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Review by **Victor McFarland**, University of Missouri

The Hashemite Kingdom of Jordan is one of the driest nations on Earth. The capital Amman is located in the relatively fertile northwestern part of Jordan, but even so, it receives just over ten inches of rain in an average year – far too little to grow most crops reliably. Most other parts of the country, like the southern deserts around Aqaba and the famous archeological site of Petra, are even more arid.

When I was a graduate student, I spent several months studying Arabic in Amman. My roommates and I lived in an apartment that, like the rest of the city, was under strict water rationing. We received water only one day out of seven, and had to be very careful with our cooking, dishwashing, and showering in order to make our supplies last through the other six days. Even so, we often ran out before the end of the week. It was impossible to forget that in Jordan, water was a precious commodity that could never be taken for granted.

When several friends and I visited the Dead Sea, however, our drive took us by lush farms growing bananas and other water-intensive crops. After miles of dry, rocky desert, the sudden greenery was startling. Bananas are native to rainy places like New Guinea. How could they grow in Jordan?

Nathan Citino's article helps provide the answer. The crops we saw were irrigated by the East Ghor Canal (now known as the King Abdullah Canal), which takes water from the Yarmouk River on Jordan's northern border and carries it to farms in the south. The canal runs just east of the Jordan, roughly paralleling the river's course most of the way to the Dead Sea. Today, the lands watered by the canal are visible on Google Maps as a thin green strip along Jordan's border with Israel. Zoom in far enough, and you can see the canal itself as a dark line cutting through the countryside. Citino's article examines the history of this project, focusing on the role that U.S. aid played in the canal's construction during the late 1950s and early 1960s.

It would be easy to tell the canal's history as a triumph of international cooperation and modern engineering, the way its builders wanted it to be remembered. The East Ghor Canal brought many acres of land under intensive cultivation for the first time, providing major economic benefits to Jordan. Citino's version of the

story, however, is more skeptical. He argues that the canal failed to achieve either one of its two main goals: creating a new class of prosperous, independent farmers, and ending Jordan's reliance on foreign aid.

What accounts for the failure of the East Ghor project? According to Citino, one reason is that the U.S. and Jordanian officials who promoted the canal were unable to choose between the competing priorities of egalitarian land reform and agricultural efficiency. In making this argument, Citino draws on the work of the Boston University historian Sarah Phillips. She suggests that U.S. agricultural reformers during the New Deal era were divided between agrarians, who wanted to help small farmers remain on the land, and industrialists, who wanted to promote larger, more efficient farms that relied on mechanization and modern technology instead of human labor. Phillips argues that in the United States, the industrialists triumphed by the 1940s as corporate agriculture replaced family farms and World War II factories absorbed surplus agricultural labor.[1]

Citino contends that the division between agrarians and industrialists identified by Phillips was replicated in U.S. overseas development policy. Even after the agrarians were defeated at home, they remained influential in shaping projects like the East Ghor Canal. They argued that the land irrigated by the canal should be divided into small plots worked by many independent farmers in order to create a more egalitarian society, reversing the pernicious legacy of absentee landlordism from the Ottoman era. The industrialists diagnosed a different problem, claiming that Jordan's agricultural sector was plagued by fragmented land ownership that left farms too small to be profitable. They argued that the United States should encourage the consolidation of smaller landholdings, ensuring that East Ghor water went to large farms that could be worked more efficiently. They also hoped to exploit the Yarmouk's hydroelectric potential, providing Jordan with a reliable source of electricity that would spur economic development in the kingdom.

Both sides in the debate couched their arguments in terms of Cold War strategy and U.S. national security. Jordan's political significance was greater than its small size and population would suggest. Since Jordan's government generally enjoyed good relations with the United States and Great Britain, was reliably anticommunist, and was not associated with Egyptian President Gamal Abdel Nasser's brand of revolutionary Arab nationalism, U.S. policymakers were determined to protect the Jordanian monarchy. The agrarians argued that land reform would accomplish that goal by giving farmers a stake in the status quo, reducing the political threat posed by landless Palestinian refugees and providing a bulwark of support for the Hashemite dynasty. The industrialists, by contrast, claimed that the creation of a more efficient agricultural sector and the generation of hydroelectricity would stabilize Jordan by improving the kingdom's economic prospects and reducing its reliance on foreign aid. The inability of U.S. officials to choose between those competing strategies was a major problem for the East Ghor project.

