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briefing paper

Edible Oil: Food Security in the Gulf

Rob Bailey with Robin Willoughby

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Summary points

- Sustainable food self-sufficiency is unattainable for the countries of the Gulf Cooperation Council (GCC). Domestic production meets only a small proportion of needs, yet consumes significant economic resources and almost monopolizes water use.
- GCC food security rests on international trade, leaving countries exposed to price risk (relating to volatility of import prices) and supply risk (relating to import disruption).
- Recent events such as the 2011 Arab uprisings, continued instability in Egypt and Syria, threats by Iran to close the Strait of Hormuz and repeated spikes in international food prices have sharpened these risks.
- The worst-case scenario is conflict in the wider Middle East and North Africa region that disrupts multiple import routes for a sustained period. GCC governments can hedge supply risks through strategic storage and investments in port and rail infrastructure to create a regional import and transport network.
- Land-based investments in food-insecure countries with weak governance and poor rural infrastructure do little to manage price or supply risk. Overseas investments are better targeted at existing farm operations in key trade partners.
- GCC resource wealth mitigates price risk. In the long run, the ability of governments to manage price risk will depend upon successful economic diversification.

Introduction

The food security of the Gulf Cooperation Council (GCC) states – Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates (UAE) – rests almost entirely upon international trade. Imports typically account for 80–90 per cent of food consumption, and although the GCC countries are not unique in this regard (e.g. Singapore is similarly dependent), food security assumes particular political significance in the Gulf for the reasons below.

- The perceived risk of trade sanctions has continued to shape food politics in the Gulf since the threat of a food embargo against the Organization of the Petroleum Exporting Countries (OPEC) countries following the 1973 oil crisis.
- Import routes are particularly vulnerable to disruption or closure in the event of instability within the wider Middle East and North Africa (MENA) region.
- A lack of economic diversification within the GCC means that food imports are financed through energy exports, leaving countries vulnerable to deterioration in the terms of trade between food and oil or the exhaustion of their reserves.

Recent events – such as the 2011 Arab uprisings, continued instability in Egypt and Syria, trade sanctions against regional neighbours, threats by Iran to close the Strait of Hormuz and repeated spikes in international food prices – have heightened these concerns. Unsurprisingly, governments are re-evaluating trade-based strategies and have employed a variety of measures to bolster food security. This paper considers the food security of the GCC before critically examining these measures in the context of longer-term environmental and economic trends.

Food security in the GCC

The GCC states do not have a comparative advantage in field crop production. High maximum temperatures limit yields for many crops, while rainfall (in the range of 50–250 mm per annum) is well below that required for rain-fed cereal production (e.g. wheat requires around 600–650 mm per year in hot climates).[1] Renewable freshwater resources are among the lowest in the world.[2] Soils are fragile and over 95 per cent of land on the Arabian peninsula is subject to some form of desertification. Climate change is likely to tighten these constraints.[3]

This leaves GCC countries dependent on trade and exposed to two principal risks: supply risk, relating to the availability of food imports, and price risk, relating to the affordability of food imports.

Supply risk

Geopolitics and geography combine to make supply risk a particular concern for GCC governments. The US threat of a food embargo against OPEC countries in response to the first oil price shock, and the international community's recent use of trade sanctions against regional neighbours such as Syria, Libya and Iran provides a constant reminder to GCC populations of the extent to which their food security could be undermined by geopolitical agendas. Today, politically motivated threats to GCC food security are more likely to come from closer to home, however. Moves by Iran to close the Strait of Hormuz would have serious consequences for GCC oil and gas exports,[4] given that 88 per cent of all petroleum exported from the Persian Gulf passes through the strait towards markets in Asia, Europe and the United States.[5] But a secondary effect would be to limit food imports, particularly for states that are entirely reliant on ports within the Persian Gulf: Bahrain, Kuwait, Qatar and the UAE.

1 UN Food and Agriculture Organization (FAO), http://www.fao.org/nr/water/cropinfo_wheat.html; Laaboudi, A. and Mouhouche, B. (2012), 'Water Requirement Modelling for Wheat under Arid Climatic Conditions', *Hydrology Current Research*, Vol. 3, No.130.

2 GCC countries have on average 89 cubic metres of renewable freshwater per capita. Absolute water scarcity is defined as less than 500 cubic metres. World Bank Development Indicators, http://data.worldbank.org/indicator/ER.H2O.INTR.PC.

3 Climate change is expected to lead to an increase in average and maximum temperatures on the Arabian peninsula, increased water stress and reduced food security. See, for example, Met Office (2011), 'Climate: Observations, Projections and Impacts for Saudi Arabia', http://www.metoffice.gov.uk/media/pdf/j/m/Saudi_Arabia.pdf.

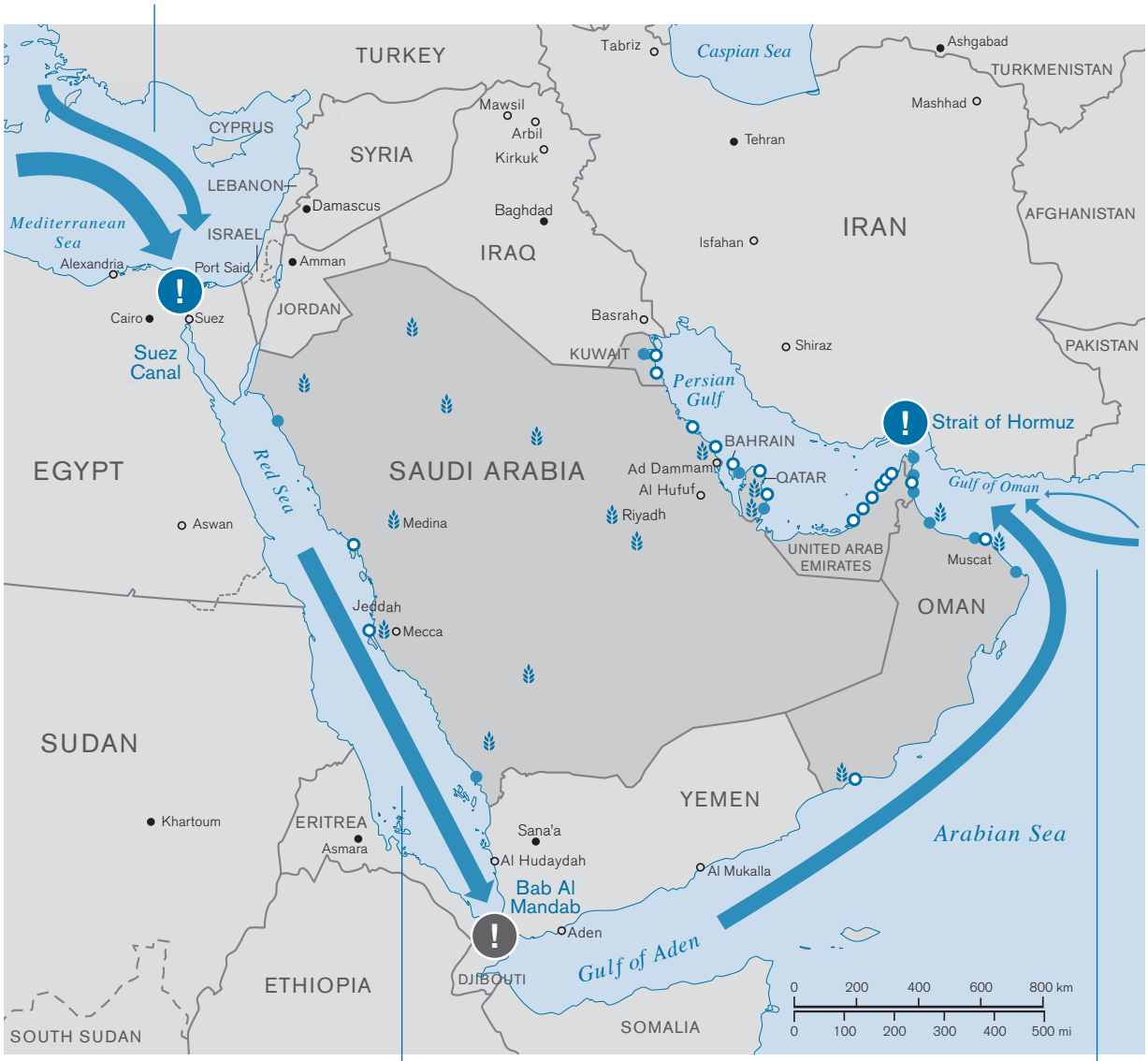
4 In recent years Iran has periodically threatened to close the Strait of Hormuz, most recently in July 2012 in response to trade sanctions.

