8

Embracing Complexity: Water and Climate Policy in the Middle East and North Africa

ALEXANDRIA FERUGLIO AND AARON TANG

8.1 Introduction

The Middle East and North Africa (MENA) region is especially vulnerable to the existential threat posed by climate change, despite the fact these countries are by no means the largest emitters. Intensified rainfall variability and greater aridity converge on a region divided by institutions and ideology, conflict which renders climate action virtually impossible.[1]

Environmental degradation has exacerbated underlying tensions of transboundary climate governance, as concerns rise over future water demand and supply. The aim of transboundary water management is to allocate water use to ensure maximum benefits to all users, while maintaining healthy ecosystems.[2] Climate change has increased uncertainty over water availability and intensified the demand side of water management, resulting in higher costs for water infrastructure and increased competition between users. This environment of uncertainty discourages States from joining international environmental agreements and making credible commitments to climate action. States have been forced to take unilateral actions to protect critical water resources, often to the detriment of other States' supply.

River basins reflect the transboundary nature of climate hazards, which do not discriminate between basin states or across borders. Overuse of water resources causes irreversible damage to ecosystems, which in turn affects all aspects of human life, particularly food and water security. Farming communities are disproportionately impacted by climate-induced water scarcity and ecosystem degradation. Increased uncertainty over resource availability thus has direct socioeconomic effects on States, limiting their politics to more immediate concerns of resource provision. Although effective water policy and resource management is critical to climate adaptation and economic development, water access in MENA is constrained by dominant paradigms of hegemony and power. These inherent power inequalities define the contours of climate policy design in the region.

The status of ecosystems and water supply is critical to reversing the effects of climate change. Ecosystem conservation facilitates adaptation through nature-based solutions for

[1] This chapter was drafted before the events of the 2023 Israel–Hamas conflict.
[2] A. Rieu-Clarke, R. Moynihan, B.-O. Magsig, *Transboundary Water Governance and Climate Change Adaptation: International Law, Policy Guidelines and Best Practice Application* (United Nations Education, Scientific and Cultural Organization, 2015), p. 35.

pluvial flood protection and water quality improvement. It also allows for mitigation, through carbon storage in the soils of wetlands. Untreated water produces excess greenhouse gas emissions, generated by the decomposition of organic matter. If ecosystems are conserved to function at optimum natural capacity, with adequate water supply, the environment is as best equipped as possible to respond to the effects of climate change. Water access also optimises agricultural productivity, thereby generating increased income for farming communities, which can then be used for further investments to build resilience against future shocks to the natural environment.

Water governance is thus the critical node of climate adaptation and mitigation in MENA, a region defined by transboundary water use and agricultural production. Shifting regional geopolitics and the compounding vulnerabilities of global warming and sea-level rise have produced an environment that is primed for consensus on water and climate action. With interests aligning like never before, these conditions give MENA a valuable opportunity to make strides towards achieving Paris Agreement targets and adapt their environment to the disproportionate effects of climate change. In this chapter we highlight the importance of politics in shaping climate policy design and implementation. Climate ambitions in MENA are inseparable from efforts to achieve consensus on water conflict. We demonstrate this with the case studies of the riparian States of the Nile River Basin, and Israel and Palestine *vis-à-vis* the Jordan River basin.

The Nile River Basin has long remained salient in the environmental discourse of the MENA region, with its Nile Delta ranked by the Intergovernmental Panel on Climate Change (IPCC) as among the most vulnerable in the world to sea-level rise.[3] The Delta faces grave risks of saline intrusion and pluvial flooding of riverbanks as its attendant population increases exponentially.[4] Unilateral construction of water projects by riparian States in the Nile River Basin reflects distinctive ambitions for regional political power, global prestige and the extreme need for natural resources. Egypt's monopoly over the Nile River Basin is facilitated by historic foreign backing and consistent non-compliance to cooperative frameworks such as the Nile Basin Initiative, in turn restricting the water access of other riparian States. As such, the climate regime of the basin is defined by State self-interest and enduring natural resource conflict, thereby preventing implementation of longer-term climate strategies which move beyond the more immediate agenda of water allocation. This chapter will explore the Grand Ethiopian Renaissance Dam (GERD) as a challenge to the water-sharing status quo, and its implications for the hostile political environment of the climate policy of the Nile.

The biophysical impacts of climate change in Israel and Palestine compound an already severely degraded environment in the Levant, which faces an acute shortage of potable water, increased desertification and flooding.[5] The 1995 Oslo II Interim Agreement between

[3] H. Elshirbiny, W. Abrahamse, Public risk perception of climate change in Egypt: a mixed methods study of predictors and implications. *Journal of Environmental Studies and Sciences* 2020, 10(3): 242–254.

[4] O. Chen, A. Abdelhalim, Y. Liu, M. Rico-Ramirez, D. Han, Climate change adaptations for food security in vulnerable areas of the Egyptian Nile – For tackling the overlooked nexus hazards of hydrological extremes and waste pollutions. *Water* 2021, 13(4): 412.

[5] Al Haq, Climate Oppression: Submission to the Office of the High Commissioner for Human Rights (OHCHR), pursuant to Human Rights Council Resolution 47/24 (30 November 2021).

Israel and Palestine institutionalised pre-existing inequalities in water allocation, perpetuating and reinforcing the cycle of water scarcity in Palestinian communities. As a result, Palestine must grapple with underdevelopment and continuous water insecurity, which in turn severely endanger its ecosystems and capacity for agricultural production.

In both case studies, climate policy design, implementation and co-operation are influenced by power politics. Pervasive inequalities span multiple levels of governance and territorial tiers. These political complexities define the contours of climate policy. Policy recommendations that do not grasp the breadth and scope of political inequalities will fail to provide sustainable climate solutions. This chapter argues that effective climate policy is not just a matter of designing the 'correct' policy instrument or framework. Options such as increasing piping efficiency, introducing water allocations, or using financial levers like extraction charges and conservation subsidies have already been the focus of previous MENA government engagement and study.[6] Co-operation between riparian States, supported by foreign investment and adaptation methodologies of the agricultural and water sectors, will also provide a profitable avenue towards achieving emissions and mitigation targets. The core issue is not a knowledge deficit of effective policy development.[7] Rather, it is how central imbalances in political structures allow certain actors to consistently maximise individual gains and compromise climate policy objectives and application. Addressing unequal power structures holistically is the only way to create equitable and effective water policy.

