

Environmental (In)Security in the Middle East

Written by Adriana Seagle

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ADRIANA SEAGLE, MAY 15 2019

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Studying the environment in the Middle East is a cultural and linguistic provocation and an opportunity to reflect on the region's capacity to maintain economic growth and meet the security expectations of 500 million people. The Middle East deserves attention because of existential threats to water, land, food, and population. It has been argued that the environment is an object to be secured and a source of security risk informed by *who* and *what* (Barnet 2013, 191). Security is about access to resources and energy, relationships, and cooperation. As this chapter demonstrates, the availability of resources matters as much as the quality of relationships within a region to protect or degrade the environment. The purpose of the chapter is to provide an overview of the major environmental problems in the Middle East illustrating the role regional governments play in both causing and trying to solve environmental problems. The first section of the chapter focuses on water scarcity as a security issue and a potential field for innovation, research, and technology. The next section is a discussion of water distribution as an inter-state/conflict problem, and the last section discusses land degradation, pollution, and food security as threats to health.

Water Scarcity – A Security Issue

Water is a trans-boundary security problem influenced by availability, use, and conservation. Israel, a semi-arid country, has viewed water scarcity as a security risk since 1948. Scarcity associated with water, land, and natural resources are linked to regional climate and human-made activities including lack of innovation, loss of traditional knowledge, poor understanding of the environment and its destruction. In the Middle East, water scarcity is a problem for all states, a problem of context, culture, and sustainability. While Israel securitises water in the military and economic sectors pressing the population to value water via price increases and education, Iran subsidises water and appeases social conflict in the societal sector. Israel 'should have been a water basket case' because of dryland and population increase (Schuster 2017). Yet, Israel's preemptive action on social responsibility, and water management approaches proved successful. 'Complete separation of water consumption from Mother Nature', prevented water consumption on false appearances. Through a holistic water management approach securitised on state's survival, Israel taught society the importance of water conservation through state led projects and TV commercials i.e. 'not to be a pig in the shower', reused treated sewage for farming, finding and fixing leaks, engineering crops, discouraging gardening, making efficient toilets mandatory, and pricing water high to discourage waste (Schuster 2017). Some argue that Israel could afford to invest in water management because of wealth and power. Smith (2009) argues that, 'in the Palestinian Occupied Territories, Palestinians drill at 70 meters deep while Israeli at 300 to 400 meters, and while Israel claims this as a sustainability measure, Palestinians view it as resource capture' (Smith 2009, 1).

The realisation that water was a natural and human-made crisis helped Israel formulate a water saving plan, develop technology and organisational change to increase sustainability. By revisiting the traditional watering method, Israel reclaimed control over water. Investments in public and private research and technology perfected water desalinisation from the Mediterranean Sea and enhanced water and food security (Cohen 2017). Netafirm, responsible for irrigation technology claims that micro-irrigation saves water because the focus is on the plant not the soil (Schuster 2017). Technology is an opportunity for countries to use and manage water, reduce food prices, and

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use less fertiliser and pesticides. Israel leads in water management technology and food security and is willing to share knowledge and technology in water management. Israel has an economy that is less water dependent. Some suggest that the model cannot be replicated in Syria, Egypt, and Jordan because of their farming populations (Smith 2009, 1).

Iran has a reactionary approach to water security, risking the survival of the nation and the state. Iran subsidises water, masking a history of missed opportunities to diversify the agricultural sector, allowing pistachio farmers to exploit ground water with no environmental considerations. Experts note that, 'within the past 50 years, Iran has been using 70% of its ground water supply to support agriculture' (Darabi 2016). Geographical and climatic conditions pressured Iran to use 'more than 90% of its water in the agricultural sector'; however, a more proactive approach involving the population would have prevented Iran from 'water bankruptcy'. Having lost water completely in Lake Urmia and the Zayandeh River (Madani 2016). Lake Urmia however, left behind a 'tsunami of salt' ready to spread across borders by wind and damage as Darabi (2016) suggests, not only the agriculture of the neighbouring countries, but also the health of the population. The salt issue illustrates an interlinked crisis demanding immediate collective actions based on common shared interests from all power actors. Drought from water scarcity in Iran causes social tensions between farmers, who believe political officials are corrupted by bribes to divert water elsewhere, and other segments of the population who feel they must spend more money on water because of farmers (Dehghanpisheh 2018).