In addition to the split between agrarians and industrialists, Citino argues the project was complicated by the fact that Jordan was not the "arrested rural society" that some U.S. officials imagined it to be (169). The same land that the East Ghor Canal was intended to irrigate had already been the site of previous Ottoman and British reform efforts. During the late nineteenth and early twentieth centuries, the Ottoman government attempted to resettle nomads and carry out land registration in the Jordan Valley. Although Ottoman land reform in most parts of the empire tended to favor the richest landowners, the outcome was different on the east bank of the Jordan, where much of the land remained in the hands of small-scale cultivators or was held

[1] Sarah Phillips, *This Land, This Nation: Conservation, Rural America, and the New Deal* (New York: Cambridge University Press, 2007).

in common by the inhabitants of rural villages. As a result, the idea that most landholdings in the area consisted of large estates run by absentee landlords that could be parceled out to yeoman farmers, as many U.S. agrarian reformers seemed to believe, was simply false (170). During the mandate period, Britain also conducted a land reform program designed to partition communal farms among individual owners, but Citino writes that the British efforts "promoted massive indebtedness" and "did not contribute as hoped to greater agricultural productivity and a more economically viable state." By parceling out large farms into smaller plots, the British actually contributed to the fragmented ownership patterns that later U.S. reformers found so objectionable (171).

The political legacy of the Ottoman and British eras complicated the East Ghor project in other ways, as well. The canal was located in 'Ajlun, a region that had been governed from Damascus during the Ottoman period. The colonial borders drawn by Britain and France severed that connection, attaching 'Ajlun to Jordan rather than Syria. After World War II and the end of the European mandates, Damascus tried to reassert its influence over 'Ajlun, impeding Washington's efforts to establish a regional order favorable to U.S. interests (171-172). The Arab nationalism promoted by Syria threatened the Jordanian monarchy and reduced Jordan's willingness to cooperate with the United States, Great Britain, and Israel. The United States had promised to support the East Ghor project as part of the Johnston Plan, the Eisenhower administration's proposal for the joint exploitation of Jordan River water by Israel and its neighbors. Syria, however, proposed an alternative scheme that would exclude Israel by damming the Yarmuk River at Maqarin Station on the Jordanian-Syrian border. The Jordanian government wavered back and forth between the U.S. and Syrian proposals, eventually choosing to complete the East Ghor project with U.S. aid, but refusing to participate in other, more ambitious schemes for the international development of the entire Jordan River Valley (174-176).

In the end, the canal was technically successful, bringing thousands of acres of new land under cultivation and contributing to a reported doubling of Jordanian agricultural production between 1959 and 1965. However, it failed to eliminate rural landlessness; in fact, a 1974 study found that the prevalence of sharecropping in the region's farms actually increased after the completion of the canal. The East Ghor project also failed to end Jordan's dependence on foreign aid. Jordan continued to rely on external subsidies in part because of the Arab-Israeli conflict, which led the Jordanian government to devote scarce financial resources to building up its military during the 1960s. Matters became even worse for Jordan after the June 1967 Arab-Israeli war. The fighting damaged the East Ghor Canal and drove farmers away from the irrigated area. More importantly, the war drove a wave of new Palestinian refugees out of the West Bank and into Jordan, exacerbating the kingdom's already daunting economic challenges. By late 1967, U.S. advisors concluded that Jordan needed to concentrate on building up its tourism industry and exporting labor in the form of expatriate workers. Whatever hopes Jordan might once have had of agricultural prosperity and self-sufficiency were dashed (185-187).

Citino uses the story of the East Ghor Canal to make a broader methodological argument about U.S. development policy during the Cold War. Development and modernization theory has attracted a great deal of attention from scholars over the past fifteen years. Citino, however, contends that the existing historiography suffers from both geographic and chronological tunnel vision, focusing too much on U.S. foreign policy during the Cold War period. He argues that previous scholarship neglects "the importance of local factors in shaping the outcome of development projects." Citino calls for "incorporating local historical perspectives into the study of the 'global Cold War' and, more broadly, for greater dialogue between Cold War and area studies" (160). These proposals echo his argument in a 2011 roundtable in the *International*

Journal of Middle East Studies.[2] Citino also encourages Cold War historians to engage with scholarship on pre-Cold War history. He contends that the East Ghor Canal project shows that "the ghosts of prior reforms haunted initiatives by U.S. officials, international experts, and Third World elites to raise living standards and develop economies in postcolonial countries." American policymakers did not have a blank slate with which to work, and even the most committed modernizers were constrained by the legacy of Ottoman and British rule in the Jordan River Valley (161-162).

