Chapter 8
Overcoming the Environmental Challenge in the MENA Region

Abstract  The triple challenge of climate change, increasing populations and rapid urbanization is creating unique challenges to MENA countries. Whilst coastal cities like Alexandria risk falling into the sea due to rising sea levels, the Dead Sea is drying up and Jeddah experiences annual floods. The challenges are made worse by government mismanagement through poor town and regional planning or looking for short-term solutions to waste-management as opposed to seeking more sustainable solutions. Environmental challenges can be mitigated through innovative forward-looking solutions with MENA states working in partnership with civil society, the private sector, neighbouring states, and international stakeholders such as the World Bank. Morocco’s partnership with the World Bank and the private sector to arrive at a more sustainable waste management system, Jordan and Israel working together to save the Dead Sea, and the nascent promise of the Nile Basin Initiative are all different facets of attempts at overcoming environmental challenges posed.

Keywords  Climate change · Desalination · Environment · Sea level · Water

8.1 Introduction

Whilst war in Syria and Yemen, the possibility of conflict with Iran, sectarian conflict and economic stagnation have preoccupied the minds of Arabs of late, it is equally clear that environmental challenges are increasingly coming to the fore. This is evident in results from Wave 5 of the Arab Barometer. Seventy percent of those surveyed regard water pollution as a very serious threat, whilst 66 percent regarded the collection and disposing of trash as a very serious threat. A further 44 percent regard air quality in their area as a serious threat to their life and lifestyle (Green 2019). What accounts for this growing environmental concern? The steep rise of population growth, evinced by the youthful demographic pyramid across the Middle East North Africa (MENA) region, is placing strain on already fragile ecosystems, made worse by climate change.
Massive urbanization is also adding further strain to local governments across the region. There was a 400 percent growth in urbanization between 1970 and 2010 and the pace of urbanization between 2010 and 2050 is expected to be 200 percent. To put it into perspective whilst 56 percent of the total population of 357 million MENA citizens lived in cities in 2010, by 2050, 68 percent of the region’s 646 million residents will live in cities. This makes the Arab countries amongst the most urbanized in the world. Of course, there are regional variations. Whilst Egypt is currently 43 percent urbanized, the figure for Lebanon is 87 percent and places like Dubai are de facto city-states and is practically 100 percent urbanized (Schafer 2013).

How governments, local and national, respond to the threats posed will determine the future of the region as a whole. What this paper seeks to do is to map out the nature of the environmental challenge and what governments can do to mitigate it deleterious impact on its citizens.

