Improving Food Security in Arab Countries
The findings, interpretations, and conclusions expressed herein are those of the authors, and do not necessarily reflect the views of the International Bank for Reconstruction and Development/The World Bank and its affiliated organizations, or those of the Executive Directors of The World Bank as well as the Food and Agriculture Organization of the United Nations (FAO), the International Fund for Agricultural Development (IFAD), or the governments they represent. The World Bank, FAO and IFAD do not guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgment on the part of The World Bank, FAO and IFAD concerning the legal status of any territory or the endorsement or acceptance of such boundaries.
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAAID</td>
<td>Arab Authority for Agricultural Investment and Development</td>
</tr>
<tr>
<td>AOAD</td>
<td>Arab Organization for Agricultural Development</td>
</tr>
<tr>
<td>AgGDP</td>
<td>Agricultural gross domestic product</td>
</tr>
<tr>
<td>CPI</td>
<td>Consumer price index</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
</tr>
<tr>
<td>GCC</td>
<td>The Cooperation Council for the Arab States of the Gulf</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross domestic product</td>
</tr>
<tr>
<td>ICARDA</td>
<td>International Center for Agricultural Research in Dry Areas</td>
</tr>
<tr>
<td>IFAD</td>
<td>International Fund for Agricultural Development</td>
</tr>
<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
</tr>
<tr>
<td>NARIs</td>
<td>National Agricultural Research Institutes</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-governmental organization</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
</tr>
<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
</tr>
<tr>
<td>USDA</td>
<td>United States Department of Agriculture</td>
</tr>
<tr>
<td>WFP</td>
<td>World Food Program</td>
</tr>
</tbody>
</table>

All dollar amounts are US dollar amounts unless otherwise indicated.
Abstract

In 2007 and the first half of 2008, a sharp rise in agricultural commodity and food prices triggered grave concerns about food security, malnutrition and increased poverty throughout the world. While the threat of a prolonged food-price shock receded with falling energy and commodity prices and a weakening global economy in the second half of 2008, many factors underlying the volatility in food prices appear here to stay and will require careful management if the world is to avoid future food-price shocks.

This paper suggests three critical strategies that, together, can serve as pillars to help offset future vulnerability to price shocks:

1. Strengthen safety nets, provide people with better access to family planning services, and promote education.
2. Enhance the food supply provided by domestic agriculture and improve rural livelihoods by addressing lagging productivity growth through increased investment in research and development.
3. Reduce exposure to market volatility by improving supply chain efficiency and by more effectively using financial instruments to hedge risk.

An approach that relies on the three pillars offers an integrated and comprehensive framework to enhance food security. This global challenge requires a global response led by governments, international and regional funding and lending institutions, United Nations agencies, non-governmental organizations, civil society, and the private sector working in unison.
1. What Factors Underlie the Recent Shock in Agricultural Commodity Prices?

Very high agricultural commodity prices in the first six months of 2008 raised concerns worldwide about increased poverty and malnutrition. However, since June 2008, prices have retreated approximately 50 percent, driven down in part by strong production gains in developed countries (FAO 2008a). Other important factors contributing to the fall in prices include the world financial crisis, the precipitous decline of world oil prices, and the appreciation of the US dollar.

In spite of recent food price drops, many of the underlying factors behind high and volatile prices appear to be here to stay. Structural factors, such as population and income growth and biofuel demand, may prevent real prices from sliding back to the historic lows witnessed earlier this decade. Sustained high prices and increased volatility create a danger for Arab countries because they are highly dependent on international commodity markets for food. The key messages of this chapter are:

- Arab countries are highly exposed to international food commodity price shocks.
- International agricultural commodities may be entering a period of sustained price volatility due to thinness of markets and limited stocks.
- Investments in agricultural productivity are critical to keeping long-term commodity prices stable and affordable.

Why are Arab countries concerned about the recent price shock?

Arab countries are very vulnerable to fluctuations in international commodity markets because they are heavily dependent on imported food. Arab countries are the largest importers of cereal in the world (Figure 1.1). Most import at least 50 percent of the food calories they consume (FAO, 2008b).

