Literacy of Relevant Experts Regarding the Consequences and Implications of the Implementation of These Projects		
Lack of Proper Education for Iran, Turkey, Iraq, Syria in Dealing with Water Resources		

 DOI: 10.22055/jise.2025.50717.2184

Table 3- Opportunities

Opportunities	Importance Level	Impact Coefficient
Iran can strive to utilize the tool of water diplomacy to manage shared water resources by virtue of its power in the region.		
Iran's efforts towards achieving a comprehensive and sustainable regional agreement accompanied by a specific management mechanism.		
A dispute resolution mechanism along with the establishment of an institution with an independent legal personality and representatives from relevant governments, experts, scientific specialists, and designated workshops that can pave the way for win-win strategies.		
The preparation of a collaborative plan by Iran to foster cooperation among all beneficiary governments (Iran, Turkey, Iraq, Syria) in the context of reversing desertification with an economic approach.		
The formation and development of scientific collaborations among higher education centers of relevant governments in the field of international water law.		
The implementation of joint projects for the management of transboundary water resources with neighboring countries and Iran's role as a key element in achieving the intended goals.		
Utilizing the principle of reasonable and equitable utilization by the states of the shared watercourse basin.		
Utilizing the general obligation for cooperation among the states of the watercourse basin for the adequate protection of the watercourse and the achievement of optimal utilization.		
Utilizing the Convention on Biological Diversity, to which Turkey is also a party.		
Reconsidering all economic and social development programs in the region with a focus on water.		
The legal authority of Iran, Turkey, Iraq, and Syria to file lawsuits in international courts and tribunals against Turkey to determine and obtain water rights.		

Table 4- Threats

Threats	Importance Level	Impact Coefficient
Creation of water crisis (reduction of groundwater aquifers, decrease in the water volume of downstream regional dams, etc.)		
Soil erosion (drying up of wetlands and lakes, drying and reduction of soil moisture, destruction of millions of hectares of agricultural lands, pastures, and forests)		
Creation of wind erosion hotspots and the generation of dust and particulate matter from Turkey and Iraq towards Iran.		
Ecosystem change (imbalance of the ecological equilibrium of dependent regions, including the Caspian Sea, leading to a major environmental catastrophe)		
Reduction of air quality (entry and production of dust and particulate matter, transfer of toxins, and increase in pollution)		
Disruption of social security and widespread migration from border regions to central cities.		
Increase in the cost of guarding uninhabited borders and the emergence of insecurity in border areas		
Increase in unemployment and the creation of economic problems for the residents of border regions		
Spread of microbial and viral diseases due to water shortages resulting from the closure of incoming waters from Turkey.		

Table 5- Evaluation Matrixs (Strengths, Weaknesses, Opportunities and Threats) of Turkey's Hydropolitical with Iran

Evaluation Matrixs			
Strengths	Importance Level	Impact Coefficient	Final Weight
Factor 1	4	0.24	0.96
Factor 2	2	0.21	0.42
Factor 3	2	0.17	0.34
Factor 4	3	0.21	0.63
Factor 5	3	0.17	0.51
Weaknesses			
Factor 1	5	0.18	0.9
Factor 2	4	0.21	0.84
Factor 3	4	0.21	0.84
Factor 4	3	0.1	0.3
Factor 5	2	0.09	0.18
Factor 6	3	0.18	0.54
Opportunities			
Factor 1	3	0.07	0.21
Factor 2	3	0.06	0.18
Factor 3	5	0.13	0.65
Factor 4	3	0.9	0.27
Factor 5	4	0.12	0.48
Factor 6	4	0.16	0.64
Factor 7	3	0.07	0.21
Factor 8	2	0.07	0.14
Factor 9	2	0.07	0.14
Factor 10	3	0.07	0.21
Factor 11	3	0.09	0.21
Threats			
Factor 1	2	0.11	0.22
Factor 2	3	0.1	0.3
Factor 3	4	0.15	0.6
Factor 4	2	0.09	0.18
Factor 5	3	0.09	0.27
Factor 6	4	0.1	0.4
Factor 7	3	0.13	0.39
Factor 8	4	0.13	0.52
Factor 9	2	0.1	0.2

Subsequently, Iran's pairwise strategies regarding the hydropolitics of its border rivers with Turkey were calculated using a brainstorming session. The calculated pairwise strategies from this session are presented in Table (6).