8.2 Egypt and the Nile Basin

8.2.1 Climate Policy and the Contest for Water

As the longest international waterway in the world, the Nile River system is a vital water source for the 10 riparian States that lie along its banks.[8] The subject of ongoing political tensions, comprising foreign intervention and investment, non-adherence to treaties and the strategic building of dams, the region is marred by the contest for water. Egypt is easily identifiable as the region's prevailing hydro-hegemon, utilising the Nile to supply 95% of the water needs of its population.[9] The country has productively leveraged the majority share of the river's water for millennia.[10] Egypt's internal hydrological potential has been largely exhausted, and thus control of the Nile River Basin is critical to securing adequate water supply for its population. Hydro-hegemonic dynamics are integral to the history of the basin and particularly the relations of Egypt, Ethiopia and the Republic of the Sudan.[11] The 1900s were defined by the ebb and flow of tripartite water extraction, agreement and

[6] O. Varis, C. Tortajada, Water governance in the Mena region: policies and institutions. Federal Ministry of Economic Cooperation and Development, policy brief. 2009; F. Roudi-Fahimi, L. Creel, R.-M. De Souza, *Finding the Balance: Population and Water Scarcity in the Middle East and North Africa* (Population Resource Bureau, 2000).

[7] B. R. Cook, M. de Lourdes Melo Zurita, Fulfilling the promise of participation by not resuscitating the deficit model. *Global Environmental Change* 2019, 56: 56–65.

[8] A. Swain, The Nile River Basin Initiative: too many cooks, too little broth. *SAIS Review* 2003, 22(2): 293.

[9] Egypt | UNDP Climate Change Adaptation (2021). www.adaptation-undp.org/explore/northern-africa/egypt.

[10] I. Ahmad, The new hydro-political situation in Africa: challenges for Nile River Basin countries. *World Affairs: The Journal of International Issues* 2018, 22(4): 60–75.

[11] Hydro-hegemony refers to strategic efforts of States to control water resources and gain regional control and dominance.

conflict, as the culture of the basin predisposes the unilateral actions of States to secure water.[12] Colonial ties and external intervention from global powers are ingrained in the socio-political makeup of the basin, from the historical influence of the Union of Soviet Socialist Republics (USSR) to, more recently, co-operation between Egypt and the People's Republic of China (PRC).[13] In the earlier decades of the pre-Cold War period, Egypt had relied on the USSR's backing to attain the majority share of available Nile water. This was such a profound alliance that it prompted the World Bank to withdraw funding for the first Aswan Dam, as Western powers were loath to enhance indirect Soviet power in the region.[14] Amid the throes of Arab nationalism, Gamal Abdel Nasser mobilised the construction of the High Aswan Dam in 1971, the largest dam in the world at the time.[15] The construction of the High Aswan Dam was seminal in solidifying the dominating influence of Egypt and upstream riparian States over the Basin's water source.[16] In the post-Cold War period, as burgeoning tensions among the basin countries grew exponentially, many scholars anticipated conflict in the region.[17] Water scarcity had increased, and questions were being raised over Egypt's rights to the majority share as populations of other upstream States continued to grow. From the mid 1980s, the river basin was peppered with unilateral development schemes which seemed to occur in response to each other.[18] On the back of a programme of action launched by the Democratic Republic of the Congo the previous year, the Nile basin countries united to form the Nile Basin Initiative (NBI) in 1999.[19] The NBI's objective is to foster joint benefit sharing while also maintaining an emphasis on long-term ecological sustainability. States agreed on this 'shared vision', which was designed to achieve sustainable socio-economic development through equitable use of Nile resources.[20] For the most part, the Nile River was thereafter viewed as a source of peace, and bilateral relationships between the riparian countries began to improve at the prospect of co-operation and shared gains. Association with the NBI allowed States to expect investment in the basin, balanced on the strategy of the shared consensus of riparian countries.[21] However, this initiative relies almost exclusively on external funding for its operation, and receives very little contribution from the basin States themselves.[22]

The Co-operative Framework Agreement (CFA) was proposed in 2010 by Ethiopia to replace the NBI, which had long been considered a transitional arrangement – a temporary alternative while an agreement with more long-term prominence was formed.[23] The CFA offered a plethora of advantages for transboundary relations. For one, it would replace the

[12] Swain, The Nile River Basin Initiative, p. 293.
[13] Egyptian exceptionalism in a Chinese-led world. Chatham House. 10 February 2021. www.chathamhouse.org/2021/02/egyptian-exceptionalism-chinese-led-world; A. Swain, Challenges for water sharing in the Nile Basin: changing geo-politics and changing climate. *Hydrological Sciences Journal* 2011, 56(4): 687–702.
[14] Swain, The Nile River Basin Initiative, p. 293.
[15] S. M. A. Salman, The Grand Ethiopian Renaissance Dam: the road to the Declaration of Principles and the Khartoum Document. *Water International* 2016, 41(4): 512–527.
[16] Swain, The Nile River Basin Initiative, p. 293.
[17] R. Clarke, *Water: The International Crisis* (Earthscan, 1991); P. H. Gleick, Water and conflict: fresh water resources and international security. *International Security* 1993, 18(1): 79–112.
[18] Z. Yihdego, A. Rieu-Clarke, A. E. Cascão, How has the Grand Ethiopian Renaissance Dam changed the legal, political, economic and scientific dynamics in the Nile Basin? *Water International* 2016, 41(4): 503–511.
[19] A. Swain, Challenges for water sharing in the Nile Basin, p. 687. [20] Ibid.
[21] A. Swain, The Nile River Basin Initiative, p. 293. [22] Swain, Challenges for water sharing, p. 687.
[23] H. Nasr, A. Neef, Ethiopia's challenge to Egyptian hegemony in the Nile River Basin: the case of the Grand Ethiopian Renaissance Dam. *Geopolitics* 2016, 21(4): 969–989.

existing agreement between Egypt and Sudan, and once adopted, establish a permanent river basin commission.[24] It would also promote a basin-wide framework for legal and institutional arrangements.[25] However, its signature and ratification by riparian States destroyed the relative balance in negotiations, and prompted Egypt and the Republic of the Sudan to renege on their decision to comply with the conditions of the NBI. Out of all 45 articles outlined by the CFA, the major sticking point was Article 14b, which endangered the implicit claims of both States as to their 'historic rights to water.' Article 14b specifically referred to the agreement of signatories 'not to significantly affect the water security of any other Nile Basin State'. Notably, Egypt and the Republic of the Sudan advocated for the appendage 'not to adversely affect the water security *and current uses and rights* of *any other Basin States*'.[26] Upper riparian ratification of the agreement was viewed by Egypt and the Republic of the Sudan as an open challenge to the political environment of the basin. As Joyeeta Gupta argues, even though transboundary relations appear to be governed by territorial sovereignty, power asymmetries and geopolitical conflict (that is, between upstream and downstream regions) remain the driving force.[27] Alas, in the absence of binding legislative power or substantial external funding, basin relations reverted to deep-seated patterns of dominating behaviour.

