

Youssef Dahraji*

Public Right or Economic Commodity? The Evolution of Water Policy in Jordan and Morocco**

المياه من حق عمومي إلى سلعة اقتصادية: تحولات سياسات المياه في الأردن والمغرب

Abstract: This study argues that water management policies in Jordan and Morocco have never been neutral. Rather, since independence, they have functioned as strategic instruments, leveraged to impose territorial control and reinforce political authority. Using a comparative analytical approach, the study traces the evolution of dam policies, privatization choices, and the role of international financial institutions in governing this vital resource. It finds that neoliberal approaches to water governance have commodified water, transforming it from a public right into an economic commodity, and in doing so have generated deep social and spatial inequalities alongside heightened water vulnerability. The study further underscores the limited capacity of privatization to deliver sustainable development and spatial justice.

Keywords: Water Policy; Dam Policy; Water Governance; Water Scarcity; Jordan; Morocco.

الملخص: تتناول هذه الدراسة سياسات إدارة المياه في الأردن والمغرب. وتنطلق من فرضية أن سياسات المياه لم تكن محايدة، بل شكلت رهاناً استراتيجياً منذ الاستقلال لضبط المجال الترابي وتعزيز استقرار السلطة واستمراريتها. واعتماداً على منهج تحليلي مقارنة، رصدت الدراسة تطور سياسة السدود، وخيارات الخصخصة، وتدخل المؤسسات المالية الدولية في إدارة هذا المورد الحيوي. وقد خلصت إلى أن هيمنة نموذج الليبرالية الجديدة على إدارة المياه أفضى إلى تسليعها وتحويلها من حق عمومي إلى سلعة اقتصادية؛ مما أنتج تفاوتات اجتماعية ومجالية عميقة وهشاشة مائية متزايدة. وأكدت الدراسة محدودية سياسات الخصخصة في تحقيق التنمية المستدامة والعدالة المجالية.

كلمات مفتاحية: سياسات المياه؛ سياسة السدود؛ حوكمة المياه؛ الندرة المائية؛ الأردن؛ المغرب.

* Professor of Political Science, Cadi Ayyad University, Marrakech, Morocco.

Email: yo.dahraji@uca.ac.ma

** This study was originally published in Arabic in: Youssef Dahraji, "al-Miyāh min Haq 'Umūmī ilā Sil'a Iqtisādiyya: Taḥawwulāt Siyāsāt al-Miyāh fī al-Urdun wa-l-Maghrib," *Hikama*, vol. 6, no. 12 (March 2026), pp. 60-85.

Introduction

Far from being merely a natural resource, water constitutes a deeply social and political issue, shaped by competing priorities and conflicting interests among a range of actors. This complexity therefore requires analytical approaches that move beyond purely technical or environmental explanations. Public policy analysis examines water management as a field of state intervention, institutional choice, and political contestation.¹ Accordingly, this study compares two Arab kingdoms, one from the Mashreq and one from the Maghreb: Jordan and Morocco, investigating the extent to which water has functioned as a strategic priority in the public policies of Arab states.

Following independence, both Jordan and Morocco adopted centralized development strategies. Yet subsequent implementation exposed their repeated failure to achieve their stated objectives, against a backdrop of weak economies, rising unemployment, and deepening social inequalities. Consequently, both governments borrowed from international financial institutions and accepted dictates and conditions that curbed their public administration. In this context, they adopted privatization policies that transferred ownership of several productive sectors from the public to the private sector.² From the early 1990s, both countries also embraced a liberal approach to water management, leading to the commodification of this vital resource and increasing its cost for citizens.

Transformations in water management in both countries have raised questions that previous scholarship has sought to address. Some studies have examined the role of informal institutions in water management at the municipal and village levels;³ while others have focused on the legislative frameworks accompanying water management projects and policies,⁴ or the importance of data systems as a cornerstone of governance.⁵ Further research has yielded important insights into the effects of privatization and the commodification of water on citizens' daily lives.⁶ These processes have transformed water from a shared, public resource into a commodity increasingly subject to control by international financial institutions and transnational corporations – developments that can impoverish communities, erode their sovereignty over natural resources, and undermine food security.⁷ Other studies have linked the water question to climate change,⁸ treating it primarily as a consequence of natural transformations, while leaving aside the interests that shape public policies around water.⁹

Given that it is such a multifaceted and complex issue, water management policies and projects must be formulated within a comprehensive, integrated, and sustainable public policy framework. Such sustainability depends on accurate and reliable data on both water resources and demographic trends, to achieve a balance between available water supplies, whether conventional or renewable, and levels of demand. Both Jordan and Morocco have diverse water resources, including surface water, groundwater,

¹ For further reading on the analysis of decision-making (and the lack thereof) in public policy on water, see: Thomas R. Dye, *Understanding Public Policy*, 11th ed. (Boston: Pearson, 2008); Pierre Muller, *Les politiques publiques*, Collection: Que sais-je? 2nd ed. (Paris: PUF, 1994).

² Habib Maalouf, "Siyāsāt al-Bank al-Dawī al-Tarwījiyya li-Mashārī' al-Istithmār fī al-Miyāh wa-Khaṣḥaṣātihā: Sadd Bisrī Lubnān Namūdḥajan," in: Abdulmawla Ismail (ed.), *al-Ittijār fī al-'Aṭash: Mu'assasāt al-Tamwīl al-Dawliyya wa-l-Ḥaqq fī al-Miyāh bil-Miṭṭaqa al-'Arabiyya* (Cairo: Sefsafa Publishing House, 2018), p. 117.

³ Rabih Wahba, "al-Miyāh: Min Ḥaqq lil-Jamī' ilā Mawrid fī Ayydī al-Muḥayminīn: Dawr al-Sharikāt 'Ābirat al-Qawmiyyāt wa-l-Mu'assasāt al-Māliyya al-Dawliyya," in: Ismail (ed.), p. 28.

⁴ Munther Haddadin, "Evolution of water, Administration and Legislation," in: Munther Haddadin (ed.), *Water resources in Jordan: Evolving Policies for Development, The Environment and Conflict Resolution* (Washington, DC: Resources for the Future Press, 2006), p. 28.

⁵ Franklin M. Fisher et al., *Liquid Assets: An Economic Approach for Water Management and Conflict Resolution in the Middle East and Beyond* (Washington: Resources for the Future Press, 2005), p. 155.

⁶ Wahba, p. 28.

⁷ Ibid., p. 29.

⁸ Fisher et al., p. 171.

⁹ Jürgen Habermas, *Connaissance et intérêt*, J.-R. Ladmiraal (trans.) (Paris: Gallimard, 1979 [1968]).

and water derived from wadis and dams. Yet there is a fundamental difference between the two countries: Unlike Morocco, Jordan does not enjoy full sovereignty over all its water resources. This helps explain shifts in Jordan's water management policies, while also inviting closer scrutiny of Moroccan policies and their faltering outcomes.

In this context, water projects and policies have attracted considerable attention in both countries since independence. Following independence, both countries embarked on dam-building programmes to address water scarcity. Over time, this challenge was compounded by climate change, particularly as international reports have been ranking Jordan and Morocco among the countries most vulnerable to water scarcity due to recurring droughts and rising temperatures.¹⁰ These dam policies were not politically neutral. Rather, they were shaped by political stakes connected to stability and the production of legitimacy. In Morocco, the political struggle over who had the authority to make public policy decisions helped tip the balance in favour of the notables (*al-a'yān*) at the expense of other social groups, thus deepening the gulf between the ruling minority and the rest of society.

In contrast, Jordan's context was geographically and politically distinct. Policies governing the Jordan River's water reflected the regime's desire to achieve a measure of spatial justice. Yet Jordan's location in a region of constant tension has impeded the implementation of these goals, forcing it to share water resources with Syria and Israel. Thus, water has played a key role in the outbreak of various wars and conflicts in the region.¹¹ Amman's failure to implement the proposal by the American engineer Millsunger, who advocated for the construction of a dam at Maqarin instead of Lake Tiberias, can be explained by Jordan's unilateral approach to managing the resources of the Jordan River, without establishing mechanisms of consultation and coordination with the riparian states, particularly Syria and Israel.¹²

The political systems of the two countries are similar in several aspects: both have constitutions and recognize political and cultural pluralism¹³ though not to an extent sufficient to curb marginalization or social inequality.¹⁴ Likewise, the development of water resources for economic and social purposes has remained a stated objective, but the results have fallen short of this goal. In general, post-independence public policies in both countries were linked to the question of power, through a security-based approach aimed at controlling and monitoring territory rather than developing it. This alienated the state from citizens and helped create a vast chasm between the ruling political class and the rest of society.¹⁵

In this context, this study examines state public policies on water management and related development sectors in order to understand the obstacles affecting their outcomes and sustainability. It adopts a comparative analytical approach as its primary methodological framework, comparing the experiences of Jordan and Morocco in water management through the lens of public policy analysis. The study investigates the political, social, and economic dimensions of water policy, employing historical

¹⁰ Dominick de Waal et al., *The Economics of Water Scarcity in the Middle East and North Africa: Institutional Solutions* (Washington, DC: World Bank Group, 2023).

¹¹ In 1965, Israeli Prime Minister Levy Eshkol said: "Israel may be forced to fight for its water". See: A. Wolf, *Hydropolitics along the Jordan River* (Tokyo: United Nations University Press, 1995), p. 51. In 1992, Shimon Peres said: "Israel needs water more than it needs land". See: Frédéric Lasserre, "Le prochain siècle sera-t-il celui des guerres de l'eau?" *Revue internationale et stratégique*, no. 33 (1999), pp. 1-17; Hugo Sada, "L'Afrique entre guerre et paix," *Revue internationale et stratégique*, no. 33 (1999), p. 104. See also: Razmig Keucheyan, *La nature est un champ de bataille. Essai d'écologie politique* (Paris: Zones, 2014); J. Cooley, "The War Over Water," *Foreign Policy*, no. 82 (1991).

¹² Haddadin, p. 31.

¹³ On political and cultural pluralism in political systems in general, see: Jacques Lagroye, *Sociologie politique* (Paris: Presses FNSP-Dalloz, 1997); Gabriel Almond & Sidney Verba, *The Civic Culture: Political Attitudes and Democracy in Five Nations* (Princeton: Princeton University Press, 1980).