Subsequently, considering the aforementioned pairwise strategies and their combination and integration, fundamental strategies were proposed Table (7).

 DOI: 10.22055/jise.2025.50717.2184

Table 6- Initial (pairwise) Calculated Strategies

SO Strategies (Aggressive Strategy – maxi-maxi)
Enhancing the security provision capabilities of Iran's border rivers with Turkey by Iranian military forces and denying entry to the armed forces of other powers into this region. Concluding security, trade, and economic memoranda of understanding between Iran and Turkey under the supervision of international monitoring bodies, including the United Nations, based on international conventions.
ST Strategies (Contingency Strategy – Maxi-Mini)
Investing and striving to grow and enhance the knowledge and economic capacity of the country's border regions to counter potential environmental and security threats, including the risk of desertification in Azerbaijan due to the drying up of the Aras River caused by Turkey's dam construction.
WO Strategies (Adaptive Strategy – Mini-Maxi)
Joint collaborations with Turkey in the field of environmental problems under the supervision of the United Nations Environment Programme and other relevant organizations.
WT Strategies (Defensive Strategy – Mini-Mini)
Emphasizing to government officials, and especially the Supreme National Security Council, the correct and principled implementation of national land-use planning schemes and the employment of expert and committed Iran-oriented personnel in provincial and national positions.

Table 7- Fundamental Strategies

Code	Strategies
1	Enhancing the security provision capabilities of Iran's border rivers with Turkey by Iranian military forces and denying entry to the armed forces of other powers into this region
2	Joint collaborations with Turkey in the field of environmental problems under the supervision of the United Nations Environment Programme and other relevant organizations
3	Emphasizing to government officials, and especially the Supreme National Security Council, the correct and principled implementation of national land-use planning schemes and the employment of expert and committed Iran-oriented personnel in provincial and national positions
4	Concluding security, trade, and economic memoranda of understanding between Iran and Turkey under the supervision of international monitoring bodies, including the United Nations, based on international conventions
5	Investing and striving to grow and enhance the knowledge and economic capacity of the country's border regions to counter potential environmental and security threats, including the risk of desertification in Azerbaijan due to the drying up of the Aras River caused by Turkey's dam construction

In this stage, the strategies were prioritized Table (8), and the opinions of experts were obtained and entered into Expert Choice software. Figure (1) illustrates the average pairwise judgments of the experts and the inconsistency ratio of the pairwise comparison of these criteria, which shows a value of 0.06. Given that this value is less than 0.1, the acceptable accuracy of this pairwise comparison is confirmed.

In this software, calculations were performed using the vector method, and the final weight of each calculated strategy was determined Table (8).

Subsequently, the results obtained from the Analytic Hierarchy Process calculations and the final weight of the strategies were extracted as shown in Figure (2) (output of Expert Choice software). Ultimately, the final prioritization of hydropolitical strategies was carried out Table (9).

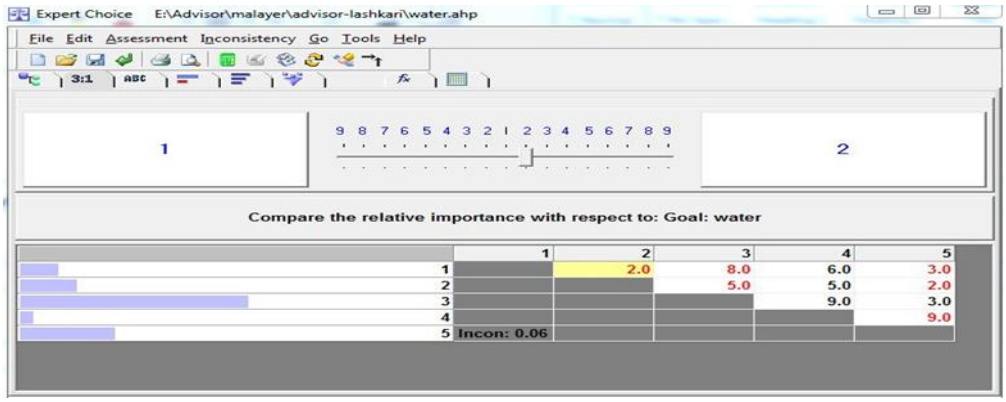


Fig. 1- Pairwise Comparisons in Expert Choice Software and the Resulting Inconsistency Ratio