Undeniably, the status of the NBI as a transitional arrangement, and not one which includes a comprehensive legal framework, has negative implications for multilateral co-operation on climate adaptation policy. This shortcoming has been largely co-opted by Egypt. In place of rules that mitigate unfair and unequal power dynamics, the NBI's ambiguous guidelines have allowed powerful actors to assert their interests over others. The NBI exemplifies an agreement that offers a pathway to co-operation on climate adaptation and mitigation measures, but unfortunately lacks the ability to influence state behaviour. Despite expectations of the myriad of socio-economic developments the initiative would bring, internal pressure to develop the Nile Basin's resources eventually became unavoidable, as water scarcity and climate aridity steadily increased. As an initiative with heavy financial support from the United Nations Development Programme and the World Bank, its lack of substantial institutional and political mechanisms has muted the relevance of the NBI as an effective constraint on Nile Basin States.[28] Focus must shift to adaptive policy frameworks which can supersede entrenched norms of hydro-hegemony and historic rights to water and enforce compliance.

8.2.2 The Symbolic Value of the Grand Ethiopian Renaissance Dam

Almost surpassing the relative controversy of the Aswan Dam, the construction of the GERD was successful despite the decade-long conflict between Ethiopia, Egypt and the

[24] Swain, Challenges for water sharing, p. 687.
[25] A. E. Cascão, A. Nicol, GERD: new norms of cooperation in the Nile Basin? *Water* 2016, 41(4): 550–573.
[26] Swain, Challenges for water sharing, p. 687. Emphasis added.
[27] K. Demerew, From Red Sea to the Nile: water, power, and politics in Northeast Africa. *Third World Quarterly* 2021, 42(12): 2883–2901.
[28] M. Zeitoun, N. Mirumachi, J. Warner, Transboundary water interaction II: the influence of 'soft' power. *International Environmental Agreements: Politics, Law and Economics* 2011, 11(2): 159–178.

Republic of the Sudan. First announced in early 2011, the GERD is central to Ethiopia's hydroelectric ambitions, and has the potential to provide reliable power to over 110 million people.[29] However indispensable the potential of the GERD may be to the natural environment of Ethiopia in providing a sustainable energy source, its construction on the Blue Nile from which 59% of the water reaching Egypt originates has proven a serious sticking point in the evolving Nile Dam dispute.[30] Not only does the dam constitute an attempt by Ethiopia to topple Egypt from its role as regional water hegemon, but it also stands to intensify drought conditions and issues of water availability for the country.[31] The complex interrelations between these three States exemplify how incentives for co-operation in transboundary resource management and climate policies are tempered by power politics.

Ethiopia's role in constructing the GERD constitutes an act of resistance to the status quo of hegemony in the basin. The implications for this shift in dynamics are twofold. On the one hand, improved political stability and leadership for Ethiopia has emboldened its political capacities, enabling it to mobilise external funds, namely new economic and trade partnerships with the PRC.[32] In fact, the titular significance of the dam is a nod to the humanitarian objective of the project, to reject poverty and 'undignified life', which has been largely self-funded, complemented by the issuance of bonds by Ethiopians and interested foreign nationals.[33] Conversely, Egypt has experienced economic downturn alongside frequent shifts in decision-making, employing a more opaque regional strategy with ever-stronger links to water politicisation and securitisation. The GERD poses a real challenge to Egyptian water security and suggests that their argument of historic rights to Nile water will no longer be sufficient. Conflict has arisen as a direct consequence of this asymmetry of economic institutions and the prospect of increased water scarcity. Egypt and the Republic of the Sudan have perceived the construction of the GERD as provocation and have appeared prepared to take military action against Ethiopia.

The Sudanese response to the construction of the GERD raises concerns for the effects of power dynamics at play in transboundary relations, and the complex relationship it maintains with Egypt. Assertions of Egyptian superiority *vis-à-vis* relations with the Republic of the Sudan are enshrined in the 1959 Nile Waters Agreement between the two States, which outlined Egypt's absolute dependence on the water source as a matter of national security.[34] Another example of the 'strategic securitization' of water, this agreement formed a close and lasting relationship between the two States.[35] It also defined the contours of Sudanese–Egyptian Nile relations, as it stipulated that both countries would decide together whether other Nile riparian States might claim a share in the water sources.[36] When the prospective GERD was first announced, both Sudan and Egypt were vehemently opposed. However,

[29] Ethiopia's massive Nile dam explained. Explainer News, Al Jazeera. 2021. www.aljazeera.com/news/2021/7/8/explainer-ethiopias-massive-nile-dam.
[30] R. Tawfik, Revisiting hydro-hegemony from a benefit-sharing perspective: the case of the Grand Ethiopian Renaissance Dam (Deutsches Institut für Entwicklungspolitik, Discussion Paper 5/2015, 2015).
[31] Yihdego et al., How has the Grand Ethiopian Renaissance Dam changed the changed the legal, political, economic and scientific dynamics in the Nile Basin?, p. 505.
[32] Cascão and Nicol, GERD: new norms of cooperation, p. 550. [33] Ethiopia's massive Nile dam explained. Explainer News.
[34] Ahmad, The new hydro-political situation in Africa, p. 62.
[35] I. Fischhendler, The securitization of water discourse: theoretical foundations, research gaps and objectives of the special issue. *International Environmental Agreements: Politics, Law and Economics* 2015, 15(3): 245–255.
[36] Salman, The Grand Ethiopian Renaissance Dam, p. 512.

studies conducted by the International Panel of Experts (IPoE) demonstrated that the GERD would not threaten the Republic of the Sudan's Nile water supply and would even further aid the Republic of the Sudan with flood mitigation and increased access to power.[37] The Republic of the Sudan then solidified its acceptance of the project by announcing the planned construction of transmission lines from the GERD to its main cities.[38] Yet despite these fundamental advantages, the Republic of the Sudan has since pivoted to join Egypt against Ethiopia in the Nile–GERD dispute.[39] Once again, by aligning water usage with national security objectives, beyond the realm of normal politics, Egypt has recourse to its lasting framework of hegemony over its neighbour. A distinct pattern of power dynamics is thus revealed, one which echoes the events surrounding the breakdown of the NBI.

For all this, the GERD presents an array of advantages to Ethiopia, Egypt and Sudan in terms of regional integration and co-operation in hydropower and sustainable electricity trade.[40] The central issue is Ethiopia's assertion of dominance over regional co-operation, in an environment where Egypt has historically been the long-standing commander of basin relations. Again, the policy itself is not the issue here. It is the implementation of said policy that inherently falls within hegemonic codes of the broader politics at play. After the GERD was announced in 2011, tripartite negotiation intensified immediately as the three nations' respective ministries of water resources established an international panel of experts to further examine prospective consequences of the GERD's construction. Involving representatives from each of the three countries, the IPoE produced a report which cautioned the need for further studies, citing lack of information as a considerable risk to comprehensive assessment.[41] Although the report found the GERD would provide transformative economic opportunity for the entire region, only the Ethiopian government had complied with information provision requirements. From then on, tripartite relations have remained fraught. In 2014, Egypt withdrew itself from ministerial negotiations on the GERD, and sought instead to develop new relationships, particularly with the Republic of South Sudan ('South Sudan'), to counter Ethiopian–Sudanese rapprochement.[42] This blossoming relationship involved training of South Sudanese army personnel in Egyptian military colleges, the sharing of expertise and joint military exercises.[43] Cairo signed a water agreement with Juba that listed major hydropower projects to be funded by an Egyptian grant scheme. Egypt continued to extend its reach of military co-operation across the horn of Africa to indicate its influence over Ethiopia's regional interests.[44] In 2015, the three leaders signed a historic deal known as the Declaration of Principles (DoP), balanced on

