

The events of 2020 have thrown the Gulf states into an even deeper conundrum over how to balance food security with water scarcity. Which is less of a risk for countries of marginal environment – to depend on food imports and risk supply disruptions, or to invest in agriculture and risk further stressing water resources? In the quest for food security and self-sufficiency, the Gulf should account for the large amounts of virtual water it imports.

The coronavirus pandemic has brought into sharp relief economic vulnerabilities, system inefficiencies and sectorial risks in countries and regions around the world. In the Gulf, in addition to economic pressure, the outbreak is a stress test for food and water security.

Measures to contain the spread of COVID-19 have led to a full or partial halt of economic activities and shipments, causing supply-chain disruptions of consumer products, including food, and leading governments to reconsider their food strategies and security. The situation calls to mind the 2007-08 crises, which saw a 40% hike in food prices globally and triggered the “Riyadh Declaration to Enhance Arab Cooperation to Face World Food Crises.”

Gulf food security strategies revolve around five major objectives: 1) [investing in agricultural land in foreign countries](#) 2) diversifying sources of supply 3) investing in local agricultural production 4) enhancing storage capacity domestically and 5) decreasing food waste. Some measures have enhanced the accessibility and availability of food, but investing abroad has been subject to political risk, including conflicts with the local community over resource availability, as many of the foreign countries are also in water-stressed areas in Africa.

What is virtual water?

The Gulf is highly dependent on food imports, including the oft-neglected import of virtual water.

Virtual water, which describes the volume of water consumed in the production of agricultural commodities, has enabled water-scarce Gulf economies – through regional and international food trading – to offset the volumes of water otherwise needed to cultivate produce domestically.

Tony Allan, who coined the term in 1993, argued that the virtual water trade enabled by the global economic system had enabled the Middle East to tackle its water challenges, averting droughts, water

conflicts and wars. However, a heavy reliance on food trading disputes the concept of self-sustainability and the pillars of food security. As long as the Gulf remains focused on reducing vulnerabilities in food security through growing food domestically, water scarcity will remain a major risk.

A resource in short supply

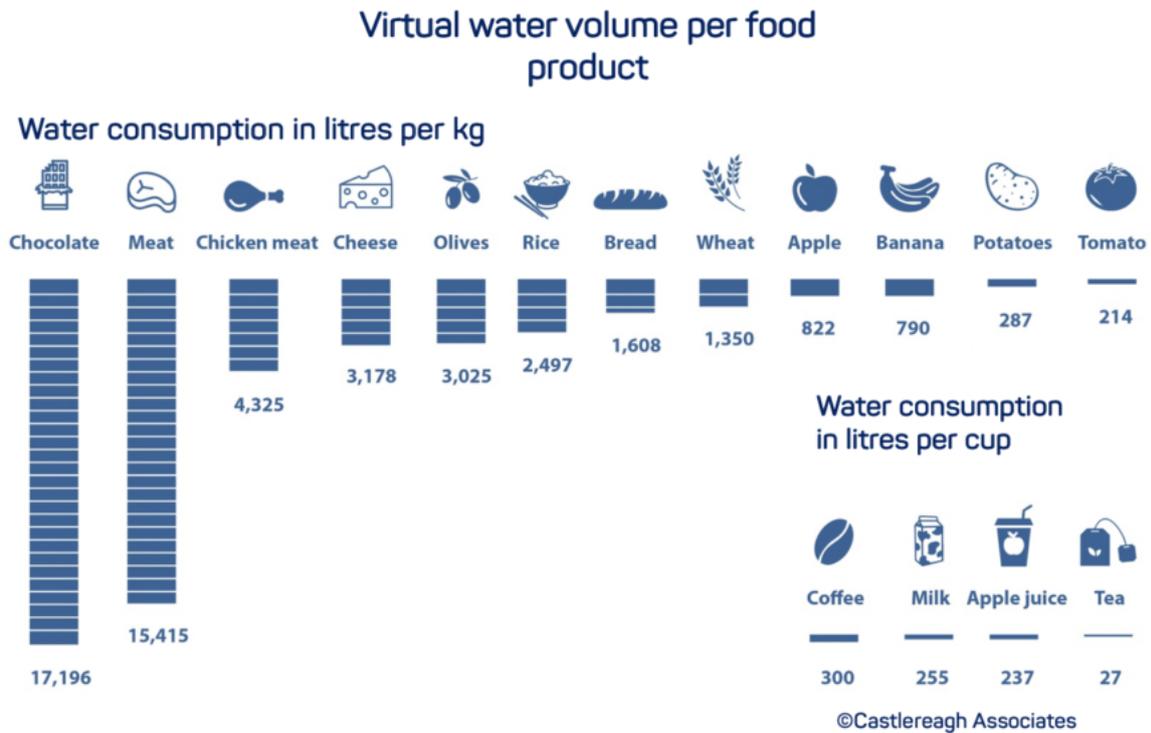
Water scarcity, following food security, is considered [the greatest threat to human and ecological security in MENA](#).^[1] The region is the most water-stressed with the lowest ratio of renewable water resources per capita in the world. The World Bank estimates that water scarcity will cost the region 6-14% of GDP in losses by 2050.^[2]

The challenge is more acute in the Gulf's arid climate, and will be further exacerbated by climate change. According to the World Resources Institute, in 2019 Qatar ranked 1st in the extremely high water-stress indicators, while Kuwait and Saudi Arabia ranked 7th and 8th respectively. The remaining Gulf States were in the top 16 countries^[3]

With water in such short supply, it is critical that the Gulf's food security strategies consider how much water is contained in a product in order to determine where it should be produced, and how best to make use of this precious resource.