5 Rodrigue, J.-P. (2013), *The Geography of Transport Systems* (New York: Routledge).

Figure 1: The GCC, choke points and strategic infrastructure

Transiting Suez Canal

7.5 million tonnes of wheat and coarse grains are shipped from North America, South America and Europe, and 4.6 million tonnes from the Black Sea. This represents 81% of total imports of these commodities to the GCC.



Transiting Bab Al Mandab

5.8 million tonnes of imports of wheat and coarse grains from North America, South America, Europe and the Black Sea are shipped on from Suez to Kuwait, UAE, Qatar, Bahrain, Oman and eastern ports in Saudi Arabia. This represents 39% of total imports of these commodities to the GCC.

Transiting Strait of Hormuz

5.2 million tonnes of wheat and coarse grains from North America, South America, Europe and the Black Sea are shipped on through the Strait of Hormuz to Kuwait, the UAE, Qatar, Bahrain and eastern ports in Saudi Arabia. This represents 35% of total imports of these commodities to the GCC.

2.5 million tonnes of rice from South and Southeast Asia (81% of total rice imports).

0.7 million tonnes of wheat from Australia.

Source: Chatham House analysis based on data from Chatham House Resource Trade Database, BACI, COMTRADE, Saudi Port Authority, World Port Source, and http://www.arabspatial.org/. Data on strategic grain storage for the UAE and Kuwait are unavailable.

Note: Imports shown are for selected strategic trade flows of cereals in 2010, representing over 80% of imports for wheat and coarse grains and for rice.

As Figure 1 shows, the GCC countries are surrounded by a number of maritime choke points vulnerable to disruption or closure. Nearly all food imports must pass through at least one. Recent instability in Egypt has increased supply risks for imports through the Suez Canal.[6] Navigation in the waters around Bab Al-Mandab is vulnerable to piracy and events in Yemen. The worst-case scenario is conflict in the wider MENA region that disrupts multiple import routes for a sustained period.

Extreme weather may also disrupt supply chains and trade routes. In particular, climate change may lead to increased cyclone intensity in the Arabian Sea and larger storm surges in the Gulf, resulting in temporary import disruptions or the loss of port infrastructure.[7]

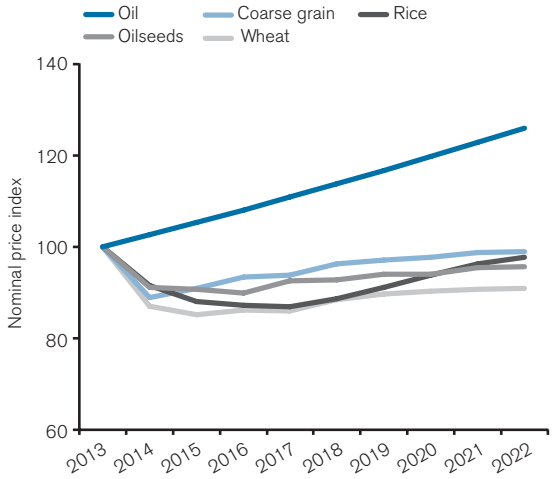
Domestic politics in exporting countries also create supply risk. Export controls may force GCC importers to seek alternative sources of supply at short notice. If commodities are thinly traded and multiple exporters impose restrictions simultaneously, there may be no alternative source of supply in the timeframe needed. This almost happened for rice during the 2007–08 food price crisis, when a flurry of controls saw prices triple in the space of a few months and liquidity fall to the point where Qatar, home to the richest population in the world, was reportedly unable to secure supply.[8]

Price risk

For other strategic commodities such as wheat or corn, markets are deeper and more liquid. Therefore the risk of total market failure is very small and export controls are primarily a source of price risk, as was apparent during the 2007–08 global food price crisis when over 30 countries imposed export restrictions. The impact of export controls on prices became apparent again in 2010–11, after Russia and Ukraine imposed export bans following a poor wheat harvest. The resultant price spike – and its economic impact on the major wheat importers of North Africa – has been identified by some analysts as a precursor of the wider social, political and economic grievances that became the Arab Spring.

Non-exporting countries may exacerbate price spikes by applying import subsidies, or more subtly by reducing import tariffs. Unilateral trade measures such as these are applied with the objective of containing domestic prices but are pro-cyclical as far as international prices are concerned and therefore increase the incentives for other governments to follow suit. A set of international rules to militate against pro-cyclical trade measures would represent a valuable global public good, yet nothing of the sort has been developed. Attempts to agree rules limiting the use of export controls at the G20 in 2011 were unsuccessful beyond securing a pledge from governments to exempt humanitarian food aid from any bans they choose to impose. As such, an outbreak of unilateral trade measures remains a real and significant threat to global market stability and the food security of import-dependent countries.

Figure 2: Forecast international price trends for oil and selected agricultural commodities, 2013–22



Note: Nominal prices indexed to 100 in 2013, and based on IEA New Policies Scenario for energy prices.
Sources: OECD-FAO, *Agricultural Outlook 2013-2022* and IEA, *World Energy Outlook 2012.*

6 The Suez Canal Authority has received threats targeting the waterway and in late August 2013, militants reportedly attacked a container ship transiting the canal with rocket-propelled grenades. See, for example, 'Egypt arrests three after attack on containership in Suez Canal', gCaptain, 1 September 2013, http://gcaptain.com/cosco-asia-containership-attack-suez-egypt-arrests/.

7 Bin Wang et al. (2012), 'Intensified Arabian Sea Tropical Storms', *Nature*, Vol. 489; Sumesh, K.G. and Kumar, R.M.R. (2013), 'Tropical Cyclones over the North Indian Ocean during El-Nino Modoki Years', *Natural Hazards Journal*, April 2013.