[37] Yihdego et al., How has the Grand Ethiopian Renaissance Dam changed the legal, political, economic and scientific dynamics in the Nile Basin?, p. 505.
[38] Gleick, Water and conflict, p. 79.
[39] F. Gebresenbet, D. Y. Wondemagegnehu, New dimensions in the Grand Ethiopian Renaissance Dam negotiations: ontological security in Egypt and Ethiopia. *African Security* 2021, 14(1): 80–106.
[40] Tawfik, Revisiting hydro-hegemony from a benefit-sharing perspective.
[41] Demerew, From Red Sea to the Nile, p. 2883.
[42] Tawfik, Revisiting hydro-hegemony from a benefit-sharing perspective.
[43] Disabled South Sudanese soldiers stage protest over unpaid salaries. Sudan Tribune (blog, 25 March 2014). https://sudantribune.com/article49269/; A. Melhem, New chapter begins in Israel–Palestine water dispute. Al-Monitor. 2017. www.al-monitor.com/originals/2017/06/palestine-israel-joint-water-committee-dispute-meeting.html.
[44] Tawfik, Revisiting hydro-hegemony from a benefit-sharing Perspective.

the idea that any Nile development must 'do no harm' to other basin States.[45] This agreement unequivocally established core principles of international water law alongside norms of prevention and an understanding of up- and downstream diverging water needs.[46] It echoes the provisions of United Nations (UN) watercourses, but also accounts for co-operation and acceptance of the GERD. The DoP was also directly tasked with implementing the recommendations of the IPoE and outlined that the three parties must co-ordinate mechanisms of monitoring the dam's impacts within 15 months.[47] However, despite clear stipulations of co-operation outlined in the DoP, said meeting did not occur within the time frame. The agreement remains a tool of normative 'soft governance' that has done little to subdue increasing aggravation from Egypt against Ethiopia. These weak institutions undermine the climate adaptation potential of the Nile, as States are afforded unequal water allocations which damage their ecosystems and endanger food security. In a similar vein, lacking institutions invite conflict over co-operation, which undercut the collective benefits of large-scale innovative developments such as the GERD.

Although this breakdown of relations exemplifies that hydro-hegemony is not absolute and can be fractured with enough political will, economic power and foreign backing, it also reaffirms that political drivers are intrinsic to climate policy implementation. Although Ethiopia's GERD project represents large-scale innovative climate policy development, these advantages are undermined by pervasive political instability in the basin.

8.3 The Levant

8.3.1 Climate Policy, Power Relations and Water

The Levant faces intersecting climate hazards of intensified rainfall variability, water scarcity, desertification and saline intrusion into groundwater.[48] The protracted longevity of conflict and occupation has emerged as an increasingly singular aspect of the Israeli–Palestinian climate regime, which has resisted various forms of international laws and conventions. Israel, as basin hegemon, enacts so-called 'climate apartheid' via restriction of potable water, contamination of coastal aquifers and the eradication of arable Palestinian land.[49] Shared with Palestine, Jordan, Lebanon and Syria, the Jordan River Basin is riven by the powers of its hegemon, Israel. The crisis of transboundary water management in the Jordan River Basin is no new phenomenon, nor are its conditions of severe environmental strain. Since its occupation in 1967 of the remaining 22% of historical Palestine, Israel has exerted almost absolute control over Palestinian water resources.[50] Treaties associated with

[45] S. M. A. Salman, Agreement on the Declaration of Principles on the GERD: levelling the Nile Basin playing field, in Z. Yihdego, A. Rieu-Clarke, A. E. Cascão (eds.), *The Grand Ethiopian Renaissance Dam and the Nile Basin: Implications for Transboundary Water Cooperation* (Taylor & Francis Group, 2017), p. 65.

[46] Yihdego et al., How has the Grand Ethiopian Renaissance Dam changed the legal, political, economic and scientific dynamics in the Nile Basin?, p. 505.

[47] Salman, The Grand Ethiopian renaissance, p. 512.

[48] M. Mason, M. Zeitoun, R. El Sheikh, Conflict and social vulnerability to climate change: lessons from Gaza. *Climate and Development* 2011, 3(4): 285–297.

[49] Al Haq, Climate oppression: submission to the Office of the High Commissioner for Human Rights (OHCHR), pursuant to Human Rights Council Resolution 47/24 (30 November 2021).

[50] H. S. Salem, Z. Yihdego, H. H. Muhammed, The status of freshwater and reused treated wastewater for agricultural irrigation in the Occupied Palestinian Territories. *Journal of Water and Health* 2021, 19(1): 120–158.

the Jordan River demonstrate that compliance with the conditions outlined by its hegemon in no way reduces costs to weaker States. In manifold ways, hydro-hegemony over the basin emulates the dynamics of the 'occupier' and the 'occupied', and as such, a finer-grained treatment of politics is justified. These central political ruptures at the interface of conflict and climate consistently prevent formal adoption of transboundary water agreements, and in turn the implementation of effective climate policy.[51] As Fischhendler states, the shared hydrology of the river basins inextricably links riparian States within a network of political interdependencies.[52] The securitisation of water, when appropriated to connote a 'national security' imperative, such as it is, is elevated from a low politics issue to one which may defy regular political processes. This messaging favours the historic hydro-hegemon, ensuring that outcomes of water allocation are entirely dictated by power relations. Unsurprisingly, the political conditions of Palestinian climate response are severe. The marked lack of institutional capacity and legal frameworks of water allocation established in 1995 are effectively accepted by the international community, even as the Palestinian population has almost doubled. It has also been asserted that Israel's invasion of the West Bank and (properly Syrian) Golan Heights in 1967 was in part motivated by a desire to control the majority share of the Jordan River, and the aquifers in the West Bank. The nexus of shared hydrology and power politics is thus central to climate policy in the Jordan River basin. Unequal water policy flows into other associated effects of climate change, in a region with heavy reliance on climatic conditions for agricultural production. Water insecurity is a systemic issue intrinsic to climate policy, as it imbues other areas of social and economic development.[53]

Gaza provides a suitable illustrative case to further examine the central feedback loop of power politics, as a Palestinian enclave that also shares borders with Israel and Egypt. It is estimated that only 10% of its population of two million have direct access to clean and safe drinking water.[54] Gaza's coastal aquifer is integral to Palestinian life, as its sole freshwater resource, of which only 4% of the water extracted annually is potable. Reliance upon the aquifer is already precarious, as its groundwater level has dropped to 10 m below mean sea level. Israel's overuse of agricultural pesticides and insufficient waste management capacities have significantly worsened the quality of the available water.[55] As previously stated, wastewater accelerates the effects of climate change by increasing the amount of greenhouse gas emissions released into the atmosphere. It also contributes to a whole host of hygiene and sanitation issues, which spread disease in Palestinian communities. Following the Interim Agreement on the West Bank and the Gaza Strip of 1995 – also known as the Oslo II Accord – a period of comparatively cordial relations between Israel and Palestine allowed for progress

[51] G. Joffé, The impending water crisis in the MENA region. *The International Spectator* 2016, 51(3): 55–66; F. J. Khouri, The Jordan River controversy. *The Review of Politics* 1965, 27(1): 32–57; D. M. Wishart, The breakdown of the Johnston negotiations over the Jordan waters. *Middle Eastern Studies* 1990, 26(4): 536–546.