¹⁴ "NMD et la Crise de l'Eau: Déconstruire le lien entre les Retards d'Implémentation et le Désespoir Socio-économique de la Génération Z au Maroc," *marocscenarios*, 13/10/2025, accessed on 15/1/2026, at: <https://acr.ps/1L9B9Gy>; Fisher et al., pp. 177-179.

¹⁵ "Ḥāzim al-Nāṣir Yantaqid Ḥukūmat al-Razzāz: Ilghā' Sulṭat al-Miyāh Khaṭa' Kabīr," *Nesan*, 18/2/2020, accessed on 3/7/2025, at: <https://acr.ps/1L9F3d0>. In the same source, al-Nasser, a water sector expert and former finance minister, says: "The issue of water is not a top priority for the current government, nor was it a priority for the previous government [that of Omar Al-Razzaz]".

analysis to trace the evolution of these policies since independence, with a focus on dam policies, privatization, and the intervention of international financial institutions. It also draws on a multi-level analysis, including institutional analysis to understand the role of formal and informal institutions; legal analysis to explain the legislative frameworks governing the water sector; and socioeconomic analysis to assess the impact of neoliberal reforms and privatization on water resource management. Finally, it considers the societal effects of these policies by examining the social and spatial inequalities, as well as water insecurity produced by the commodification of water.

State Public Policies: Between Development Goals and Spatial Control

While the dominant political theories of the immediate post-independence period advocated the mobilization and management of financial resources¹⁶ in ways that would contribute to building and developing a national economy to achieve political and democratic development, public action in both countries remained hostage to the question of who held power, and who governed. Following independence, concern for political stability became a significant factor in shaping decisions and political priorities in both countries.¹⁷ As a result, water policies became linked to objectives that often diverged from those publicly proclaimed by the states, which sought to present water management as part of a broader public policy. Political stability is crucial for effective governance, and its absence can disrupt and delay development projects.

Yet the pursuit of stability has also contributed to the postponement or abandonment of important political decisions, leading to the loss of significant developmental opportunities. It can therefore be argued that two key periods shaped the conditions of political stability in both Jordan and Morocco, directly affecting the state's approach to resource management in two key respects: the use of public policy to exercise territorial control and monitor the population; and the blocking of crucial decisions that could have offered different prospects for development and spatial justice.

1. Jordan: Water Security and the Construction of Spatial Control

Water security in Jordan is closely linked to the trajectory of the Arab-Israeli conflict. The region's groundwater and the waters of the Jordan River have been targets of Israeli colonial ambitions since the establishment of the state.¹⁸ Water policy in Jordan developed within a regional context shaped by colonial plans to establish a Jewish state in Palestine, plans that materialized with the creation of Israel following the Nakba of 1948.¹⁹ The period from 1952 to 1957 marked a key moment in Jordan's political history, following the enactment of the constitution, as the state adopted plans and programmes developed by foreign water experts and engineers, which formed the basis for all subsequent water management policies and projects. In 1955, the Jordanian government adopted a water resources management policy for the Jordan River Basin based on the ideas of the US ambassador, Eric Johnson, who proposed a unified plan for all parties. Thus, the state's water policies focused on the Jordan River Basin, and the British civil engineering company Sir M. MacDonald & Partners was commissioned to conduct a feasibility study for using the basin's water. That study formed the basis for subsequent comprehensive policies.²⁰

¹⁶ Catherine Colliot-Thélène, "Violence et contrainte," in: Etienne Balibar & Bertrand Ogilvie (dir.), *Violence et politique*, Collection: Revue Lignes, no. 25 (Paris: Edition Hazan, 1995), pp. 264-279.

¹⁷ Jordan gained independence with the end of the British Mandate in May 1946, and Morocco gained independence with the end of Spanish and French protectorates in 1956.

¹⁸ Haddadin, p. 30.

¹⁹ Ibid.

²⁰ Ibid., p. 32.

The stated objective here was economic and social development. Yet the main underlying aim was to control territory and manage the population by controlling water resources and how they were administered, a responsibility previously held by local councils. Thus, the Jordanian government focused on amending its water policies, prioritizing the water of the Jordan River and regulating its management, while linking the right to use it to land ownership. This measure helped control the population at the local level by establishing a new irrigation system, for which fees were collected from beneficiaries in exchange for management and maintenance.²¹

Since governance requires political legitimacy or public consent, the Jordanian government resorted to water management and distribution policies and projects based on agricultural land ownership, redistributing land and determining the amount of water needed for irrigation.²² A superficial reading of its plan for redistributing these lands and modernizing the sector, under Law No. 38 of 1946, which granted the government the authority to manage water resources, and Law No. 40 of 1952, which defined land and water ownership rights, suggests that the state was aiming to minimize potential disputes among farmers. However, an alternative reading centered on the perceptions of political actors reveals that state intervention was not merely regulatory in nature. It also functioned as an instrument of population management and territorial control.

The regulation of real estate and the allocation of water quotas were manifestations of state authority at the territorial level. Through this process, the state became able to identify each individual in the population by tracking their movements. Its external services assisted in this through the appointment of loyal public officials, to ensure the faithful implementation of government programmes and plans, including the modernization of the real estate sector through the identification of irrigable land in new title deeds issued by the Land and Survey Department.²³ One could conclude that the decision to redistribute land to farmers and enable them to benefit from water quotas proportional to the area they owned reflected the state's pursuit of spatial justice as a primary objective. However, the reality was that state control over the distribution of water quotas to farmers concealed a hidden agenda: keeping access to land and water conditional on loyalty and obedience. While observers had assumed that political life in Jordan was institutionalized and organized according to rational rules, they were in fact confronted with political practices based on customary law, which effectively paralysed the role of political parties, whose legal operation was not resumed until 1989. One justification offered for this system was the preservation of state security and stability.²⁴

At certain junctures, Jordanian political actors failed to grasp that formulating policies and projects related to the Jordan River Basin necessarily entailed engaging in regional interactions with neighbouring countries, even in situations marked by hostility. The logic of political realism rests on transcending the dichotomy of permanent friends and enemies,²⁵ asserting instead that interests are the primary determinants of political behaviour. Therefore, dealing with an adversary in specific contexts requires the adoption of rational strategies aimed at containing or neutralizing the threat it poses. Indeed, political practice may sometimes compel the formation of temporary alliances dictated by interest and necessity.²⁶

²¹ Ibid.

²² Ibid.

²³ Ibid.

²⁴ Ibrahim Fawzi Riyath, "The Role of Political Parties in Shaping the Democratic Process in Jordan," *Al-Biruni Journal of Humanities and Social Sciences*, vol. 3, no. 4 (2025), pp. 1-8.

²⁵ Julien Freund, *L'essence du politique*, 3ème ed. (Paris: Dalloz, 2003).

²⁶ In his interpretation of engagement in political practice, Max Weber held that: "The early Christians recognised that the world was ruled by demonic forces, and that an individual's involvement in politics – as a sphere of power and violence – amounted to entering into a covenant with evil forces". Max Weber, *Le savant et le politique*, Julien Freund (trans.) (Paris: Éditions Plon, 1959), p. 210.

Consequently, Jordan's engagement in negotiations with Israel and the resulting forms of normalization never constituted a strategic choice stemming from an independent political will, given the structural pressures the Kingdom has faced since independence. But this does not preclude an interrogation of the governance of water policies within a complex system of relationships, roles, and strategies.²⁷ This system is governed by rules that every actor seeking influence within it must understand and effectively utilize to achieve the desired outcomes. From the perspective of organizational psychology, and given the excessive depletion of natural resources under the capitalist system, particularly since the mid-20th century, there is an urgent need for robust and innovative management models. In this context, some researchers have advocated for approaches based on what is known as "conflict-based cooperation" as a practical mechanism for managing tensions.²⁸ Therefore, in light of intensifying competition over shared water resources, cooperation appears inevitable, despite differences in value systems and cultural frameworks among the actors.

2. Morocco: Who Decides? Elite Control of the Public Sphere

Morocco's post-independence political life was defined by a central question: Who decides on public policy? This became the focus of a political struggle between the palace and the parties comprising the nationalist movement, which sought a monarchy that would reign but not rule. These parties favoured political change and the construction of a national economy based on industrialization, the training and empowerment of farmers and peasants, and the formation of a cadre of senior administrators. However, they often lacked both strategic vision and flexibility in their positions.²⁹ Their insistence on a one-party system and on a monarchy with limited authority ultimately hindered Morocco's efforts to join the ranks of developed nations.

Within the context of this struggle for power, water policy did not become a government priority before 1960. The period from 1956 to 1962 was deeply politically significant, as leftist parties and the palace promoted competing visions over who should decide on public policy. King Hassan II (1962-1999) was hostile to these parties and their vision; after dismissing the government of Abdallah Ibrahim (1958-1960), he adopted a strategy aimed at building stable relations with the West while achieving domestic political stability through conservative economic and social policies.³⁰ The new government adopted a different outlook. Instead of seeking to industrialize the country, it focused on agriculture and relied on the tourism sector to bring in foreign currency.³¹ To achieve his goals and fulfil his promises to the West, King Hassan issued a new constitution in 1962, founded on a separation of powers that favoured the monarchy.³² Article 19 also enshrined the King as Commander of the Faithful, underlining the monarchy's historical and religious legitimacy.³³ However, ongoing tensions and a lack of dialogue or mutual recognition continued to dominate the political landscape, which remained stagnant until 1977.³⁴

At the territorial level, the concern for unity was the defining factor in state policy. Rabat adopted a security-led approach aimed at keeping the country under close surveillance. This was facilitated by the

²⁷ Michel Crozier & Erhard Friedberg, *L'acteur et le système* (Paris: Éditions Seuil, 1977).

²⁸ Marc Benninger, "Compte rendu du livre d'Yves Clot: Le prix du travail bien fait, éd. La Découverte, 2021, 221 pages," *hrtoday*, 16/6/2022, accessed on 22/1/2026, at: <https://acr.ps/1L9F2yw>

²⁹ Youssef Dahraji, "al-'Uzūf al-Siyāsī fi-l-Mu'aththir fi al-Siyāsāt al-'Umūmiyya," *al-Majalla al-Maghribiyya lil-Dirasat al-Qanuniyya wa-l-Siyasiyya*, no. 1 (2023), p. 288.