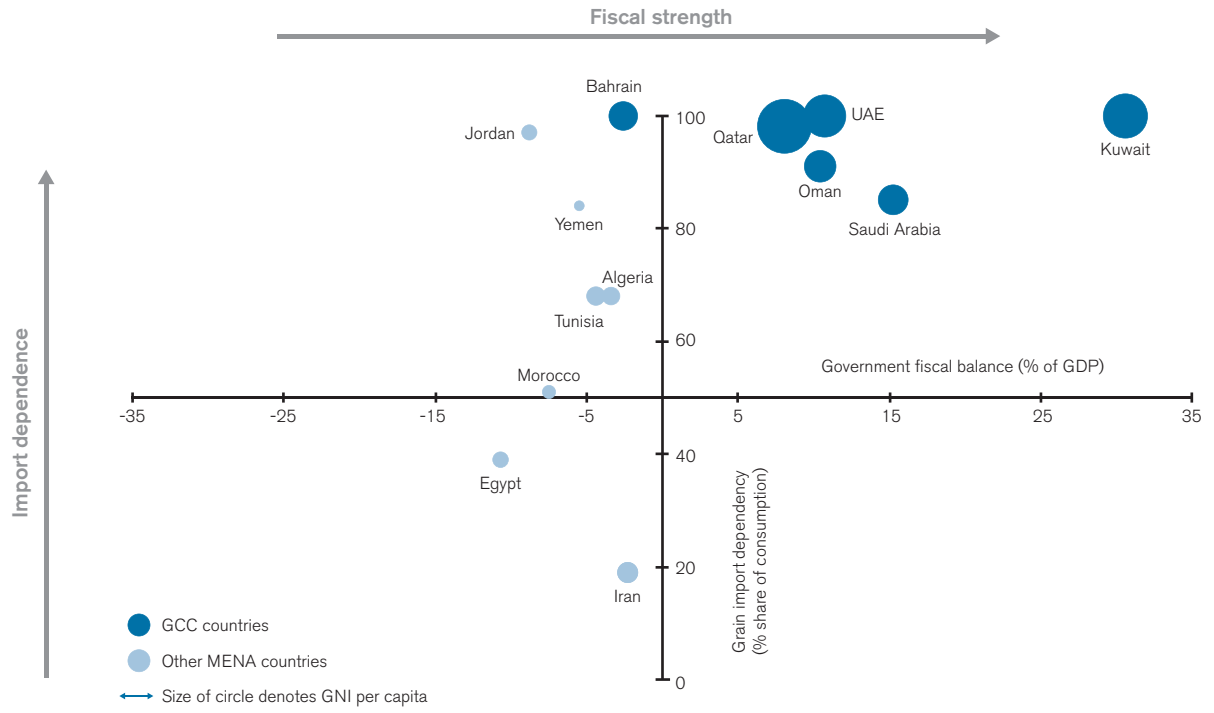
8 Baker, A. (2012), 'Desert Dreams: Can the Middle Eastern Country of Qatar Learn to Feed Itself?', *Time*, 19 November 2012, http://science.time.com/2012/11/19/desert-dreams-can-the-middle-eastern-country-of-qatar-learn-to-feed-itself/.

Price risk is likely to remain a concern for GCC countries. International markets are expected to remain tight and thin as production growth lags demand and stock-to-use ratios struggle to recover, leaving global supply vulnerable to destabilizing weather events such as droughts or heat-waves in key producer regions. Volatility will be further amplified by biofuel mandates, which limit exports of food commodities, create inelastic demand and depress stock-to-use ratios further.

In addition to short-term volatility, GCC policy-makers are also concerned about the risk of a deteriorating trade balance should food prices trend upwards faster than oil prices in the long run. However, over the next decade at least, agricultural commodity prices are forecast to increase more slowly than oil prices (Figure 2).

Beyond the next decade, the outlook for the terms of trade between food and oil may be less sanguine. Climate change is likely to become an increasingly important driver of agricultural commodity prices, while mitigation policies should dampen demand growth for fossil energy. Higher temperatures are expected to exert a drag on aggregate yields, contributing to significant increases in average food prices.[9] Climate change will also lead to an increase in the frequency and severity of extreme weather events such as droughts, floods and heat-waves, increasing the risk of yield shocks in key producer countries and concomitant price spikes.[10]

Figure 3: Vulnerability of MENA countries to food price spikes



Sources: Chatham House based on International Monetary Fund (2013), *Middle East and Central Asia: Regional Economic Outlook*, Statistical Appendix (Washington, DC: International Monetary Fund); Ianchovichina, E. et al. (2012), *How Vulnerable Are Arab Countries to Food Price Shocks?* (Washington, DC: World Bank); World Bank Development Indicators.

Notes: Fiscal balance and per capita income figures based on 2012 calculations, import dependency based on 2010 estimates. Per capita income levels on purchasing power parity basis, based on 2010 US dollar rates.

9 For example, in their baseline scenario, Nelson et al. forecast price rises of over 50% for rice and wheat, and over 100% for corn from 2010 to 2050, with climate change meaning that 2050 prices are between 20% and 30% higher than would otherwise have been the case. Nelson, J. et al. (2010), *Food Security, Farming, and Climate Change to 2050: Scenarios, Results, Policy Options* (Washington, DC: International Food Policy Research Institute (IFPRI)).

10 Willenbockel (2012) estimates potential short-term price increases of up to 33% for wheat, 140% for corn and 26% for rice in response to climate-related yield shocks in 2030. Willenbockel, D. (2012), 'Extreme Weather Events and Crop Price Spikes in a Changing Climate: Illustrative Global Simulation Scenarios' (Oxfam International).

Unlike supply risk, price risk is directly mitigated by wealth. High per capita incomes in GCC countries mean that the majority of households are at low risk of a reduction in their ability to afford food. Reliable demographic and household spending data in the region are scarce; however, a 2007 survey indicated most people probably spend between 10 and 20 per cent of income on food, similar to the percentage in industrialized countries.[11] At the national level, resource revenues mean GCC governments enjoy greater fiscal space than their poorer regional neighbours, allowing them to insulate populations from price rises through social spending. Figure 3 shows how North African countries' lower per capita incomes and negative fiscal balances render them more vulnerable to price risk despite their lower levels of import dependency. It is notable that Morocco, Tunisia, Algeria and Egypt (and Yemen in the Arabian peninsula) have experienced protests about food prices in recent years.

However, GCC populations are not uniformly wealthy: the poorest 10 per cent or so may spend 30–50 per cent of their income on food – a rate more typical of a developing country.[12] In Abu Dhabi, 12 per cent of households earn below $10,000 a year.[13] Reports indicate around 20 per cent of the population in Saudi Arabia live on less than $12,000 a year.[14] Price risk constitutes a major threat to the food security of these households, which are likely to consist primarily of poor expatriate workers from South Asia who depend on rice as their staple food and have little in the way of social protection.

Food security strategies

GCC governments use a range of policies to manage price and supply risks.

Price controls and consumer subsidies

GCC populations benefit from a wide range of support measures designed to ensure food remains affordable.

Table 1: Estimates of consumer food subsidy costs for GCC countries and selected neighbours

Country	Year	Cost ($ million)	% of GDP
Qatar	2010	82	0.06
Saudi Arabia	2010	1,100	0.24
Bahrain	2010	114	0.5
UAE*	2011	111	0.5
Kuwait	2011	1,200	0.68
Jordan	2011	217	1.0
Egypt	2009	3,800	2.0
Iraq	2009	2,300	3.5

Sources: Espinoza, R. (2012), *Government Spending, Subsidies and Economic Efficiency in the GCC* (Washington, DC: IMF); International Monetary Fund (2012), *Kuwait, Selected Issues and Statistical Appendix* (Washington, DC: IMF); International Monetary Fund (2012), *Jordan Article IV Consultation, IMF Country Report No 12/119* (Washington, DC: IMF); World Bank (2011), *Facing Challenges and Opportunities: Middle East and North Africa Region* (Washington, DC: World Bank).
* Data available for Abu Dhabi only.

Principal among these are price controls: an implicit subsidy transferring wealth from food companies to food consumers. In some cases, governments may compensate businesses for some or all of the cost of these measures, generating a fiscal expenditure. Other explicit subsidies include conditional transfers to help consumers purchase food, or measures such as import subsidies applied during times of high international prices.

