Strategy, Foreign Policy and Climate Change

The Middle East in the cross hairs

James A. Russell

In 2007 the United Nations’ Intergovernmental Panel on Climate Change, or IPCC, presented evidence suggesting that the stock of greenhouse gases in the atmosphere could triple by the end of the century, leading to a 50% chance of temperature rises of up to 5°C between now and the end of the century. Researchers believe that climate change is expected to accelerate a series of already negative trends in the Middle East and Persian Gulf:¹

- Decreased precipitation and decreased river flows that are critical to regional populations. For example, some analysts believe that the Euphrates River could shrink by 30% and the Jordan River by 80% between now and the end of the century. Ground water aquifers are also being depleted at dangerous rates.
- Lower yields on major food crops that will only further politicize the issue of food security in an already overpopulated region that still maintains one of the highest population growth rates in the world.
- Rising sea levels that will affect populations in the eastern Mediterranean and the Nile Delta. Populations in the coastal areas of the Gulf region such as Abu Dhabi, Dubai, and Doha will also be affected.
- Rising temperatures are generally believed to negatively affect economic growth, in part due to the increased mitigation and adaptation costs. The lesser developed states in the Middle East, such as Egypt, Jordan, and Syria will have less ability to cope with increased temperatures than the wealthier states of the Gulf.
- Hotter, drier climates will negatively affect human health throughout the region.
- Biodiversity throughout the region will be negatively affected by rising temperatures.
- Weather patterns that will become more erratic, with sandstorms and other disturbances that will make life more difficult for the region’s inhabitants.

Environmental stresses in the region are of course not new, but these stresses promise to gather momentum over the next quarter-century and beyond. These stresses promise to overflow the in-boxes of decision-makers around the world as world leaders show little interest in seriously addressing climate change as a systemic challenge to global security and stability. Meanwhile, the Middle East staggers towards an environmental crisis. As visitors to and inhabitants of the
contemporary Persian Gulf and Middle East can attest, the region’s vast efforts to make its environment appear to be anything other than dusty and sand-colored have required extraordinary and expensive interventions by the region’s governments to create an artificial and man-made world that allows its inhabitants to escape from the effects of the inhospitable physical environment. The tree-lined highways and flower-dotted promenades of today’s modern cities throughout the Middle East and Persian Gulf are all testimonials to efforts mounted over the last several decades to mitigate the impact of an environment that is hotter and drier than any place on earth. States have gone to extraordinary lengths in this quest, and the work continues unabated. For example, Saudi Arabia continues to hopefully seed clouds with calcium, chloride and silver iodide in an attempt to generate sorely needed rain over its arid landscape.2

As the world slowly and reluctantly wrenches its attention to the daunting challenges of addressing climate change and the specter of a future in which environmental issues may exert an increasing impact on regional security and stability,3 the Middle East offers lessons on the problems and prospects of adapting to and mitigating the effects of an already hostile environment on its human inhabitants. While on the one hand the steel and glass towers of Dubai, Riyadh, Doha, and Beirut represent the envy of developing states around the world, their continued existence is inextricably intertwined with the planet’s continued environmental and economic folly. These cities depend on the continued expansion of world petroleum markets, which are themselves dumping carbon emissions, largely from the developed world, into the atmosphere. These emissions must be controlled if the world is to address credibly the inexorable march of climate change. Hence the challenge of climate change is undeniably linked to the functioning of world petroleum markets on which the states of the Persian Gulf, in particular, depend for their environmental mitigation and adaptation efforts. If these mitigation and adaptation efforts fail or are compromised, societies throughout the Gulf and the wider Middle East will be negatively affected. Regional stability will surely be a casualty of this process.

This chapter addresses the challenge posed by climate change and environmental security to the Middle East, with particular focus on the states surrounding the Gulf, such as Iran, Iraq, Saudi Arabia and the smaller states of Bahrain, Kuwait, Qatar, the United Arab Emirates and Oman. Each of these states faces similar challenges. The Gulf states particularly depend upon oil markets to continue their economic growth. These markets have also provided these states with the means to delay political reforms while they maintain anachronistic forms of governments. After assessing the environmental challenges in the region, the chapter will address the degree to which climate impacts hypothesized for 2030 may lead to an appreciable additional factor in triggering disruptive social change and the likelihood of civil conflict. Lastly, it will address the foreign policy challenges for the USA and the region.