Pistachio farmers, the most impacted and displaced population, requires training and re-integration in the economic and social sectors. Iranian cities are expected to receive more of the displaced people and to deliver water, food and other goods and services to millions of new inhabitants. Technology plays a critical role in reaching and teaching about water scarcity, as half of the population is under 35 and technologically connected, which makes it easier for the government and NGOs to reach and teach. Hashtagging images of great social impact brings water scarcity awareness to the younger generation and strengthens social cohesion. However, despite technology, the population seems at the beginning of the learning curve, not reaching yet the 'conservation mindset', because of a decline in government legitimacy. Young Iranians continue to learn about water management through image association and group visits at places once iconic, vibrant, and full of water. The disappearance of the recreational sites at the lake or the river brings people into a state of nostalgia-indication that environmental destruction has an emotional impact.

How did Iran reach this stage? Public officials suggest that, 'these are the effects of international sanctions policies and their great pressure on the economy and the food security' (Darabi 2016). Pressure on rivers, lakes, and ground water left Iran in water and food ruin. The government is partnering with the UNDP in sustainability projects to retrain farmers and reinvent agriculture with new water conserving farming techniques, including rotation of cultures and transportation of water with better equipment that prevents water leakage. The strategies extend time to aquifers to replenish water naturally and prevent the formation of sink holes. Prioritising and subsidising the sprinkle irrigation system against the flooding technique helps farmers increase agricultural production, reduce water consumption, and costs for pesticides and fertilisers. 'Iranian leaders blame the water management policies of neighbouring countries, the presence of US forces in the region, climate change, and overlooking corruption, mismanagement and wrong government policies' (Majidyar 2018). Iran shares water with 12 neighbouring countries and despite 'diplomacy and soft power' the potential for regional conflict is high (Majidyar 2018). Regional powers can guide Iran productively toward preserving the environment by pursuing regional cooperation versus confrontation. According to Iranians, 'political sympathy from Europe with Iran's nuclear deal is "not enough"; concrete economic steps should be considered' (China Daily 2018).

The latest developments indicate that oil prices are falling fast because of Saudi Arabia's intentions to meet the global oil demand (Petroff 2018). Conflict between Iran and its neighbours will begin from water scarcity and the decline in oil prices. The nuclear deal also has spillover effects on the environment, water and food security. Power hierarchies and the global power dynamic can influence regional tensions between friends and friends and between friends and foes. Within the current environment, new alliances are expected. Rouhani knows that dealing with the environment is no longer a problem of Iran, and the fact that Turkey is working on 22 dam projects could have destructive implications on the Euphrates and Tiger Rivers. Turkey and Afghanistan claim that consultation over projects is not a matter of regional cooperation. Afghanistan accused Iran of being rogue and supporting insurgent

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groups versus participating in helping Afghanistan thrive environmentally, socially, and economically. Iran however, ponders over how building 22 dams and 19 power plants will not threaten water in Iran. 'Turkey is building dams on the Euphrates and Tigris Rivers, curtailing the flow of water and taking a high toll on Iran's environment' (Financial Tribune 2017).

Water Distribution and Potential for Interstate Conflict

Forecasts indicate that 'water will be the source of next wars' and Israel will win the fight against Palestinians over common water sources in the Gaza Strip and the West Bank (Asser 2010). The relationship between Israel and Jordan will be affected by the appropriation of water from the Jordan River and the frictions from the Red-Dead project. Environmental threats emerge from geographical and climate conditions, as well as ignorance of know-how economic development, population size, industrial pollution, and habitat loss. Water shortage is a regional problem and conflict over water may arise from interdependency, overexploitation, pollution, gap between supply and demand, expanding populations, water management, conservation and recycling, as well as lack of trust and misunderstanding among parties.