8.2 Nature of the Challenge Posed

The MENA region, together with the rest of the planet, is getting hotter. Unlike the rest of the planet, the heat in the MENA region will be experienced far more severely as a result of the phenomenon of “desert warming amplification” which creates a feedback loop that intensifies heat in already-hot desert climates (Kramer 2016). Soil, already dry, will become drier holding tremendous risks for food insecurity. An already inhospitable climate will increasingly becoming uninhabitable. According to researchers from Germany’s Max Planck Institute who had assembled data from 1986 to 2005 and compiled over two dozen models, even under the best-case models, temperatures are set to rise by 4 °C across the MENA region by 2050. Heatwaves by 2050 will be ten times more frequently, than currently, experienced. By 2050 summer temperatures in the MENA region will stay above 30 °C whilst day time temperatures will hover at 46 °C. The latter will increase to 50 °C by the year 2100 (Dvosky 2016). There is already evidence for this future scenario. In 2016, the MENA region recorded its highest temperature of 54 °C at Mitribah in Kuwait and Basra in Iraq saw temperatures soar to 53.9 °C. In June 2017 in Sweihan in Abu Dhabi, the thermometer passed 50 °C. At the same time in Dubai, the government appealed to motorists not to leave aerosols in their vehicles after canisters exploded setting alight several cars (Broom 2019). Moreover, as a result of protracted drought since 1998, desert dust has accumulated in the atmosphere over Iraq, Saudi Arabia and Syria making the likelihood of increased sand storms an inevitability. This will be further exacerbated by climate change (Dvosky 2016). Neither will this impact be confined to the environmental sphere. Many analysts have noted how the current Syrian civil war has its roots in the environment – specifically the severe 2006-2010 drought. This compelled 1.5 million farmers to leave their land and migrate to the city. In the process, not only was food insecurity increased but also greater political friction and social instability (Stang 2016).
To be clear, the 2050 scenario, apocalyptic as is, is a result of climate change and global warming whose negative consequences is already self-evident across the length and breadth of the MENA region today. Saudi Arabia and the city-states in the Gulf as well as Libya had already exceeded their renewable freshwater resources by 2010 (Sowers et al. 2011). Many citizens of the MENA region are already receiving inadequate, erratic or polluted water supplies and are fueling discontent with governments across the region. This is made worse, by the fact that in some countries those who are politically connected have better access to clean water than others. This unequal access is especially evident in the informal sprawling urban dwellings dotting the MENA. This is likely to intensify as precipitation is expected to decrease by up to 30 percent across the region. In Morocco, decrease in the rainfall over the Atlas mountains is already translating into a reduction in the flow of majority rivers and having a negative impact on the replenishment of the aquifers of the Draa, Souss-Messa, Tadla and Ziz basins (Sowers et al. 2011). Also considering the case of the Dead Sea in Jordan which has shrunk by a third over the past twenty years as a consequence of lower precipitation, more water being siphoned off the River Jordan and increased evaporation rates as a result of higher temperatures. The future of the Dead Sea looks bleak with its expecting to shrink more than 1.2 metres annually (Broom 2019). This also constitutes a major blow to the Jordanian economy, dependent as it is on revenues from tourism.

Climate change is also evident in a World Bank report which declared the MENA region to be among the most vulnerable regions on earth to rising sea levels. The historic Egyptian city of Alexandria which is inhabited by 5 million people is literally sinking as sea levels rise. Lives have already been lost as apartment blocks collapse opposite the picturesque seafront. Neither is Alexandria confronting this unfolding tragedy alone. Coastal areas in Kuwait, Libya, Qatar, Tunisia and the United Arab Emirates are all at risk as sea levels are expected to rise by half a metre by 2099 (Broom 2019). These rising sea levels have negative consequences for food security since one consequence of rising sea levels is the intrusion of seawater in coastal aquifers and wells causing the salinization of water there. To compound the issue, it is these coastal plains which are the most fertile and the most cultivated in the MENA region. Much of Morocco’s agricultural exports, for example, are concentrated in the Souss-Messa basin, a coastal region in south-western Morocco. This aquifer is not only suffering from salination as a result of the intrusion of sea-water but also over-exploitation as a result of burgeoning population demands. This over-exploitation is evident in the man-made contamination of his aquifer (Sowers et al. 2011).

The Saudi city of Jeddah, meanwhile, has been experiencing annual floods since the 1960s as a result of violent storms. These storms and resultant floods have grown in intensity as a result of climate change. The damage to lives and property has been exacerbated however by poor urban planning. The city’s haphazard expansion, as a result of increased urbanization, has resulted in routes through which water used to be drained from is now built over. With the water trapped, the impact of the floods is felt more intensely (Broom 2019). The Saudi example suggests that whilst climate
change is a reality, its impact could be mitigated through the implementation of sound policies.