³⁰ Pierre Vermeren, *Histoire du Maroc depuis l'indépendance* (Paris: Edition La Découverte, 2006), p. 30.

³¹ *Ibid.*, p. 23.

³² Mohamed Moatassim, *al-Hayāt al-Siyāsīyya al-Maghribiyya 1962-1991* (Casablanca: Muassasat Isis lil-Nashr, 1992), p. 13.

³³ R. Elmoassadek, "Les forces politiques face au problème de la démocratisation du régime au Maroc," PhD. diss., Political Science Department, Université Paris-XII, 1981, p. 15.

³⁴ Mohamed Moatassim, *al-Nizām al-Siyāsī al-Dustūrī al-Maghribī* (Casablanca: Muassasat Izis lil-Nashr, 1992), p. 70.

control it now exerted over the distribution of lands and water resources reclaimed from the country's occupiers,³⁵ through policies and projects that primarily benefited the notables at the expense of other groups, who suffered marginalization and social inequality. In this way, a historic opportunity to achieve spatial justice was squandered. One consequence of this situation was that citizens took to the streets in opposition to all forms of marginalization and violence. The Rif Revolt of 1957 had a particular impact: the authorities responded to them differently, through the Sebou Project, a local development initiative. This could have marked a turning point in state policy toward the Rif and High Atlas regions, opening the way for policies aimed at their economic and social development and empowerment, rather than their control and surveillance.³⁶

As was the case elsewhere in the Middle East, international organizations were prepared to finance projects related to the development and regulation of Morocco's major river basins. The Sebou Project provides a revealing example. Given the immense agricultural potential of the Gharb Plain, experts from the United Nations Food and Agriculture Organization (FAO) believed that the region could be developed through large-scale irrigation schemes and the organization of farmers into productive agricultural structures. The Moroccan state, however, represented at the time by the Minister of the Interior, Mohamed Oufkir (1964-1972), viewed the project differently. It interpreted these proposals as part of a communist-inspired agenda and consequently brought the mission to an end.³⁷

One objective of the Sebou River Basin Project was to organize and modernize land ownership in the Gharb plain by distributing land to farmers. However, the state believed that such a measure could disrupt the political and social balance in the region, and that the regime's stability and continuity required the Interior Ministry to maintain control over the population.³⁸

As a result of water and agricultural policies that favoured the local elite, the regime faced two coup attempts, in 1971 and 1972. These policies had created social disparities between an elite that owned the means of production and the rest of society. For example, in the early 1980s, dam policies were financed through price increases on basic commodities like tea and sugar. Given citizens' weak purchasing power, they took to the streets in protest, particularly in major cities such as Casablanca, Fez, and Marrakech, as well as in the Rif region.³⁹

An assessment of Morocco's dam policies from their inception reveals a lack of impartiality in their design and implementation, indicating that political legitimacy was the primary consideration. In 1973, the king issued the decree on "Moroccanization", which reclaimed land from the colonial powers for distribution to Moroccan citizens. However, the benefits largely went to the local elite, whom the state granted complete freedom to cultivate crops without any oversight or evaluation – essential elements of any integrated, sustainable water policy. Thus, the elite exploited the tense political and social situation, as well as the legal vacuum concerning the structuring, organization, distribution, and use of water, and proceeded to cultivate water-intensive crops, expand the drilling of wells, and overconsume water, depleting the country's water resources.

³⁵ Mohamed al-Nasiri, "Murāqabat al-Majāl al-Turābī aw Tanmiyatuh? Ma'ziq al-Šulṭa Mundhu Qarn," in: Mohamed al-Nasiri et al., *al-Taḥawwulāt al-Ijtīmā'iyya bil-Maghrib* (Rabat: Markaz Tariq ibn Ziyad lil-Dirasat wa-l-Abḥath, 2000), pp. 15-75, 45.

³⁶ Ibid., p. 44.

³⁷ Ibid., p. 45, 49.

³⁸ Ibid.

³⁹ In January 1984, residents of Morocco's major cities took to the streets to protest the high cost of living. The late King Hassan II referred to the protesters in the Rif region as a "rabble", in a speech that can be considered a defining moment of those protests. See: Michel Rousset, "Politique administrative et controle social," in: Jean-Claude Santucci (dir.), *Le Maroc actuel: Une modernisation au miroir de la tradition?* (Paris: Aix-en-Provence, Institut de recherches et d'études sur les mondes arabes et musulmans, CNRS Éditions, 1992), pp. 151-169.

Based on these summaries, neither Jordan nor Morocco had anticipated the policies that would result from their internal political contradictions and differences, or from foreign alliances and interests. The domestic and external circumstances surrounding both countries obscured key priorities for political actors, in government and opposition alike, including those related to water. The political experiences of both kingdoms highlight a lack of strategic water management. While Jordan sought to implement policies and projects related to water resources of an international character without consulting its riparian neighbours, its funding was blocked by Israel. Morocco's Sebou project could have made a significant difference, had it been properly utilized: the basin could have been equipped for irrigation and Moroccan farmers organized, given the willingness of international organizations on the ground to provide financial support. However, conflicting interests led to the project being halted. The episode demonstrates that when political actors neither share a common vision of the public interest nor adhere to principles of consultation and cooperation, they squander genuine opportunities.

Water: A Developmental or Political Imperative?

Water is a vital resource that plays a fundamental role in shaping societies. Studies have shown that progress in Europe only accelerated after governments made water and sanitation a policy priority, mobilizing financial and technological resources and enacting regulations to guarantee universal access to water and sanitation services. Prior to these reforms, Europe suffered from high infant mortality rates and widespread epidemics and infectious diseases. However, the adoption of integrated and sustainable water policies led to tangible gains in health and education. For example, the development of sanitation in Britain helped increase life expectancy by approximately 15 years during the four decades after 1880.⁴⁰ The sector was restructured by prioritizing water quality through safe supply and recognizing water as a fundamental right. This reflected the conviction that water security afforded access to sufficient clean water – at least 20 litres per person per day.⁴¹ Engaged intellectuals championed these policies through works that fostered awareness and accountability.⁴²

Considering Jordan and Morocco, it is possible to understand the constraints imposed by conditions in the post-independence period. However, circumstances change, and data on water level has become more widely available. This data can be used to design and implement water management policies and projects that reduce overuse and improve quality. With declining rainfall and rising temperatures, both Jordan and Morocco face increasing challenges related to water scarcity and hydrological stress. How, then, have the governments of the two countries dealt with the problem of scarcity, drought, and water stress and pollution? And have they managed water as a commodity, or as a public asset?⁴³

1. The Impact of Water Scarcity and Pollution on Individuals' Social Lives

Jordan and Morocco both face severe water crises due to drought and the depletion of water basins and exacerbated by prolonged water shortages that have affected natural resources, the environment, and the population.⁴⁴ Low rainfall, declining river levels, and the depletion of surface and groundwater basins

⁴⁰ United Nations Development Programme, *Taqrīr al-Tanmiyya al-Bashariyya lil-ʿĀm 2006, Mā Huwa Abʿad min al-Nudra: al-Quwwa wa-l-Faqr wa-Azmat al-Miyāh al-ʿĀlamiyya* (Cairo: UNDP, 2006), p. 21.

⁴¹ Ibid.

⁴² Fiction has also highlighted the centrality of issues related to the provision of public services and facilities. Notable examples include Victor Hugo (1802-1885), who devoted his most prominent works to defending the marginalized and those suffering from harsh living and health conditions, including his famous novel *Les Misérables*. Similarly, George Orwell wrote a vivid account of deprivation and poverty in the late 1920s and early 1930s, in *Down and Out in Paris and London*.

⁴³ Elinor Ostrom, *Governing the Commons-The Evolution of Institutions for Collective Action* (Cambridge: Cambridge University Press, 1990), p. 28.

⁴⁴ Anil K. Gupta et al., "Drought Disaster Challenges and Mitigation in India: Strategic Appraisal," *Current Science*, vol. 100, no. 12 (2011), pp. 795-806.

can be attributed to government policies and projects as well as external circumstances. In Morocco, the government has been reluctant to regulate the water sector, especially since the country began adopting structural adjustment policies in 1981. Morocco was forced to adopt a liberal policy approach to managing the agricultural sector, allowing investors to cultivate profitable crops without any assessment of their impact on groundwater, surface water, or green water resources. This trajectory began with the Agricultural Development Fund and continues with the policies adopted under two strategies: the 2008-2020 Green Morocco Plan (Plan Maroc Vert) and Green Generation 2020-2030.⁴⁵

Jordan, meanwhile, has long possessed permanent springs and watercourses, yet their use was not managed in a systematic and sustainable manner.⁴⁶ In the period from 1952 to 1983, the government embarked on some innovative water management policies and projects, establishing bodies responsible for their management and for monitoring water use. However, regional tensions and armed conflicts, coupled with criticism from political actors regarding the delegation of water sector management to independent bodies, constituted structural obstacles for the desired outcomes.⁴⁷

Despite the efforts of both countries, they have failed to mitigate the negative effects of water scarcity, especially in light of population growth. Morocco's population increased from 11.5 million in 1960 to 38.5 million in 2025,⁴⁸ while Jordan's rose from 853,471 to 11.5 million over the same period.⁴⁹ This imbalance between population and water resources helps explain the challenges facing water policies and projects in both countries.⁵⁰ According to water experts, when annual water supplies fall below 1,700 m³ per capita, a region experiences water stress; if supply drops below 1,000 m³ per capita annually, the population faces water scarcity. If water availability falls below 500 m³ per capita, the population faces "absolute scarcity".⁵¹

In Jordan, rainfall remains very low, averaging between 50 to 200 mm annually. In 2024 it received just 89.4 mm, down from 145.4 mm in 2023,⁵² while the lowest level was recorded in 2017, at 53.2 mm.⁵³ Precipitation can vary widely between the north and the south, from 400 mm annually in the northwest (west of the Jordan River), to less than 100 mm annually in the south.⁵⁴ By comparison, average annual precipitation exceeds 300 mm over approximately two-thirds of the land area of the United States and Europe.⁵⁵ Due to low rainfall and its arid to semi-arid climate, Jordan faces structural challenges related to drought, the negative effects of which are evident in the environment, water supplies, agriculture, food security, the functioning of dams and water basins, and various forms of pollution. Consequently, the government has attempted to employ modern technology to collect and analyse rainfall data, measure temperature and wind speed, and inform policy.⁵⁶

In Morocco, weak, variable, and irregular rainfall has resulted in recurring droughts. Their intensity varies between the north and the south. The country receives significant rainfall during only two months of the year, October and November, while temperatures are highest between June and August. The year 2022

⁴⁵ A 2024 report by Morocco's Royal Institute for Strategic Studies (IRES) noted an expansion in the drilling of wells and the exploitation of aquifers, supported by the Agricultural Development Fund after its establishment in 1985. This trend accelerated significantly with the launch of the Green Morocco Plan in 2008. See: Mohamed Qarnan, "al-Ma' had al-Malakī lil-Dirāsāt Yajlid al-Mukhaṭṭaṭ al-Akhdar wa-l-Siyāsāt al-Zirā'iyya bi-Sabab Istinzāf al-Mā," *Tel Quel Arabi*, 30/5/2024, accessed on 30/8/2024, at: <https://acr.ps/1L9F2Fa>

⁴⁶ Haddadin (ed.), p. 32.