Table 8- Final Weight of Fundamental Strategies

Code	Strategies	Final Weight
1	Enhancing the security provision capabilities of Iran's border rivers with Turkey by Iranian military forces and denying entry to the armed forces of other powers into this region	0.089
2	Joint collaborations with Turkey in the field of environmental problems under the supervision of the United Nations Environment Programme and other relevant organizations	0.126
3	Emphasizing to government officials, and especially the Supreme National Security Council, the correct and principled implementation of national land-use planning schemes and the employment of expert and committed Iran-oriented personnel in provincial and national positions	0.532
4	Concluding security, trade, and economic memoranda of understanding between Iran and Turkey under the supervision of international monitoring bodies, including the United Nations, based on international conventions	0.029
5	Investing and striving to grow and enhance the knowledge and economic capacity of the country's border regions to counter potential environmental and security threats, including the risk of desertification in Azerbaijan due to the drying up of the Aras River caused by Turkey's dam construction	0.224

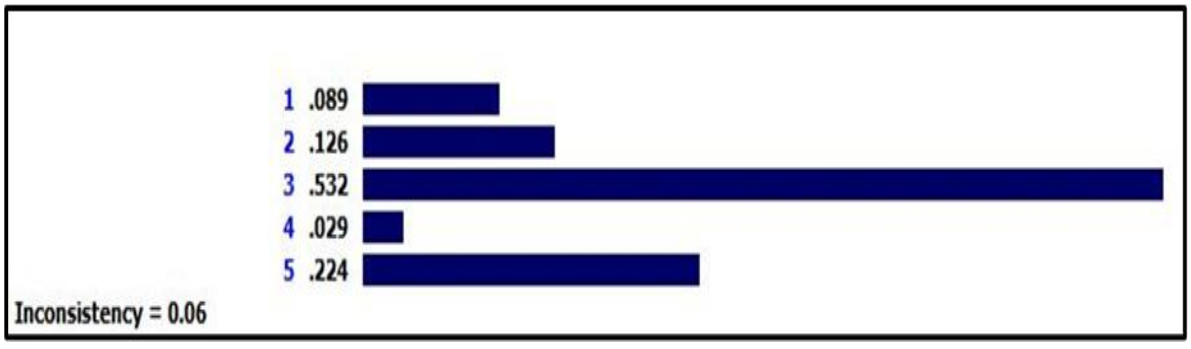


Fig. 2- Final Weights of Fundamental Strategies in Expert Choice Software Output

 DOI: 10.22055/jise.2025.50717.2184

Table 9- Final Prioritization of Hydropolitical Strategies

Strategy Code	Priority
1	4
2	3
3	1
4	5
5	2

The current trend in environmental protection is such that many natural resources are now facing serious threats and even extinction. Furthermore, in recent decades, preventive measures that could reverse this trend have not been taken. Turkey's expansionist actions in the field of dam construction and control over water resources, with the aim of exerting power in the region, have created a multitude of environmental, economic, and social challenges. The findings of research and related studies indicate that Turkey's two major dam construction projects, known as DAP in the Aras basin and GAP in the Tigris-Euphrates basin, threaten the region's water security and infringe upon the water rights of downstream countries. Environmental impact assessments reveal that Turkey's GAP and DAP dam construction projects do not fall within the scope of domestic sovereignty and have trans-regional effects. Dependence of water security on water resources outside the country effectively ties a portion of the country's national security to the region.

The absence of managerial structures in the utilization of these resources can become a factor in creating crises between countries. While the implementation of these projects meets national-level water needs, the political objectives of these projects appear to be more significant, or at least it can be inferred that these plans have the potential to be used as a tool of pressure on downstream countries, to the extent that water could be leveraged against the oil of Iraq and Syria as a trump card. It seems that Turkey seeks to establish itself as the (water power) of the region by controlling the water arteries, thereby consolidating its power over neighboring countries. Given that the West Asia region is located in the arid belt and has experienced successive droughts and reduced rainfall in recent years, the final operation of the dams has meant that Syria, Iraq, and Iran, as downstream countries in the Tigris-Euphrates and Aras River basins, have not been spared the environmental consequences.