These environmental challenges hold political implications and further exacerbate state fragility across the MENA region. This is most graphically witnessed in Lebanon. Given the twin challenges of demographic momentum and urbanization, Beirut has been encountered problems with garbage disposal since 1998. The Naameh landfill, in southern Beirut, was opened as an emergency measure since other landfills had reached their capacity. This emergency site was supposed to close in 2001. However, by July 2015, and despite being overfilled, it was still being used as a dumping site. Residents of Naameh, concerned about the health hazard posed decided to close the roads to Naameh. Without any alternative landfill, trash began to accumulate across Beirut’s streets and beyond. This angered ordinary Lebanese who not only paid their rates but also an additional fee to recycle the trash under the Zero Waste Act. However, only 6 percent of Lebanon’s waste is recycled. The incompetence displayed by the government together with questions being raised on where the additional fee for recycling went resulted in mass protests. Tens of thousands of people began taking to the streets on 23 August 2015. Whilst initially peaceful and focused on demands for a solution to the challenge of waste management, this soon began taking a violent turn with protestors demanding for a new government given the current one’s incompetence (Petre 2015). As one youth activist noted, “The root cause of the waste crisis in Lebanon is not technical but political. There is no political will to solve the problem – from one side mainly because of the failure of state institutions and a deadlock in decision making within the cabinet; and from the other, because multiple political actors with vested interests have been blocking any solution” (The World Bank 2016).

Of all the plethora of environmental threats confronted, perhaps none is more pressing than water. Between 80 and 100 million of the MENA’s citizens will suffer from water stress by 2025 (ibid, 2016). Beyond the human suffering, it is access to water, where one starkly witnesses the political and geo-strategic dimension of environmental challenges. Iraq has historically always relied on the waters of the Tigris and Euphrates Rivers to meet its needs. However, Iraq has lost more than half of the water from these rivers. This, in turn, is resulting in the real prospect of rising food insecurity as four million square miles of fertile lands is reclaimed by the ever-creeping desert (Neriah 2019). The reduced water flow has compromised Iraq’s ability to secure a stable electricity supply to its teeming cities. Iraq’s electricity generation used to stem from its twelve hydro-electric stations on its rivers. However, the reduced flow from these rivers has resulted in Baghdad unable to generate electricity to the same level it was accustomed to. The resulted intermittent electricity supply to the country’s major cities also served to fuel unrest across the nation as Iraqis protested water shortages and erratic electricity supply. The reason for Iraq losing more than fifty percent of its water was a direct consequence of activities of Iran and Turkey. Tehran has diverted 42 rivers and springs from flowing into Iraq as they have prioritized their own needs over that of its neighbour. The fact that this diversion of water is taking place with Iraq, a country with whom Iran enjoys friendly relations, suggests the seriousness with which Iran views the threat of
water insecurity. Ankara, too, has contributed to Iraq’s increasing water woes. Turkey has built five huge dams on the Tigris, thereby decreasing the amount of water going downstream into Iraq (Neriah 2019).

A similar dynamic is taking place between the Egypt and Ethiopia regarding the waters of the Nile. Egyptian history is intertwined with that of the ebbs and flows of the River Nile. The Blue Nile provides 85 percent of Egypt’s water needs. Cairo, however, is facing a looming calamity – a water shortage the like of which the country has not experienced for seven millennia. As with Iraq, the cause is a foreign country. In this case, Ethiopia which has begun construction of the Grand Ethiopian Renaissance Dam (GERD) on the waters of the Blue Nile. Once completed in 2022, it will be the largest hydro-electric power facility on the African continent. Its construction holds huge challenges to Egypt. It has been estimated that Egypt would lose 80,000 hectares of agricultural land to desertification with each two percent drop in the flow of the waters of the Blue Nile. As with Iraq, the decrease in water flow to Egypt’s Aswan Dam would negatively impact on electricity generation. Under these circumstances, Cairo has threatened military strikes against the Ethiopian dam. In March 2020, Egyptian President Abdel Fattah Al-Sisi met with the Egyptian High Command and called on the country’s armed forces to be at the highest level of combat readiness so that they can defend any threat to Egypt’s national security. Commentators believed that this was in response to Ethiopia continuing with the construction of GERD despite Cairo’s protestations (Abu Hableh 2020). Increased water stress may well make prospects of a water war a possibility.