Other scholars have written about the relationship between U.S. development projects and similar efforts undertaken by imperial administrators before the mid-20th century. Those connections are a central theme of Odd Arne Westad's *The Global Cold War*, for example, and David Ekbladh has noted that many U.S. officials in South Korea during the early Cold War saw themselves as the inheritors of a flawed Japanese effort to modernize Korea before 1945.[3] More than most Cold War historians, however, Citino stresses the importance of engaging with area studies and other scholarship that ranges beyond the mid-20th century, an approach that is reflected in his footnotes. "The Ghosts of Development" cites an unusually diverse array of secondary sources, from the work of Americanists like Sarah Philips, to Middle East historians like Eugene Rogan and Michael Provence, to area studies specialists from other disciplines, like the anthropologist Martha Mundy.[4]

The cast of characters in "The Ghosts of Development" also goes beyond the State Department and White House policymakers usually featured in the history of U.S. foreign relations. Citino's protagonists include Afif Tannous, a Middle East specialist with the U.S. Department of Agriculture, and John Spencer, an official with the U.S. Bureau of Reclamation (part of the Department of the Interior). Their presence in the narrative suggests the degree to which overseas development efforts blurred the lines between domestic and foreign policy.[5]

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[2] Nathan Citino, "Between Global and Regional Narratives," *International Journal of Middle East Studies* 43:2 (May 2011): 313-316.

[3] Odd Arne Westad, *The Global Cold War: Third World Interventions and the Making of Our Times* (New York: Cambridge University Press, 2005); and David Ekbladh, *The Great American Mission: Modernization and the Construction of an American World Order* (Princeton: Princeton University Press, 2011), Chapter Four: "'The Proving Ground': Modernization and U.S. Policy in Northeast Asia, 1945-1960."

[4] Eugene Rogan, *Frontiers of the State in the Late Ottoman Empire: Transjordan, 1850–1921* (New York: Cambridge University Press, 2002); Michael Provence, *The Great Syrian Revolt and the Rise of Arab Nationalism* (Austin: University of Texas Press, 2005); Martha Mundy, "Village Land and Individual Title: Musha' and Ottoman Land Registration in the 'Ajlun District," in Eugene L. Rogan and Tariq Tell, eds., *Village, Steppe, and State: The Social Origins of Modern Jordan* (London: British Academic Press, 1994).

[5] A similar point is made in Megan Black's recent work on the Department of the Interior. Although Black focuses on the opening of foreign mineral resources to American companies, a more clearly exploitative enterprise than canal-building, both she and Citino stress the ways in which the Department of the Interior and other U.S. government agencies sought to export techniques that had first been tested at home. See Megan Black, "Interior's Exterior: The State, Mining Companies, and Resource Ideologies in the Point Four Program," *Diplomatic History* 40:1 (January 2016): 81-

Citino is primarily interested in the East Ghor Canal as a political object and a way to illuminate the connections between U.S. ideas about development, Middle East politics, and U.S. foreign policy. He treats the physical properties of the canal itself, and its role in carrying water in an arid region, as incidental to its status as a tool for supporting the Hashemite monarchy. Future work on this topic might expand the focus to include more on the relationship between the East Ghor Canal and its surrounding environment. The environmental history of the Middle East is a small but growing subfield.[6] Much of that scholarship focuses on the problem of water – its scarcity in the Middle East, and the immense technological, economic, and political work that has gone into overcoming that scarcity.[7] Citino places East Ghor in the context of the politics of land reform in the Middle East; comparing the canal to other irrigation projects in the region might also prove fruitful.