Israel's water and power hegemony in the region cannot be denied; however, evidence shows Israel approaching water security with research, water management, and desalinisation technologies. In contrast, Jordan approached scarcity through rationing and criminalisation of water use for anything other than drinking, personal and domestic use (Namrouqa 2017). Jordan opened its first desalinisation plant in 2017 and hopes to meet Aqaba's water security by 2035 (TJ 2017). The rationing approach, however, does not seem to build water consciousness. Whereas the Jordanian government calls it 'water rationing day', regular people call it 'water day', a day of water indulgence and household chores celebration (Nahhas 2015). Jordan is the second poorest water country in the region and attributes water shortages to drought and population growth. Existing disagreements over Lake Tiberias point to issues of water management, decision making, and technology. Although in the water security sector, mutual interests are clear, mutual gains are to be established.

As regional power, Israel feels that it has a say on 'how to use' water (Levitt, 2014). At this time, Syria is busy fighting its civil war, but historically, 'Syria has built more than 40 dams along the Jordan', and expectations are for farmers to turn on the taps for irrigating crops (Cooke 2017). On reneging previous deals and agreements, Jordanians feel that Israel uses water share agreements for political gains (Namrouqa, 2018). Palestinians claim asymmetric appropriation, suppression to developing technology, drilling, demand over water quantity and quality (Lazarou, 2016). They feel that their human dignity is attacked, and their health and hygiene are at risk. As mediator, the EU and other global actors are building a desalination plant in the Gaza Strip to provide drinking water to 75,000 people by 2020 (Lazarou, 2016). From the Israeli perspective, underdevelopment, lack of understanding, and mistreatment of water by the Arab states, threatens Israel's survival (Borthwick 2010).

The Tigris, Euphrates, and Nile Rivers provide enough water for farming communities and electricity, but here the struggle over hydro-hegemony is visible. Conflict has potential to emerge from water allocation and disagreements over the technical construction of the Grand Renaissance Ethiopian Dam. As the African population is set to double by 2050, Egypt is predicted to experience water shortage by 2025. Egypt and Ethiopia claim historical and geographic rights over the Nile River, respectively. Lack of trust over the technical mega project is influencing regional stability. The other Nile member, Sudan sided with Ethiopia for cheaper electricity and flood regulation along the Nile. While for Ethiopia the dam means economic prosperity, for Egypt it is a potentially destructive factor for agriculture and economy. Ethiopians claim that, 'It's not about control of the flow, but an opportunity to develop' (Raphelson 2018). With the dam, Ethiopia hopes to provide electricity to 75 million Ethiopians. Experts on Nile politics forecast an immediate risk for Egypt to revolt 'if Egypt "loses" Sudan, the only country it has a water allocation agreement with, and the only Nile riparian country which can pose significant threats to waters flowing downstream due to its high irrigation potential' (Raphelson 2018).

Conflicts produce obscured political shifts and distract states from securing economic opportunities. Egypt has been contemplating a dam on the Blue Nile for years; however, the Arab Spring created an opportunity for Ethiopia to start building. 'The irony is Egypt did in the 1960s exactly what Ethiopia is doing today, when it built the Aswan High Dam'

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(BBC 2018). An agreement between Ethiopia and Egypt will slow down tensions; however, both countries reached a stalemate over technical details (The New Arab 2018). If no consensus on common interests is reached, Egypt may take military action against Ethiopia. Also, increases in nationalist movements and heavy investments in military equipment are expected in all involved countries. The Nile case is an opportunity for international law to create new governance mechanisms to help solve water sharing disputes.

The Tigris and Euphrates illustrate a sovereignty problem of sharing water resources. Geographically, Turkey controls the Tigris-Euphrates River Basin and claims exclusive control. Iraq claims 'historical use of the Tigris and Euphrates water resources' (Wilson 2012). Potential for conflict can arise from decreasing water flow. Iraq critiques Turkey's dam and hydropower construction and decreased agricultural production. Turkey points to Iraq's poor water management practices (Wilson 2012). Since both Syria and Iraq experienced domestic conflicts their demand for water has been low. Potential for conflict may arise when Turkey threatens to regulate the water flow to Syria and Iraq, or when Turkey uses water as political leverage to obtain concessions. Turkey criticises Iraq and Syria's water management systems and experiences with cutting on/off water supplies. Increases in droughts will make Iraq vulnerable to food security and imports. Dam constructions will increase demand for new security technologies to protect against the vulnerability of future conflicts. Turkey blames decreased water flow on Iran and its dams assuring Iraq of 'sufficient quantities of water' (Al-Saleh 2018).