8.3 Overcoming the Environmental Challenge

We began this chapter by providing insights from the Arab Barometer that demonstrates that environmental challenge is increasingly viewed with concern by vast swathes of the Arab public. What is important regarding this survey is that there was little difference in the views of those in rural or urban settings, across the gender divide or indeed between the different income groups (Green 2019). This suggests that the environment is a cross-cutting issue on which the majority could agree upon. Governments across the MENA region should build on this consensus in promoting and strengthening environmentally friendly legislation from building codes in cities to better management of water resources in rural settings.

Whist there is consensus in Arab public opinion surveys on the seriousness of the environmental challenge confronted this does not necessarily translate into action. Research has demonstrated that only 25 percent of the MENA public comply with current environmental legislation, only 17 percent would support their government to impose penalties or taxes in an effort to protect the environment, whilst a paltry 7 percent would support national or local government funds to be utilized to create an environmental protection fund (Statista 2017). What this suggests is that government needs to lay greater emphasis on environmental education in schools and
university curricula as well as social campaigns to draw the connection between a deteriorating environment’s impact on human life and lifestyle of ordinary citizens. The Arab Barometer makes clear that those with a higher education are more attuned with environmental concerns than those who are less educated. On the issue of water pollution, for instance, 67 percent of those with a basic education regard it as an important problem, as opposed to 71 percent with a secondary education and 74 percent with a higher education (Green 2019).

This public education and social messaging on environmental considerations are important to ensure public involvement and initiatives to protect the environment. One such public initiative is EcoMENA (2019) which is a volunteer-driven movement aiming to increase environmental awareness through a robust social media campaign and also seeking to foster greater environmentally sustainable development projects from renewable energy and waste management to energy efficiency, the promotion of green building technologies and resource conservation. In Lebanon, the YouStink social media movement was launched to raise awareness about waste management and to pressurize government to recycle waste (Petre 2015).

Such public initiatives should not detract from the fact that the primary responsibility for governance lay with the regimes in power across the region. Governments seem unable to prioritize core areas which need immediate intervention. Egypt is a case in point. Confronted with rising sea-levels which would displace 6 million Egyptians and the loss of 15 percent of arable land, Cairo chose to invest in a new multi-billion dollar capital as opposed to make investments in protective coastal structures (Sowers et al. 2011). The questionable capacity of MENA states to effectively exert governance is also evident in their inability to prevent private actors from expropriating water at will. Half of Jordan’s 2000 water wells are illegally constructed and over-exploited posing severe risk of increased water stress in the future. Similarly, in the Sanaa basin, Yemen has been unable to prevent the illegal drilling of wells as unscrupulous individuals use this water to plant the narcotic qat (ibid, 2011). The onset of the civil war in Yemen and the demise of any semblance of governmental authority has only made these activities more rampant. Across North Africa, too, the illegal pumping of aquifers is undermining long-term prospects for future sustainability and makes the implementation of any coherent national strategy all but impossible.

As primary cities morph into metropolitan and mega-urban regions, the issue of urban governance with its attendant authority conflicts and governance voids will come more to the fore. There are some laudable initiatives in this regard. Abu Dhabi’s Masdar Initiative, for instance, has environmentally-friendly building codes and town and regional planning which aims to create a green city. In addition, solar power is increasingly the norm in Abu Dhabi (Stang 2016). Despite exceptions like Abu Dhabi, regionally, MENA states have performed poorly when confronting environmental degradation. Why is this so?

Current governance frameworks are a poor fit to the challenges confronting local and national governments. The current highly centralized structures – itself a product of the democratic deficit alluded to in Chap. 2 – serve to weaken relationships between citizens and local government. With inclusive government impossible,
there is no local ownership or buy-in to enforce green legislation and the like. Moreover, such highly-centralized governance structures also undermine local authority efficiency (Schafer 2013). As Gerald Stang (2016) has noted so eloquently,

\[\ldots \text{the continued environmental degradation would seem to indicate the limited effectiveness of regulatory instruments, which require effective governance to enforce. MENA countries have been ruled mostly by authoritarian regimes – with limited political accountability – which have too often used the state to distribute economic rents rather than make long-term investments in their economies, societies, and environments.}\]

This inefficiency is exacerbated if one considers the nepotism and corruption alluded to earlier in this volume. The nature of the state has to change fundamentally from its current rentier state configuration and resultant patronage networks to a more democratic inclusive polity. With the price of hydro-carbons on the decline states need to tax its citizens. These taxes are essential if states are to respond to the challenges of climate change and investing in green renewable energy and reconfigure cities to make them more eco-friendly. However such taxes will not be forthcoming without representation.