The construction of Middle Eastern hydro-projects was often carried out with U.S. assistance. East Ghor is only one example of the American money and technical advice that went into the building of dams, water treatment plants, and desalination plants in the region. Studying those enterprises can open up new scholarly possibilities by connecting the history of U.S. foreign relations with the environmental history of the Middle East. We might look even further afield; scientists, engineers, and policymakers in arid regions from Soviet Central Asia to West Africa to Australia confronted similar challenges in developing their water resources, and sought to learn from one another.[8] This is a global story; what we might call "hydro-history" can often be studied most effectively from an international perspective.[9]

Hydro-history can also lead back to the United States. The American West, in particular, is defined by an enduring scarcity of water and by the projects designed to support human life and economic growth in such a dry place. As Wallace Stegner has written: "*limitation*, *deprivation*, are words we must keep in mind when

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110; and *The Global Interior: America's Quest for New Mineral Frontiers in the Modern World Order*, book manuscript in progress.

[6] Alan Mikhail, ed., *Water on Sand: Environmental Histories of the Middle East and North Africa* (New York: Oxford University Press, 2013).

[7] See, for example, Mikhail, *Nature and Empire in Ottoman Egypt: An Environmental History* (New York: Cambridge University Press, 2011); Toby Jones, *Desert Kingdom: How Oil and Water Forged Modern Saudi Arabia* (Cambridge: Harvard University Press, 2010); and Michael Christopher Low, "Ottoman Infrastructures of the Saudi Hydro-State: The Technopolitics of Pilgrimage and Potable Water in the Hijaz," *Comparative Studies in Society and History* 57:4 (October 2015): 942-974.

[8] The scholarship on the history of efforts to overcome water shortages in many different countries includes, among others: Maya Peterson, "US to USSR: American Experts, Irrigation, and Cotton in Soviet Central Asia, 1929-32," *Environmental History* 21:3 (July 2016): 442-466, and "Technologies of Rule: Water, Power, and the Modernization of Central Asia, 1867-1941," Ph.D. Dissertation (Harvard University, 2011); Matthew Gandy, *The Fabric of Space: Water, Modernity, and the Urban Imagination* (Cambridge: MIT Press, 2014); and Ruth Morgan, *Running Out? Water in Western Australia* (Crawley: University of Western Australia Publishing, 2015). See also the work of the members of the International Water History Association, http://www.iwha.net.

[9] The idea of "hydro-history" has been used by Vincent Lemire in *La soif de Jérusalem: Essai d'hydrohistoire, 1840-1948* (Paris: Publications de la Sorbonne, 2011).

speaking of the reputedly limitless West," since "that is the West's ultimate unity: aridity."[10] The history of Western canals and other irrigation projects goes back to the Native American period, but human modification of local waterways expanded dramatically after the Euro-American conquest and settlement of the region. The importance of irrigation to the American West is suggested by its ubiquity in the region's most famous works of fiction. Irrigation ditches are where George and Lennie hide from their pursuers in John Steinbeck's *Of Mice and Men*, where Oliver and Susan Ward lose their daughter to drowning in Stegner's *Angle of Repose*, and where the cowboy Earl, rumored to be gay, is found beaten to death in Annie Proulx's "Brokeback Mountain."[11]

The history of water in the West has also spawned a vast academic literature.[12] Most of it is classified as regional or environmental history, but it nevertheless offers rich possibilities for historians of U.S. foreign relations to learn more about the ideas that American officials brought to overseas development work. It can also serve as a starting point for comparative approaches to water projects in other parts of the world. For example, the Johnston Plan for sharing the waters of the Jordan River paralleled the famous Colorado River Compact of 1922 that divided the Colorado between California, Arizona, and other states in the river's watershed.[13] The history of U.S. water policy influenced the engineers sent by the Bureau of Reclamation to work on the East Ghor project; it helped set their expectations of what a successful irrigation scheme should accomplish.

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[10] Wallace Stegner, *The Sound of Mountain Water: The Changing American West* (New York: E.P. Dutton, 1980); reprint (New York: Penguin, 1997), 10, 15.

[11] John Steinbeck, *Of Mice and Men* (New York: Covici Friede, 1937); Stegner, *Angle of Repose* (New York: Doubleday, 1971); and Annie Proulx, "Brokeback Mountain," in *Close Range: Wyoming Stories* (New York: Scribner, 1999).