As observed in Table (5), the total score (final weight) of the factors related to strengths, weaknesses, opportunities, and threats are 0.57 for strengths, 0.60 for weaknesses, 0.28 for opportunities, and 0.34 for threats. This indicates that currently, the net effect of the existing opportunities and threats is neutral. Although the threats are not critical, there are no particularly significant or golden opportunities either. Furthermore, as observed in Figure (2), Strategy 3 has the highest weight (0.532) and is of the greatest importance, while Strategy 4 has the lowest weight (0.29). Therefore, the strategy of "Emphasizing to government officials, and especially the Supreme National Security Council, the correct and principled implementation of national land-use planning schemes and the employment of expert and committed Iran-oriented personnel in provincial and national positions" is identified as the most prioritized and effective hydropolitical strategy for Iran, warranting the attention of relevant authorities Zaki and Najafi (2020) also alluded to this in their study.

The prioritization results reveal a clear policy preference among experts: Strategy 3 focused on institutional reform and expert-driven land-use planning received the highest weight (0.532). This reflects a consensus that Iran's most effective leverage lies in strengthening domestic governance capacity rather than pursuing high-risk diplomatic or military postures. The low priority assigned to Strategy 4 (internationally monitored economic agreements, weight = 0.029)

suggests skepticism about Turkey's willingness to accept external oversight or the feasibility of such frameworks under current geopolitical conditions. Moreover, the relatively high weight of Strategy 5 (0.224) investing in border region resilience indicates recognition that local socio-ecological stability is a prerequisite for effective transboundary engagement. This aligns with recent scholarship emphasizing "bottom-up" water diplomacy that empowers subnational actors (Keskinen et al., 2021).

Conclusion

This study demonstrates that Iran's optimal path forward in managing transboundary water tensions with Turkey lies not in confrontation, but in institutional consolidation, expert-led planning, and sub-national resilience-building. The top-ranked strategy implementing scientifically informed land-use policies with qualified personnel addresses both environmental sustainability and national security by reducing vulnerability to upstream disruptions. Future research should expand the expert pool to include Turkish and Iraqi scholars, incorporate hydrological modeling of dam impacts, and explore the role of non-state actors (e.g., NGOs, academia) in Track II water diplomacy. Although, according to the results and the opinions of experts and specialists, the country's current strategy regarding hydropolitics vis-à-vis Turkey is a defensive strategy, it is very close to the center due to its position on the border of the SO region in the SWOT matrix. Therefore, employing aggressive strategies in this situation is not very reasonable.

While it is true that Iran has an advantage over its competitor, Turkey, in terms of both internal and external environments, this advantage is not very significant. Consequently, considering that a review of the historical behavior of the neighboring country, as well as its specific geography and limited access to open waters, indicates that if Turkey gains superiority in economic and military fields over Iran, it could pose an actual threat to our country. As a first step, it is most appropriate for our country's government officials, especially the Supreme National Security Council, to strive for the correct and principled implementation of national land-use planning schemes and the employment of expert and committed Iran-oriented personnel in provincial and national positions. The second step involves investing and striving to enhance the country's knowledge and economic capacity to counter potential environmental and security threats, including the risk of desertification in Azerbaijan due to the drying up of the Aras River. The third step involves paying special attention and allocating appropriate budgets to enhance and develop the country's industrial, infrastructural, strategic economic, nuclear, and military equipment, utilizing domestic scientific, technical, and academic capacities and capabilities to achieve balance and relative superiority over Turkey. In the fourth step, Iranian officials and government authorities should, within a complementary approach, with prudence, policy, and the adoption of smart diplomacy, strive to expand bilateral relations with Turkey and develop the shared water basin regions and areas.