Iraq focuses on controlling the water message, assuring people that the water supply will last for drinking, electricity, and farming. Iraq reached a 'fair' agreement with Turkey over annual water; however, Iraq is confronted by an 'unfair and organised defamation campaign to spread panic among Iraqis' (Al-Saleh 2018). Despite promises, Turkey held back water behind the Ilisu dam earlier than promised (Aboulenein & Kucukgocmen 2018). Escalation in rhetoric is expected. Turkey's experiences with cutting off water and food supply in the Syrian-Afrin city while fighting in a military campaign against the Daesh groups. Water and food supply experiments test the risk for disease development and the spread of diseases from people drinking untreated water (Al Jazeera, 2018).

Desertification, Pollution, and Health Degradation

It has been argued that, in addition to water, land degradation and pollution threaten a region's economic and social development. Desertification or dryland degradation is prevalent for all states and is associated with overgrazing, intense cultivation, deforestation, deficient irrigation systems, and the blend between loss of traditional knowledge and lack of modern knowledge. Desertification can be natural, or caused by human-led factors influenced by climate change, the hydrological cycle, population growth, urbanisation, and food. Studies reveal that a mix of factors lead to droughts, erosion by wind and water, flash floods, and storms (Brauch 2006, 11). Land degradation is context specific and can be related to 'population growth, failure of resource management policies, and overgrazing' (NASA Land-Cover and Land-Use Change (LCLUC)). 'Almost half of Israel's agricultural land is at risk of soil erosion and when soil is washed away, only God and the sea can stop it' (Rinat 2016). Researchers find that soil erosion can arise from reasons involving heavy equipment use and grazing. In Israel, farmers are advised to either stop cultivating or cultivate only plants that enhance soil stability. Israel is committed to reversing desertification through afforestation, traditional knowledge to maintain soil fertility, 'making the most from the sun', and 'more crop per drop' (Kloosterman 2012).

Economic growth and human activity are linked to pollution and experts warn that the Middle East is running out of clean air. Some say that, 'no matter how the statistics are gathered or interpreted, the pollution picture is grim' (Cooke 2017). Air pollution threatens human health and the economy via 'death and disability' (Bajaj 2015). Saudi Arabia, the United Arab Emirates (UAE), and Qatar have the highest pollution levels based on the levels of small particles of sand, dust, and chemicals in the air. The World Bank estimates the UAE to be the most polluted Middle Eastern country outpacing China and India on airborne pollutants. According to the World Bank, most Middle Eastern countries exceed threshold concentrations of particulate matter.

In the Gulf States, air pollution is considered 'the silent killer and the most toxic air on the planet' (Cooke 2017). According to a World Health Organisation (WHO) report, 'Not all air pollution originates from human activity', air quality is influenced by dust and sand storms, but the pollution in the Middle East is often a cocktail of 'high level

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viruses, chemicals, and even radioactive materials used by the region's military' (Cooke 2017). Because of pollution, there are high levels of health degradation. Like obesity, alcohol use, physical inactivity, air pollution is a 'threat to sustainable prosperity' costing countries billions of dollars in lost productivity and workforce (World Bank). Dust from desert storms has been associated with health deterioration and death. Studies reveal that outdoor air pollution from desert storms kills millions of people every year. 'Egypt is the highest country with air-pollution-related deaths in the region at 35,322 deaths per year and Iraq and Saudi Arabia with 20,335 and 14,600 people, respectively' (Amer 2015).

The next problem is agricultural and involves release of ammonia from livestock and fertilisers linked to strokes and heart attacks. Pollution causes incidences of asthma in the adult population, as well as cancers, and heart and respiratory diseases. Although some air pollution results from geographical conditions and meteorological factors, most pollution is attributed to 'human hands'. Some suggest that the Arab Spring has contributed to the decline in air pollution because nitrogen dioxide has not been emitted at the same levels as when car engines and power plants worked at full capacity (Worland 2015). According to Cooke (2017), 'seawater desalination plants are not only power hungry, but also polluting', and Gulf countries are large oil producers. Among proposed solutions is investment in 'comprehensive networks of ground monitoring stations, considered to be the most accurate way of measuring levels of air pollution' (Cooke 2017).