---

1 In particular, income growth in China and India and the increased demand for livestock products in these countries has increased the global demand for cereal crops.

2 Arab countries include all members of the League of Arab States (LAS): Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, UAE, and Yemen. Comoros is omitted from analysis because of its unique geography.
Heavy dependence on food imports raises concerns about food security. Reliance on international commodity markets raises both price and supply concerns. In terms of price, high food prices put enormous pressure on household and national budgets. In terms of supply, five exporters (Argentina, Australia, Canada, the EU, and the United States) supply 73 percent of the world’s traded cereals (FAO, 2008b) making access to imported cereal heavily dependent on events in these countries and on Arab countries’ relationships with them.

**What factors are increasing food security risks?**

The recent food-price shock is widely acknowledged to be a result of the untimely convergence of multiple structural and cyclical factors. Structural factors are long-term factors that cause a permanent shift in demand or supply. Cyclical factors are short-term factors that induce a temporary shift in supply or demand. While this may or may not be true, of greater concern for Arab countries is that structural and cyclical forces are creating a system that is very sensitive to supply shortfalls and ever-increasing demand, making future price shocks very probable. The unexpected speed at which food prices can increase is especially problematic because of the inelasticity of both supply and demand. Households, especially poor ones, cannot quickly alter and reduce their food consumption in response to high prices. Instead, they

---

3 Structural factors are long-term factors that cause a permanent shift in demand or supply. Cyclical factors are short-term factors that induce a temporary shift in supply or demand.
must make sacrifices in other areas of their budgets. Agricultural producers cannot quickly ramp up production in response to high prices due to the seasonal time-cycle of agricultural production and the slow development of agricultural technologies.

In order to keep up with food demand, global agricultural-productivity growth needs to stay ahead of population growth. If not, demand will outpace supply and food prices will rise. Global productivity growth rates for major cereals are slowing (Figure 1.2). This is partly because public support for agricultural research has decreased since 1990 (Ruttan, 2002). Unless this trend is reversed, commodity markets will remain thin and the likelihood of food-price shocks will increase.

Thin international cereal markets imply that relatively small shifts in supply or demand will lead to large shifts in prices. Only 18 percent of world wheat production and 6 percent of world rice production is exported; the rest is consumed domestically (FAO, 2008d). At the height of the recent shock some major wheat- and rice-exporting countries banned exports for fear of not being able to feed their people. These bans contributed to the rapid escalation of global market prices. The thinner the market, the sharper the fluctuation in international prices and the higher the likelihood of future price shocks.

**Figure 1.2: Global Growth Rates of Yields for Major Cereals Are Slow**

*(percent change in growth of yields, 1980–2005)*

Low stock levels increase price sensitivity to disturbances in demand and supply. Policy reform in recent years, such as replacing price supports with direct farmer payments, has

---

4 Productivity growth refers to percent change in growth of yields.
brought down stocks in OECD countries from their high levels in the 1980s and 1990s (Gardner and Sumner, 2007; World Bank, 2008a). Low stock levels, combined with thin cereal markets and ever-increasing demand, contribute to a just-in-time commodity market that is more vulnerable to disruptions. FAO forecasts world end-of-season cereal stocks for crop years closing in 2008/2009 at 474 million metric tons, up 9 percent from their exceptionally low opening level and the highest volume since 2002/03 (FAO, 2008a). As a result, the cereal stock-to-use ratio is forecasted to rise two percentage points from a low of 20 percent in 2007/08. Although stocks are increasing, the probability of price shocks remains high when the pipeline stocks dip below the 25 to 30 percent range.

Climate change will contribute to market thinness and instability by increasing cereal yield volatility and possibly decreasing global cereal production. Global climate change models project an increasing probability of droughts and floods worldwide (Cline, 2007). A critical concern for Arab countries is how often droughts and floods occur in key cereal exporting regions. Research on the impact of global warming on average cereal production is not conclusive, but there are indications that average production will decrease. Rosenzweig and Parry (1996) estimate that global cereal production could decrease by 5 percent from 1996 to 2060, even with moderate investment in climate change adaptation.