[52] Fischhendler, The securitization of water discourse, p. 245.

[53] D. Helbing, Globally networked risks and how to respond. *Nature* 2013, 497(7447), 51–59.

[54] A. Beshtawi, The Human Right to Water and the Realisation of Water Rights in the Occupied Palestinian Territory. *Utrecht Law Review* 2020, 16(2): 137–149.

[55] M. K. El-Sayed, R. S. Mansour, Water scarcity as a non-traditional threat to security in the Middle East. *India Quarterly* 2017, 73(2): 227–240.

in policy issues areas such as bilateral aquifer management.[56] However, sparks in political tensions, driven by continued Israeli settlements, have stymied climate diplomacy and policy progress.[57] The majority share of quality agricultural land and water sources is syphoned by Israel to support illegal settlements, which have amassed a 'settler' population of some 640,000 in the West Bank. These settlements have been proven to exacerbate the environmental degradation of the West Bank through land clearing to create roads inaccessible to Palestinians and severe contamination of the aquifer.[58] More than 108,000 m^3 of untreated sewage flow daily from Gaza into the Mediterranean Sea, creating overwhelming public health hazards in Gaza, Israel and Egypt.[59] As such, the environmental management arrangements under Oslo II are scarcely applicable. In lieu of abiding by binding international law or agreements, Israel is able to exert its dominance over Gaza and severely contaminate a crucial water resource. Climate planning of the Occupied Palestinian Territories is regularly undermined by lack of access and information provision given to stakeholders and third parties trying to conduct participatory vulnerability assessments.[60] These actions are further manifestations of institutional securitisation by the hegemonic power Israel, through the exclusion of civil society members in climate governance strategy and negotiation.

Alongside water, soil is fundamental to climate resilience. It facilitates the environment's natural capacity for carbon storage.[61] When plants die, the carbon they once absorbed from the atmosphere is returned to the soil. As a result of this process, global soil supplies contain more organic carbon than the entire atmosphere and all of its plants combined. As such, adaptation and mitigation methodologies have become centralised around the importance of soil, encompassing agricultural and land management strategies and soil-based sequestration.[62] This contextualises the impact of Israel's sustained attacks against Palestine, ranging from dropping 21,000 tons of explosives in 2014 to the damage incurred from consistent pilfering of natural resources.[63] Israel's efforts to clear agricultural lands along the Eastern border of Gaza have even involved periodic spraying of crop-killing pesticides dropped strategically from military planes, carried by the wind across borders.[64] In this sense, the soils of Gaza have become a site of warfare, weaponised by Israel *vis-à-vis* Palestine, to the direct detriment of its natural environment. Given that Israeli seizure of Palestinian natural resources is an extension of this intrinsic power dynamic, which flouts international norms and laws, resolution will require a holistic approach to the core politics of the issue.

[56] E. Rached, D. B. Brooks, Water governance in the Middle East and North Africa: an unfinished agenda. *International Journal of Water Resources Development* 2010, 26(2): 141–155.
[57] Joffé, The impending water crisis, p. 55.
[58] Adaptation to climate change induced stress in the Nile Basin. United Nations Environment Program. www.unep.org/news-and-stories/story/adaptation-climate-change-induced-stress-nile-basin.
[59] S. Efron, J. R. Fischbach, I. Blum, R. I. Karimov, M. Moore, *The Public Health Impacts of Gaza's Water Crisis: Analysis and Policy Options* (RAND Corporation, 2018).
[60] Mason et al., Conflict and social vulnerability to climate change, p. 285.
[61] Can soil help combat climate change? State of the Planet (blog, 21 February 2018). https://news.climate.columbia.edu/2018/02/21/can-soil-help-combat-climate-change.
[62] Ibid.
[63] H.S. Salem, Geopolitical challenges, complexities, and future uncertainties in the Occupied Palestinian Territories: land and population's perspectives. *New Middle Eastern Studies* 2020, 10(1): 45–82.
[64] Herbicidal Warfare in Gaza. Forensic Architecture. 2021. https://forensic-architecture.org/investigation/herbicidal-warfare-in-gaza.

The effects of climate change on the demand side of water are crucial, as some sectors are more sensitive to water availability than others. The agricultural sector of the MENA region exemplifies this causal relationship, as the Nile Basin is responsible for nearly 75% of total water withdrawal in the surrounding region.[65] Equitable water management constitutes an ecosystem-based climate change adaptation measure, ensuring sustainable use of resources which aims to increase resilience within the natural system. Water, and in turn soil, provide two immeasurable sites of climate change adaptation for MENA, which have been constrained by the contest for water. Common agricultural practices in the region provide an example of this. Popular methods such as tilling, the use of fertilisers and overgrazing involve the excessive movement of soil, with natural dispersion into the atmosphere.[66] The importance of soil sequestration to intensely cultivated regions is exceedingly beneficial to climate adaptation measures, one easily implemented through development of public awareness. This understanding has now become central to strategies at Conferences of the Parties (COPs) to the UNFCCC, and even formed the basis of 4p1000, which was launched in COP21.[67] A study in 2017 found that with more effective management and awareness of agricultural adaptation practices and sequestration potential, global croplands have the potential to store nearly 2 gigatons of additional carbon each year – equivalent to the amount emitted by the entire transportation sector.[68] Therefore, in order to harness the abundant potential of Egypt's natural resources in climate mitigation and adaptation, the focus must move beyond the mere access to water towards methodologies that embrace what is already available. Changes in the water demand side will have disproportionate effects on the MENA region as a result of this heavy reliance on water, and thus the cross-border water policy agenda must be driven by climate adaptation and mitigation opportunities.