Israel's increased salinisation concerns health practitioners who need more studies to confirm the link between myocardial infarction and desalinated water and magnesium supplements. As outlined by the 2017 report, 'the problem is not what is in the water, but what has been removed from water and how to best compensate, since studies point to an elevated mortality risk of myocardial infarction in areas with wide use of desalinated water' (Rinat 2017). Israel shows leadership and responsibility in protecting the environment by good water management practices and investment in research and technology. What is known in Israel about environmental exposure and health risk is that outdoor air pollution from dust storms and emissions from industry, transportation, and households influence a large spectrum of diseases. In response, Israel passed the Clean Air Law and has specific plans to reduce pollution in Haifa Bay. Although plans exist, challenges remain in areas of transboundary and transportation pollution. The 2017 health report notes that, 'despite reductions in emissions, there are still over 2,000 deaths attributable to air pollution in Israel every year and the cost associated with air pollution exceed \$7 billion annually'. Proposals to create a nationwide database on the health implications of climate change are being considered.

In Iran, agricultural and energy policies negatively influence air and water pollution across the country, but especially in the ethnically diverse region of Ahwaz. It was not until recently that Iran acknowledged that dust storms originate also in Iran (Teheran 2015). Pollution is caused by abuse of the wetland for oil extraction and intense cultivations. 'Cane is not a crop native to the region' and has been used by the Iranians with no concerns over the environment. 'Sugarcane is a crop for high water consumption, which often results in habitat loss and soil erosion' (Teheran 2015). People claim that Chinese oil companies exacerbated pollution 'with inferior technologies razing the land to find oil, hectare after hectare of the plant species around Horolazim wetland were burned and bulldozed' (Teheran 2015). Reports on water pollution indicate that the 'drinking water in Ahwaz city is so dirty and brown in color, residents joke that they don't drink water. They drink chocolate milkshake' (Assadi 2017).

Ahwaz is being presented as one of the most polluted cities in the region with pollution caused by intense oil exploitation, sand, dust and high levels of desertification. Intensive oil and sugar cane production polluted the environment to the extent that the Karoun River, the main source of drinking and irrigation water in the region, has been affected and the local marshes dried out affecting also fishing and air quality. 'Once the marshes dried out, large sandstorms regularly occurred, disrupting the lives of people at their homes and at work, and causing a major increase in cases of lung infections and cancer' (Assadi 2017). Ahwazi residents claim their water smells like sewage and have been demanding clean, drinkable water and better standards of living for quite some time though the government has resisted protestors (Amnesty International 2018). There are claims that the region has the lowest life expectancy rates in Iran, and levels of chronic respiratory diseases and cancers are above the national norms. Ahwazi residents claim government injustices target their ethnicity and this explains Iran's rerouting of the two main rivers from the region which has led to increased desertification and pollution (Hamid 2018).

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The Jordan River is one of the most 'polluted promised land[s]' even 'too polluted for baptism' (Cooke 2017). Environmentally friendly organisations urged Israel's health and tourism ministries to stop baptisms due to health risk. 'Sadly, the lower Jordan River has long suffered from severe mismanagement with the diversion of 98% of its fresh water by Israel, Syria and Jordan and the discharge of untreated sewage, agricultural run-off, saline water and fish pond effluent in its place' (Friends of the Middle East).

The Food Security Complex and the Amity/Enmity Power Dynamic

The UAE and Saudi Arabia are among the major food security players in the Gulf region. Both countries focus on sustainability in all economic sectors including agriculture and food security using research and sound policies based on diversification (Zeyoudi 2018). The UAE securitised the agricultural sector on the history of its population, research, and innovation. The Vision of 2021 engages the youth in research and fisheries management. To minimise food dependency, the UAE incentivised rationing consumption, reinvention of traditional crops, and import diversification. 'Sustainable agriculture is deep-seated in our history; ancestors used our scarce water resources wisely by developing a water-well management system called Tawi, and a traditional water irrigation system known as Fala' (Zeyoudi 2018).