⁴⁷ Ibid., pp. 33-39.

⁴⁸ "Morocco Population," *Worldometer*, 1/7/2025, accessed on 15/8/2025, at: <https://acr.ps/1L9F2jk>

⁴⁹ "Jordan Population," *Worldometer*, 1/7/2025, accessed on 15/8/2025, at: <https://acr.ps/hBy2sUB>

⁵⁰ Haddadin (ed.), p. 43.

⁵¹ Saeed Nairizi (dir.), *Irrigated Agriculture Development under Drought and Water Scarcity*, ICID.CIID (October 2017), p. 21.

⁵² "Jordan Average Precipitation," *Trading Economics*, accessed on 18/8/2025, at: <https://acr.ps/hBy2tbc>

⁵³ Ibid.

⁵⁴ Ibid.

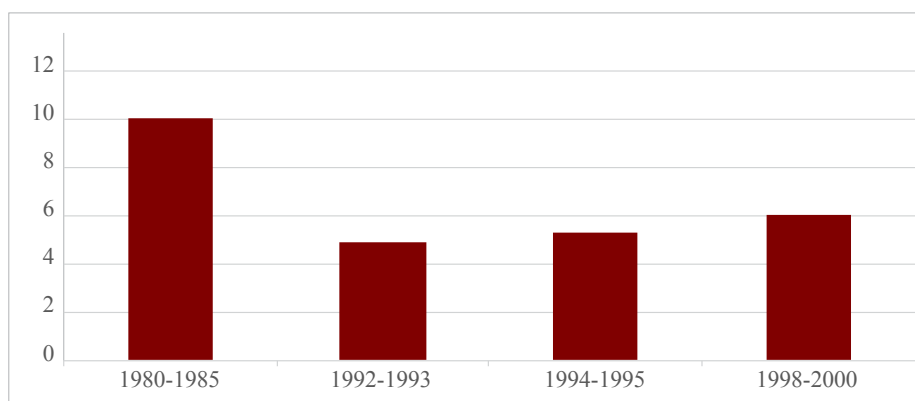
⁵⁵ Elias Salameh & Helen Bannayan, *Water Resources of Jordan, Present Status and Future Potentials* (Amman: Friedrich Ebert Stiftung, 1993).

⁵⁶ Hala Zawati Katkhuda & Munther J. Haddadin, "Water Data Systems in Support of Water Management and Planning," in: Haddadin (ed.), p. 55.

saw the highest temperatures in the past 40 years, with the national mean temperature exceeding the 1981-2010 average by +1.63°C.⁵⁷ The precipitation deficit reached 27% compared with the average, and the period from 2019 to 2022 was the driest in over 60 years, with a deficit of nearly 32%.⁵⁸ Between 1981 and 2024, only 18 years recorded above-average rainfall.⁵⁹ Whereas Morocco had previously experienced one year of drought every 11 years, it has recently recorded six drought years in quick succession. Annual rainfall did not exceed 103 mm in 2017,⁶⁰ while the 2021-2022 season was particularly severe, with rainfall down by 50% and Morocco's stored water reserves falling below two billion m3, compared with an average of 10 billion m3 in recent years.⁶¹

A good indicator of this state of drought is the decline in surface water volumes, from an annual average of 19 billion m3 to 10 billion m3 over the period 1980-1985; then to 4.9 billion m3 in 1992-1993; 5.3 billion m3 in 1994-1995; and 6 billion m3 in 1998-2000.⁶² Figure (1) illustrates the factors that underly this decline, alongside the policy of dam construction, after water storage mobilization had previously reached 40 billion m3 in some years.⁶³

Figure (1): Annual Average Surface Water in Morocco



Source: World Bank Group, "Country Climate and Development Report, Historic Trends: Water Scarcity and Droughts in Morocco," accessed on 25/7/2025, at: <https://acr.ps/1L9B9Lr>

In Jordan, successive periods of drought led to a policy of building dams to trap rainwater and develop water resources, through a series of water projects that initially focused on the Jordan River Basin. These projects were expected to be adopted immediately after independence, based on plans and studies prepared by foreign experts and in alignment with the state's public policies, which placed a high priority on regulating land ownership.⁶⁴ However, strained relations with Israel forced their postponement. The first project, the Sharhabil Bin Hassneh Dam, was constructed in 1967. Today, the Kingdom has 17 dams of varying sizes

⁵⁷ Royaume du Maroc, Ministère de l'équipement et de l'eau, *Maroc état de climat en 2022* (Mars 2023), p. 3, accessed on 26/2/2026, at: <https://acr.ps/1L9Ba3j>

⁵⁸ Ibid. p. 4.

⁵⁹ Fatima Ezzahra Mengoub, "Au fil de l'eau: L'innovation hydrique au Maroc," *Publications*, Policy Center for the New South, 22 March 2024, accessed on 26/2/2026, at: <https://acr.ps/1L9F2NJ>

⁶⁰ Ibid.

⁶¹ Interview with water expert Abdelhafid Al-Dabbagh, "Ḥadīth al-Thulāthā': Ayy Tadbīr lil-Mawārid al-Mā'iyya fī al-Maghrib bayn al-Siyāsāt al-Qitā'iyya wa-Jawdat al-Hikāma," Policy Center for New South, 12 April 2023.

⁶² World Bank Group, "Country Climate and Development Report, Historic Trends: Water Scarcity and Droughts in Morocco," accessed on 25/7/2025, at: <https://acr.ps/1L9B9Lr>

⁶³ Morocco's 2024 Climate Report highlights how low rainfall and rising temperatures have had a negative impact on water inflows to most of the country's dams, exacerbating the decline in reservoir levels, harming the agricultural sector, and making the provision of potable water costly and complicated. See: Royaume Du Maroc, Ministère de l'équipement et de l'eau, Direction générale de la météorologie, *Etat du climat Maroc 2024*, accessed on 26/2/2026, at: <https://acr.ps/1L9B9xY>

⁶⁴ Haddadin (ed.), pp. 29-32.

and storage capacities. Among the most important are the King Talal Dam in Jerash Governorate,⁶⁵ fed by the Zarqa River, and the Unity (Al-Wehda) Dam, a joint Jordanian-Syrian facility located on the Yarmouk River, with a storage capacity of 110 million m³.⁶⁶ However, the storage capacity of these dams has declined significantly due to decreasing rainfall in recent years, including during the 2024-2025 rainy season.⁶⁷ Whereas storage capacity was approximately 75 million m³ at the King Talal Dam, 110 million m³ at the Unity Dam, 55 million m³ at the Karameh Dam, and 30 million m³ at the Mujib Dam, the majority of the reservoirs behind these dams are now on the verge of drying up. At the time of writing, water reserves in three of them did not exceed 20 million m³.⁶⁸ World Bank experts who assessed the situation in Jordan for the *Jordan Country Climate and Development Report* have emphasized that climate and development goals should be defined based on public policies and the promotion of investment in five strategic sectors: first and foremost water, followed by energy, agriculture, transport, and urban development.⁶⁹

Morocco began constructing dams as early as 1929, during the French Protectorate. However, dam building to mobilize water resources, as a practical strategy to address the challenges and constraints associated with low and irregular rainfall, became policy in 1967, the year a World Bank report classified Morocco as an agricultural country. The late 1970s saw the construction of the Al Massira Dam, the second largest in the Kingdom, with a storage capacity of 2.7 billion m³. Al Wahda Dam, the country's largest in terms of volume, was also built to provide irrigation water for 100,000 hectares. Further construction brought the total number of dams in Morocco to over 140, both large and small, suggesting the prominence of water mobilization in the country's development plans.

From 1945-1980, Morocco's dams mobilized 20 billion m³ of water on average, sometimes rising to as much as 40 billion m³. This declined by an estimated 30% between 1980 and 2021, to the point that average water mobilization in recent years has not exceeded 10 billion m³. In 2021, Morocco recorded a severe water shortfall of some two billion m³.⁷⁰ Some 50 years later, Morocco's dam strategy has revealed serious limitations, failing to achieve its stated objectives of irrigating 100,000 hectares, and providing the population with a reasonable supply of drinking water.⁷¹

Agriculture is one of the country's most water-intensive sectors. Between 1998 and 1999, Morocco's agricultural sector consumed 9.95 billion m³ out of 13.64 billion m³ of groundwater and surface water. Thus, 70% was used for irrigation, while only 2.27 billion m³, or 16%, was allocated for drinking water.⁷² The dams that were built have irrigated no more than one million out of 7.7 million hectares of arable land.⁷³ Given the scarcity of rainfall and the limited availability of water reserves in basins and dams, Morocco's

⁶⁵ Fisher et al., p. 157.

⁶⁶ "al-Urdun 'alā Ḥaffat al-'Aṭash Wasaṭ Azmat Miyāh wa-Sudūd Shibh Khāwiya," *Al Jazeera*, 2/11/2025, accessed on 26/2/2026, at: <https://acr.ps/1L9F2Jg>

⁶⁷ Ibid.

⁶⁸ "Ba'd Jafāf al-Sudūd... al-'Ajz al-Mā'ī Yuṭārid al-Qiṭā'āt al-Iqtisādiyya bil-Urdun," *Al Jazeera*, 15/11/2025, accessed on 26/2/2025, at: <https://acr.ps/1L9F38F>. The article quotes Hazem al-Nasser saying: "Drought has affected most of the dams, and three of them have reserves of less than 5%". He notes that water was not a priority in the preceding government's public policies; as a result, water reserves in the three dams did not exceed 20 million m³. He also warned of a drought at King Talal Dam.