Data on implicit and explicit consumer subsidies are scarce. Table 1 provides estimates for the GCC countries and a number of neighbours. However, these may be incomplete and are likely to fluctuate significantly as subsidies and price controls are announced and withdrawn. For example, in 2012 the president of the UAE announced food subsidies for Emiratis reportedly worth AED 13,000 ($3,500) a year, a potential fiscal liability of $3.3 billion annually – far more than the 2010 estimate shown in Table 1.[15]

11 Bayt.com and YouGov Siraj (2007), cited in Woertz, E. (2013), *Oil for Food: The Global Food Crisis and the Middle East* (Oxford University Press).
12 Ibid.
13 Household wealth data courtesy of the Crown Prince Court, Abu Dhabi, showing that 29,674 of 238,136 households earned less than AED 36,000 in 2009.
14 Saudi Arabia National Strategy to Combat Poverty, cited in Ramady, M.A. (2010), *Saudi Arabian Economy: Policies, Achievements and Challenges* (New York: Springer).
15 Calculation assuming an indigenous population of approximately 950,000.

Despite the lack of data, estimates indicate that the relative cost of food subsidies within the GCC is less than in other MENA countries. However, this is not the full picture. Food prices are a significant driver of inflation within the GCC, and governments have responded with an array of expensive wider social expenditures not explicitly linked to food. Following the 2007–08 food price crisis, governments hiked public-sector wages for national workers in addition to implementing price controls for key food commodities. Similar measures were taken in 2011 and 2012, alongside initiatives such as minimum wage policies, unemployment allowance, rent controls and the further expansion of housing benefits for nationals (see Table 2).

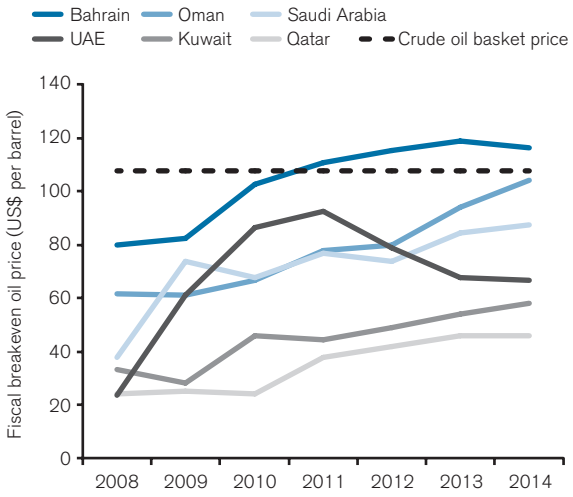
The fiscal position of GCC governments is coming under increasing strain from ballooning public spending costs as populations rise and hand-outs become more generous. Fuel, electricity and water subsidies in many GCC countries are on paths that may be unsustainable in the medium to long term.[16] On top of this, government expenditures – driven by public-sector wage bills and social spending – leapt 20 per cent in 2011 as political unrest rippled across the wider MENA region.[17]

Consequently, the fiscal breakeven oil price (the oil price needed to generate revenue to cover government expenditure) for GCC countries has increased sharply: from $37 per barrel (/b) in 2008 to $84.5/b in 2013 for Saudi Arabia, while Bahrain and Oman have projected breakeven prices of over $100/b by 2014 (see Figure 4). A decline in oil prices from current levels could see a number of GCC countries run into current-account deficit.[18]

Price risk and food subsidies must therefore be considered within the wider context of general inflation, shrinking fiscal space and sharpening political risks in the wake of the Arab Spring: generous public spending announcements in 2011–12 were a response both to inflation and to the uprisings in neighbouring countries (see Table 2). Governments view high food prices as a risk factor for social unrest. As such, prices drive public spending directly, via subsidies, and indirectly via general social expenditures to placate potentially restive populations.

Troublingly for GCC governments, it appears that the effect of food subsidies is to mitigate price rises in the short term, but 'lock in' inflation in the medium term. Research by the World Bank indicates that price transmission from international markets is asymmetric: price rises are dampened, but price falls are dampened more. A one per cent increase in international prices tends to translate to a gradual increase of around 0.4 per cent in domestic prices, while in most GCC countries a one per cent decline in international prices barely passes through at all (Table 3).[19] Volatile international prices mean that

Figure 4: Fiscal breakeven oil prices in the GCC



Source: International Monetary Fund (2013), *Regional Economic Outlook, Middle East and Central Asia: Statistical Appendix* (Washington, DC: IMF).
Note: OPEC crude oil basket price accurate as of 15 October 2013.

16 For example, Glada Lahn and Paul Stevens (2012), *Burning Oil to Keep Cool* (London: Chatham House). See also International Monetary Fund (2013), 'Oman: Article IV Consultation Concluding Statement of the IMF Mission' and 'IMF Concludes Article IV Consultation with the Kingdom of Bahrain'.

17 International Monetary Fund (2012), 'Economic Prospects and Challenges for GCC Countries, Note Prepared for Annual Meeting of Ministers of Finance and Central Bank Governors, October 2012'.

18 Modelling from the IMF suggests that a 30% drop in the international price of oil in the medium term would result in current account deficits in Bahrain, Oman, Qatar and Saudi Arabia by 2017. International Monetary Fund (2012), 'Economic Prospects and Challenges for GCC Countries'.

19 The one exception to this is the UAE, where price transmission is symmetric. See Ianchovia, E., Loening, J. and Wood, C. (2012), *How Vulnerable Are Arab Countries to Global Food Price Shocks?* (Washington, DC: World Bank).

Table 2: GCC policy responses to food inflation and regional unrest in 2007/08 and 2011/12

Saudi Arabia	Decreases or elimination of import tariffs for 180 basic food and agricultural commodities and extension of government control of basic commodity pricing at point of sale. 17-point plan to alleviate impacts of inflation, including wage increases of 15% for civil servants, a 10% increase in social insurance benefits and expedition of public housing projects – costing an estimated SR13.5 billion ($3.6 billion) in 2008 and SR67 billion ($17.8 billion) by 2011.	Direct intervention from the government to prevent increases in milk prices. Introduction of a minimum wage policy for nationals working in the public sector of SR3,000 ($800) per month. Unemployment allowance of SR2,000 ($530) per month introduced in 2011 for nationals.
United Arab Emirates	Government intervention to freeze the price of 18 basic foodstuffs at 2007 levels. Government memorandum of understanding with supermarkets chains to limit price increases of essential consumer items. Civil servant wage increases of 20–70%; a 5% annual rent cap and subsidized cement prices to facilitate house-building.	Extension of implicit subsidies on dates, cooking oil, juices, water, tomato paste, rice and flour to save residents AED 13,000 ($3,538) per annum. Announcement of 3,000 housing grants for lower-income citizens in Abu Dhabi.
Kuwait	Price fixing introduced for 367 food products with three-year imprisonment for retailers ignoring this decree. Cost of living allowance of KD120 and KD50 per month ($449 and $187 at 2008 rates) for nationals and expatriates working in the public sector – estimated to represent a 10–15% pay rise for 550,000 people.	'Free food' for Kuwaiti citizens until August 2014 through a discount price programme on key items such as sugar, rice, cooking oil and milk powder. Non-discretionary transfer of $2,600 per family in 2011. Legal decrees on the price of bread and falafel.
Oman	Increases in civil servant wages, representing a pay increase of between 5% and 42% for public-sector employees.	Price fixing for essential food commodities such as rice. Subsidies for products such as sugar (with sugar prices reduced by 10% at point of sale) and wheat, as well as for locally produced fodder. Introduction of unemployment benefits. Provision of grants for housing assistance to lower-income citizens totalling $520 million.
Bahrain	BD40 million ($106 million) 'inflation allowance' fund for nationals.	Increased meat, flour and poultry subsidies and social welfare expansion estimated at BD 133 million ($352 million) over 2011 and 2012. Non-discretionary transfer of BD 1,000 ($2,600) per family in 2011.
Qatar	Expansion of subsidies for bread and flour. Introduction of wage increases of 30% for civil servants.	30 billion riyals ($8.24 billion) in salary, pension and benefit increases for state employees – including wage increases of 60% for civil servants, 120% for military staff and pension pay-outs for civilian retirees.