Environmental stress in the Middle East

That environmental stresses strike hard in the Persian Gulf states as they do throughout the wider Middle East is not in question. The Persian Gulf and the wider Middle East exist in what could only be described as one of the most hostile environments on the planet with burgeoning, youthful and largely unemployed populations. All statistical indicators suggest that the Persian Gulf is one of the hottest, most water-starved environments in the world. With the exception of Iraq and Iran, which have somewhat better access to fresh water than its neighbors, most states in the Gulf and the wider region suffer from acute fresh water scarcity (defined by the World Bank as access to less than 1,000 cubic meters a year). These scarcities promise to become more acute as the world’s temperature increases and the demand for fresh water increases due to population growth. Domestic water demand is projected to double in the Gulf by 2025 and the demand for
water required for industrial uses will increase threefold over the period. As indicated below in Table 10.1, the baseline of renewable fresh water availability in today’s Gulf is already an environmental crisis.

The United Nations identifies fresh water scarcity as a critical risk factor in all societies, contributing to such systemic problems as poverty, unplanned urbanization, environmental degradation and the stresses on fragmented institutional governing structures where shortages are particularly acute. In other words, water security is now deemed essential to the growth, development and stability of a society. Water scarcity is perhaps the most serious of the direct environmental impacts in the Gulf that will be felt by increasing temperatures over the next 20 years. It is by any measure a systemic problem. The World Bank projects that per capita water availability throughout the Middle East and North Africa region will decline from today’s average availability of 1,000 cubic meters per year to 500 cubic meters by 2050. In contrast, by 2050 when the world’s population is expected to reach 9bn people, average per capita annual water availability will amount to 6,000 cubic meters per person.

Total water demand is projected to increase in the Gulf Co-operation Council (GCC) states by 36% over the next decade. In addition to systemic shortages, water scarcity in the Persian Gulf region in particular promises to gather momentum over the coming decades as a result of persistent mismanagement by the regional states of their limited renewable water resources. It is a disheartening picture. In 2007 the GCC countries extracted 19.5m. cubic meters of fresh water from underground aquifers, while the recharge of these aquifers accumulated at the rate of only 4.8m. cubic meters. The Gulf states currently extract 91% of their total water demand from these underground sources, with the remaining demand satisfied by desalinization and treated effluent. This unsustainable practice has resulted in falling water tables, a deterioration in water quality and saline water intrusion into the declining aquifers.

In some regional cities the depletion of ground aquifers is already a crisis. Researchers at the Center for Strategic and International Studies found that residents of Sana’a (with an estimated population of 1.7m. in 2010) in Yemen are resorting to oil drilling equipment to reach water to preserve existing wells. The water table in Sana’a is estimated to be falling at the rate of 4–6 meters per year and some believe the city will run out of groundwater by the year 2017.

Table 10.1 Fresh water availability in Middle East/Gulf States

<table>
<thead>
<tr>
<th>Country</th>
<th>Renewable Water Availability in 2005 in cubic meters per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saudi Arabia</td>
<td>96</td>
</tr>
<tr>
<td>Yemen</td>
<td>198</td>
</tr>
<tr>
<td>Egypt</td>
<td>790</td>
</tr>
<tr>
<td>Bahrain</td>
<td>157</td>
</tr>
<tr>
<td>Jordan</td>
<td>160</td>
</tr>
<tr>
<td>Syria</td>
<td>1440</td>
</tr>
<tr>
<td>UAE</td>
<td>49</td>
</tr>
<tr>
<td>Qatar</td>
<td>86</td>
</tr>
<tr>
<td>Oman</td>
<td>340</td>
</tr>
<tr>
<td>Lebanon</td>
<td>1190</td>
</tr>
<tr>
<td>Kuwait</td>
<td>8</td>
</tr>
<tr>
<td>Iraq</td>
<td>2920</td>
</tr>
<tr>
<td>Iran</td>
<td>1970</td>
</tr>
</tbody>
</table>
There are few alternative sources to this water for Yemen’s population, since building desalinated water plants is prohibitively expensive.

Jordan also faces a short-term water crisis due in part to a deliberate program to expand irrigated areas during the 1990s. Jordan invested heavily in expanding agricultural production during this period and now exports food valued at over US$500m. annually. This unsustainable increase in agriculture production has come at a serious long-term price. Not only does this hugely inefficient program deplete Jordan’s underground aquifers, but it also creates a political problem for the regime since a wealthy, politically-connected elite controls much of the water for this agricultural production.13

The experiences in Yemen and Jordan are not anomalies. States throughout the Middle East have pursued a nonsensical and hugely inefficient policy of developing their own agriculture despite the inhospitable environment. A staggering 85% of the ground water in the GCC states is used for agricultural production of food that could be imported much more cheaply.14 Moreover, the disproportionate investment of their limited fresh water assets in agriculture has been of negligible benefit to their economies, contributing on average less than 1% of GDP throughout the region.15 Saudi Arabia’s particularly egregious agriculture program illustrates the point. During the 1980s Saudi Arabia became the sixth largest wheat exporter in the world (with production reaching nearly 5m. tons in the early 1990s) courtesy of non-renewable ground water provided through inefficient irrigation systems.16 In belated recognition of this folly, Saudi Arabia announced plans in early 2008 to reduce grain production annually by 12.5% and to halt all production by 2016.17 Figure 10.1 below indicates trends in Saudi grain production.