The need for more decentralized and inclusive governance is especially acute in the water sector. Commenting on this aspect, Sowers et al. (2011) note, “Legacies of centralized systems of planning, taxation, and revenue distribution have rendered multi-scalar governance mechanisms weak in terms of organizational capacities and integration with local constituencies. Cities, provinces, and other subnational levels of government are not significant players in identifying vulnerable populations or planning for increased hydrological risk. Voluntary associations are tightly regulated in most of the authoritarian states of the region, while a variety of communal services, charities and forms of Islamist collective mobilization are seen as a threat to state integrity and legitimacy.”

Climate change-induced water scarcity also necessitates that government approach the issue with greater emphasis on innovation and sustainability. Political elites in the MENA region have largely responded to water scarcity by focusing on the supply side building large dams, utilizing desalination techniques, transferring water between basins, tapping into groundwater aquifers and importing virtual water through food imports (Sowers et al. 2011). Desalination plants are expensive, dams and aquifers do not adequately deal with loss of precipitation, increased evaporation, poor and inefficient water usage or the poor quality of existing infrastructure. Many of these aquifers are also heavily contaminated. Saudi Arabia has made use of the Saq aquifer. This aquifer, however, is highly radioactive and poses health risks to the population consuming its water. Therefore more investment in remediation is needed (ibid, 2011).

As for the importation of food, the Gulf States have for the past two decades been purchasing overseas farms, securing long-term leases of arable land and guaranteed purchases of rice crops in exchange for developmental finance. Countries targeted by Gulf States include Algeria, Morocco and Sudan closer to home as well as Asian countries like Cambodia, Indonesia, Vietnam and Thailand. However, in recent years, there has been much domestic opposition to these agreements with Gulf
countries. In Cambodia, for instance, when the agreement to provide Kuwait for long-lease or rice-producing land became public, NGOs, small farmers and the political opposition mobilized to scuttle the deal (Sowers et al. 2011). Under these circumstances, it is highly unlikely that land transfers or long-term leases are politically viable in target states. These are some of the constraints MENA states are confronted with when focusing merely on the supply side of water scarcity.

What regional governments have been loathe to do is engage in adaptive governance strategies which focus on the demand side. By adaptive governance, we mean the development of the necessary political and institutional capacity to ensure continuous and virtual water supply and quality. Such governance relies on social capital, the buy-in of non-state actors which authoritarian governments in the region with their tarnished democratic credentials have resisted. Under no circumstances, do political elites want to surrender centralized policy making and effectively give up sole control. Yet such inclusive governance is imperative for integrated water resource management. Such an inclusive water management system helps to prevent unequal access to water and connects water access to population growth in key nodes whilst allowing greater coordination of a scarce resource across different ministries, for example, agriculture and industry. Strategies on the demand side would include enhancing effective water usage and conservation promotion (Sowers et al. 2011).