Sources: International Monetary Fund (2008), *Regional Economic Outlook Middle East and Central Asia* (Washington, DC: IMF); World Bank (2011), *Middle East and North Africa, Facing Challenges and Opportunities* (Washington, DC: World Bank); Alpen Capital (2013), GCC Food Industry, Alpen Capital; Woertz, E. et al. (2008), *Food Inflation in GCC Countries* (Cambridge, UK: Gulf Research Center); Al-Obaid, A., 'King Abdullah's Initiative for Saudi Agricultural Investment Abroad: A Way of Enhancing Saudi Food Security', Presentation to the Expert Group Meeting on 'Achieving Food Security for Member Countries in a Post-Crisis World', Islamic Development Bank, Jeddah, 2–3 May 2010; National Bank of Kuwait (2008), 'Economic Brief: Salary Increases' (Kuwait City: National Bank of Kuwait); in addition to regional media articles from *Arab News*, *Bloomberg News*, *Gulf News*, *Gulf Daily News*, *Kuwait Times*, Oman News Agency, *Qatar Tribune*, Reuters and *Saudi Gazette*.

Table 3: 12-month food price pass-through co-efficients in GCC countries

Country	World price increase	World price decrease
Bahrain	0.349	0.051
Kuwait	0.279	0.020
Oman	0.213	0.075
Qatar	0.355	0.220
Saudi Arabia	0.266	0.023
UAE	0.413	0.315

Source: Ianchovichina, E. et al. (2012), *How Vulnerable Are Arab Countries to Food Price Shocks?* (Washington, DC: World Bank).

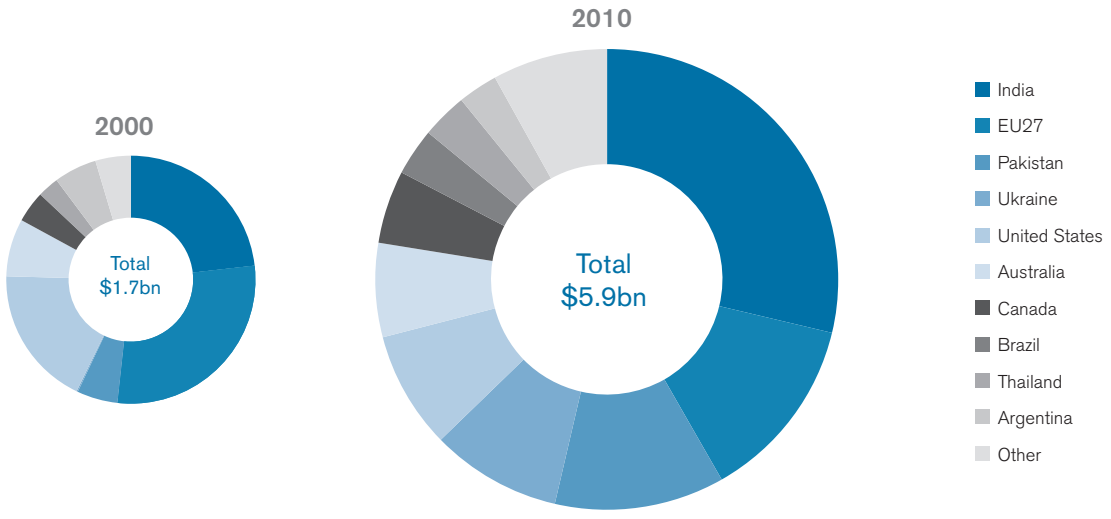
over time this asymmetry may contribute to domestic inflation through a ratchet effect. Possible explanations for why prices are 'downward sticky' include insufficient competition among food retailers and manufacturers, and the effect of price controls on business behaviour: retailers may be reluctant to pass on price decreases if they believe they will be prevented from passing on increases.

Economy-wide food price controls are expensive, and potentially counterproductive in the longer term. To the extent that they encourage the consumption of unhealthy, energy-dense foods, they may also aggravate obesity and related health issues.[20] Interventions targeted at poor food consumers in the form of cash transfers would be cheaper and less price-distorting. Effective targeting requires significant administrative capacity, however, while subsidy reform carries a degree of political risk that governments have so far been reluctant to assume.

Trade diversification

Maintaining a diversified import profile allows GCC governments to manage supply and price risk by maximizing alternative sources of supply. Over the last decade, they have developed new bilateral trade relationships (Figure 5), although some new trade partners appear less reliable than others. For example, rice imports from India and Pakistan increased significantly between 2000 and 2010, from $490 million to $2.4 billion a year. Both of these

Figure 5: GCC trade dependencies in cereals, 2000 and 2010



Sources: Chatham House Resource Trade Database, BACI, COMTRADE.
Note: Countries ordered in descending order of trade value using 2010 figures. Cereals include coarse grains (barley, maize, millet, oats, rye and sorghum), rice and wheat. Excludes intra-regional trade.

20 Musaiger, A. (2011), 'Overweight and Obesity in the Eastern Mediterranean Region: Prevalence and Possible Causes', *Journal of Obesity*, Vol. 2011. See also Asfau, A. (2006), 'The Role of Food Price Policy in Determining the Prevalence of Obesity: Evidence from Egypt', *Review of Agricultural Economics*, Vol. 28, No. 3.

countries have imposed bans on rice (and wheat) exports within recent years,[21] and India has opposed attempts within the G20 to agree rules to limit export controls. In the same period, imports of coarse grains from the Black Sea region increased in value from $10 million to $658 million – reflecting increased feed demand.[22] However, Black Sea yields are highly variable compared with those in Western Europe and North America, while the governments of Russia and Ukraine have recently illustrated their willingness to impose bans on cereal exports.

It is striking how little regional food trade there is within the GCC and between the GCC and nearby countries in the MENA region. Intra-regional trade between GCC countries accounted for only seven per cent of food imports in 2010, while imports from other countries in the MENA region accounted for a further nine per cent.[23] Partial exceptions are the UAE, which has positioned itself as a regional re-export hub, and Saudi Arabia, a regional dairy exporter.

Strategic stockholding

Strategic stocks can provide GCC governments with a degree of insurance against price and supply risks. Stocks can be judiciously accumulated or released to dampen domestic price volatility – building inventories when international prices are low and unwinding them when prices are high – though governments often have a poor track record of doing this in practice. Strategic reserves can also strengthen purchasing power by signalling to sellers that countries have alternative sources of supply, militating against price gouging. Most importantly, by providing governments with the breathing space to secure alternative supplies or trade routes, a strategic reserve can insure against the supply-risk 'worst-case scenario', where imports are severely disrupted and insufficient food is available domestically. At the micro level, stocks can be used to provide targeted releases to poor households in the event that they are unable to access sufficient food through markets.

The reduced risk provided by strategic stocks has a price. In the first instance, stockpiling will increase the import bill in the short run and may require additional investments in silo capacity and transport infrastructure. Storage costs include the cost of capital, and costs of fumigation and rotation (to minimize grain losses) in addition to the cost of training staff to manage the reserve. Finally, there is an opportunity cost associated with tying up resources in a reserve rather than allocating them to productive investments.[24]

Storage costs are not insignificant. Based on global benchmarks, a 12-month strategic wheat reserve might cost Saudi Arabia in excess of $70 million a year.[25] Potentially more significant are the losses that governments may accumulate if they actively use a reserve to influence prices, a strategy vulnerable to political capture and rent-seeking.[26] For these reasons, governments may prefer to subsidize private-sector stockholding to ensure that reserves are managed by businesses with the appropriate skills, knowledge and incentives. This approach is used in the UAE, for example, where companies such as Al Dahra and Agthia manage food reserves on behalf of the government.