⁶⁹ World Bank, *Jordan Country Climate and Development Report*, 7 December 2022, accessed on 12/5/2024, at: <https://acr.ps/hBy1Clq>

⁷⁰ "Rapport climat et développement au Maroc, Pénurie d'eau et sécheresse," Groupe de la Banque Mondiale,

3/11/2022, p. 5, accessed on 25/7/2025, at: <https://acr.ps/1L9F2OI>

⁷¹ Addressing the challenges associated with water management projects raises numerous issues, as it requires attention to public policy in an integrated and comprehensive manner. Discussions of water policies in both countries must link them to production patterns, assessment, and data collection. At the same time, it is worth examining water-related projects and programmes, as well as the nature of the political groups involved in them and benefiting from them.

⁷² Kevin Warkins (dir.), "Résumé: Rapport mondial sur le développement humain, au-delà de la pénurie: pouvoir, pauvreté, et crise mondiale de l'eau," Programme des Nations Unies pour le Développement (PNUD), 2006, p. 32, accessed on 15/6/2025, at: <http://hdr.undp.org>

⁷³ Nairizi (dir.), p. 21.

National Water Report shows that per capita water availability decreased from 2,500 m³ in 1960 to 830 m³ in 1990, and to just 411 m³ in 2020,⁷⁴ putting the country in a situation of absolute water scarcity.

Meanwhile Jordan has undergone exceptional population growth, particularly with successive influxes of refugees, reaching 1.9% by the end of 2023, and having increased from 7.1 million in 2011 to 11.1 million in 2022.⁷⁵ This has increased demand for water, alongside scarce rainfall and drying dams. Jordan's per capita water supply is expected to decrease further; it currently stands at less than 100 m³, a figure significantly lower than the 500 m³ per capita threshold used in international reports.⁷⁶ The real figure may be even lower if the water needs of refugees are taken into account.⁷⁷ These factors Jordan among the countries most severely affected by water scarcity. Therefore, the country faces several challenges related to irrigation in the agricultural sector and to meeting the population's drinking water needs.

Furthermore, the influx of refugees from Syria and other neighbouring countries further stressed water supplies.⁷⁸ Water is delivered only once a week in major cities like Amman, and once every 12 days in some areas. A World Bank Group report on Jordan warned that the implementation of development projects and policies in Jordan is threatened by water scarcity, which is only expected to worsen due to climate change.⁷⁹ The report added that rising demand could place greater pressure on the sustainable use of water resources, resulting in groundwater depletion exceeding 200%, in addition to an annual decline of approximately 20% in surface water reserves in water basins.⁸⁰

In response to the multiple challenges threatening water security, the governments of both Jordan and Morocco have implemented policies focused on water diversion technologies. Morocco has worked on transferring water between river basins, particularly in the Souss-Massa, Oued Tensift, and Oum Er-Rbia basins.⁸¹ A study conducted on Jordan, the West Bank, and Israel confirmed the existence of large-scale water transfer operations. Israel's water conveyor diverts an average of 450 million m³ annually from north to south, using Lake Tiberias as a strategic reservoir.⁸² In Jordan, the capacity of the King Abdullah Canal's northern sections is estimated at approximately 600 million m³ annually, decreasing to about 180 million m³ annually in the southern part of the Jordan Valley, with an average annual flow ranging between 140 and 160 million m³. The canal helps divert water from the Yarmouk River for irrigation in the upper Jordan Valley, as well as supplying the Deir Alla project with an average annual volume of approximately 35 million m³.⁸³

The quality of water used for irrigation is also at risk; from agricultural runoff, pollution, the effects of climate change, soil composition, and the quantities of fertilizers and pesticides used.⁸⁴ Research conducted in the Tadla region of Morocco, specifically in the expansive irrigated areas of Beni Amir and Beni Moussa, revealed nitrate concentrations in numerous wells exceeding the national drinking water safety limit of

⁷⁴ "Rapport climat et développement au Maroc," p. 4.

⁷⁵ The Hashemite Kingdom of Jordan, Department of Statistics, Population and Social Statistics, "Adad al-Sukkān al-Muqaddar li-Nihāyat 'Ām 2025," January 2026, accessed on 6/2/2026, at: <https://acr.ps/1L9B9w>

⁷⁶ World Bank Group, "Morocco: Country Climate and Development Report, CCDR: Background Paper -Water Scarcity and Droughts" (Washington, DC: 2023), accessed on 25/2/2026, at: <https://acr.ps/1L9B9w>

⁷⁷ Edoardo Borgomeo et al., *Ebb and Flow*, vol. 2. *Water in the Shadow of Conflict in the Middle East and North Africa* (Washington, DC: World Bank Group, 21/12/2021), accessed on 25/2/2026, at: <https://acr.ps/1L9F2rv>

⁷⁸ Ibid.

⁷⁹ World Bank, "al-Mamlaka al-Urduniyya al-Hāshimiyya: Tashjī' Inhā' al-Faqr wa-Ta'zīz al-Rakhā' al-Mushtarak, al-Dirāsa al-Tashkhīṣiyya al-Manhajīyya 'an al-Urdun," *Report*, no. 103433-JO (February 2016), p. 71, accessed on 15/8/2025, at: <https://acr.ps/1L9B9M2>

⁸⁰ Ibid., p. 68.

⁸¹ Alia Gana & Mohamed El Amrani, "Les crises hydrauliques et la gestion sociale des risques. Illustrations en Tunisie et Au Maroc," in: Alexandre Brun & Frédéric Lasserre (dir.), *Politiques de l'eau: Grands principes et réalités locales* (Québec: Presses de l'Université du Québec, 2006), p. 367.

⁸² Gilbert F. White et al., *Water for the future, The West Bank and Gaza Strip Israel and Jordan* (Washington: National Academy Press, 1999), p. 128.

⁸³ W. Alkhoury et al., "Water quality of the King Abdullah Canal/Jordan – impact on eutrophication and water disinfection," *Toxicological and Environmental Chemistry*, vol. 92, no. 5 (2010), pp. 855-877.

⁸⁴ Gana & El Amrani.

50 mg/L. Similar observations were made regarding the Sebou River, where nitrate levels are increasing by five mg/L annually, posing a significant public health risk.⁸⁵ The same study also indicated that wastewater discharge significantly affects water quality, with half of the samples collected from water stations showed water of average to poor quality.⁸⁶ This highlights the need to promote scientific research aimed at improving water quality and reducing pollution levels.⁸⁷

2. Toward an Integrated and Sustainable Water Policy

According to the UNDP's Human Development Report, water insecurity poses a grave threat to human development in most developing countries. This underscores the responsibility of public authorities to implement sound water policies to ensure access to fresh water and sanitation for the whole population at affordable prices.⁸⁸ Recognizing the challenges they face due to water scarcity and poor water quality, from 1990 onward both Morocco and Jordan quickly adopted alternative policies aimed at balancing water supply and demand, rationalizing consumption through pricing policies, and employing modern technologies to develop non-conventional resources, particularly seawater desalination, reverse osmosis, cloud seeding, water harvesting, and watershed management.

In Jordan, government water management projects and policies have largely been unable to meet citizens' needs for potable water and for agricultural and industrial use, even when those efforts have been overseen by independent and highly effective bodies. A 1978 study by a British company indicated that by 2000, the available water resources would not be sufficient to meet municipal and industrial demand without compromising supplies allocated for the expansion of irrigated agriculture in the Jordan Valley. The deficit was estimated to be approximately 160 million m³ by the turn of the millennium, unless the government took immediate measures to secure additional supplies.⁸⁹ Amman reached an agreement with Damascus for the construction of the Maqarin Dam on the Yarmouk River, with US financial support estimated at \$150 million. However, strained relations between the two countries during the Iran-Iraq War from 1980 onward prevented the project's completion. Groundwater was, however, discovered in the Yarmouk and Wadi al-Arab valleys, enabling the supply of municipal water to Irbid in the north and the surrounding areas.⁹⁰

This development, amid a turbulent regional political landscape, necessitated the signing of a peace agreement with Israel in 1994. The Wadi Araba Treaty defined the sharing and allocation of common water resources from the Yarmouk River and Lake Tiberias,⁹¹ regardless of the Arab League's position, reflecting the Jordanian government's awareness of the challenges posed by the population's water needs. Jordan also adopted a new approach to water resource management, publishing a strategic water policy and establishing a Ministry of Water and Irrigation in 1995. Furthermore, it implemented a series of plans aimed at rationalizing the use of treated wastewater in agriculture and improving the management of water supply in the country's western regions.⁹² However, wastewater treatment in urban areas requires

⁸⁵ Ibid.

⁸⁶ Ibid.

⁸⁷ Jean Maurice Arbour & Sophie Lavallée, *Droit international de l'environnement* (Cowansville, Qc: Yvon Blais, 2006), Introduction.

⁸⁸ Warkins (dir.), Chapter 2: "L'eau destinée à la consommation humaine," p. 75.

⁸⁹ Haddadin (ed.), p. 40.

⁹⁰ Ibid.

⁹¹ National Research Council, *Water for the Future: The West Bank and Gaza Strip, Israel, and Jordan* (Washington, DC: National Academy Press, 1999), p. 171.