Unlike major food security players, Qatar imported 90% of its food from Saudi Arabia. Qatar transitioned from food insecurity to food security in almost one year. A diplomatic blockade initiated by Saudi Arabia, the UAE, Egypt, Bahrain and Yemen was imposed on Qatar after a speech in Saudi Arabia given by the US president, urging Qatar to stop supporting terrorist organisations. In the aftermath, Qatar's food supply has been cut off for 'funding and hosting' (Hunt 2017). The suspension of the food supply including milk has been interpreted by Qatar as regionally orchestrated, 'unilateral and unjust', prompting Qatar to seek counselling at regional and international institutions including the World Trade Organisation (WTO), reporting the situation as an 'illegal siege' committed by its neighbours.

Acknowledging Iran as a regional 'Islamic power', seems to be a cause of the rift with Saudi Arabia, which feels undermined in regional competition (Hunt 2017). Qatar's diplomatic blockade shifted regional power into a triad formed by Qatar, Iran, and Turkey. Solidary with Qatar, Turkey, and Iran came with food and new ideas for trade and security partnerships. 'Cargo planes full of milk, yogurt and poultry', were deployed in less than 48 hours from Turkey in addition to military troops (Al Jazeera 2017). In the context of amity/enmity, Iran signed a transportation pact. The Turkey-Qatar route via Iran boosted friendship and trade. Qatar's regional friendship dilemma illustrates a shift in power dynamics and an opportunity to re-think food and environmental security. Although food prices shortly increased, a stronger partnership and cooperation in food and environmental security in the region has been created. 'Before the siege, we did not have any desire (to expand ties) because Qatar was importing most of its requirements from some of its neighbouring countries. But, right now, Iran has the desire and the plan to import and export to Qatar. We want to extend our business in Qatar' (Financial Tribune 2017).

The diplomatic blockade brought food and water security awareness to Qatar. Qatar plans to develop programs in 'agriculture, livestock, and fisheries to address climate change and achieve self-sufficiency and national food security' (HE Abdulaziz 2018). Through diversification of imports and investments in food security and sustainability, Qatar later refused imports from the UAE and Saudi Arabia on grounds of health security (The National 2018). On enmity/amity, Bahrain claims that since cutting diplomatic ties with Qatar, the incidence of terrorist attacks in Bahrain decreased. Known as one of the most polluted countries in the region, Qatar hosted UN climate change negotiations in Doha and displayed leadership in using and developing solar energy, as well as help others cope with food and water insecurity.

[T]he most vulnerable in the world in the water and food production has no rivers, and no fresh water. Every single drop of water used in Qatar needs to be desalinated. Every single gram of food needs to be either imported or grown with desalinated water (Figueres 2017).

Qatar experiences water insecurity, increased desertification, and sea-level rise and is interested in food security and self-sufficiency. By 2024, Qatar hopes to produce 70% of its food requirements. As a regional power, environmentally

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friendly and technologically innovative Qatar securitised protection of the environment on the international Islamic identity and the Islamic effort to exchange information and experiences in the environmental sector. 'In order to effectively address the environmental risks, cooperation among the countries of the world in general, and those of Islamic world in particular, is imperative' (He al-Rumaihi 2017).

The Joint Islamic Action seeks protection of the environment, preservation of natural resources, and sustainable development via Islamic cooperation, consultation, and dialogue on how to meet and cope with environmental challenges. The Global Dryland Alliance (GDA) illustrates a pan-Arabic dialogue focused on food security through sharing knowledge and support in case of disasters. Held by economic trade, amidst the diplomatic crisis, Jordan did not suspend economic trade with Qatar. After recalling ambassadors from Doha and Amman respectively, a Jordanian member of parliament said that, 'There is relentless parliamentary pressure on the [Jordanian] government to restore relations with Doha and develop them, while Jordan is subject to immense pressure to block it from restoring [full] relations with Qatar' (Al Jazeera 2018). The Saudi-led boycott of Qatar securitised on Qatar's support of extremist movements was viewed with scepticism by European powers who encouraged diplomatic relationships after the nine-month boycott on grounds that Qatar's regime or behaviour has not changed (Wintour 2018).