[12] The historiography of water in the American West is far too extensive to summarize here. To take just one example, William Mulholland's acquisition of the rights to the water of the Owens Valley, an episode that inspired the movie *Chinatown* (1974), has been the subject of numerous scholarly and journalistic studies. The most widely-read account is probably Marc Reisner's *Cadillac Desert: The American West and Its Disappearing Water* (New York: Viking, 1986), Chapter Two: "The Red Queen"; but see also, among others, Abraham Hoffman, *Vision or Villainy: Origins of the Owens Valley-Los Angeles Water Controversy* (College Station: Texas A&M University Press, 1981); Margaret Leslie Davis, *Rivers in the Desert: William Mulholland and the Inventing of Los Angeles* (New York: Harper Collins, 1993); John Walton, *Western Times and Water Wars: State, Culture, and Rebellion in California* (Berkeley: University of California Press, 1993); Catherine Mulholland, *William Mulholland and the Rise of Los Angeles* (Berkeley: University of California Press, 2000); and Gary Libecap, *Owens Valley Revisited: A Reassessment of the West's First Great Water Transfer* (Palo Alto: Stanford University Press, 2007).

[13] As with the Owens Valley water transfer, the Colorado River Compact is the subject of an extensive literature. For two brief introductions, see Stacey Roberts and Lauren Foster, "'Citizens of a Watershed': The Colorado River Compact and the Exigencies of Drought," *Arcadia* 1 (Spring 2016), Rachel Carson Center for Environment and Society, http://www.environmentandsociety.org/node/7403; and John Fleck, "What Seven States Can Agree to Do: Deal-Making on the Colorado River," Bill Lane Center for the American West, Stanford University (May 2012), http://web.stanford.edu/group/ruralwest/cgi-bin/drupal/content/what-seven-states-can-agree-do-deal-making-colorado-river.

What might we learn from reading the history of the East Ghor Canal alongside the history of water development in the American West? For one thing, it will give us a better sense of scale. Citino tells us that under the Johnston Plan, Jordan was to receive 377 million cubic meters per year from the Yarmouk River (173). Without more context, however, it is difficult for a non-specialist to make much sense of that number. How much water is 377 million cubic meters?

The answer, at least by U.S. standards, is: not much at all. At the same time that the U.S. Bureau of Reclamation was helping to build the East Ghor Canal in the 1950s and 1960s, it was simultaneously working on a far more ambitious enterprise, the Central Valley Project, which diverted the waters of the Sacramento and San Joaquin rivers to serve the needs of Californian farmers. The Central Valley Project was finally completed in the 1970s and today manages about 11.1 *billion* cubic meters of water per year – roughly 30 times the amount of Yarmouk water granted to Jordan. The Central Valley Project reserves almost one billion cubic meters of water just for the preservation of fish and wildlife habitat – more than Jordan's entire national allocation under the Johnston Plan. King Hussein's ambition was to bring 150,000 acres of land under cultivation with the East Ghor project (173); the Central Valley Project, by contrast, irrigates about 30 million acres.[14] California recently suffered through a drought that peaked in the summer of 2015, which triggered arguments between farmers, cities, and other users competing for the remaining water. Even during a dry year, though, Californians have a far easier time of it than the average Jordanian. In their use of water, as in their use of many other natural resources, Americans are profligate.

Another major U.S. irrigation project is the Grand Coulee Dam constructed on the Columbia River in central Washington during the 1930s. Behind it lies Lake Roosevelt with about 116 billion cubic meters of water. The East Ghor Canal was originally designed to carry 10 cubic meters per second (183). If it were possible to connect the canal to Lake Roosevelt and run it at full capacity, it would take *368 years* to draw down the water stored in the main reservoir. The Grand Coulee Dam has six pumps that lift water to Banks Lake, a secondary reservoir that can supply the dam during times of high electricity demand. Each one of those 65,000 horsepower pumps can lift 45 cubic meters of water per second, four and a half times the original capacity of the East Ghor Canal.[15] It should be clear that the largest U.S. irrigation projects were constructed on a completely different scale from anything in the Jordan Valley.

Such comparisons are useful for more than simply their curiosity value. They help us understand just how scarce water truly is in the Middle East. When Americans think of the Jordan River, its historical and Biblical importance might mislead them into thinking that the Jordan is a huge waterway.[16] In fact, at somewhat more than a billion cubic meters per year, its average historical flow was always tiny by comparison to the largest rivers in the United States – around 1/200th the size of the Columbia and 1/450th the size of the Mississippi. Even second-tier American rivers like the Arkansas, the Mobile, and the Willamette are more

[14] U.S. Bureau of Reclamation, "About the Central Valley Water Project," http://www.usbr.gov/mp/cvp/about-cvp.html.