Another egregious example of Saudi Arabia’s fresh water folly is represented by the Al Safi Dairy Farm, identified in the Guinness Book of World Records as the largest integrated dairy farm in the world. The farm, located about 60 miles outside Riyadh, covers 14 square miles and supplies approximately one-third of the country’s dairy needs. The farm’s 29,000 cows produce an estimated 122,000 gallons of milk per day, with each cow needing up to 30 gallons of fresh water daily to drink and stay cool in temperatures that can reach as high as 115°F in the summer. Water for the entire operation is pumped from a depth of 6,000 feet underground. In

![Figure 10.1 Trends in Saudi grain production](image-url)
addition to cooling down the cows, the water is used to grow all the food for the farm’s four-legged inhabitants. Clearly, projects like this must become a casualty of the region’s dwindling fresh water supplies.

As dire as this well known story of fresh water scarcity may be, however, all these states have taken dramatic steps to address chronic shortages by building desalination plants. The region today boasts the most developed infrastructure for fresh water production in the world. Desalinated water is extremely expensive to produce, costing on average from $0.5-0.6 per cubic meter. The Gulf states today operate over one-half of the world’s estimated 10,400 desalination plants that produce over 35m. cubic meters of water per day around the world. Saudi Arabia’s Saline Water Conversion Company (SWCC) is the largest desalinated water company in the world, producing approximately 3m. cubic meters per day and 5000 megawatts of power, representing 50% of the kingdom’s drinking water supply and 20% of its power generation. In March 2006 SWCC Governor, Fehied al Shareef, indicated that the kingdom will need an additional 6m. cubic meters of water and 30,000 megawatts of power generation capacity to meet anticipated demand.

The scale of the joint desalination/electrical power projects under consideration throughout the region is truly staggering. In August 2007, the French company Veolia Water Solutions and Technology announced it had launched an $805m. project to build a desalination plant in Fujairah in the United Arab Emirates that will produce 590,000 cubic meters of water per day upon completion in 2010. The same company also received a $1.4bn contract in June 2007 to build what will be the world’s largest desalination plant in Jubail, Saudi Arabia that will produce 800,000 cubic meters of water per day. In December 2006, Saudi Arabia began studying a potential $5.3bn “Water Bank” project in Tihama that will add significant desalination capacity for the entire country. Demand for desalinated water in the region is projected to grow at an annual rate of 6% and may require an investment of over $100bn in new capacity over the next decade to meet increased demand.

The fresh water shortage is the Gulf states’ critical environmental stress for the foreseeable future and becomes exacerbated by population growth and the economic growth that must sustain the region’s burgeoning population. As indicated in Table 10.2 below, population in the Gulf state region is expected to grow from 117m. in 2000 to 219m. by 2050, an increase of over 85%.

<table>
<thead>
<tr>
<th>Country</th>
<th>1950</th>
<th>2000</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saudi Arabia</td>
<td>3.200</td>
<td>20.800</td>
<td>45.03</td>
</tr>
<tr>
<td>Iran</td>
<td>16.900</td>
<td>66.001</td>
<td>100.17</td>
</tr>
<tr>
<td>Iraq</td>
<td>5.300</td>
<td>25.020</td>
<td>61.90</td>
</tr>
<tr>
<td>Yemen</td>
<td>4.316</td>
<td>18.182</td>
<td>53.689</td>
</tr>
<tr>
<td>Kuwait</td>
<td>0.152</td>
<td>2.200</td>
<td>5.20</td>
</tr>
<tr>
<td>Egypt</td>
<td>21.514</td>
<td>70.174</td>
<td>129.533</td>
</tr>
<tr>
<td>Jordan</td>
<td>0.472</td>
<td>4.853</td>
<td>10.241</td>
</tr>
<tr>
<td>Syria</td>
<td>3.536</td>
<td>16.511</td>
<td>36.911</td>
</tr>
<tr>
<td>Oman</td>
<td>0.456</td>
<td>2.400</td>
<td>4.60</td>
</tr>
<tr>
<td>Qatar</td>
<td>0.025</td>
<td>0.617</td>
<td>1.30</td>
</tr>
<tr>
<td>Bahrain</td>
<td>0.116</td>
<td>0.650</td>
<td>1.17</td>
</tr>
<tr>
<td>Totals</td>
<td>55.987</td>
<td>227.408</td>
<td>449.744</td>
</tr>
</tbody>
</table>