How much water?

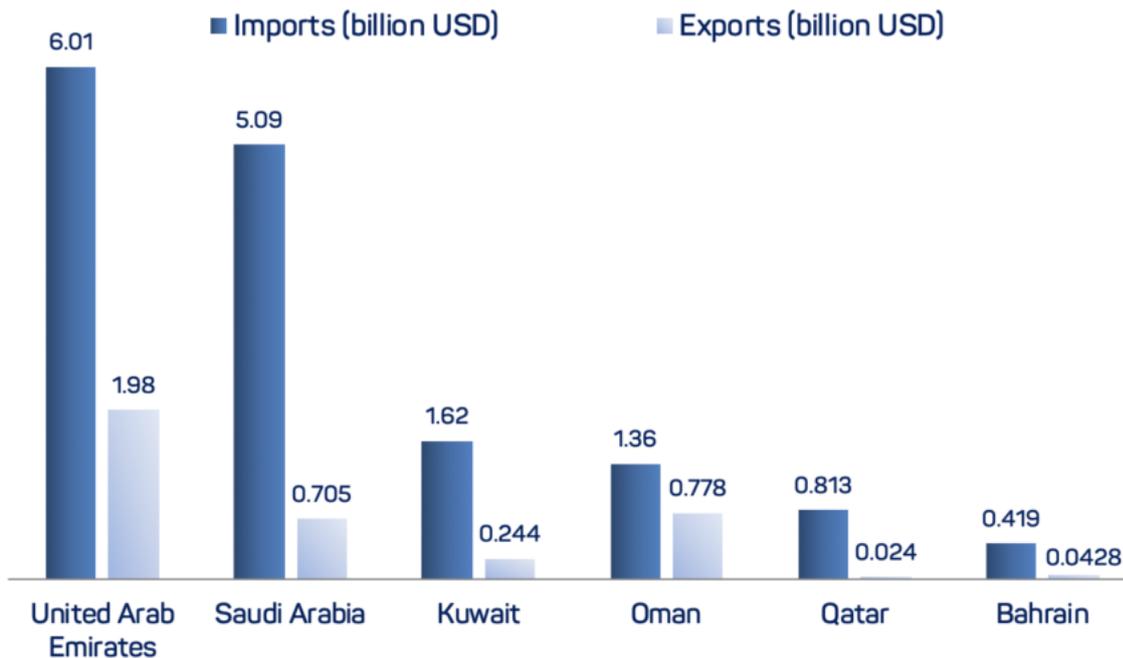
The volume of virtual water contained in food products varies depending on the type of crop and agricultural practice used. According to 2017 data from the Observatory of Economic Complexity, the top food imports in the Gulf are rice, wheat and barley. These are water-intensive. Other imports, like apples, tomatoes and potatoes, are less so. The virtual water content of several food products is shown below:



Gulf states import virtual water in foods from distant locations in Europe, Australia, India, US and Latin America, but also export virtual water to neighbouring countries.

The UAE has the highest value of food exports in the Gulf, followed by Saudi Arabia, with the lowest being Qatar and Bahrain. In 2017 Saudi Arabia imported \$16.2bn worth of food products and exported \$1.6bn.^[4] The value of the UAE imports, meanwhile, was \$15bn, and its exports \$3.8bn, including food products, animal products and vegetable products. Within the food products, most exports go to other Gulf and Middle Eastern countries, including Oman, Kuwait, Jordan and Lebanon, in addition to African countries including Sudan and South Africa.

Gulf food products trade by value



Data from Observatory of Economic Complexity

Oman exports water-intensive wheat to Qatar and Saudi Arabia. UAE and Qatar import wheat from Russia, the world's top wheat exporter, which announced mid-April the possibility of suspending exports of most grains, including wheat, until June.^[5]

Saudi Arabia invested significantly in wheat production domestically until 2016, when it discontinued the programme due to high water demand, which placed pressure on the country's groundwater supplies. The kingdom is now focused on silos; it has a wheat storage capacity of 3bn tonnes and a production capacity of 15,150 tonnes per day, while the flour stock is of 1.8m of 35kg bags each.^[6]

Food, water – and energy

The choice of becoming self-sufficient comprises a trade-off of energy and water resources. Investments in agriculture domestically reduces the volume of groundwater resources – 85% is

currently used for agriculture. As there is a low level of renewable freshwater, agriculture would require additional water resources and increase the demand for water desalination.

Water desalination requires energy: The Middle East accounts for 90% of the fossil-fuel thermal desalination globally, led by the UAE and Saudi Arabia.^[7] The International Energy Agency estimates that water desalination in the region will increase fourteen-fold by 2040, with the bulk of it being of reverse-osmosis that relies on electricity.

Optimising the usage of water and energy resources without compromising on food security will require a comprehensive water-food-energy strategy that focuses on technological advancements and enhanced efficiency in water irrigation, aquatic and aeronautical agriculture, and substituting high-water-intensity crops for low-water ones.

In the quest for food security and self-sufficiency, the Gulf should account for the large amounts of virtual water the region imports. Virtual water has mitigated the region's water challenges and will need to remain a large part of its food and water security policy, while building more resilient supply chains.



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Sources:

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