Earlier we discussed Lebanon’s disastrous waste management system. Other countries in the MENA region, however, demonstrate what is possible when state actors work in partnership with international stakeholders to resolve this issue. A decade ago, Morocco’s waste sites were mismanaged whilst toxic effluent flowed through towns, into rivers and found its way into the Atlantic Ocean. Unregulated dumping sites were scoured by waste-pickers for valuable scraps as these sought to earn a living. Injuries occurred quite often amongst waste-pickers as they rummaged through the trash without any protection. This has since changed following an intervention of the World Bank working in partnership with Moroccan authorities and the private sector to arrive at more sustainable solutions to waste management. The underlying object was to ensure that recycling of household garbage increase from 5 percent in 2016 to 20 percent in 2022 (The World Bank 2016). The newly created Oum Azza landfill site, which is run by a private operator, is the largest collecting and landfilling operation currently in the Maghreb. It takes in 850,000 tons of refuse per annum. Moreover, the private operator, recognizing the need for local buy-in and cognizant of the economic situation in Morocco, sponsored a cooperative for waste-pickers and constructed a sorting facility so that incomes could be earned by waste-pickers in safer and more organized conditions. The kingdom seeks not only to overcome the challenges of urbanization and population growth but is also attempting to transform these challenges into opportunities for growth. At the Oum Azza landfill, for instance, biogas is captured from organic waste and sold to fuel electricity to the national grid (ibid, 2016). It is this kind of forward thinking and innovation which is sorely needed if MENA countries want to overcome the environmental challenges posed.
Given the regional dimension of the environmental threats posed, there is a need for greater regional cooperation amongst states. Such cooperation would entail that despite strained political or economic ties, states see the value of their cooperation in confronting a common challenge. The 1994 Israel–Jordan peace agreement also recognized the quest for fresh water supplies that both countries were confronted with. A Joint Water Commission was duly established and aimed to engage in joint water infrastructure development, joint project management and to regulate water sharing between the neighbours (Stang 2016). The fact that this cooperation has endured for almost three decades despite the political tensions between Amman and Jerusalem is testimony to the seriousness with which water security is viewed. In similar vein one, could note the existence of the Oman-based Middle East Desalination Research Centre which includes Israel and other Arab countries (ibid, 2016).

Israel and Jordan have agreed also to jointly fund a pipeline to the Dead Sea from the Red Sea as they attempt to save it from shrinking further. Whilst a laudable initiative, there is some concern that the Dead Sea’s fragile ecosystem will be harmed as water from the Red Sea changes the alkalinity in the Dead Sea’s water content (Broom 2019). Despite this criticism, no viable alternative is proffered by critics. Such joint and regional ventures are needed to increase water security across the region and may well serve as a confidence-building mechanism to ensure that cooperation learned in the environmental arena could be applied to other areas of contention between states.

Could such a model be applied to Egypt and Ethiopia given their fraught tensions over the waters of the Nile? At face value, the answer is negative. After all, both countries have been taking unilateral measures without consultation with the other party despite mediation from Washington and the involvement of the World Bank. Moreover, Cairo has been making threats of military action against Addis Ababa. However, despite the threats being made, the military option is unlikely on account of the challenges posed by geography, military capabilities and geo-politics. Both these countries also have linkages to other players – both regional and international. These outside players could assist by using their leverage to force both countries to come to the negotiating table and achieve compromises.

Such compromises would entail understanding the position of the other. The Nile holds an average flow of 84 billion square metres per annum (Mahlakeng 2020). According to Egypt, the construction of GERD would threaten its own share of the river by 55.5 billion cubic metres (Abu Hableh 2020). However, one can also understand the position of Ethiopia. Eritrea and Ethiopia contributes 85 percent to the water of the Blue Nile yet because of a colonial agreement, Egypt and Sudan benefits 100 percent from its waters but upstream countries cannot make use of the waters for their own growing needs (Mahlakeng 2020). Despite the seemingly intractable position between the parties, there is hope. Egypt is not opposed to filling the GERD with waters from the Nile but simply asks that it does not take place in one go. Doing so, will immediately having a deleterious impact on Egypt for years to come (Abu Hableh 2020). In the short term, then, the solution seems to be for
Ethiopia to fill the GERD with the waters of the Blue Nile in stages to stagger the impact on Egypt.

In the longer term, riparian countries should explore the idea of using the waters of the Nile more cooperatively and multilaterally. The obvious place to start is re-energize the Nile Basin Initiative (NBI) which began in 1999. The idea behind it was to promote regional peace and security and to share the socioeconomic benefits of cooperatively utilizing the waters of the Nile (Mahlakeng 2020). Distrust is what collapsed the NBI as riparian states did not think that other states will abide by commitments made and take more from the waters of the Nile than allotted by the agreement.