Note: Population in millions
Regional economic growth to accommodate this increased population will for most of these states literally be fueled by the functioning of world petroleum markets. It is less clear where the water will come from. Without the revenues provided by these global markets, the Gulf states may face the prospect of economic stagnation and political uncertainty. Income from oil exports is a vital supporting component in the system of government practised by all regional regimes, a system of government that features no taxation and little representation. The future, however, appears bright for regional regimes as they seek to preserve their “rentier” governmental model of redistributing energy market proceeds. The US Energy Information Administration (EIA) forecasts that the world will need 40% more oil than it is using today by 2030, when global demand will increase from approximately 85mbpd in 2008 to between 118 and 120mbpd. Developing Asia and the USA will drive the increase in demand. The USA is anticipated to need an additional 10mbpd by 2030, taking its consumption to between 28 and 30mbpd by 2030. Asia will be the Gulf’s most important market over this period. Asian anticipated economic expansion will be enabled and fueled by increased production of gas and oil in the Gulf. Net oil imports in China and India combined are expected to increase from 5.4mbpd in 2006 to 19.1mbpd in 2030. Gulf producers must nearly double production to keep pace with anticipated growth in demand, and these producers will face particular pressure to increase production after 2020 when non-OPEC suppliers are projected to plateau. The EIA projects that Persian Gulf share of worldwide petroleum exports may reach 66% by 2025.

The paradox of the Gulf states’ situation is that their continued ability to adapt and mitigate the impact of environmental stresses for their growing population depends upon the functioning of markets that must somehow be artificially restrained if the world is to successfully regulate carbon emissions. This fundamental contradiction lies unaddressed by all the major energy market participants. Both suppliers and consumers of fossil fuels continue to believe that the future will be like the past. That the Gulf states are proceeding down the road of planning their future based on the premise of continued, unrestrained revenue growth is not in question. The recent past suggests their reasons for optimism. Revenues in the region delivered courtesy of the increase in oil prices have resulted in a veritable waterfall of cash into the coffers of these states. According to a recent Kuwaiti economic report, regional oil revenues surged from $364bn in 2007 to $636bn in 2008; aggregate oil revenues may have topped $1.3 trillion in 2008 and 2009.

These revenues are required to allow the regional regimes to continue the environmental mitigation and adaptation efforts upon which their survival and prosperity depends. The future for economic growth and development looks bright in the Gulf states. The region today is among the fastest growing in the world. The Saudi American Bank forecast in June 2008 that GCC economies could expect growth rates of 14 and 15% in 2009 and 2010, with medium-term growth rates into the next decade of at least 8% annually. Contrary to popular perception, while the current boom in the Gulf states is moved inexorably higher by energy markets, non-oil sector growth is an equally important factor in driving the growth in Gulf economies.

The GCC has taken steps to open its markets to outside investors over the last decade and is becoming steadily more competitive relative to other global states, according to World Bank figures. The region boasts an estimated $2 trillion in ongoing development projects: $1.3 trillion in construction projects and $266 billion in energy infrastructure represent the main components of these developing economies.

Dubai, once regarded as a model of sustainable economic development, now confronts a landscape littered with half completed highrises after the economic tsunami of 2009 wreaked havoc on its aggressive development projects to position itself as the Monte Carlo of the Middle
East. The Emirate of Abu Dhabi is pursuing a similar series of fantastical development projects. In early 2008 Abu Dhabi broke ground on a project called Masdar City, a $22bn project to build a 6-square kilometer carbon-free city.31 Similar aggressive development is proceeding in Doha, fueled by export revenues from the North Dome natural gas field.32 Other ambitious projects abound throughout the region. Three are plans, for example, to position the region as a leading producer of aluminum in global markets. A series of huge, environmentally unfriendly aluminum smelter projects are underway in Kuwait, Qatar, Oman, and the United Arab Emirates that will boost production to 1.8m. metric tons per year by 2010.33

Saudi Arabia has launched aggressive plans to build a series of new cities for its increasing population that will provide housing and jobs. The Saudi Arabian General Investment Authority has launched a massive development plan to build six new cities that it hopes will add $150bn to the nation’s economy by 2020; housing for 4.3m. people and 1.3m. jobs. The King Abdullah Economic City, Knowledge Economic City in Medinah, Prince Abdulaziz bin Mousaed Economic City in Hail (500 miles north of Riyadh), Jizan Economic City, and Petro Rabigh represent the cornerstone of the regime’s attempts to build an infrastructure that can absorb the bow wave of population growth that will be breaking over the kingdom during the next 30 years.34

Unsurprisingly, the rapid economic growth of the last five years has increased the environmental footprint of the region’s populations. The World Wildlife Foundation has developed an index to measure the demand a country places on biosphere in terms of the area of biologically productive land and sea required to provide the resources and absorb the waste of the world’s population.35 The index references the number of global hectares used per person for resource consumption in each country (see Table 10.3 above)36. The ecological footprint of the region is significantly higher than global averages, particularly in countries like Saudi Arabia and the United Arab Emirates. The figures indicate that the United Arab Emirates boasts the world’s largest ecological footprint on a per capita basis, in which each citizen is using a staggering 11.8 hectares for resource consumption and waste absorption.