The cost of maintaining a strategic reserve is borne primarily in return for the food security and political security it provides against a major supply disruption. Accordingly, as GCC confidence in international markets has declined, the attraction of stocks has increased. Governments have announced ambitious plans to develop

21 See, for example, Sharma, R. (2011), *Food Export Restrictions: Review of the 2007–10 Experience and Considerations for Disciplining Restrictive Measures* (Rome: UN FAO).

22 This was primarily driven by Saudi imports of barley from the Ukraine, which surged in value from $2.9 million in 2000 to $508 million in 2010.

23 Food trade includes cereals and oilseeds, dairy products, fish and seafood, fruit and vegetables, meat and live animals, pulses, roots and tubers and sugar. Chatham House Resource Trade Database, BACI, COMTRADE.

24 World Bank and UN FAO (2012), *The Grain Chain: Food Security and Managing Wheat Imports in Arab Countries*, http://www.fao.org/fileadmin/user_upload/tci/docs/The%20Grain%20Chain_ENG.pdf.

25 Based on a global storage benchmark of $2 per tonne per month, and a 12-month wheat reserve of three million tonnes.

26 In managing buffer stocks, governments may struggle to resist political pressures to lower food prices, resulting in expensive decisions to release stocks when prices are low and rebuild them when prices are high.

large stockpiles of strategic agricultural commodities, often in excess of 12 months' consumption. This provides ample insurance against logistical supply-chain failures such as dust fires in silos and bottlenecks at ports or even temporary closures of strategic maritime choke points, and indicates that policy-makers are considering more serious scenarios relating to regional conflict and the prolonged, simultaneous closure of multiple choke points and trade routes.

There may be much that GCC governments can do to manage supply risk beyond holding reserves as insurance. Improving the efficiency and capacity of unloading ports could in many cases reduce import costs and the risk of delays. Benchmarking of wheat import logistics in the Middle East by the World Bank and UN Food and Agriculture Organization indicates that there may often be significant opportunities to reduce vessel turnaround times. Ships importing wheat into Saudi Arabia spend 13 times as long waiting and unloading as do ships bringing wheat into the Netherlands, leading to port logistic costs that are around twice as high.[27]

Maintaining multiple ports capable of handling agricultural commodities allows for rapid rerouting of imports should the need arise. This makes obvious sense for Saudi Arabia, where port capacity on the Red Sea hedges against a possible disruption of the Strait of Hormuz. More ambitiously, GCC countries could develop a small number of deep-water 'hub' ports at key strategic locations – for example on the Saudi Red Sea coast, on the coast of Oman, and within the Persian Gulf – to maximize routing options. As Figure 1 shows, port capacity along the Red Sea is relatively underdeveloped, but could insure against threats to shipping in the Gulf. This model would depend upon enhanced regional cooperation and an adequate intra-regional transport infrastructure to link the hubs to national storage and milling sites, but so far plans to develop a GCC-wide rail network have stalled.

Investing at home: self-sufficiency?

Strategic stocks may not be cheap, but for GCC countries they are considerably less expensive than growing cereals in the desert. In Saudi Arabia, annual storage costs of $70 million for a year's reserve of wheat are tiny in comparison with the historical cost of wheat production subsidies, estimated to have exceeded $5 billion a year between 1984 and 2000.[28] During this period, Saudi Arabia produced wheat at over four times the prevailing international price, this difference reflecting poor endowments of soil, climate and most importantly water. For a time, government largesse appeared to have overcome these environmental constraints: by 1992 production eclipsed the stated aim of self-sufficiency and Saudi Arabia had become the sixth largest wheat exporter in the world, albeit on a highly subsidized basis.[29] But Saudi wheat production was built on sand, literally and figuratively. With minimal rainfall and no renewable water resources, farmers were mining fossil aquifers at alarming rates. Faced with a collapsing water table, the government began phasing out wheat production in 2008 and it is now slated to end in 2016.

Saudi Arabia's failed wheat programme is the most notorious example of unsustainable self-sufficiency ambitions in the Gulf, but it is not the only one. Self-sufficiency was a 'matter of principle' for Sheikh Zayed, the former UAE president, under whose leadership domestic agriculture enjoyed significant support from the 1970s onwards.[30] More recently, new technologies such as solar PV, solar desalination, greenhouse production and hydroponics have renewed interest in domestic production. Qatar is at the vanguard of this new drive, having announced an ambitious goal to achieve 70 per cent food self-sufficiency by 2023.

The attraction of sustainable food self-sufficiency to GCC states is obvious, but environmental constraints and economics render it unachievable in practice. Agriculture typically accounts for somewhere between 80 and 90 per cent of water use – almost monopolizing a desperately scarce

27 World Bank and UN FAO (2012), *The Grain Chain.*

28 This represented 18% of the kingdom's oil revenues during the period. Including the costs of other subsidies for fuel, electricity, water, concessionary credit, administration and land distribution could double the estimate. Elhadj, E. (2008), 'Saudi Arabia's Agricultural Project: From Dust to Dust', *Middle East Review of International Affairs*, Vol. 2, No. 2.

29 Ibid.

30 See Woertz (2013), *Oil for Food*, for a summary of endeavours by the UAE and other GCC countries to develop domestic agriculture.

resource that could be employed far more productively elsewhere. In Saudi Arabia, water put to use in industry produces 300 times more economic value than in agriculture. In the UAE, the most water-scarce of all the GCC countries, the difference is over 1,000 times.[31]

As in most industrialized countries, GCC support for agriculture often has more to do with domestic political economy than food security. Public investments in agriculture were used initially as a means to settle nomadic populations in disputed border areas and build political

Table 4: Selected examples of agricultural support in the GCC

Country	Agricultural support interventions
Bahrain	• National Initiative for Agricultural Development to encourage private-sector production of fruit, vegetables and poultry provides soft loans and grants and supports the introduction of hydroponic technology.
Kuwait	• Direct agricultural subsidies in the region of 80–100 million Kuwaiti dinars (around $350 million) in 2011–12. • Direct subsidies for production of fruit palms, fisheries, locally reared livestock, plant production and milk production. • Indirect support through a rebate on fodder purchased for fish farms, subsidized electricity and water and exemption from product taxes for farmers. • Import protection for some fresh fruit and vegetables and processed agricultural goods (estimated at a tariff of about 5%). • Investment in infrastructure and public goods for agriculturalists, such as research and development, road infrastructure and water facilities for key production areas.
Oman	• Direct investment of $361 million in 2010–11 on fisheries, modern irrigation systems, agricultural production and livestock breeding technologies.
Qatar	• Establishment of the flagship Qatar National Food Security Programme, with initial government investment of $5.1 billion as part of a ten-year plan to promote self-sufficiency. • Indirect support to agricultural companies through tax breaks, with tax for corporate entities engaged in agriculture reduced from 35% to 10% in 2011. • Input subsidies of 25–75% on the cost of levelling land, seeds, fertilizer and cultivation.
Saudi Arabia	• Direct government investment of $800 million on agriculture and livestock production companies through the Saudi Company for Agricultural Investment and Animal Production, established in 2009. • Indirect support to the sector through allocation of $12.3 billion for development of agricultural infrastructure such as irrigation, electricity, transportation and mills in 2010. • Guaranteed purchase price for locally produced wheat until 2016. • Implicit subsidies for crop production through unrestricted pumping of groundwater and highly subsidized diesel and electricity, and the provision of farmland for nationals 'free of cost'. • Import subsidies for feed crops such as barley, hard wheat and soy products to support the local livestock and dairy industry, with rebates ranging from $49.33 to $202.13 per tonne. • Tariffs on non-locally manufactured products such as eggs, sugar, poultry, infant foods and macaroni to support local food and agricultural industry.
UAE	• Extension support and technical advice from government, while national authorities such as the Abu Dhabi Food Control Authority provides income support to farmers of up to AED 100,000 ($27,000) a year. • Direct support to food companies: the UAE invested $258.4 million on food-processing and packing machinery to support the food industry in 2011 – with overall allocation of some $1.4 billion to support the food-processing industry since 1994. • Input subsidies of 50% of the cost of crop protection, including cost reductions on veterinarian services and other inputs such as fertilizers. • Creation of 'free zones' such as Khalifa Industrial Zone in Abu Dhabi and Dubai Investment Park with subsidized lease terms, tax exemptions and low utility costs to support development of the UAE food-processing sector and other domestic industries. • The Arab Authority for Agriculture Investment and Development and Al Dahra Agriculture aim to improve food security in the emirates including the provision of $100 million of revolving credit to support smallholder farmers.