Policies that promote biofuels such as ethanol and biodiesel, coupled with high domestic tariffs that discourage biofuel imports, shift land away from production of food and pasture (FAO, 2008e). There is evidence that this is occurring in the United States, a country that accounts for 28 percent of world cereal exports (Figure 1.3). Fabiosa et al. (2008) suggest that such policies in the United States will probably transmit directly to higher world-market prices for wheat and oilseeds. Sustaining such policies in the future would contribute to thinner wheat markets and an upward structural adjustment in world wheat prices. Similar biofuel policies in the European Union, Canada, and elsewhere could exacerbate anticipated structural changes in the production of wheat, coarse grains, oilseeds, sugar, and other crops.
Petroleum is the primary ingredient of diesel and fertilizer, which are two key components of agricultural inputs. The cost of transporting food also increases with the price of fuel. A recent study indicates that when oil prices are above $50 a barrel, oil and food commodity prices move together, but when the price of oil falls below $50 a barrel, oil and food prices decouple (World Bank, 2009). Rising petroleum prices can also impact commodity prices by increasing the demand for biofuels, which diverts cereal and sugar from food to fuel (FAO, 2008c).

Monetary policies, currency fluctuation, and financial speculation may have also contributed to the recent shock. Low interest rates reduce the price of storage and encourage the buying and holding of real commodities (Frankel, 2008). The recent decline of the U.S. dollar against other hard currencies increased the demand for these goods, since commodities priced in dollars became cheaper in real terms. Financial speculation may also have contributed to the price shock. In periods of uncertainty and/or recession, investors shift to real assets including commodities. This leads to large increases in non-traditional investments in commodity markets as fund investors bet on continued price increases. However, recent research suggests that speculation may be a symptom of the food-price shock and not a cause (Carter, Rausser, and Smith, 2008).

**Will food-price shocks continue to be a problem for Arab countries?**

Population growth, urbanization, and income growth are relatively strong in Arab countries
and will increase the demand for food. Supply-side constraints are also more binding in most Arab countries than elsewhere due to acute competition for limited amounts of arable land and water, constraining these countries’ ability to increase cereal production. Thin cereal markets and climate change will increase price sensitivity to disturbances in these demand and supply factors. The potential decoupling of petroleum and food commodity prices may cause deterioration in the fiscal balances of oil-producing countries, reducing their ability to cope with future shocks. It is unknown if world food prices will be high or low, but it is certain that Arab countries will remain vulnerable to food price and quantity shocks in the future.

The structural factors driving food demand are increasing faster in Arab countries than worldwide. The combined population growth rate of all Arab countries is projected to be 1.7 percent, which is much higher than the world rate of 1.1 percent (World Bank, 2008b).\(^5\) Not only is the number of people increasing faster in Arab countries than elsewhere, but so is their purchasing power. The current income growth rate of Arab countries outpaces the global average, at 3.4 percent to 3 percent (World Bank, 2008b).\(^6\) Urbanization is also on the rise in Arab countries, with urban population growing by 3 percent during the 1990–2006 period, surpassing the global average of 2.2 percent (FAO, 2008b).

Water and land constraints are particularly challenging for agriculture in Arab countries. Approximately 75 percent of exploitable renewable water resources are taken out of the natural system and put to use compared to between 1 percent and 30 percent in other regions (World Bank, 2007a). In some areas, non-renewable sources such as fossil groundwater are being exploited. Consequently, there is little to no potential for sustainable increase in water use in most Arab countries. The expansion of arable land is also much slower in Arab countries than globally. Excluding Sudan, the amount of arable and permanent cropland increased at an annual growth rate of 1.7 percent from 1995–2005 (6.7 percent with Sudan). Worldwide, arable and permanent cropland increased 2.3 percent (FAO, 2008b). In addition to water and land constraints, cereal-yield growth has been slower in Arab countries than the rest of the world. From 1990 to 2007 average cereal yields increased 14.5 percent in the Arab region, compared to 21.5 percent worldwide.

\(^5\) World Bank population data is for the World Bank’s Middle East and North Africa region (MENA).
\(^6\) Income as measured by annual percent change in GDP per capita PPP at constant 2005 international dollars from 2001–2007.
2. What is the Impact of the Recent Price Shock on Arab Economies?