8.3.2 Bad Deal or No Deal? The Legacy of Oslo II

Effective cross-boundary climate governance requires international and inclusive co-operation. However, the involvement of multiple stakeholders does not always ensure equitable policy processes or outcomes. 'Co-operation' can still be tokenistic and coercive, as is seen in MENA climate policy.[69] Facing critical resource scarcity and climate pressures, States do not always have the capacity to challenge existing power structures.[70] Climate impacts impinge on State capacity to negotiate, design and implement effective policy. However, a bad deal of imperfect and inequitable policy can be preferable to no deal. The Oslo II Accord between Israel and Palestine is an example of such a coercive deal. Oslo II was a complex document outlining the contours of Israel–Palestine co-operation. Designed as a stepping stone for further peace negotiations, Palestinian desire for statehood was woven significantly into the negotiation process. A hardline negotiation approach on the

[65] Egypt, UNDP Climate Change Adaptation. 2023. www.adaptation-undp.org/explore/northern-africa/egypt.
[66] R. Cho, Can soil help combat climate change? Columbia University News. 2018. https://news.climate.columbia.edu/2018/02/21/can-soil-help-combat-climate-change.
[67] B. Minasny, B. P. Malone, A. B. McBratney, et al., Soil carbon 4 per mille. *Geoderma* 2017, 292: 59–86. [68] Ibid.
[69] M. Zeitoun, N. Mirumachi, Transboundary water interaction I: reconsidering conflict and cooperation. *International Environmental Agreements: Politics, Law and Economics* 2008, 8(4): 297–316.
[70] Zeitoun et al., Transboundary water interaction II, p. 159.

Palestinian side risked compromising future negotiations and the long-term objective of future statehood.[71] Marginal gains were preferable to a 'no deal' of continued conflict and reduced prospects of sovereignty and recognition.[72] Such policy compromises are reflected in Oslo II's treatment of water allocations, which are heavily skewed in favour of Israel. Israel would continue using 87% of the supply of the West Bank's two aquifers, with Palestine only using 13%.[73] Palestinian water rights are formally recognised in annex III articles 40.1 to 40.3, but they provide neither further substance nor policy implications.[74] Rather than changing unfair and unequal water practices, Oslo II institutionalised them into law. This laid the foundations for contemporary vulnerabilities to climate-worsened water scarcity – the Israeli allocation set the stage for the unilateral overuse of water resources beyond the basin's regenerative capacity, compromising collective water access and quality, and the Palestinian allocation created water insecurity and vulnerabilities that strain adaptive capacities, especially when taken together with climate change. Given that water scarcity in Israel and Palestine occurs almost exclusively as a result of anthropogenic change, these allocations are at the crux of climate adaptation of the States of the Jordan River basin. Overexploitation and unilateral overuse of water resources beyond the basin's regenerative capacity will result in permanent damage to ecosystems, compromising collective water access and quality. Moreover, rights to water and land are synonymous with climate justice. Institutionalising principles of Palestinian water rights, both implicitly via allocations and explicitly via agreement text, in theory is a major step in Palestinian agency in gaining some control over their own natural environment. Rather than changing unfair and unequal practices, Oslo II institutionalised them into law. The discursive meaning of Oslo II outlines the blueprint for co-operation between both States on climate adaptation, mitigation and resilience measures, a relationship defined by hegemony and overexploitation.

Palestinian adaptive capacity was further eroded with the organisations that Oslo II created, even though they were nominally designed to increase Palestinian agency. Article 40.11 establishes the Joint Water Committee (JWC), mandated to facilitate co-operative management of water resources by granting project approvals for infrastructure developments. The JWC is composed of an equal number of representatives from Israel and Palestine (per article 40.13). Palestinian decision-making input is built into its organisational design, placed on equal footing with Israeli counterparts. This is in theory a positive direction for equitable and inclusive water and adaptation policy. However, more granular analyses of JWC implementation reveal a more unequal picture. Project approvals are almost exclusively determined by Israel – indeed, from 1995 to 2008, Palestinians approved

[71] O. Barak, The failure of the Israeli–Palestinian peace process, 1993–2000. *Journal of Peace Research* 2005, 42(6): 719–736.

[72] J. A. Weiner, Israel, Palestine, and the Oslo Accords. *Fordham International Law Journal* 1999, 23(1) 230; Y. Sayigh, Arafat and the anatomy of a revolt. *Survival* 2001, 43(3): 47–60.

[73] J. Selby, Dressing up domination as 'cooperation': the case of Israeli–Palestinian water relations. *Review of International Studies* 2003, 29(1): 121–138. It is widely cited that Oslo II directly partitions water along percentage allocations. Al Jazeera, for instance, cites a 71:17 allocation from Oslo II. Rather, schedule 10 of Oslo II estimated existing extractions and potentials (per mn^3), with Selby (ibid.) putting forward an 87:13 estimate. This estimate has become widely used to describe Oslo II commitments. For clarity, it is worth in the future differentiating between Oslo II commitments themselves and the *ex-post* percentage estimates of policy analysts.

[74] S. Klawitter, Water resources at stake: the mountain aquifer beneath the Occupied West Bank, Palestinian Territories (2006). https://hdr.undp.org/en/content/water-resources-stake.

almost all projects proposed by Israel, whereas Israel approved only around half of Palestinian-proposed projects.[75] Critically, the vast majority of Palestinian permits for Area C (under full Israeli control) were denied. This is significant, as Area C comprises 60% of the West Bank. Cutting off Palestinian developments and repairs in such a large portion of the West Bank precludes the effective integration and co-ordination of Palestinian water infrastructure at a larger level, thus compromising adaptive capacity to climate-worsened water scarcity. Furthermore, Israeli approval of Palestinian projects was often made on condition of Palestine approving Israeli projects.[76] This conditionality stoked Palestinian resistance and withdrawal from the JWC, eventually leading to a seven-year suspension of the body's activities from 2010 to 2017.[77] Taken together, these events paint a picture not of inclusive and equal co-operation, but of institutionalised power politics and exploitation. Such actions increase vulnerability and weaken adaptive capacity to respond to climate-worsened water scarcity.

Israeli water exploitation continues to this day, compromising Palestinian water security and climate adaptive capacity through the vehicle of Mekorot – Israel's state-owned water carrier and utility.[78] Mekorot's water extraction is prolific to the point of severely compromising water source quality and quantity, and thus the natural systems of the climate of Palestine. The Wadi Auja spring ('وادي العوجا') is a prominent example of a critical water source for Palestine. Mekorot's upstream well digging of the spring has dried out the resource for Palestinian communities downstream.[79] This is essentially direct diversion of water away from Palestinian communities to Israeli settlements. Across Palestinian territories, Mekorot is notorious for a wide range of similar extraction practices that severely endanger its climate.[80] Mekorot's extraction may be justified as adaptation to climate-worsened water scarcity, but it also increases the vulnerability and water insecurity of Palestinian communities. Such maladaptive policies are rooted in and enabled by historical power inequalities. The result is massive underdevelopment of Palestinian water resources and infrastructure, and low adaptive capacity facing worsening climate impacts. With insufficient well developments and repairs, as well as declining supply from springs, Palestinian water production in the West Bank dropped by 20 cubic megametres between 1995 and 2013[81]. During this period, population density has increased, and climate-induced stressors have become increasingly severe.