⁹² Rémy Courcier, Jean Philippe Venot & François Molle, "Historical Transformation the Lower Jordan River Basin (in Jordan): Changes in Water Use Basin and Projections (1950-2025)," *IWMI Research Reports H038306*, International Water Management Institute, 1 January 2005, p. 29, accessed on 17/1/2026, at: <https://acr.ps/1L9F2Ex>

twin municipal distribution systems, one for drinking water and the other for treated water, to mitigate the potential environmental damage and water pollution caused by treatment technologies.⁹³

As the Ministry of Water and Irrigation focused on the causes of water loss and explored ways to improve its management, it decided to prioritize three key areas in the Jordan Water Sector Efficiency Project, implemented in cooperation with the United States Agency for International Development (USAID):⁹⁴ reducing leakage in water networks; preventing water theft; and ensuring accurate billing for consumption and payments. Accordingly, it focused on restructuring and upgrading water networks and pumping stations, and on providing smart metres and rapid leak-detection devices.⁹⁵ The project included water management services, wastewater networks, wastewater treatment plants, and drinking-water pumping stations, such as the Zara Ma'in water treatment plant, the Samra wastewater treatment plant (which treats 70% of the country's wastewater), and the Wadi Al-Arab project, designed with support from USAID.⁹⁶

Jordan has also launched several other initiatives, such as the Sahara Forest Project (SFP) in the Wadi Araba region, which includes a solar-powered seawater desalination plant. There is also the planned Aqaba-Amman Water Desalination and Conveyance Project (AAWDC), also known as the National Water Carrier, which aims to desalinate Red Sea water and transport it to Amman via pipelines. Funded by the European Investment Bank (EIB), the project aims to meet Jordan's water needs by 2028. It is also expected to mitigate the decline in water levels in the Dead Sea, contribute to its recovery, and provide the hydraulic pressure required for reverse osmosis desalination. It is worth noting that the sustainability of such a project will require evaluations of the cost of fresh water, chemicals, and energy generation, as well as the environmental impacts of using the Carrier.⁹⁷

Furthermore, employing innovative agricultural technologies, such as harvesting local runoff and floodwater, helps prevent soil salinization and produce high-quality crops for export, including ornamental plants, fruits, vegetables, and herbs. Additionally, fertigation can reduce groundwater pollution, while efforts to desalinate brackish water offer clear potential to increase the available water supply.

Many foreign experts advocate against cloud-seeding techniques, due to ongoing debates about their effectiveness. While some estimates suggest that Jordan's cloud-seeding programme has contributed to an approximately 19% increase in rainfall, increases in surface runoff have been less significant, raising questions about the technique's real impact on water resources. As a statistical analysis by Rangno and Hobbs showed in 1995, seeding experiments in two Israeli trials were marred by statistical errors that cast doubt on their validity, meaning that they did not produce any statistically significant effect on rainfall.⁹⁸ The World Meteorological Organization states: "If one can accurately predict rainfall from a cloud system, it is easy to detect the effect of artificial cloud-seeding in that system ... As such, the expected effects of seeding often occur within the range of natural fluctuations ... and our ability to predict natural behaviour remains very limited".⁹⁹

⁹³ Ibid.

⁹⁴ Jacqueline Marie Tront, "Project Information Document - Jordan Water Sector Efficiency Project - P176619" (Washington, DC: World Bank Group, 2023), accessed on 26/2/2026, at: <https://acr.ps/1L9B9sr>

⁹⁵ Ibid.

⁹⁶ According to the Minister of Water and Irrigation, Engineer Raed Abu Al-Saud, the Zara Ma'in Water Treatment Plant is one of the main systems supplying Amman, with a capacity of 100,000 m³ per day – or 38 million m³ annually – of potable water. See: Hashemite Kingdom of Jordan, Ministry of Water and Irrigation, "Ittifaqiyya li-Taṭwīr wa-Istidāmat Maḥaṭṭat al-Zāra Mā'in bi-Qīmat 1.8 Milyūn Dūlār," 24/1/2025, accessed on 26/2/2026, at: <https://acr.ps/1L9F2Yy>

⁹⁷ White et al., p. 125.

⁹⁸ Between 1961 and 1975, two cloud seeding experiments were conducted in northern and central Israel. Each claimed to have contributed to rainfall, with a 15% increase in the first experiment and a 13% increase in the second. See: White et al., p. 156.

⁹⁹ "WMO Statement on Weather Modification," *World Meteorological Organization*, 14/6/2025, accessed on 26/2/2026, at: <https://acr.ps/1L9Babx>

Several studies have warned against the overexploitation of groundwater resources in Jordan, estimated at some 300 million m³ annually, highlighting that this could lead lower water levels and lead to the salinization of freshwater aquifers. Thus, any attempt to meet the population's water needs by increasing surface-water and groundwater extraction risks causing environmental degradation and depleting freshwater resources.¹⁰⁰

Morocco's water policy has been marked by a reformist trend since the 1990s. Despite maintaining the same goals and the support of the elite across all its policies, the Moroccan government, headed by Aziz Akhannouch since his victory in the 2021 legislative elections, has produced a draft law on public procurement.¹⁰¹ The country continues to build dams, despite the limitations of this policy, the influence of certain interest groups over it, and the absence of governance and sustainability mechanisms which would support productive sectors, particularly agriculture. In addition, the liberalization of agricultural investment, which started in the 1980s in response to the structural adjustment programme mentioned above, has negatively affected the structure and organization of water management by giving agricultural investors the freedom to cultivate crops and drill wells without any oversight, monitoring, or evaluation.¹⁰²

The liberalization of the agricultural sector has led to the excessive and indiscriminate use of both groundwater and surface water, affecting the water table. Some experts argue that this has moved the country from a state of scarcity to one of water stress.¹⁰³ State agricultural policies introduced in 1985, which established the Agricultural Support Fund to promote the farming sector, have generated counterproductive results in the form of expanded well drilling and depletion of the water table. The Green Morocco Plan, which allocated substantial financial support within the framework of the National Drip Irrigation Programme further added to this stress.

Faced with the ongoing challenges posed by drought and water scarcity in Morocco, the National Water Resources Management Strategy has encouraged the use of modern and innovative irrigation technologies within the framework of the National Irrigation Water Conservation Plan, as well as the pursuit of alternative solutions such as wastewater treatment and seawater desalination (Figure (2)).¹⁰⁴ It should be noted that the government has established a programme to support investment in the water sector through the Agricultural Development Fund, which provides 30% support for projects with budgets not exceeding two million Moroccan dirhams.¹⁰⁵

¹⁰⁰ Clive Lipchin et al. (eds.), *Integrated Water Resources Management and Security in the Middle East*, NATO Science for Peace and Security Programme (Amsterdam: Springer, 2006).

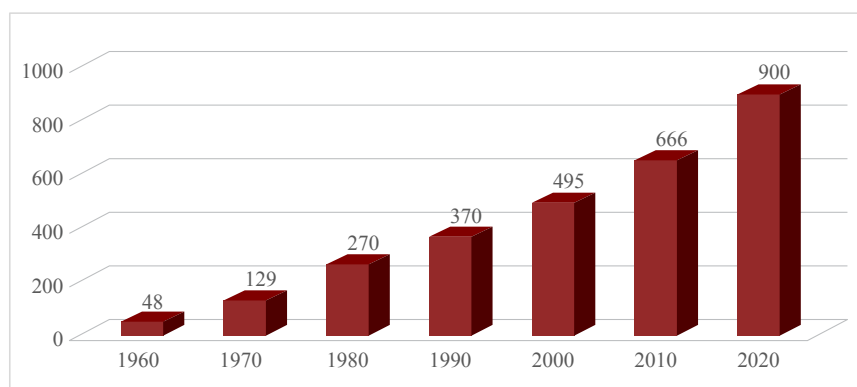
¹⁰¹ "Marsūm Raqam 2.22.431 Šādir fī 15 min Sha'bān 1444 (8 Ādhār/Mārs 2023) Yata'allaq bil-Šafaqāt al-'Umūmiyya," *Official Gazette of the Kingdom of Morocco*, no. 7176, p. 2861. The first section of this paper discussed the stakes involved in the state's public policies amidst the power struggle between the palace and Morocco's nationalist parties. It became clear to the monarchy that resolving the conflict in its favour required strengthening its legitimacy. Consequently, it became evident that the only actors that could support it at that time were the notables (*al-a'yān*). Thus, the monarchy positioned agriculture as the economic foundation of the state, contrary to the wishes of the three-party Koutla alliance. The notables also benefited from the Moroccanization policy of 1973 and the privatization policy of 1989. The creation of a new investment system, known as "innovative management", was merely another vehicle for supporting capitalists in various ways. Furthermore, the Green Plan was a clear form of support for large landowners at the expense of small farmers.

¹⁰² Economic researcher Najib Akesbi has criticized agricultural policies in Morocco, specifically the Green Morocco Plan, which he has argued focuses solely on technical aspects, implementing ready-made solutions at the expense of other dimensions, particularly social and cultural ones. He has also warned that the plan's reliance on high sector productivity threatens natural resources and fails to address the issue of food security for Morocco. See: Najib Akesbi, "Le Plan Maroc vert: Une analyse critique," in: AMSED (Rabat, Maroc), Fondation CDG (Rabat, Maroc), *Questions d'économie marocaine* (Rabat: Presses universitaires du Maroc, 2011), pp. 9-46.

¹⁰³ According to the World Bank, "Since 1979, Morocco has seen its water inflows (surface water) declining from an annual average of 22 billion m³ between 1945 and 1978 to an annual average of 15 billion m³ between 1979 and 2018. In addition, while there was an 80% probability of having an annual inflow of 15 billion m³ between 1945 and 1978; this probability declined to a mere 50% between 1979 and 2018". See: World Bank Group, "Country Climate and Development Report."

¹⁰⁴ Kingdom of Morocco, Ministry of Energy Transition and Sustainable Development, Sustainable Development Sector, "al-Mawārid al-Mā'iyya wa-l-Taḥrīr al-Sā'il bil-Maghrib," accessed on 20/8/2025, at: <https://acr.ps/1L9F3bJ>

¹⁰⁵ "Marsūm Raqam 2.23.1 Šādir fī 25 Rajab 1444 (16 Fibrāyir 2023)," Articles 10 and 11, *Official Gazette of the Kingdom of Morocco*, no. 7172, p. 2211.