The recent price shock provides important lessons about the potential macro and microeconomic effects of high food prices, and about the results of government responses to these trends. At the macro level, inflation in Arab countries is a challenge, increasing at more than twice the speed of world inflation in recent years (IMF, 2008). High energy and food prices are driving factors, outpacing overall inflation by several percentage points. High food prices also deteriorate the trade balances of all Arab countries. Most countries employ subsidies to address high food prices, but these subsidies can strain a country’s fiscal balance. Although food commodity prices have fallen in recent months, they remain higher than when the price shock began; inflation remains a concern. The global financial crisis and declining oil prices will have a significant impact on the fiscal balances of the wealthier oil-exporting Arab countries, dampening their ability to absorb food-price shocks.

At the micro level, the recent shock probably made poverty both more widespread and more severe, although it is too early to determine the exact damage. The poor are certainly most vulnerable to food-price shocks, because they spend the largest share of their budget on food. Food-price shocks can push people above the poverty line into poverty, and worsen the condition of those who are already poor. Key messages of this chapter are:

- Food-price shocks threaten macroeconomic stability in resource-poor countries.
- Falling petroleum prices make oil-rich countries more vulnerable to shocks.
- Food-price shocks increase the depth and incidence of poverty.
- Different countries face different food security concerns depending on their resource endowment and fiscal balance.
What is the impact of the food-price shock on government budgets?

Non-oil-exporting countries face increasing fiscal pressure due to the recent shock. In addition to inflation, food-price shocks directly affect trade and fiscal balances. Many Arab countries (e.g. Egypt, Jordan, Syria, and Yemen) have increased wages for public sector employees and have tried to support the poor by increasing bread subsidies, implementing direct cash transfers, and lifting tariffs on basic food commodities. However, these measures are not sustainable without concurrent increases in revenues. In order to finance the additional expenditures, oil-poor countries may be forced to reduce other essential expenditures or increase borrowing, which has a negative long-term effect on their economies. Non-oil-exporting countries that rely significantly on cereal imports (e.g. Jordan, Lebanon, Morocco, and Djibouti) all have fiscal and trade deficits, contributing to their economic hardship. However, rising revenues from other commodity exports have eased some of the burden in oil-poor countries that are rich in other natural resources. For example, Morocco’s phosphate exports tripled in value in 2008 and covered the oil deficit, while Jordan’s export of potash helped cushion its food-import bills.

Oil-rich countries have maintained fiscal surpluses, despite high food prices largely because of strong oil revenues. Governments of oil-rich countries have been able to raise public sector wages and implement large food subsidy programs without incurring unbearable fiscal strain. However, the recent sharp decline in oil prices may deteriorate trade surpluses and reduce foreign exchange earnings, government revenues, and investment options. If oil prices continue to decline but food prices remain high, fiscal and trade surpluses could become chronic deficits.
Across-the-board food-subsidy programs can create a substantial fiscal burden. Food-price shocks drive up the cost of government food subsidies. At the same time, a common government response to shocks is to increase the coverage and size of these subsidies, driving up costs even further. In countries such as Syria and Egypt, which have across-the-board subsidies, the subsidies exceed one percent of GDP and could become a major fiscal problem if commodity prices stay high or in the event of future price shocks (Figure 2.2).\(^7\) While social and political considerations may make rationalizing food subsidies unpopular, Chapter 3 of this paper outlines potential strategies to improve their performance and reduce their fiscal burden.

![Figure 2.2: Food Subsidies Are a High Share of GDP in Some Countries (2007)](chart.png)


**What impact can food-price shocks have on poverty?**

Rural poverty is at the core of Arab countries’ food-security problems. About one quarter of the population of Arab countries is poor, and 76 percent of these poor people live in rural areas. Poverty rates in rural areas are also dropping more slowly than in urban areas (IFAD and FAO, 2007). Table 2.1 shows how the poor are distributed between rural and urban areas in Arab countries for which poverty data is available. With so many of the poor residing in rural areas, it is imperative that social safety nets are designed to reach these people. Safety nets will be covered in greater detail in Chapter 3.