The 1997 Convention on the Law of Non-Navigational Uses of International Watercourses ('Watercourses Convention') limits territorial sovereignty over water, but remains ultimately ineffective.[82] The Watercourses Convention is characterised by overly

[75] Selby, Dressing up domination as 'cooperation'.
[76] A. Abu-Baker, Water-deprived. *Sur — International Journal on Human Rights* 2017, 25: 37–55.
[77] Melhem, New chapter begins in Israel–Palestine water dispute.
[78] R. Sarsak, M. N. Almasri, Health of Palestinians, water and coastal aquifer in Gaza – authors' reply. *The Lancet* 2014, 383(9924): 1207–1208.
[79] A. Butmeh, Palestine is a climate justice issue. 2019. www.aljazeera.com/opinions/2019/11/28/palestine-is-a-climate-justice-issue.
[80] M. Najib, Palestine runs dry: 'our water they steal and sell to us'. 2021. www.aljazeera.com/news/2021/7/15/water-war-palestinians-demand-more-water-access-from-israel.
[81] Selby, Dressing up domination as 'cooperation'.
[82] J. Gupta, The Watercourses Convention, hydro-hegemony and transboundary water issues. *The International Spectator* 2016, 51(3): 118–131.

vague provisions that are difficult to enforce, with concordantly poor compliance from signatories.[83] For instance, the Watercourses Convention highlights the core principles that water use avoid significant harm (article 7) and be equitable and reasonable (article 5). But what constitutes 'significant harm', and what is 'equitable and reasonable'? Without prescribed weight of crucial factors of the Watercourses Convention, its implementation is shaped by political interests instead of international law. Consequences for non-compliance (that is, water use causing significant harm with insufficient prior notification) are similarly vague. An offending actor needs to 'take all appropriate measures . . . to eliminate or mitigate such harm and, where appropriate, discuss the question of compensation' (article 7.2). What constitutes 'appropriate measures', or the choice between elimination or mitigation, are once again highly subjective, and crucially do not carry a time frame for implementation. Indeed, timing is another critical flaw of the Watercourses Convention. Although signed in 1997, the Watercourses Convention only entered into force in 2014. By then, inequitable water use and policies were deeply entrenched in political and urban systems, particularly in the MENA region. With its focus on prevention, little guidance is given regarding retributive and restorative water policy. In the time taken for the Convention to be implemented, it became unfit for purpose: in the absence of a strong rules-based system, politics and sovereign self-interests dominate. In the case of the MENA region, inequitable power politics are institutionalised within climate law and policy.

8.4 Prospects

The humanitarian overtones of the DoP provide an example of theoretically 'good' policy designed to mitigate risks of conflict. Similarly, the GERD itself epitomises nominally 'good' water policy from several perspectives – its approach towards regional economic integration, Nile Basin regime shift and the emphasis it places on links between water politics and climate adaptation measures.[84] The marked lack of institutional mechanisms to enforce compliance with the DoP undermines its potential, however, just as the political environment encourages conflict over basin disagreements despite inherent climate benefits. The GERD, and relations between the three States on the whole, has once again dissolved into a security dilemma.

Low levels of institutional trust and credibility in the MENA region are a unique facet of intra-State relations that prevent co-operation and result in increased costs to governments.[85] The totality of the current policies surrounding the GERD epitomise water relations of the Nile Basin, where a sustainable process is constrained by water scarcity and conflict. Moreover, the preponderant focus on the material aspects of water security neglect to address the issues across both macro and micro levels. The implications of shifting Nile relations for state identity and biological continuity will inexorably influence climate policy moving forward. Consideration of the asymmetry of statecraft and these

[83] C. A. Krakow, The international law and politics of water access: experiences of displacement, statelessness, and armed conflict. *Water*2020, 12(2): 340.
[84] Cascão, Nicol, GERD: new norms of cooperation, p. 550.
[85] J. B. Alterman, N. Hall, W. Todman, *Sustainable States* (Center for Strategic and International Studies: 2021).

regional dynamics must be taken into account to address political drivers of policy inefficacies, to create more equitable and sustainable water policy frameworks.

Water security is a fundamental tenet of climate policy and adaptation.[86] The overarching theme across both case studies is centred around how politics pervade essentially every aspect of climate policy, from design through to implementation. While we focus on the MENA region, we can observe similar patterns of politics pervading climate policy elsewhere. For example, in the Australian context, the Water Act 2007 (Cth) – which was enacted to ensure that management of Australia's largest water resource, the Murray–Darling River Basin, be handled in the national interest[87] – is a nominally robust water-sharing policy on its face, spurring a multi-billion dollar funded implementation plan in 2012.[88] However, contestation over agricultural politics resulted in critical overextraction of the Murray–Darling Basin.[89] Returning to the European perspective, the 2000 Water Framework Directive (WFD) aimed to prevent deterioration of water sources.[90] The original WFD has been criticised for being too complex to apply across the diversity of EU States, yet too soft in its commitments to create sufficient policy action. WFD complexity and ambition has been attributed to environmentalist non-governmental organisation (NGO) lobbying, whereas soft commitments can be directly traced back to the diverging self-interests of EU States.[91] The agreements examined in this chapter have revealed similar shortcomings. At the biggest picture policy levels, similar patterns remain. The soft 'pledge and review' system of the Paris Agreement (where the main commitment is to submit a new climate target every 5 years) was specifically used to ensure that the United States could join by way of Presidential Executive Order, bypassing the significant and often fatal hurdle of Senate approval.[92] The preceding Kyoto Protocol included binding emissions reductions. Consequently, U.S. ratification was undermined by bipartisan resistance in the U.S. Senate.[93] Non-participation by the United States is one of the reasons for the Kyoto Protocol's failure to curb emissions.[94] There is an international theme of broader political drivers, themselves at times an opaque black box,[95] being the critical node of effective policy design and implementation. Even extant literature that emphasises the importance of complexity and intellectual humility still frames the aim of research to 'serve policy that will reach those