Sources: Alpen Capital (2013); US Department for Agriculture (2013), *Grain and Feed Annual: Saudi Arabia* (Riyadh: USDA); Trade Arabia (2012), 'Bahrain Plans Major Agriculture Sector Boost', 11 March 2012; Jabsheh, F. et al. (2013), 'Agricultural Subsidies in the GCC between Cost and Benefit: the Case of Kuwait', Paper for the Kuwait Economic Research Forum, March 2013.

31 UN Economic and Social Commission for Western Asia (2011), *Sustainable Production and Consumption Patterns in Energy and Water Sectors in the ESCWA Region.*

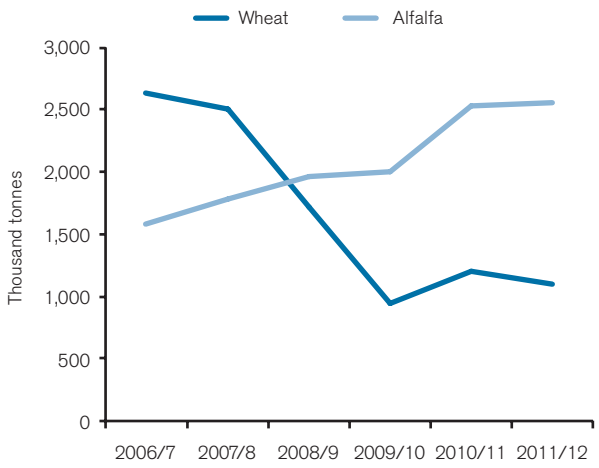
constituencies. Concerns about a possible US-led grain embargo against OPEC served as motivation to start the Saudi wheat programme in the 1970s, but perhaps equally importantly they provided a means to redistribute oil rents to patronage networks and farm and business interests.[32] In the UAE, agricultural support has traditionally formed an essential part of the welfare system. In the past, nationals were granted land and subsidies to establish farms from which the government purchased produce at a subsidized price. In Abu Dhabi, the government provides direct support payments of up to AED 100,000 ($27,000) a year to Emirati farmers. The use of direct payments, production quotas and input subsidies is widespread throughout the Gulf.

Data are scarce but indicate that production subsidies may consume a greater share of fiscal resources than consumption subsidies (Table 4) and far more if implicit subsidies for water, fuel and electricity are included. Common targets are horticultural produce, dairy and livestock. On balance, these policies probably do little to bolster food security. Horticultural production may reduce imports of tomatoes, cucumbers, dates, aubergines and peppers, for example, but does not address the primary issue of security of supply for strategic commodities. Meanwhile meat and dairy production actually *increases* imports of strategic commodities such as corn and barley for use as animal feed: Saudi Arabia consumes nearly two-thirds of global barley exports to feed its sheep. Assuming no reduction in demand, release from strategic reserves or substitution towards alternative grains, a 50 per cent increase in international barley prices, as seen during the 2007–08 food price crisis, could increase Saudi Arabia's import bill by nearly $670 million.[33]

In general, horticultural products use water more efficiently than cereal and other field crop production, particularly if grown using technologies such as hydroponics and drip irrigation. However heavily subsidized dairy and livestock sectors continue to place unsustainable pressure on water resources, particularly when animals are fed on domestically produced fodder. The UAE is now withdrawing support for Rhodes grass, a highly water-intensive forage crop. In Saudi Arabia demand for alfalfa (another forage crop) has increased in response to growing demand for dairy. Because it is commonly rotated with wheat and can be grown all year round, farmers have increased alfalfa output as wheat production has declined (Figure 6), maintaining pressure on aquifers as a result.[34]

The reorientation of domestic support to less water-intensive, higher-value-added horticulture is to be welcomed, but as long as scarce water is made available to farmers for free, unsustainable abstraction – whether for wheat, fodder, meat or dairy production – is likely to continue.

Figure 6: Saudi Arabian wheat and alfalfa production



Source: US Department of Agriculture, *Grain and Feed Annual* (Riyadh: USDA), with supplementary data from the Saudi Arabia Ministry of Agriculture.

32 Woertz (2013), *Oil for Food,* and Elhadj (2008), 'Saudi Arabia's Agricultural Project'.

33 Based on 2010 import figures.

34 From 2006–07 to 2011–12, wheat production declined by 60% while alfalfa production increased by 60%. As a result, aggregate water use for wheat and alfalfa production declined by only 15% – less than 3% a year. Based on Saudi water use efficiencies of 0.83 kg per m^3 for wheat and 0.84 kg per m^3 for alfalfa in Hassim, M. et al. (2012), 'Determination of Water Requirement and Crop Productivity of Crops Grown in the Makkath Region of Saudi Arabia', *Australian Journal of Basic and Applied Sciences*, Vol. 6, No. 9.

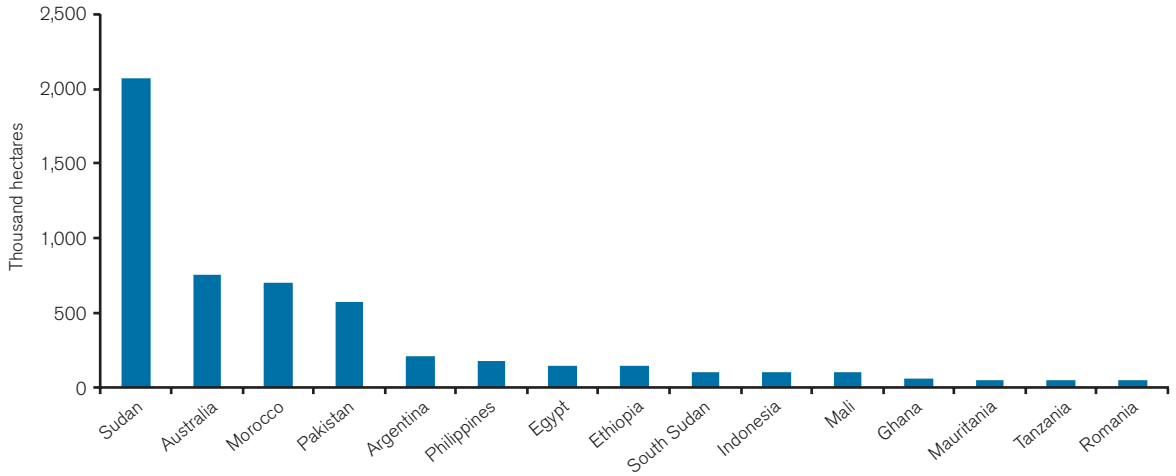
Investing abroad: securing supply?