Higher food prices contribute to an increase in the incidence, depth, and severity of

---

\(^7\) This pales in comparison to energy subsidies, which average 7 percent of GDP across the region (World Bank 2008j).
poverty. The poor in the region are hit hardest by food-price shocks, spending anywhere from 35 to 65 percent of their income on food. Rough calculations suggest that, barring economic growth, a 30 percent increase in food prices in Egypt would have resulted in a 12 percentage point increase in poverty. In Morocco a 14 percent increase in food prices would have resulted in a 4 percentage point increase in poverty. In Djibouti a 21 percent increase in the food CPI could have pushed extreme poverty up by 14 percentage points. These are relatively high magnitudes of impact, which reflects a characteristic feature of poverty in the region: a relatively high concentration of the population near the poverty line makes poverty numbers very sensitive to even small increases in the cost of living (World Bank, 2006).

Some groups of poor people stand to lose more than others from higher food prices. Those that stand to lose the most are the urban poor, the rural landless, and small and marginal farmers. Large farmers will be buffered from shocks since they are likely to benefit from higher agricultural produce prices (FAO, 2008f). In contrast, a large proportion of small farmers in several Arab countries stand to lose from higher food prices because they are net consumers of food. Preliminary findings from Yemen are alarming. Between 2006 and

---

8 These figures are the result of simulations and represent maximum possible effects. They refer to the changes in food prices (or food component of the CPI) approximately over the same time period from the pre-crisis (2005) to early 2008, assuming no income growth and no substitution away from food. They also do not take into account possible positive effects of higher food prices on incomes of farmers.
2008 the percentage of the surveyed population with inadequate food consumption grew a shocking 35 percentage points (from 24 percent to 59 percent) (World Food Program, 2008). In order to help marginal groups become food secure, employment opportunities need to be generated. Strategies to create economic activity in rural areas will be dealt with in Chapter 4.

Investing in smallholders is essential to eradicating rural poverty and increasing food security at the national level. There are many reasons policymakers would want to help smallholders. They usually make up the majority of the rural population and of the rural poor. Enabling smallholders to become more productive contributes to household food security, which contributes in turn to national food security. Therefore the success of smallholders should also be recognized as a food security goal (IFAD and FAO, 2007; FAO 2008f). The need to invest in smallholders will be discussed further in Chapter 4.

The impact of the food-price shock on select groups may endure after prices drop. Households in extreme poverty may sacrifice productive inputs to purchase food, reducing their earning potential in the following year. For example, in Yemen 10 percent of surveyed farmers consumed seed stocks reserved for the following year (World Food Program, 2008). Some poor households are undoubtedly forgoing spending on health and education in order to feed themselves, ultimately sacrificing the productivity of future generations. The same study in Yemen revealed that 39 percent of surveyed households decreased expenditures on health (World Food Program, 2008).

What are the food security implications for Arab countries with different resource endowments and fiscal balances?

Exposure to food price and quantity risk is a function of dependence on cereal imports and fiscal balances. Arab countries are price takers and import dependent because they produce a relatively small share of world cereal, exposing them to substantial price and quantity risk. Price risk is the risk that cereal prices will be prohibitively high, making purchase difficult even though quantity is available on world markets. Quantity risk is the risk of food not being available, even if there are sufficient funds for purchase. Figure 2.3 provides some possible combinations of dependence on imported cereals and fiscal balance to measure food price and quantity risk faced by Arab countries. GCC and other countries that are highly dependent on cereal imports but have strong fiscal balances are less vulnerable to price risk because of their strong resource base. However, since these countries depend entirely on food imports, they are concerned about quantity risk that could occur via export bans and other export restrictions like the ones witnessed at the height of the recent shock.

GCC countries are most vulnerable to food-price shocks when oil prices are low and food commodity prices are high. Low oil prices can weaken fiscal balances of oil-rich nations,
making it harder for them to handle high food commodity prices. Cyclical factors (e.g., a decrease in demand due to the financial crisis and high oil prices) are contributing to the recent decline in oil prices, reducing income for the oil exporters. Structural factors driven by Western concerns about energy security and global warming may contribute to a longer-term slump in oil prices. These factors could decouple oil and food commodity prices, making it more difficult for oil-rich countries to offset terms of trade losses.