### Environmental vulnerability

The dire projections for the impact of declining access to fresh water are but one component in assessing the cumulative impact of climate change on regional states. Table 10.4 below summarizes the findings from the Center for International Science Information Network at Columbia University that assesses the aggregate vulnerabilities of selected Middle Eastern States over the next 20 years to climate change.

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**Table 10.3** Gulf State ecological and carbon footprint per person, 2003

<table>
<thead>
<tr>
<th>Country</th>
<th>Ecological Footprint</th>
<th>Carbon Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saudi Arabia</td>
<td>4.60</td>
<td>3.43</td>
</tr>
<tr>
<td>Iran</td>
<td>2.40</td>
<td>1.52</td>
</tr>
<tr>
<td>Iraq</td>
<td>0.90</td>
<td>0.75</td>
</tr>
<tr>
<td>Kuwait</td>
<td>7.30</td>
<td>0.29</td>
</tr>
<tr>
<td>UAE</td>
<td>11.0</td>
<td>9.06</td>
</tr>
<tr>
<td>Qatar</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Oman</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Bahrain</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>MENA Avg</td>
<td>2.20</td>
<td>1.36</td>
</tr>
<tr>
<td>Global Avg</td>
<td>2.23</td>
<td>1.06</td>
</tr>
</tbody>
</table>

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Interestingly, the data above does not indicate a “serious” societal vulnerability to projected increases in the world’s temperature. While the data shows that in Iran and Saudi Arabia there will be continued significant shortages of potable water, these shortages are not deemed threatening to the social fabric of the societies. Another of the environmental phenomena commonly associated with climate change is the prospect of rising sea levels. Of the four countries above, only Egypt is assessed to suffer significant impact of a rise of between 1 and 3 meters in sea levels. An estimated 10% of Egypt’s population (6m. people) would be affected by a 1-meter rise in sea level, with that number increasing to 10m. people by a 3-meter rise.38 While none of the Gulf states in the sample (Saudi Arabia, Iran and Iraq) are assessed to have significant coastal populations that might be affected by dramatic rises in sea levels that is not true elsewhere in the Gulf. The island nation of Bahrain could lose up to 15 kilometers of coastline with significant increases in sea levels.39 Moreover, the aggressive development of man-made islands off the coast of Dubai and the land “reclamation” projects in Qatar and Bahrain certainly would become more problematic in the event of rises in sea levels. Low-lying areas in Egypt’s Nile River delta, which are among the most agriculturally productive in the country, will also be submerged by significant rises in sea levels.

### Regional stability and climate change

Climate change in and of itself does not significantly affect the Middle East, since the region is already one of the hottest, driest places on the planet. Limitations of the physical environment have always proven to be a powerful and systemic factor shaping these societies. As the Gulf societies have moved from agrarian to industrial economies and moved from rural to urban populations, the region’s ruling elites have devised sophisticated and expensive means to mitigate and adapt to the systemic limitations imposed upon them by a hostile environment. The environmental adaptive capacities throughout the Gulf states today are the most advanced in the world, although Iraq and Iran have some catching up to do relative to the states of the Arabian Peninsula. Saudi Arabia, for example, has constructed an elaborate adaptive infrastructure at a cost of billions of dollars that has enabled the kingdom to cope with environmental extremes. There is an admitted air of unreality to these measures, that have been taken without regard to cost or common sense. To survive, regional regimes must continue to fund expensive and environmentally unfriendly programs to continue the process. Assuming that these societies can continue their unfettered investments in fresh water development, power generation, housing and economic development these efforts can continue as long as petroleum markets provide revenues that will allow them to do so. Continuing down this path may mitigate the prospect of

### Table 10.4 Middle East environmental vulnerability snapshot

<table>
<thead>
<tr>
<th>Country</th>
<th>Aggregate Vulnerability Score</th>
<th>Relative Temp. Vul.</th>
<th>Temp. Change</th>
<th>2000 Pop. w/access to annually less than 1000 m³</th>
<th>2030 Pop. w/access to less than 1000 m³</th>
<th>% change</th>
<th>Agricultural productivity impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt</td>
<td>0.90</td>
<td>Avg.</td>
<td>0.71</td>
<td>66.4</td>
<td>74.8</td>
<td>8.5</td>
<td>Positive</td>
</tr>
<tr>
<td>Iraq</td>
<td>1.06</td>
<td>Avg.</td>
<td>0.74</td>
<td>31.5</td>
<td>50.1</td>
<td>18.6</td>
<td>Very serious</td>
</tr>
<tr>
<td>Iran</td>
<td>0.96</td>
<td>Avg.</td>
<td>0.83</td>
<td>83.2</td>
<td>90.8</td>
<td>7.6</td>
<td>Serious</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>0.78</td>
<td>Avg.</td>
<td>0.66</td>
<td>94.1</td>
<td>96.3</td>
<td>2.2</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

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internal instability. All the Gulf states thus find themselves in a series of difficult contradictions. They all rely on revenues from fossil fuels, which must be limited if the world is to successfully address CO₂ emissions.