[15] U.S. Bureau of Reclamation, "Grand Coulee Dam Statistics and Facts," http://www.usbr.gov/pn/grandcoulee/pubs/factsheet.pdf.

[16] This point is stressed in Daniel Hillel, *Rivers of Eden: The Struggle for Water and the Quest for Peace in the Middle East* (New York: Oxford University Press, 1994), 156.

than twenty times the size of the Jordan.[17] And that was before the Jordan's waters were diverted by the East Ghor Canal and other irrigation projects; today, only a trickle reaches the Dead Sea.

International politics add more complications. The meager flow of the Jordan must be divided between four separate countries: Israel, Jordan, Syria, and Lebanon. Considering those severe resource constraints, perhaps we should be amazed that there have not been more wars over water in the Middle East. Most of the time, the four nations have been able to share the region's water in a more or less peaceful fashion, despite their history of conflict over other issues. The 1967 Arab-Israeli war, triggered in part by disputes over the Jordan River, was the exception rather than the rule – and even in 1967, other events, like the closure of the Straits of Tiran, were more important as immediate causes of the war.

The environmental constraints faced by Jordan are one reason that outside observers have repeatedly predicted the collapse of the Jordanian monarchy. One of the most remarkable quotations in Citino's article comes from a 1955 report by the U.S. embassy in Amman. The embassy staff wrote that "Jordan's resources susceptible of development are below the level required to establish a fully viable state supporting the present population," and argued that "not less than 300,000 individuals" needed to emigrate before Jordan could be stabilized (177). At that time, the population of Jordan was less than one million people. Since the 1950s, in addition to natural growth, Jordan has absorbed several huge waves of refugees: Palestinians in 1967, Iraqis in 1991 and after 2003, and Syrians after 2011. More than 600,000 Syrians have arrived in just the past five years.[18] Today, Jordan's population is in the range of eight million people and growing – more than ten times the number that U.S. experts originally believed the land could support.[19]

The ability of the Jordanian state to endure in the face of such massive challenges is remarkable. Projects like the East Ghor Canal, which help Jordan make the most of its limited resources, are part of the reason why Jordan has repeatedly defied the predictions of foreign observers who expected the nation to collapse. That achievement, however, has not been without its costs. As I discovered while living in Amman, many Jordanians live under a water rationing system that would be extremely uncomfortable for the average American. Jordan's growth has also damaged the country's natural environment. To the east of Amman, the Azraq Oasis, once home to spectacular wetlands that sheltered water buffalo and migrating birds, has largely dried up as its springs have been diverted for human use. The small wetlands that remain are only sustained by water artificially pumped into the area. To the west, the Dead Sea is shrinking and becoming even more saline as Jordan River water is diverted by the East Ghor Canal and other irrigation projects. And with refugees continuing to arrive from Syria, Jordan's demographic challenges become worse every day.

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[17] For the average discharge of the most important American rivers, see J.C. Kammerer, "Water Fact Sheet: Largest Rivers in the United States," U.S. Geological Survey, May 1990, https://pubs.usgs.gov/of/1987/ofr87-242.

[18] Rana Sweis, "Jordan Struggles Under a Wave of Syrian Refugees," *The New York Times*, 13 February 2016, http://nyti.ms/1R1YkQh.

[19] Historical demographic statistics are from the World Bank, http://data.worldbank.org/country/jordan. As of July 2015, the CIA's estimate of Jordan's current population was 8,117,564. See CIA World Factbook, https://www.cia.gov/library/publications/the-world-factbook/geos/jo.html.

In the long run, the most serious environmental threats to Jordan and other arid nations may come from climate change. Scientific models suggest that global warming will increase the frequency and severity of drought in many parts of the world.[20] The Middle East, where water is already scarce, is likely to be one of the first places to feel the full impact of drought exacerbated by climate change. Many other parts of the world, however, are also vulnerable. Over half the world's population currently lives in conditions of severe water scarcity during at least part of the year, so they have little margin of safety in the event of any future reduction in their water supplies.[21] With climate change, the sort of water shortage that is routine in the Middle East may become more common in other regions, as well.