Figure (2): Wastewater Potential in Morocco

Source: Kingdom of Morocco, Ministry of Energy Transition and Sustainable Development, Sustainable Development Sector, “al-Mawārid al-Mā’iyya wa-l-Taḥīr al-Sā’il bil-Maghrib,” accessed on 20/8/2025, at: <https://acr.ps/1L9F3bJ>

The National Programme for Potable Water Supply and Irrigation (PNAEPI, 2020-2027) aims to strengthen Morocco’s capacity to meet the challenges posed by drought and the increasing demand for water from individuals and economic sectors, particularly agriculture and industry. It is expected to generate investments of approximately 115.4 billion dirhams, with the goal of diversifying water supply through the construction of dams and desalination and water-treatment facilities; optimizing demand by reducing leakage from distribution networks and adopting drip irrigation; and ensuring the availability of high-quality drinking water.¹⁰⁶

The National Drinking Water Supply and Irrigation Plan (NWP) is the first phase of the National Water Plan 2020-2050 (PNE) and outlines the steps necessary to achieve water security in Morocco over a 30-year period. Official data shows that the Kingdom currently has over 150 dams, with a storage capacity of 19.9 billion m³. However, their effectiveness remains dependent on both rainfall levels and efforts to combat social exclusion. In recent years, Morocco has therefore had to use water-transfer technology to redirect water from parts of the system with a surplus to others requiring additional supplies. Sixteen water transfer facilities have been constructed, spanning a distance of 785 kilometres.¹⁰⁷

In terms of seawater desalination, Morocco has nine operational plants and a further seven under construction. It is also expected to launch wastewater treatment facilities to enable the reuse of approximately 32 million m³ of treated water per year.¹⁰⁸ Since water-related projects and policies require legislation and the establishment of institutions to ensure their implementation, the state has made efforts to pass laws aimed at implementing strategies, regulating the sector, and monitoring consumption. Law No. 10-95 of 1995 established agencies tasked with managing water basins,¹⁰⁹ while Law No. 36-15 of 2016 enshrined access to water as a human right.¹¹⁰ However, while laws regulating the water sector are important, they alone are insufficient to guarantee effective governance; they must be supported by evaluation on the ground to assess the practical aspects of their implementation.¹¹¹

¹⁰⁶ Kingdom of Morocco, Ministry of Energy Transition and Sustainable Development, Sustainable Development Sector, “al-Barnāmij al-Waṭanī lil-Taḥīr al-Sā’il,” “al-Istrāṭījiyya al-Waṭaniyya lil-Miyāh,” p. 29, accessed on 10/8/2025, at: <https://acr.ps/1L9F2jo>

¹⁰⁷ Kingdom of Morocco, Economic, Social and Environmental Council, *al-Taqrīr al-Sanawī 2023*, p. 62, accessed on 15/8/2025, at: <https://acr.ps/1L9F2nA>

¹⁰⁸ “al-Maghrib Yusarri’ Mashārī’ Taḥliyat al-Miyāh wa-l-Sudūd li-Takhfīf Āthār al-Jafāf,” *Al Jazeera*, 14/6/2025, accessed on 14/1/2026, at: <https://tinyurl.com/ypf6stkk>

¹⁰⁹ “Dahir n° 1-95-154 du 18 rabbi I 1416 (16 août 1995) portant promulgation de la loi n° 10-95 sur l’eau,” *Bulletin Officiel*, no. 4325, 20/9/1995, p. 626.

¹¹⁰ “al-Qānūn Raqam 36.15 al-Muta’alliq bil-Mā’ al-Ṣādir bi-Tanfīdhihi al-Ḍahīr al-Sharīf Raqam 1.16.113 bi-Tārīkh 6 Dhī al-Qa’da 1437 (10 August 2016),” *Official Gazette of the Kingdom of Morocco*, no. 6494, 25/8/2016, p. 6305.

¹¹¹ Michel Grozier, *On ne change pas la société par décret* (Paris: Edition Grasset, 1979), p. 83.

Generally, public administration falls short if it is limited to the logic of technical competence, however important that may be. To be effective, it must also incorporate political dimensions, as an expression of differing perceptions and values that may be marked by ambiguity or even irrationality, especially in times of crises and exceptional circumstances.¹¹² In this context, several theoretical approaches¹¹³ – particularly Max Weber’s distinction between the ethics of persuasion and the ethics of responsibility¹¹⁴ and Jürgen Habermas’s theory of communicative action¹¹⁵ – have helped provide analytical tools for understanding the trajectories of public policies, from planning to implementation.¹¹⁶ Consequently, the implementation of water policies and projects becomes contingent upon the availability of effective leadership, given that major transformations are often associated with the contributions of leading actors to guiding and influencing the dynamics of public decision-making.¹¹⁷

Conclusion

Water policies and projects in both Jordan and Morocco have failed to achieve their stated development goals, despite significant investments in infrastructure, especially dams. At crucial junctures, these policies have been shaped more by political and security considerations than by principles of sustainability and spatial justice, thus further deepening spatial disparities and social inequalities. The dominance of a security-focused, liberal approach to water management has limited the effectiveness and efficiency of water policies and stripped them of their social dimension. Moreover, the absence of integrated strategic planning, along with weak evaluation and accountability mechanisms, has deepened water vulnerability and exacerbated spatial inequalities. Furthermore, the privatization and commodification of water, under the influence of international financial institutions, has left the state unable to guarantee the right to water and exposed this vital resource to conflicting private interests. In light of intensifying climate change, demographic pressures, and urban expansion, the shortcomings of the current approach necessitate a comprehensive reassessment based on good governance, policy integration, and active stakeholder participation.

These findings inform a series of recommendations. The first is to strengthen water management policies in Morocco and Jordan through a clear political will, and to foster integrated strategies to take these projects and programmes forward. Political will is key to strengthening mechanisms for overseeing water companies and setting price ceilings, in order to prevent the commodification of public resources from becoming a tool for impoverishing populations. Alongside a comprehensive strategy, there is an imperative to adopt integrated, inclusive, and sustainable policies. One cause of water waste and scarcity is the adoption of multiple, independent sectoral water management policies that disregard the needs of other sectors. Therefore, coordination mechanisms should be developed among stakeholders at the central, regional, and local levels, particularly those in agriculture, the sector that consumes the largest share of water, and in public health.

The study also recommends the development of decision-making mechanisms to help reduce groundwater depletion, such as making well-drilling subject to a permit granted following an environmental impact assessment. Developing these mechanisms would also include establishing a robust, information-

¹¹² Catherine Colliot-Thélène, “Carl schmitt contre Max Weber, rationalité juridique et rationalité économique,” in: Carlos-Miguel Herrera (ed.), *Le droit, le politique autour de Max Weber, Hans kelsen, Carl schmitt* (Paris: Harmattan, 1995).

¹¹³ Crozier & Friedberg.

¹¹⁴ Max Weber, *Le Savant et le Politique*, Catherine Colliot-Thélène (pref., trans. & notes) (Paris: Éditions La Découverte, 2003).

¹¹⁵ Jean-Marc Ferry, *Habermas: L'éthique de la communication* (Paris: Presses Universitaires de France 1987) (réédition numérique FeniXX).

¹¹⁶ Yves Meny & Jean-Claude Thoenig, *Politiques publiques*, Collection: Thémis (Paris: Presses Universitaires de France, 1990); Pierre Muller, *Les politiques publiques*, Collection: Que sais-je? (Paris: Presses universitaires de France, 1990).

¹¹⁷ Paul Ricœur, “Min al-Sulṭa ilā al-'Unf: Ufūl al-Siyāsa,” Fuad Makhoukh (trans.), *Majallat Fikr wa-Naqd*, no. 56 (February 2004).

based decision-making system, with continuously updated, comprehensive data, to build policies based on concrete evidence. It is also vital that haphazard investment in the agricultural sector is curbed. It is no longer viable to continue with a model that grants private actors absolute freedom to select crops and decide on their production cycles without any guidance or planning, as this leads to water depletion and degradation of ecosystems. The cultivation of genetically modified crops must be reduced, as they are detrimental to soil fertility and pose risks to public health. Water resource management should be entrusted to public bodies, although there is no reason to exclude private-sector involvement, with the exception of foreign entities. Finally, there is a need for investment in research focused on innovative technologies for water resource development and the reduction of pollution.

References

- “al-Qānūn Raqam 36.15 al-Muta‘alliq bil-Mā’ al-Şādir bi-Tanfīdhihi al-Zahīr al-Sharīf Raqam 1.16.113 bi-Tārīkh 6 Dhī al-Qa‘da 1437 (10 August 2016).” *Official Gazette of the Kingdom of Morocco*. no. 6494, 25/8/2016.
- “Dahir n° 1-95-154 du 18 rabbi I 1416 (16 août 1995) portant promulgation de la loi n° 10-95 sur l’eau.” *Bulletin Officiel*. no. 4325. 20/9/1995.
- “Marsūm Raqam 2.22.431 Şādir fī 15 min Sha‘bān 1444 (8 Ādhār/Mārs 2023) Yata‘allaq bil-Şafaqāt al-‘Umūmiyya.” *Official Gazette of the Kingdom of Morocco*. no. 7176.
- “Marsūm Raqam 2.23.1 Şādir fī 25 Rajab 1444 (16 Fibrāyir 2023).” *Official Gazette of the Kingdom of Morocco*. no. 7172.
- “Rapport climat et développement au Maroc, Pénurie d’eau et sécheresse.” Groupe de la Banque Mondiale. 3/11/2022. Accessed on 25/7/2025, at: <https://acr.ps/1L9F2OI>
- Alkhoury, W. et al. “Water quality of the King Abdullah Canal/Jordan – impact on eutrophication and water disinfection.” *Toxicological and Environmental Chemistry*. vol. 92, no. 5 (2010).
- Almond, Gabriel & Sidney Verba. *The Civic Culture: Political Attitudes and Democracy in Five Nations*. Princeton: Princeton University Press, 1980.
- al-Nasiri, Mohamed et al. *al-Taḥawwulāt al-Ijtimā‘iyya bil-Maghrib*. Rabat: Markaz Tariq ibn Ziyad lil-Dirasat wa-l-Abhath, 2000.
- AMSED (Rabat, Maroc), Fondation CDG (Rabat, Maroc). *Questions d’économie marocaine*. Rabat: Presses universitaires du Maroc, 2011.
- Arbour, Jean Maurice & Sophie Lavallée. *Droit international de l’environnement*. Cowansville, Qc: Yvon Blais, 2006.
- Balibar, Etienne & Bertrand Ogilvie (dir.). *Violence et politique*. Collection: Revue Lignes, no. 25. Paris: Edition Hazan, 1995.
- Borgomeo, Edoardo et al. *Ebb and Flow*. vol. 2. *Water in the Shadow of Conflict in the Middle East and North Africa*. Washington, DC: World Bank Group, 21/12/2021. Accessed on 25/2/2026, at: <https://acr.ps/1L9F2rv>
- Brun, Alexandre & Frédéric Lasserre (dir.). *Politiques de l’eau: Grands principes et réalités locales*. Québec: Presses de l’Université du Québec, 2006.
- Cooley, J. “The War Over Water.” *Foreign Policy*. no. 82 (1991).