Food as a Weapon of War in Yemen

Yemen illustrates subordination of the environment to state political power. A heavily impoverished country with unravelling institutions, crippled by a civil war and on the brink of becoming a failed state, Yemen imports 95% of its food. With a rapidly growing population, water scarcity is a major problem, as Yemen is predicted to be the first country to run out of water because of human-made environmental destruction. Experiencing social and political conflict since March 2015, access to food declined not because of food scarcity, but because of access. Yemen has a small amount of arable land available for cultivation. Despite being an agricultural country, the ability to produce its own food from agriculture is limited. Yemen has a well-developed fishing and livestock industry affected by water scarcity, disputes over land and water rights, and population displacement. International advanced projects to empower women and prevent population dislocation through access to food and income security from chickens and vegetables grown on the land and sold at the market exist. Due to conflict, international organisations lack opportunities to collect and analyse real data on food, water, and land security. Khat (a shrub with effects similar to amphetamine) farming demands 38% of the total water used by the agricultural sector is affecting the country's water and food security (Aldaghbasy, 2017).

At the societal level, Khat has been securitised on claims of 'medical benefits closer to relaxation, energy boosting, and hunger-numbing properties like coffee, alcohol and Viagra in the West' (Butters 2009). Yemenis also prefer to cultivate Khat for high profits. 'Khat is alcohol for Muslims... you can chew it and still go to prayers' (Butters 2009). Khat, as Butters (2009) notes, is expensive and costs more than food. The assault on groundwater by drilling rigs to support Khat is perceived by some as analogous to a military assault. 'I see unlicensed drilling rigs as mobile artillery batteries, and the tankers that distribute the groundwater as missiles landing in every neighbourhood. I do not think that language is too strong. What we are doing to our water resource does as much damage to our country as any military campaign ever will' (Butters 2009). High demand for Khat increases demand for water and pressure on the aquifers. Without available groundwater or technology to dig deeper wells, people prefer to collect water from rainfall or ride donkeys for kilometres to fetch water. Desalination is not an option for Yemen because of cost.

Food has been used in Yemen as a 'weapon of war', when people in positions of power refused humanitarian and commercial supplies (Norton 2016). On food security, Saudi Arabia and its military interventions, and naval, land, and air blockades brought the country to the brink of famine, disease, and mass starvation. Media headlines of 'emergency', 'food is scarce in the countryside', '21 million people desperately need food, water, medical and fuel supplies', 'humanitarian catastrophe', 'world's most urgent humanitarian crisis', fill the Internet pages. Expectations are that Yemeni society will eventually reach water consciousness; however, because of Khat, it is very unlikely that this will happen soon. In Yemen, air strikes ordered by Hadi and executed by Saudi Arabia have killed more than 10,000 civilians and caused more than 14 million Yemenis (about half of the country's population) including 300,000 children to suffer severe malnutrition and starvation (Al Jazeera 2016).

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Conclusion

In retrospect, vigilance, famine, and social and political conflict over water bring attention to environmental problems in the Middle East. Environmental issues are interlinked with social and political struggles at the state and regional level. Water and food security are areas in which countries have common interests. Alliances are formed between water and food secure countries (Turkey) and vulnerable countries (Qatar), or conflict arises between water and food secure countries (Saudi Arabia) and water and food insecure countries (Yemen). The Middle East is still consumed by sectarian and religious divisions and global powers continue to shape and influence amity and enmity relations. Food, water, and energy security are areas in which the possibility for governance of the common good is immediate. Common ground is usually found after a rearrangement of interests and loyalties. Rich countries like Qatar demonstrate a disposition to find, design, and implement security agreements in the environmental sector. High population growth rate, poor water management and conservation strategies, over pumping and overconsumption, lack of critical research, lack of regulations on the use of water from aquifers, and practices of resource capture are common practices influencing the security of the environment. Food and water remain resources with which to exploit power and alliances. On societal awareness of water management, more is to be learned about water, conservation, love and respect for the environment.

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About the author:

Adriana Seagle is Assistant Professor and Intelligence & Security Studies Program Director at Bellevue University.