Such distrust is pervasive amongst the states of the region and served to undermine the aquifer coordination mechanism between Algeria, Libya and Tunisia. Such distrust was also pervasive between Chad, Egypt and Libya as they sought an aquifer agreement and undermined the agreement between Beirut and Damascus over the waters of the Nahr al-Kabir al Janoubi and Orontes Rivers (Stang 2016). Such distrust is perhaps understandable in a region where states have historically made use of such negotiations and agreements to lull their neighbours into a false sense of security whilst illegally appropriating more water. Such was the case between Iraq and Turkey. Turkey formed a Joint Technical Committee with Iraq in 1980 to ensure equitable sharing of the waters of the Tigris-Euphrates basin. Various agreements were signed on water appropriations from the basin between the two countries in the 1980s, 1990s and 2000s. Despite the ongoing negotiations and various agreements signed, Ankara was busy building more than a dozen dams in the basin, seriously undermining Iraq’s water security (ibid, 2016).

There are other regional non-state-centric initiatives which are attempting to place greater emphasis on regional collaboration in an effort to respond to water scarcity. These include the Mediterranean Environmental Technical Assistance Programme (METAP) established in 2002 and the Arab Water Council in 2004. Four aspects are important to note about both these initiatives. First, they are regional in scope. Second, they include non-governmental organizations. Third, they involved technical experts. Fourth, they are multi-donor funded projects also bringing in the private sector (Sowers et al. 2011). Whilst these are all positive, one might well ask why has effective water usage not resulted from these deliberations and cross-sector, multi-state collaborations.

The answer goes back to the centralized and dysfunctional nature of governance alluded to earlier in the chapter. Regimes across the region are also obsessed with their own security. In the process, their narrow focus on short-term political survival harms prospects of long-term environmental security. For instance, despite recommendations by experts in these bodies to create water users associations, governments have not legally recognized these, nor have they attempted to devolve decision-making over local irrigation to such associations. Egyptian climate researchers, meanwhile, were prevented in their international collaboration efforts to use satellite imagery to understand the impact of climate change. Cairo rejected it
on account of dubious national security considerations. Such challenges that scientists in the MENA region confront add to the emigration of scientific skills abroad – so-called brain-drain migration. This, in turn, undermines the capacity of states to respond to the environmental challenges posed (Sowers et al. 2011).

8.4 Conclusion

The MENA region according to the National Aeronautical Space Agency (NASA) is undergoing its worse dry period for 900 years. The prognosis for the future does not look any better if one considers the scenario up to 2100 for the MENA region which researchers at the Max Planck Institute have meticulously researched. These environmental challenges have geopolitical impact and should be everyone’s concern. Recurrent drought have contributed to the civil war in Syria and resulted in the displacement of over 2 million Yemenis (Kramer 2016). This population displacement will gather pace as the impact of climate change intensifies. Europe is barely coping with the current wave of refugees from the MENA region fleeing political turmoil and economic downturn. How will Europe cope with much larger numbers of MENA citizens fleeing environmental catastrophe?

Consequently, what is happening in the MENA region is everyone’s problem. This is a fact that is recognized by international actors. The Paris Agreement which came into force on 4 November 2016 aims to craft a global response to limit the impact of climate change by limiting global temperature rising to well below 2 °C. A key instrument in order to do this is by limiting global carbon emissions. The withdrawal of the United States, which together with China contributes 40 percent of global carbon emissions, is a setback for global efforts to fight climate change (United Nations Climate Change 2019). At the regional level, the World Bank is currently spending US$ 1.5 billion to fight climate change in the MENA region (Broom 2019). Such initiatives are, however, hampered by the fact that the World Bank has to work within national structures which are not always fit to purpose. Adaptive governance, inclusive governance and democratic governance has to be the norm. The fact that countries from Egypt to Qatar have already begun to integrate the United Nations’ Sustainable Development Goals into their legislation would be a good place to start the dialogue (Stang 2016).