- Courcier, Rémy, Jean Philippe Venot & François Molle. "Historical Transformation the Lower Jordan River Basin (in Jordan): Changes in Water Use Basin and Projections (1950-2025)." *IWMI Research Reports H038306*. International Water Management Institute. 1 January 2005. Accessed on 17/1/2026, at: <https://acr.ps/1L9F2Ex>
- Crozier, Michel & Erhard Friedberg. *L'acteur et le système*. Paris: Éditions Seuil, 1977.
- Dahraji, Youssef. "al- 'Uzūf al-Siyāsī fī-l-Mu' aththir fī al-Siyāsāt al- 'Umūmiyya." *al-Majalla al-Maghribiyya lil-Dirasat al-Qanuniyya wa-l-Siyasiyya*,. no. 1 (2023).
- de Waal, Dominick et al. *The Economics of Water Scarcity in the Middle East and North Africa: Institutional Solutions*. Washington, DC: World Bank Group, 2023.
- Duran, P. & H. Bruhns (dir.). *Max Weber et la politique*. Paris: L.G.D.J, 2009.
- Dye, Thomas. R. *Understanding Public Policy*. 11th ed. Boston: Pearson, 2008.
- Elmossadek, R. "Les forces politiques face au problème de la démocratisation du régime au Maroc." PhD. diss. Political Science Department. Université Paris-XII. 1981.
- Ferry, Jean-Marc. *Habermas: L'éthique de la communication*. Paris: Presses Universitaires de France 1987.
- Fisher, Franklin M. et al. *Liquid Assets: An Economic Approach for Water Management and Conflict Resolution in the Middle East and Beyond*. Washington: Resources for the Future Press, 2005.
- Freund, Julien. *L'essence du politique*. 3ème ed. Paris: Dalloz, 2003.
- Grozier, Michel. *On ne change pas la société par décret*. Paris: Edition Grasset, 1979.
- Gupta, Anil K. et al. "Drought Disaster Challenges and Mitigation in India: Strategic Appraisal." *Current Science*. vol. 100, no. 12 (2011).
- Habermas, Jürgen. *Connaissance et intérêt*. J.-R. Ladmiral (trans.). Paris: Gallimard, 1979 [1968].
- Haddadin, Munther (ed.). *Water resources in Jordan: Evolving Policies for Development, The Environment and Conflict Resolution*. Washington, DC: Resources for the Future Press, 2006.
- Hashemite Kingdom of Jordan, Ministry of Water and Irrigation. "Ittifāqiyya li-Taṭwīr wa-Istidāmat Maḥaṭṭat al-Zāra Mā 'īn bi-Qīmat 1.8 Milyūn Dūlār." 24/1/2025. Accessed on 26/2/2026, at: <https://acr.ps/1L9F2Yy>
- Herrera, Carlos-Miguel (ed.). *Le droit, le politique autour de Max Weber, Hans kelsen, Carl schmitt*. Paris: Harmattan, 1995.
- Ismail, Abdulmawla (ed.). *al-Ittijār fī al- 'Aṭash: Mu' assasāt al-Tamwīl al-Dawliyya wa-l-Ḥaqq fī al-Miyāh bil-Minṭaqa al- 'Arabiyya*. Cairo: Sefsafa Publishing House, 2018.
- Keucheyan, Razmig. *La nature est un champ de bataille. Essai d'écologie politique*. Paris: Zones, 2014.
- Kingdom of Morocco, Economic, Social and Environmental Council. *al-Taqrīr al-Sanawī 2023*. Accessed on 15/8/2025, at: <https://acr.ps/1L9F2nA>
- Kingdom of Morocco, Ministry of Energy Transition and Sustainable Development, Sustainable Development Sector. "al-Mawārid al-Mā' iyya wa-l-Taṭhīr al-Sā' il bil-Maghrib." Accessed on 20/8/2025, at: <https://acr.ps/1L9F3bJ>
- Kingdom of Morocco, Ministry of Energy Transition and Sustainable Development, Sustainable Development Sector. "al-Barnāmij al-Waṭanī lil-Taṭhīr al-Sā' il." Accessed on 10/8/2025, at: <https://acr.ps/1L9F2jo>

- Lagroye, Jacques. *Sociologie politique*. Paris: Presses FNSP-Dalloz, 1997.
- Lasserre, Frédéric. “Le prochain siècle sera-t-il celui des guerres de l’eau?” *Revue internationale et stratégique*. no. 33 (1999).
- Lipchin, Clive et al. (eds.). *Integrated Water Resources Management and Security in the Middle East*. NATO Science for Peace and Security Programme. Amsterdam: Springer, 2006.
- Mengoub, Fatima Ezzahra. “Au fil de l’eau: L’innovation hydrique au Maroc.” *Publications*. Policy Center for the New South. 22 March 2024. Accessed on 26/2/2026, at: <https://acr.ps/1L9F2NJ>
- Meny, Yves & Jean-Claude Thoenig. *Politiques publiques*. Collection: Thémis. Paris: Presses Universitaires de France, 1990.
- Moatassim, Mohamed. *al-Hayāt al-Siyāsiyya al-Maghribiyya 1962-1991*. Casablanca: Muassasat Isis lil-Nashr, 1992.
- _____. *al-Nizām al-Siyāsī al-Dustūrī al-Maghribī*. Casablanca: Muassasat Izis lil-Nashr, 1992.
- Muller, Pierre. *Les politiques publiques*. Collection: Que sais-je? 2nd ed. Paris: PUF, 1994.
- _____. *Les politiques publiques*. Collection: Que sais-je? Paris: Presses universitaires de France, 1990.
- Nairizi, Saeed (dir.). *Irrigated Agriculture Development under Drought and Water Scarcity*. ICID.CIID (October 2017).
- National Research Council. *Water for the Future: The West Bank and Gaza Strip, Israel, and Jordan*. Washington, DC: National Academy Press, 1999.
- Ostrom, Elinor. *Governing the Commons-The Evolution of Institutions for Collective Action*. Cambridge: Cambridge University Press, 1990.
- Ricœur, Paul. “Min al-Sulṭa ilā al-‘Unf: Ufūl al-Siyāsa.” Fuad Makhoukh (trans.). *Majallat Fikr wa-Naqd*. no. 56 (February 2004).
- Riyath, Ibrahim Fawzi. “The Role of Political Parties in Shaping the Democratic Process in Jordan.” *Al-Biruni Journal of Humanities and Social Sciences*. vol. 3, no. 4 (2025).
- Royaume du Maroc, Ministère de l’équipement et de l’eau. *Maroc état de climat en 2022*. Mars 2023. Accessed on 26/2/2026, at: <https://acr.ps/1L9Ba3j>
- Royaume Du Maroc, Ministère de l’équipement et de l’eau, Direction générale de la météorologie. *Etat du climat Maroc 2024*. Accessed on 26/2/2026, at: <https://acr.ps/1L9B9xY>
- Sada, Hugo. “L’Afrique entre guerre et paix.” *Revue internationale et stratégique*. no. 33 (1999).
- Salameh, Elias & Helen Bannayan. *Water Resources of Jordan, Present Status and Future Potentials*. Amman: Friedrich Ebert Stiftung, 1993.
- Santucci, Jean-Claude (dir.). *Le Maroc actuel: Une modernisation au miroir de la tradition?* Paris: Aix-en-Provence, Institut de recherches et d’études sur les mondes arabes et musulmans, CNRS Éditions, 1992.
- The Hashemite Kingdom of Jordan, Department of Statistics, Population and Social Statistics. “‘Adad al-Sukkān al-Muqaddar li-Nihāyat ‘Ām 2025.” January 2026. Accessed on 6/2/2026, at: <https://acr.ps/1L9Bagw>
- Tront, Jacqueline Marie. “Project Information Document - Jordan Water Sector Efficiency Project - P176619.” Washington, DC: World Bank Group, 2023. Accessed on 26/2/2026, at: <https://acr.ps/1L9B9sr>

- United Nations Development Programme. *Taqrīr al-Tanmiyya al-Bashariyya lil- 'Ām 2006, Mā Huwa Ab 'ad min al-Nudra: al-Quwwa wa-l-Faqr wa-Azmat al-Miyāh al- 'Ālamiyya*. Cairo: UNDP, 2006.
- Vermeren, Pierre. *Histoire du Maroc depuis l'indépendance*. Paris: Edition La Découverte, 2006.
- Warkins, Kevin (dir.). "Résumé: Rapport mondial sur le développement humain, au-delà de la pénurie: pouvoir, pauvreté, et crise mondiale de l'eau." Programme des Nations Unies pour le Développement (PNUD). 2006. Accessed on 15/6/2025, at: <http://hdr.undp.org>
- Weber, Max. *Le Savant et le Politique*. Catherine Colliot-Thélène (pref., trans. & notes). Paris: Éditions La Découverte, 2003.
- _____. *Le savant et le politique*. Julien Freund (trans.). Paris: Éditions Plon, 1959.
- White, Gilbert F. et al. *Water for the future, The West Bank and Gaza Strip Israel and Jordan*. Washington: National Academy Press, 1999.
- Wolf, A. *Hydropolitics along the Jordan River*. Tokyo: United Nation University Press, 1995.
- World Bank Group. "Country Climate and Development Report, Historic Trends: Water Scarcity and Droughts in Morocco." Accessed on 25/7/2025, at: <https://acr.ps/1L9B9Lr>
- World Bank Group. "Morocco: Country Climate and Development Report, CCDD: Background Paper -Water Scarcity and Droughts." Washington, DC: 2023. Accessed on 25/2/2026, at: <https://acr.ps/1L9Ball>
- World Bank. "al-Mamlaka al-Urduniyya al-Hāshimiyya: Tashjī' Inhā' al-Faqr wa-Ta'zīz al-Rakhā' al-Mushtarak, al-Dirāsa al-Tashkhīṣiyya al-Manhajīyya 'an al-Urdun." *Report*. no. 103433-JO (February 2016). Accessed on 15/8/2025, at: <https://acr.ps/1L9B9M2>
- World Bank. "Taqrīr al-Manākh wa-l-Tanmiyya al-Khāṣṣ bil-Urdun." 7 December 2022. Accessed on 12/5/2024, at: <https://acr.ps/1L9F2jK>