Political chaos triggered by global drought is already emerging as an important theme in science fiction. The early *Mad Max* movies, influenced by the 1970s energy crisis, depicted gang conflict over the world's last remaining fuel supplies. In the latest installment, *Mad Max: Fury Road* (2015), the focus has shifted to a different commodity; the villain derives his power from his control over fresh water. Similar themes are explored in Paolo Bacigalupi's novel *The Water Knife*, which depicts a parched, near-future American Southwest torn apart by refugee flows and paramilitary warfare between Nevada, Arizona, and the other former signatories of the Colorado Compact.[22]

The history of the Jordan River Valley offers some reasons to hope that the most dystopian predictions of future water wars may be off the mark. The region has managed to endure water shortages much worse than anything Nevada or Arizona are likely to experience over the next few decades. Although the Middle East has a reputation for war and political violence, the waters of the Jordan River have been shared in a mostly peaceful manner. Despite repeated predictions that population growth in Jordan has exceeded the nation's available resources, there has been no Malthusian catastrophe or political collapse in Amman. And despite the rapid growth of Jordan's cities and refugee camps, around 60 percent of the nation's water supplies are still reserved for agriculture, including the banana farms that I saw on my way to the Dead Sea.[23]

Those water supplies, however, cannot be withdrawn from the agricultural sector without risking serious economic and political consequences. The fruit and vegetable farms of the Jordan Valley produce crops both for the domestic market and for export, an important source of hard currency in a nation that runs a large trade deficit. Climate change could drive up food prices around the world, making it even less attractive for Jordan to become totally dependent on imported food. Irrigated farms also provide vital job opportunities for the rural poor, no small concern in a country where unemployment is high and the government needs to

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[20] Aiguo Dai, "Drought Under Global Warming: A Review," *WIREs Climate Change*, 2:1 (January/February 2011): 45-65, http://onlinelibrary.wiley.com/doi/10.1002/wcc.81/abstract; and C.F. Schleussner et al., "Differential Climate Impacts for Policy-Relevant Limits to Global Warming: The Case of 1.5°C and 2°C," *Earth System Dynamics Discussions* 6:2 (November 2015): 2447-2505, http://www.earth-syst-dynam.net/7/327/2016.

[21] Mesfin Mekonnen and Arjen Hoekstra, "Four Billion People Facing Severe Water Scarcity," *Science Advances* 2:2 (12 February 2016), http://advances.sciencemag.org/content/2/2/e1500323.

[22] Paolo Bacigalupi, *The Water Knife* (New York: Knopf, 2015).

[23] Turi Fileccia et al., Food and Agriculture Organization (FAO) of the United Nations, "Jordan: Water Along the Food Chain," 2015, http://www.fao.org/3/a-i4608e.pdf.

maintain popular support to avoid the sort of political turmoil that has engulfed many of its neighbors.[24] The fact that urban consumers have been forced to undergo such severe restrictions on their water supplies demonstrates the importance that the Jordanian government attaches to preserving the country's agriculture.

Since the mid-twentieth century, Jordan has struggled to maximize employment, balance its budget and trade accounts, and conserve water resources at the same time. If Jordan becomes even drier than it is today, those tradeoffs will become more painful with each passing year. And in a region where the provision of water resources is one of the most important functions of the state, drought will have political consequences – a danger that may already be playing out in Syria. One 2015 study suggested that climate change contributed to the 2007-2010 drought in that country, possibly helping trigger the brutal civil war that began in 2011.[25] Even if climate change never leads to complete societal collapse, it will narrow economic opportunities and exacerbate existing political strains in the Middle East, increasing the risk of violent conflict.