The Al Saud is frankly ahead of the rest of the world in its thinking on the impact of climate change and the politics of climate change on its national interests. This is in part due to the fact that Saudi Arabia is already one of the most environmentally inhospitable parts of the planet, and the regime has spent much of the last 50 years investing in arguably the world’s best developed climate-related adaptation and mitigation infrastructure. An American football metaphor illustrates the Al Saud’s approach. At a time when the rest of the world still has yet to arrange a huddle to call plays, the Al Saud is already positioned in a prevent defense on the issue of climate change (a strategy to prevent the “hail mary” touchdown pass with the recognition that the defense is prepared to give up the short pass and the run up the middle).

This approach to the politics of climate change has earned them the ire of environmental groups, who, in 2006 rated Saudi Arabia as the worst country in the world at addressing climate change. At the December 2007 United Nations conference on climate change held in Bali, environmental groups labeled Saudi Arabia as the “fossil of the day” for its reluctance to support the global climate change talks. The Saudi approach to the issue seems encapsulated, on the one hand, by King Abdullah’s announcement in November 2007 that the kingdom would spend $300m. to support climate change research, and, on the other, by the simultaneous announcement that Prince Alaweel bin Abdulaziz al Saud was spending $300m. for an Airbus 380 flying palace.

Saudi Arabia, the USA, and China have united over the last eight years to water down findings of the Intergovernmental Panel on Climate Change. The Saudi approach to the issue has been perhaps best articulated by Saudi oil minister Ali bin Abrahim al-Naimi, who, in objecting to attempts in the industrialized world to restrain gasoline demand through higher taxes, told the United Nations General Assembly in September 2007 that “Those industrialized nations are imposing more high taxes which are … providing direct and indirect aid for the industries of coal and nuclear energy which are the most polluting sources of climate and the global environment … This affects growth rates in the world for demanding oil in the coming period and contributes to the negative impact on the march of development in our country.” Naimi added that “The call for moving away from fossil fuel consumption as a way to address climate change is not a viable alternative. I can assure you that through the use of technology solutions the world can continue to rely on oil.”

The Al-Saud family fears not the impact of climate change on their own physical environs that will change little if the world continues to heat up, but they do foresee disaster in the politics and policies of climate change as the international community starts to grapple with the problem. The Saudi and Gulf state nightmare is global agreement on a system of market distorting forces that produce two outcomes: (1) a reduced demand for energy; (2) demands that energy producers shoulder the costs for states that lack the resources to implement climate-related adaptation and mitigation measures.

This is a strategy to hold off for as long as possible a system of global carbon taxes and/or mechanisms to spread the costs of adaptation and mitigation to climate change. The Al Saud and their colleagues around the region look upon this outcome as inevitable, but the longer they can avoid dipping into their own pockets as part of the market distorting measures, the better off they will be in building up their own environmental adaptation and mitigation efforts. The Al Saud is motivated by economic self-interest in this matter and, more broadly, by the recognition that the kingdom depends upon increasing amounts of cash to cope with the traditional sources of instability that confront it: population growth, urbanization,
unemployment, lack of fresh water, and disruptive social movements that could spring from Saudi urban centers, to name but a few.

The Al Saud and the other Gulf state ruling families have ruled their country and paid close attention to a series of domestic stakeholders in cementing their hold on their respective countries. In Saudi Arabia, these stakeholders include the extended royal family; the religious establishment; the merchants of the Hijaz; the new caste of dissident religious clerics that wield influence in the Nejd; Shias in the eastern provinces, which are still second class citizens in the kingdom; tribal and clan leaders throughout the peninsula that have been indirectly integrated into the familial structure via marriage. Each of these stakeholders benefits in various ways from the system of economic and political patronage that characterizes the internal system of governance in the kingdom.

Internally, each family in the Gulf states has constructed an elaborate system of political patronage and wealth redistribution in the form of free education, cheap gas and electricity and government jobs for a mostly underemployed male population. Continued economic growth built on the continued expansion of world demand for energy provides the means for them to continue this “rentier” system that keeps their friends happy and co-opts and buys off potential internal opponents.

The Saudis and the Gulf state partners greatly fear the impact that climate change could have on the orderly functioning of global markets for petroleum and they fear that the politics of the issue may result in market distorting forces. Both issues could lead to a drop in revenue and mitigate the regime’s ability to address traditional risk sources.