[86] M. Zeitoun, B. Lankford, T. Krueger, et al., Reductionist and integrative research approaches to complex water security policy challenges. *Global Environmental Change* 2016, 39: 143–154.
[87] Commonwealth of Australia, Parliamentary Debates, House of Representatives, 14 August 2007, 5 (Anthony Albanese, Shadow Minister for Water and Infrastructure).
[88] R. Q. Grafton, Policy review of water reform in the Murray–Darling Basin, Australia: the 'do's' and 'do'nots'. *Australian Journal of Agricultural and Resource Economics* 2019, 63(1): 116–141.
[89] Y. Chen, M. J. Colloff, A. Lukasiewicz, J. Pittock, A trickle, not a flood: environmental watering in the Murray–Darling Basin, Australia. *Marine and Freshwater Research* 2021, 72(5): 601–609.
[90] European Commission, Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 Establishing a Framework for Community Action in the Field of Water Policy, [2000] OJ L 327.
[91] T. Giakoumis, N. Voulvoulis, The transition of EU water policy towards the Water Framework Directive's Integrated River Basin Management Paradigm. *Environmental Management* 2018, 62(5): 819–831.
[92] L. Kemp, Bypassing the 'ratification straitjacket': reviewing US legal participation in a climate agreement. *Climate Policy* 2016, 16(8): 1011–1028. See also, for example, the Senate rejection of the *Treaty of Versailles – Appendix and Index to Parts 1 to 9 of the Proceedings and Debates of the Second Session of the Sixty-Sixth Congress* (Government Printing Office, vol. LIX, pt. 9, 1929), pp. 8979–8980.
[93] J. Hovi, D. F. Sprinz, G. Bang, Why the United States did not become a party to the Kyoto Protocol: German, Norwegian, and US perspectives. *European Journal of International Relations* 2012, 18(1): 129–150.
[94] Q. Schiermeier, The Kyoto Protocol: hot air. *Nature* 2012, 491(7426): 656–658.
[95] A. Closas, K. G. Villholth, Groundwater governance: addressing core concepts and challenges. *WIREs Water* 2020, 7(1): e1392.

most negatively impacted by resource allocation'.[96] Indeed, creating more implementable climate policy recommendations often requires the simplification of social and political complexity. Otherwise, these can result in policies that are blind to existing inequalities. The alternative is to be wholly engaged in the sheer complexity of politicised natural resource management. While this may illustrate a more accurate picture, this risks only providing broad discussions of 'wicked', 'intractable' problems that are too difficult to meaningfully address. This is a recurring issue with climate policy, which unravels when faced with these definitions.

Similar patterns of politics pervading policy can be seen in MENA's relatively poor decarbonisation policy. Saudi Arabia, for instance, is a well-known climate laggard in UN climate arenas. However, the underlying politics provide important context. A drastic move away from oil- and fossil-based economies would rapidly affect regional balances of power, potentially flowing into political instability across the MENA region.[97] Reducing emissions cannot be solely framed from the perspective of energy and economics, as is commonly the case in energy literature.[98]

For future policy, we emphasise the importance of recognising the broader political context, both at large and small scales. The technical details of policy are important, but can simply reflect and reinforce existing inequalities if treated in a rationalist technocratic vacuum. We therefore recommend that:

1. Policy analysis should start from the political landscape, and identify policy windows that policy amendments or new approaches can be built from.[99] Resolving key political and power imbalances should be prioritised alongside the details of technocratic water management and adaptation.
2. Policy processes, from initial ideation through to implementation, should ensure diverse and equitable representation and engagement.
3. Relatedly, improving bottom-up adaptive capacity is critical. Adaptation relies especially on local context and knowledge.[100] This is particularly important when trying to equitably balance the different needs of different communities.
4. Finally, policy should focus on systemic policy *packages* rather than single policy instruments. The problems that MENA faces are many and complex. The technical complexities of effective mitigation and adaptation are compounded by political divides with decades deep roots intertwined with the legacy of colonial politics.[101] Effectively addressing adaptation, and broader climate policy, requires multiple complementary policies to hit at multiple points within complex social, political, and environmental systems.

[96] Zeitoun et al., Reductionist and integrative research approaches to complex water security policy challenges, p. 143.
[97] R. Mills, A fine balance: the geopolitics of the global energy transition in MENA, in M. Hafner, S. Tagliapietra (eds.), *The Geopolitics of the Global Energy Transition* (Springer International Publishing, vol. 73, 2020), pp. 115–150; D. Manley, J. F. Cust, G. Cecchinato, Stranded nations? The Climate policy implications for fossil fuel-rich developing countries. OxCarre Policy Paper 34. 2017. http://dx.doi.org/10.2139/ssrn.3264765.
[98] B. K. Sovacool, Diversity: energy studies need social science. *Nature* 2014, 511(7511): 529–530.
[99] D. C. Rose, N. Mukherjee, B. I. Simmons, et al., Policy windows for the environment: tips for improving the uptake of scientific knowledge. *Environmental Science & Policy* 2020, 113: 47–54.
[100] D. Conway, R. J. Nicholls, S. Brown, et al., The need for bottom-up assessments of climate risks and adaptation in climate-sensitive regions. *Nature Climate Change* 2019, 9(7): 503–511.
[101] N. Faulkner, *Empire and Jihad: The Anglo-Arab Wars of 1870–1920* (Yale University Press, 2021); D. Freeman-Maloy, Remembering Balfour: empire, race and propaganda. *Race & Class* 2018, 59(3): 3–19.

The hosting of UNFCCC COPs in 2022 and 2023, in Egypt and the United Arab Emirates (UAE), respectively, are hoped to yield important outcomes for international climate policy. The objective of these COPs is to finalise the remaining operational issues required to implement the objectives of the Paris Agreement. Key to this process is the clarification of the information and reporting necessary to conduct the Paris Agreement's Global Stocktake (a collective review of countries' progress). While Egypt and the UAE play a diplomatic 'negotiation chair' role, the key drivers of outputs are other countries with strong political positions. Transparency and reporting of the Global Stocktake, for instance, is likely to be driven by the PRC and the United States. These are important policy developments at the international level, but are not necessarily important for boots-on-the-ground implementation, especially of complex adaptation policy. UN climate processes have historically marginalised adaptation. Most countries' Paris Agreement Nationally Determined Contributions focus on mitigation efforts, and international adaptation funding has substantially lagged behind mitigation.[102] Policy implementation issues that are critical to effective adaptation policy, like resolved power inequalities or ensuring diverse and equitable representation, will not be resolved by international climate policy platforms.

8.5 Conclusion

Integrative and interdisciplinary analyses are critical to climate policy, especially as the environmental stresses and conflicts we discuss are steadily increasing. This chapter identifies common patterns of power dynamics across the Jordan River Basin in Israel and Palestine, and between Egypt, the Republic of the Sudan and Ethiopia as they reflect zero-sum power politics. What is common to both cases is a pervasive influence of deeply entrenched norms of hegemony and State-versus-State perspective of transboundary water politics, which undermine effective climate policies. Under this rubric of power dynamics, truly effective and equitable climate policy is unattainable. The self-reinforcing feedback loop of water stress, political fractures and ineffective climate policy in MENA needs to be addressed. Systemic issues require systemic solutions. Broader shifts in institutions to distribute power and promote regional stability may themselves be understood as good water and climate policy. Addressing underlying political and social inequalities requires moving beyond the technical – beyond the physical science and engineering of water policy. It is a task that deals in power and complex interrelations. Fragmented reductionist policy is a drop in the ocean of deepening water and climate issues. An integrative and interdisciplinary policy approach that considers the broad scope of water and climate politics as it spans territorial and legislative tiers provides the best chance of a more equal future for MENA.

[102] United Nations Environment Program, Adaptation Gap Report 2022 (United Nations Environment Programme, 2022). www.unep.org/resources/adaptation-gap-report-2022.