Given that the complementary strategy is a model and framework for resolving issues and problems in geographical locations, and the fundamental assumption in this approach is based on the existence of differences and inequalities among geographical locations, in this regard, Turkey, due to its specific geographical situation regarding easy and convenient access to open waters, has at certain historical junctures sought to overcome this geographical problem, the result of which has been the creation of tension and conflict with its neighboring countries (Turkey, Iraq, and Kuwait). Based on the complementary strategy, the development of the transboundary water basin with the participation of Turkey should be on the agenda of Iran's diplomatic apparatus and foreign policy. Efforts should be made to identify areas of interaction, cooperation, and partnership between the two countries based on the four domains of the complementary approach (political, economic, security, and cultural) to mitigate Turkey's geographical disadvantage and limitations as

much as possible. To this end, the relevant authorities and officials should create incentives and motivation for the Turkish government to participate in the management and utilization of the shared water basin.

Acknowledgment

The authors of this article would like to thank editor and anonymous reviewers.

Conflict of Interest

The authors declared no potential conflicts of interest concerning the research, authorship, and publication of this article.

Funding

The authors received no financial support for the research, authorship, and publication of this article.

Data Availability Statements

Data Availability Statement: All information and results are presented in the text of the article.

Authors' Contribution

First Author: Fatemeh Lashkari, Conceptualization, Methodology, Software, Investigation, Writing

Second Author: Mir Mehrdad Mirsanjari, Writing - Review & Editing, Visualization, Supervision

Third Author: Fatemeh Mohammadyari Conceptualization, Software, Writing - Review & Editing.

References

1- Council of the European Union, 2018. *Council Conclusions on Water Diplomacy*.

2- Council of the European Union, 2020. *Council conclusions on Climate Diplomacy*.

3- Cuppari, R., Schmeier, S. and Demuth, S., 2017. *Preventing conflicts, fostering cooperation*–The many roles of water diplomacy. https://www.waterandchange.org/wp-content/uploads/2018/02/PUB_Water-Diplomacy_Bericht.

4- Eilstrup-Sangiovanni, M. and Hofmann, S.C., 2020. Of the contemporary global order, crisis, and change. *Journal of European Public Policy*, *27*(7), pp.1077-1089. https://doi.org/10.1080/13501763.2019.1678665

5- Ghaznafarzadeh Kapte, H., 2018. Environmental Impacts of Turkey's Anatolian Project on Iran's Climate. *In National Conference on Climate Change and Aquatic Ecosystems*.

6- Gleeson, T., Wang-Erlandsson, L., Zipper, S.C., Porkka, M., Jaramillo, F., Gerten, D., Fetzer, I., Cornell, S.E., Piemontese, L., Gordon, L.J. and Rockström, J., 2020. The water planetary boundary: interrogation and revision. *One Earth*, *2*(3), pp.223-234. https://doi.org/10.1016/j.oneear.2020.02.009

7- Grech-Madin, C., Döring, S., Kim, K. and Swain, A., 2018. Negotiating water across levels: A peace and conflict "Toolbox" for water diplomacy. *Journal of Hydrology*, *559*, pp.100-109. https://doi.org/10.1016/j.jhydrol.2018.02.008

8- Gurl, E. and Merba, T., 2017. SWOT analysis: A theoretical review. *Journal of International Social Research*. 10(51):994-1006. https://doi.org/10.17719/jisr.2017.1832

9- Hekmat Ara, H., 2022. Water Dispute between Iran and Turkey in the Aras Basin and How to Manage Them. *IRAS (Institute for Iran and Eurasia Studies).* https://www.iras.ir/p=6432

10- Honkonen, T. and Lipponen, A., 2018. Finland's cooperation in managing transboundary waters and the UNECE Principles for Effective Joint Bodies: Value for water diplomacy?. *Journal of Hydrology*, *567*, pp.320-331. https://doi.org/10.1016/j.jhydrol.2018.09.062

11- IPCC, 2019. Climate Change and Land: An IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems -*Summary for Policymakers (Intergovernmental Panel on Climate Change IPCC)*

12- Karjalainen, T., 2020. EU peace mediation in the 2020s: *From intervention to investment*.