Second order effects of climate change

The stresses stem not from the environment per se, but from the regime’s ability to continue the process of adaptation and mitigation to an already stressed environment. If the regimes can’t continue to produce this artificial construct, the basis of the internal “rents” system becomes unglued since domestic constituencies can no longer be bought off and co-opted. In such a scenario, the regional regimes devolve down to Mukhabarat (police states), the consequences of which could be catastrophic for the regimes over the long term. In Saudi Arabia, the most serious near term political threat that could be energized by market disrupting forces are the dissident populist clerics that are operating outside the confines of the government sanctioned religious establishment. This group is highly xenophobic, virulently anti-Shia, and virulently anti-Western.

This analysis suggests that regional security will not be seriously threatened by climate change per se in the period to 2030, assuming that climate change or other factors lead to no systemic changes in international energy markets. Climate change impacts are not forecast to gather forceful momentum until the second half of the 21st century. The Al Saud and other regional regimes above all seek to ensure the security of the family and their continued political and economic ascendance. As previously indicated, we can expect all the Gulf state regime leaders to act with alacrity in managing threats to the state that stem from market distorting forces. As long as the world demand for energy continues on its inexorable path, regional regimes are provided with the means to stave off stresses to the state stemming from environmental and climate-related forces.

Here, however, it is worth noting that the climate models do not account for disruptive, cascading events that can dramatically alter orderly political and economic interaction between and among global actors. In other words, the cumulative impact of climate change may produce unanticipated incremental changes that can materialize into much more serious problems. Surprises happen. Climate change will affect economic development around the world and will
make it more difficult for various states, particularly in Asia, to sustain a predictable path of economic development. The continued economic expansion in Asia is vitally important to Saudi Arabia as a source for its oil exports.

The analysis here is that the latent reserves of social and political resilience are proportionate to latent reserves of oil and natural gas. If the oil runs out or if markets fundamentally change due either to a sustained global economic slowdown or to successful energy demand mitigation efforts around the world, it is doubtful that today’s residents of the Gulf will willingly and peacefully return to the Bedouin-type existence of their ancestors (a way of life that coped with the extreme environment before oil was discovered). The Saudis hope this will never happen, and their hope seems justified. The US Geologic Survey estimates that the kingdom may have as much as 1 trillion barrels in recoverable reserves of all kinds of oil. No amount of demand mitigation measures will dry up the world’s thirst for oil.

It is unlikely that Saudi Arabia, for example, will ever be a preferred destination for migrants or refugees of any kind, unless they are perhaps Muslim religious refugees fleeing persecution. This is not necessarily the case in the more socially relaxed Gulf states such as Bahrain, Qatar and the United Arab Emirates. In the United Arab Emirates and Qatar, for example, foreign nationals already outnumber the host nation nationals. Saudi vulnerability stems from the functions of international energy markets and the faith, or lack thereof, in these markets. This is a phenomenon that could be described as the “militarization of energy security,” a situation in which states lose confidence in markets to deliver mean reversion in energy pricing. Alternatively, states judge that successively higher cost plateaux in energy pricing are unacceptable, weighting the cost-benefit calculus on the use of force towards using force. Such a scenario is not difficult to imagine if “peak oil” becomes a reality or if the world’s advanced states decide that successively increasing prices of oil are politically and economically unacceptable. In such an environment, the Gulf states, and most particularly Saudi Arabia, become subjected to intimidation and coercion by advanced states. I argue here that the potential of armed aggression directed at Saudi Arabia stems not from climate-related issues but from a loss of confidence in international energy markets.

Foreign policy implications

All states in the Middle East face profound environmental stresses over the coming decades. But it must be stated that the regional regimes are reasonably experienced at dealing with these stresses with their elaborate and expensive mitigation and adaptation efforts. For example, the region is heavily investing in new fresh water capacity to address its shortfalls and prepare for the population growth that is expected over the next several decades. Unlike the oil wealth explosion of the early 1980s, this time the regional states are heavily investing in development projects at home to build their infrastructures to ensure some form of sustainable development.

Despite these prudent steps, however, the regional regimes all remain vulnerable to fluctuations in global energy markets. A sudden drop in global demand for energy or a sustained drop in energy prices will negatively affect their ability to continue their mitigation and adaptation efforts. The global politics of climate change threaten to change the dynamics of international energy markets in ways that redound to the disadvantage of the Gulf state producers. They will thus continue to publicly embrace “green” development policies at home while joining together with other states to forestall a global system that will limit emissions and, hence, demand for energy. Moreover, they will seek to avoid schemes that distribute their wealth to the lesser developed world to pay for the climate-related mitigation and adaptation efforts that they themselves have build their modern societies around. Any global system that comprehensively
addresses climate change will have to incorporate the needs and interests of the energy producing states in the Gulf.