Clearly more needs to be done at the level of developing partnerships between state and non-state actors in domestic settings, between regional neighbours and international actors to ensure that a more effective interface is created when dealing with environmental challenges. Let us not forget, too, that because environmental challenges are felt at the local level, the primary responsibility lay with states in the region who are far from ready – at the levels of organizational configuration, institutional capacity or political will – to confront the looming environmental catastrophe.
Literature

Abu Hableh, A. (2020). *Egypt’s options in the Renaissance dam crisis*. Retrieved March 9, 2020, from https://www.middleeastmonitor.com/20200313-egypts-options-in-the-renaissance-dam-crisis/

Broom, D. (2019). *How the Middle East is suffering on the front lines of climate change*. Retrieved March 9, 2020, from https://www.weforum.org/agenda/2019/04/middle-east-front-lines-climate-change-mena/

Dvosky, G. (2016). *Extreme heat will make parts of the Middle East uninhabitable by 2050*. Retrieved March 9, 2020, from https://gizmodo.com/extreme-heat-will-make-parts-of-the-middle-east-and-africa-uninhabitable-by-2050-1774311994

EcoMENA. (2019). *Echoing sustainability in MENA*. Retrieved March 9, 2020, from https://www.ecomena.org/

Green, J. (2019). *Environmental issues in the Middle East and North Africa*. Retrieved March 9, 2020, from https://www.arabbarometer.org/wp-content/uploads/environment-10-17-19-jcg.pdf

Kramer, S. (2016). *Skyrocketing temperatures means parts of the Middle East could be uninhabitable by 2050*. Retrieved March 9, 2020, from https://www.businessinsider.com/global-warming-migration-middle-east-north-africa-2016-5?IR=T

Mahlakeng, M. K. (2020). *Tension over the Nile: Egypt, Ethiopia and the United States*. RIMA Occasional Papers 8 (4), Retrieved March 16, 2020, from https://muslinsinafrica.wordpress.com/2020/03/06/tensions-over-the-nile-egypt-ethiopia-and-the-united-states-dr-mahlakeng-khosi-mahlakeng/

Neriah, J. (2019). *A scorecard on the first decade after the Arab Spring*. Retrieved March 12, 2020, from https://jcpa.org/article/a-scorecard-on-the-first-decade-after-the-arab-spring/

Petre, C. (2015). *#YouStink: The environmental youth movement in Lebanon*. Retrieved March 9, 2020, from https://blogs.worldbank.org/arabvoices/youstink-environmental-youth-movement-lebanon

Schafer, K. (2013). *Urbanization and urban risks in the Arab Region*. Retrieved March 10, 2020, from https://www.preventionweb.net/files/31093_habitataqabaurbanresillience.pdf

Sowers, J., Vengosh, A., & Weinthal, E. (2011). Climate change, water resources, and the politics of adaptation in the Middle East and North Africa. *Climate Change, 104*(3–4), 599–627.

Stang, G. (2016). *Climate challenges in the Middle East: Rethinking environmental cooperation*. MEI Policy Paper 2016-2, Washington: Middle East Institute. Regional Cooperation Series.

Statista. (2017). *Public opinion on level of environmental protection by selected countries across the Middle East and North Africa (MENA) as of June 2017*. Retrieved March 9, 2020, from https://www.statista.com/statistics/868271/mena-public-opinion-on-level-of-environmental-protection/

The World Bank. (2016). *Waste Management key to regaining public trust in the Arab World*. Retrieved March 9, 2020, from https://www.worldbank.org/en/news/feature/2016/03/14/waste-management-key-to-regaining-public-trust-arab-world

United Nations Climate Change. (2019). *Paris Agreement*. Retrieved March 10, 2020, from https://unfccc.int/about-the-un-climate-change-conference-december-2019