Following the 2007–08 food price crisis, GCC states announced various initiatives to invest in agricultural production overseas as a strategy to 'lock in' supply and reduce reliance on international markets. These took a variety of forms, although most were state-led; the governments negotiated framework agreements with host countries, guaranteed purchases and provided subsidized credit. The investors themselves were typically Gulf agribusinesses, sovereign wealth funds or dedicated agri-investment vehicles.

These initiatives coincided with a global surge in land deals, but it is hard to assess the scale of the phenomenon and the Gulf states' role within it, owing to a lack of official data from host governments. Analysts have relied on press reports but this approach has a number of drawbacks. Press articles may fail to distinguish between deals that are in the early stages of negotiation and may never reach conclusion, and deals that have been completed; journalists may fail to verify and cross-check their sources. Any database of press articles may also be skewed towards deals that fit a particular media narrative, such as those by Gulf states or China, resulting in sample bias.

With these important caveats in mind, it nevertheless appears that Gulf states, in particular the UAE and Saudi Arabia, were important sources of investment. Of 416 overseas investments between 2006 and 2011 reported in a database compiled by the non-governmental organization GRAIN, 11 per cent originated among GCC investors, accounting for 5.4 million hectares (15 per cent of the total area acquired by foreign investors). Data from the Land Matrix (a monitoring initiative coordinated by the International Land Coalition) broadly corroborate this. They indicate that GCC investors accounted for 19 per cent of overseas agricultural investments in low- and middle-income countries since 2000, and nine per cent of the area in completed deals.[35] GCC countries are not the largest sources of investment in absolute terms – these appear to be the United States, the United Kingdom, India and China – but they are among the most acquisitive relative to the size of their populations.[36] According to the Land Matrix, the UAE has acquired three times its own agricultural land area since 2000.[37]

Figure 7: Targets of GCC agricultural investments ranked by area acquired, 2006–12



Source: GRAIN database, http://www.grain.org/article/entries/4479-grain-releases-data-set-with-over-400-global-land-grabs.

35 Note that these databases use different inclusion criteria, which may provide different pictures of investments. For example, the Land Matrix includes investments in land in low- and middle-income countries only for a variety of final uses, while GRAIN includes low-, middle- and higher-income countries as recipients of investment for the production of food crops only. For more on methodology and sources see GRAIN, http://www.grain.org/ and Land Matrix, http://www.landmatrix.org/about/.

36 Based on investment in land for agricultural use, http://www.landmatrix.org.

37 Data from Land Matrix and World Bank Development Indicators.

The countries on which the GCC states rely for their food imports appear to be under-represented among a list of primary investment destinations (Figure 7). While important trade partners such as Australia and Pakistan are evident, many others are absent.[38] More remarkable is the prominence of food-insecure and politically fragile countries. The Horn of Africa and the Sahel – the two most famine-prone regions in the world[39] – have attracted significant investment in countries such as Sudan and South Sudan, Ethiopia, Mali, and Mauritania. Other popular targets include Tanzania, Morocco and Egypt. In addition to proximity and political ties, some of these have considerable agricultural potential, notably Sudan and Tanzania. However, state fragility, rapid population growth, vulnerability to climate change, high levels of poverty, poor infrastructure and weak governance make these countries high-risk counterparties. Many have imposed export controls on their agricultural sectors during recent periods of high food prices,[40] and it would be naïve to suppose that supply from these countries would be secure during periods of national, regional or global food crisis.

Food-secure countries with more developed agricultural sectors and stronger governance present less risky investment destinations, and there is evidence that GCC countries are rebalancing their portfolios accordingly. Recent investments have targeted Eastern Europe and the Black Sea, Australia and South America.[41] Investors are increasingly seeking existing farming operations rather than undeveloped land. For example, the UAE's Al Dahra recently announced plans to invest $400 million in eight Serbian farming companies, with an additional $400 million in loans from the Abu Dhabi Development Fund to help develop the agricultural sector.[42] This approach minimizes the risk of conflict with local communities and reduces start-up times, problems encountered with earlier land-based investments.[43]

Conclusions

The principal risks to Gulf food security are supply risks: that, for a period, governments will not be able to secure sufficient supplies of food at any price. The worst-case scenario is the sustained closure of multiple import channels owing to regional instability. Other scenarios might include a major storm temporarily closing ports or disrupting imports, temporary closure of the Strait of Hormuz, or a flurry of export controls in a thinly traded commodity such as rice leading to temporary unavailability.

These risks can be managed through strategic stockholding, the costs of which increase with the size of reserve. Ultimately the size of reserve (and amount of cover it provides) is a political decision and it appears that GCC governments are willing to finance large reserves in return for comprehensive cover.

Infrastructural investments provide other opportunities to manage supply risks. In particular, a regional network of deep-sea ports on the Red Sea, Omani and UAE coasts, linked through a regional railway and strategically located silos, would provide governments with more routing options and hedge against the risk of maritime choke points being disrupted or closed. Realizing this opportunity requires enhanced cooperation between governments.

On the other hand, land-based investments in food-insecure countries with weak governance and infrastructural deficits do little to manage supply risks. Agro-investments in developed agricultural sectors are not only less risky, but allow GCC countries to deepen strategic trade relationships through investment in key export partners.

The attraction of domestic production as a means to reduce supply risks is understandable, but while new technologies mean GCC states can increase their production of horticultural produce while reducing their water footprints, production of strategic commodities, meat and

38 This may be due to high land prices in developed countries and investment restrictions in others, such as India.

39 Bailey, R. (2013), *Managing Famine Risk: Linking Early Warning to Early Action* (London: Chatham House).

40 For example Tanzania, Ethiopia, Egypt and Pakistan have all imposed export bans in recent years. Sharma (2011), *Food Export Restrictions*.

41 Woertz (2013), *Oil for Food*.

42 'UAE's Al Dahra to invest $400 million in Serbian agriculture', Reuters, 28 March 2013.

43 Woertz (2013), *Oil for Food*.

dairy make no ecological or economic sense. Agriculture support is perhaps best understood as a means to transfer income to farm interests.

The resource wealth of GCC countries means price risks present a minimal threat to food security: populations are generally wealthy and governments have ample resources with which to ensure that all members of society can afford sufficient food at all times. Instead, price risk is primarily a political risk because GCC populations are reluctant to accept declines in real incomes. Inflation is consequently a major concern for governments, which have responded to international price rises and instability in the MENA region with ad hoc policies to suppress prices, subsidize consumption and boost incomes.

This reactive approach has mitigated inflation for the time being but cannot be pursued indefinitely. In most GCC countries, it appears price controls contribute to 'downward sticky' domestic prices, locking in inflation in the long run. More fundamentally, recent rates of public spending increase are unsustainable and have forced governments towards historically high fiscal breakeven prices, which leave them vulnerable to declines in oil prices and risk pushing oil consumers further towards unconventional supplies. Bahrain, with a negative fiscal balance and breakeven price of around $120/b, is most vulnerable. The long-term ability of GCC countries to finance food imports and social spending may increasingly come to depend upon foreign exchange earned from non-oil sectors.

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Rob Bailey is a Senior Research Fellow of the Energy, Environment and Resources Department at Chatham House and leads on food security. Current research topics include famine prevention, global governance of the food system, biotechnology, and resource use in the Gulf. He previously held a number of posts at Oxfam GB. In 2011 he was named as one of the DEVEX 40-under-40 leading thinkers on international development.

Robin Willoughby is a consultant researcher on food and environmental security in the Energy, Environment and Resources Department.

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Chatham House
10 St James's Square
London SW1Y 4LE
www.chathamhouse.org

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