During the 1950s and 1960s, Jordan responded to water shortages by working with the United States to build the East Ghor Canal. How is Amman responding to similar challenges today? In part, by continuing its old partnership with Washington. The United States Agency for International Development (USAID), for example, contributes funding and technical expertise to address the problem of drought in Jordan. Rather than large, centralized projects like dams and canals, contemporary U.S. assistance tends to be closer to the "community development" efforts described by Daniel Immerwahr – smaller-scale efforts like building cisterns for Jordanian villages.[26] Other current projects reflect the post-1970s turn to market-based solutions, like providing small loans to local communities and encouraging the Jordanian government to charge higher prices for water in order to encourage greater efficiency.[27]

Massive international water projects have not lost all of their allure in the Middle East. Jordan and Israel recently agreed to build a joint desalination plant on the Gulf of Aqaba, combined with a controversial plan

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[24] Jordanian Ministry of Planning and International Cooperation, "Assessment of the Agricultural Sector in Jordan," http://inform.gov.jo/en-us/By-Date/Report-Details/ArticleId/63/smid/420/ArticleCategory/216/Assessment-of-the-Agricultural-Sector-in-Jordan. For an overview of Jordan's current economic situation, including high unemployment, see Marc Lynch's interview with Pete Moore, "Political Economy & Refugees in Jordan," POMEPS Conversation 74 (11 July 2016), http://pomeps.org/2016/07/11/political-economy-refugees-in-jordan-pomeps-conversation-74-with-pete-moore.

[25] Colin Kelley et al., "Climate Change in the Fertile Crescent and Implications of the Recent Syrian Drought," *Proceedings of the National Academy of Sciences*, 112:11 (2015): 3241-3246, http://www.pnas.org/content/112/11/3241.abstract.

[26] Daniel Immerwahr, *Thinking Small: The United States and the Lure of Community Development* (Cambridge: Harvard University Press, 2015).

[27] Kathy Sullivan, "Water from a Stone: Jordanians Stretch Meager Resources to Sustain Syrian Refugees," U.S. Agency for International Development (USAID), *Frontlines* (July/August 2013), https://www.usaid.gov/news-information/frontlines/aid-action-delivering-results/water-stone-jordanians-stretch-meager; and USAID, "Sustainable Agriculture and Water Management" (updated 16 June 2016), https://www.usaid.gov/jordan/sustainable-agriculture-and-water-management.

to reverse the drying of the Dead Sea by piping in seawater from the Gulf of Aqaba.[28] Desalination, though, is usually not a very attractive option for most water-short nations like Jordan. It is expensive and uses huge amounts of energy, making it unsuitable for countries without money and hydrocarbons to burn. Even Saudi Arabia and the other oil exporters of the Gulf, although they produce much of their water supply through desalination, are increasingly concerned about the vast quantities of oil and natural gas that the process requires. The members of the Gulf Cooperation Council (GCC) have announced their intention to desalinate water, generate electricity, and conserve fossil fuels by constructing a multi-billion-dollar network of nuclear power plants, including 16 reactors in Saudi Arabia alone.[29] Perhaps the old high-modernist spirit of the 1950s and 1960s, with its giant engineering projects designed to overcome environmental constraints, is not entirely dead after all.

Whatever strategies are adopted by the nations of the Middle East to deal with water shortages, it is clear that the problem of drought and climate change is international in scope. As a result, the story of the East Ghor Canal and projects like it could hold clues to the future not only of the Middle East, but much of the rest of the world as well. Jordan and its neighbors, on the front lines of the struggle against drought, might show where other countries are headed. The scholarship on climate change adaptation has so far been dominated by natural scientists and a few economists. The sharing of scarce water resources, however, is likely to become an increasingly important political challenge in arid regions around the globe. Showing how similar challenges were confronted in the past is one way that history may be valuable in a warming world.

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[28] Suleiman al-Khalidi, "Jordan, Israel Agree [on] $900 Million Red Sea – Dead Sea Project," Reuters, 26 February 2015, http://www.reuters.com/article/us-mideast-economy-water-idUSKBN0LU23Z20150226; and Ruth Krause, "Red Sea Water May Not Save Drying Dead Sea," Deutsche Welle, 13 March 2015, http://dw.com/p/1Eicq.

[29] Selim Can Sazak and Lauren Sukin, "The Other Liquid Gold: Nuclear Power and Desalination in Saudi Arabia," *Foreign Affairs* Snapshot, 10 November 2015, https://www.foreignaffairs.com/articles/saudi-arabia/2015-11-10/other-liquid-gold; Brooke Anderson, "Saudis Make Push for Nuclear Energy," *The Wall Street Journal*, 15 September 2015; http://www.wsj.com/articles/saudis-make-push-for-nuclear-energy-1442350064.