As previously noted, regional regimes will seek to mitigate developments in global politics that distort the functioning of international energy markets. To do this, the regimes must engage with a variety of international actors around the world, both states and international organizations. This engagement is necessary to pursue their strategy of forestalling the development of market distorting forces and delaying being placed in the position of paying for adaptation and mitigation costs elsewhere. They are amenable to Western interests as a function of maintaining good customer relations with a group of countries that also possess not insignificant military capacities that are useful to the kingdom. The Saudis have assiduously avoided offending their erstwhile protector (the USA) and they have in parallel built close political relationships with established European states both as a counter to US hegemony and another source of protection against external threats. There is no reason to suggest that the Al Saud will alter and/or change this approach over the forecast period, unless revolution from within topples the House of Al Saud, replacing it with some kind of populist Islamic figure.

For the USA, the long-range challenges of climate change in the region are significant. When layered upon an already unstable region, environmental stresses promise to add another complicating factor to US policy makers in this strategically vital region. Unfortunately, the USA shows no inclination to think and plan strategically on these or any other foreign policy issues. The collapse of the 2009 United Nations Climate Change Conference in Copenhagen illustrated the inability of the US to take a leadership position on climate change. The lack of leadership on climate change and other global issues stems from many sources. First and perhaps most important is America’s fractious domestic politics, which has seen the breakdown of the centrist political consensus that drove foreign and domestic policy for most of the post-World War II era. The polarization of American domestic politics has burst apart this centrist coalition and its realist-oriented foreign policy and has yet to be replaced by anything else with political and strategic coherence. Neither the Obama nor the Bush Administrations conducted a foreign policy based on sound realist strategic principles and both appeared strategically and intellectually confused about how to define, further, and protect America’s global interests and objectives.

Seizing a global leadership position on climate change issues is symptomatic of the strategic fog shrouding US global strategy and policy that is felt acutely in the Middle East. The situation calls for strong and purposeful US global leadership that can be used as the basis to initiate policies that will start slowing the dumping of carbon into the atmosphere. The oil exporting states of the Middle East must play a central role in addressing this problem and their needs and interests must somehow be figured into the global solution. That is less likely to happen without strong US leadership that has to date been lacking. The world must hope that the USA awakes from its strategic and intellectual torpor to seize the mantle of leadership on climate change that the world wants and needs. Only if and when this happens can the Middle Eastern states and the international community begin to start building policies that will address the systemic challenge posed by climate change throughout the region.

Notes

* The views in this paper are those of the author and do not represent the views and positions of the Naval Postgraduate School.

1 List drawn from Mostafa K. Tolba and Najib W. Saab, Eds., Arab Environment Climate Change: Impact of Climate Change on Arab Countries (Beirut: Arab Forum for Environment and Development, 2009); Jeannie Sowers and Erika Weinthal, “Climate Change Adaptation in the Middle East and North...

2 As reported by Sanir Al Saadi, “Kingdom to Carry Out Another Cloud Seeding Experiment,” Arab News, June 3, 2008 at www.arabnews.com/?page=1&section=0&article=110547&d=3&m=6&y=2008


10 Ibid.


12 Ibid.

13 Ibid.


15 Making the Most of Scarcity, World Bank, op. cit. 12.


20 Javid Hassan, “Kingdom Leads in Desalination, But Needs More to Meet Demand,” Arab News, March 22, 2006; online at www.arabnews.com/?page=1&section=0&article=79565&d=22&m=3&y=2006


22 Mariam al Hakeem, “Sauids Consider $5.3 Billion Water Project,” Gulf News, December 24, 2006; online at http://archive.gulfnews.com/articles/06/12/24/10091822.html


26 Ibid.


29 Ibid.
30 Ibid. 9.
32 For a summary of the largest of these regional projects see SAMBA report above, Appendix 1, Selected GCC Projects, May 2008, 18
35 Living Planet Report 2006, World Wildlife Fund, 14. The WWF defines the footprint as follows: “The footprint of a country includes all the cropland, grazing land, forest, and fishing grounds required to produce the food, fibre and timber it consumes, to absorb the wastes emitted in generating its energy uses, and to provide space for its infrastructure. People consume resources and ecological services from all over the world, so their footprint is the sum of these areas, wherever they may be on the planet.”
37 Data drawn from model on anticipated climate change by year 2030 prepared by Dr. Marc Levy and the Center for International Earth Science Information Network at Columbia University.
38 CIESN data
40 “US, Saudi, China Rank Among Worst on Climate Change: Group,” Agence France Presse, November 14, 2006. The report by the German environmental group Germanwatch rated Sweden as best, with the USA, China and Saudi Arabia at the bottom of the heap.
41 “Saudi Arabia Tops the Roll of Dishonour,” One World Net, December 5, 2007 at http://uk.oneworld.net/article/view/155885/1/
42 As noted in “Billions Face Climate Change Risk,” BBC News April 6, 2007 at http://news.bbc.co.uk/2/hi/science/nature/6532323.stm