13- Kavianirad, M., Sadrania, H., Nasri Fakhredavood, S. and Hamid, H., 2022. Water Diplomacy Role in Easing Iran-Iraq Hydropolitical Tensions. *Geopolitics Quarterly*, 18(4), pp.71-93. 20.1001.1.17354331.1401.18.68.4.6

14- Keskinen, M., Salminen, E. and Haapala, J., 2021. Water diplomacy paths–An approach to recognise water diplomacy actions in shared waters. *Journal of Hydrology*, 602, p.126737. https://doi.org/10.1016/j.jhydrol.2021.126737

15- Klimes, M., Michel, D., Yaari, E. and Restiani, P., 2019. Water diplomacy: The intersect of science, policy and practice. *Journal of Hydrology*, 575, pp.1362-1370. https://doi.org/10.1016/j.jhydrol.2019.02.049

16- Krzymowski, A., 2021. Water diplomacy and its strategic significance for sustainable development goals and global security architecture. *Sustainability*, 13(24), p.13898. https://doi.org/10.3390/su132413898.

17- Kummu, M., Guillaume, J.H., De Moel, H., Eisner, S., Flörke, M., Porkka, M., Siebert, S., Veldkamp, T.I. and Ward, P.J., 2016. The world's road to water scarcity: shortage and stress in the 20th century and pathways towards sustainability. *Scientific reports*, *6*(1), p.38495. https://doi.org/10.1038/srep38495

18- Marks, S. and Freeman, C.W., 2020. Diplomacy. *Diakses pada*, *12*.

19- MacKay, K. and Collins, R., 2025. Reorienting approaches to maritime boundary disputes: A case for hydro-diplomacy?. *Marine Policy*, *171*, p.106442. https://doi.org/10.1016/j.marpol.2024.106442.

20- McCracken, M. and Wolf, A.T., 2019. Updating the Register of International River Basins of the world. *International Journal of Water resources development*, *35*(5), pp.732-782. https://doi.org/10.1080/07900627.2019.1572497.

21- Niemann, A., Haastrup, T. and Bergmann, J., 2018. Motives, Roles, Effectiveness and the Future of the EU as an International Mediator. *International Negotiation*, *23*(2), pp.319-330. http://booksandjournals.brillonline.com/content/journals/15718069.

22- Nunnally, J. C. 1978. Psychometric Theory: 2d Ed. McGraw-Hill

23- Pohl, B., Carius, A., Conca, K., Dabelko, G., Kramer, A., Michel, D., Schmeier, S., Swain, A. and Wolf, A., 2014. The rise of hydro-diplomacy: *Strengthening foreign policy for transboundary waters.* https://doi.org/10.13140/2.1.4035.5848

24- Saaty, TL. 1977. A scaling method for priorities in hierarchical structures. *Journal of mathematical psychology*. 15 (3), 234-281. https://doi.org/10.1016/0022-2496(77)90033-5

25- Ha-Vikström, T. and Takala, J., 2016. Knowledge management and analytical modeling for transformational leadership profiles in a multinational company. *In Successes and failures of knowledge management* (pp. 151-173). Morgan Kaufmann.

26- Samei, S., Akhbari, M. and Heydari, G., 2020. Regional Cooperation Between Iran and Western Neighbors based on Water Diplomacy (Case Study: Iraq and Turkey). *Geography (Regional Planning)*, 10(2-3), pp.605-619. 20.1001.1.22286462.1399.10.39.7.4

27- Sehring, J., Schmeier, S., Ter Horst, R., Offutt, A. and Sharipova, B., 2022. *Diving into water diplomacy–exploring the emergence of a concept. Diplomatica, 4 (2), 200–221.* https://doi.org/10.1163/25891774-bja10082.

27-Sehring, J., ter Horst, R. and Said, A., 2023. Water diplomacy: A man's world? Insights from the Nile, Rhine and Chu-Talas basins. *Journal of Hydrology X*, *20*, p.100152. https://doi.org/10.1016/j.hydroa.2023.100152.

28-Zaki, Y. and Najafi, S., 2020. Determining Iran hydropolitics strategies in Arvandrood basin. *Human Geography Research*, *52*(4), pp.1529-1549. https://doi.org/10.22059/jhgr.2020.296172.1008070.

© 2026 The Author(s). Published by Shahid Chamran University of Ahvaz. This is an open-access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.