Depletion of oil reserves may also substantially reduce the extent to which current oil exporters can cushion the negative fiscal impacts of future food-price shocks.

Terms of trade losses occur when a country’s balance of trade deteriorates. This is a long-term risk for oil-rich countries since fossil fuel substitutes remain relatively expensive. The oil-rich countries can mitigate vulnerability by using current oil revenues to diversify their economies so that they are not so dependent on oil revenues in the future.

Source: Authors. Adapted from FAO, 2008b; IMF, 2008; World Bank, 2008b.
Note: Cereal import dependency is measured by net cereal imports/total cereal consumption.
* 2007 fiscal balances were drawn from the IMF. The most recent FAOSTAT data on cereal balances is for 2005.
Djibouti, Yemen, Morocco, Jordan, Tunisia, and Lebanon are most vulnerable to food-price shocks because they face both high quantity and high price risk.\textsuperscript{11} Price risk is a problem because weak fiscal balances constrain government financing options. Quantity risk is a problem because of high dependence on imports. These countries may need external support in addressing food security because they lack the fiscal resources to handle shocks.

Sudan, Egypt, and Syria face low quantity risk and high price risk. Price risk is a problem because weak fiscal balances constrain government financing options. Quantity risk is not as much of a problem because these countries are less dependent on imports. Although these countries are less dependent on cereal imports, they all have food-subsidy programs that weaken their fiscal balances. Chapter 3 presents some strategies that can be used to bring down the cost and improve the effectiveness of these programs.

No Arab country is protected from future food-price shocks. Each country needs to assess how much price and quantity risk they can tolerate, and how much they can afford to mitigate, in order to devise a risk management strategy to mitigate the impact of future price shocks. Such a strategy will consist of a combination of addressing the growth in the demand for food, increasing production of food, and managing exposure to volatility in commodity prices. At the same time, countries can reduce fiscal pressure by designing more efficient safety nets.

\textsuperscript{11} In Tunisia, for example, it is estimated that food trade balance registered a surplus of 277 million dinars in 2006 and a deficit of 426.8 million in 2007 and the import coverage went down from 121 percent to 79 percent. In terms of quantities, the country imported 296,600 metric tons of wheat in January and February 2008, 11.8 percent less than in the same period of 2007, but the value was two times as much. Moreover, the disbursements of the Caisse de compensation reached 575 million dinars in 2007 against 321 million dinars in 2006, corresponding to 1.3 percent of GDP.
3. Improving Food Security with Safety Nets, Family Planning Services, and Education

The first pillar of the food-security strategy addresses increasing domestic demand for food. Food-price shocks will be particularly catastrophic for the youngest generation in Arab countries if they lead to reduced household investment in health, nutrition, and education.

Effective safety nets are crucial to preventing a lost generation. But creating safety nets that provide the appropriate assistance to those who most need it in a financially sustainable manner requires improved targeting and flexibility, so that they can be scaled up when shocks strike and scaled down when they recede. Another method involves providing people with better access to family planning services and educating them about the consequences of an unhealthy diet. Key messages of this chapter are:

- Strengthening safety nets is critical to protect those most in need.
- Providing people with access to family planning services and educating them about the consequences of an unhealthy diet can provide sustainable benefits.

What measures are Arab governments employing to respond to the recent price shock, and what are the limitations of these measures?

Arab governments are responding to the recent price shock with a combination of trade policies, wage increases, and safety-net programs that will be difficult to scale back (Table 3.1). Trade- and tax-policy changes have been a common initial response, aimed at increasing food security and controlling consumer prices. Morocco recently reduced wheat tariffs substantially and provided subsidies to wheat importers. Egypt banned rice exports to try to shield domestic consumers from high world prices. Syria imposed export restrictions and reduced taxes on food grains. Djibouti eliminated consumption taxes on several food staples and is providing limited food assistance to rural families through donor support. Tunisia reduced taxes on wheat and is keeping price controls on strategic staples. Yemen is temporarily providing wheat subsidies, and Jordan is maintaining bread
Public-sector wages have been increased in several countries, including Jordan, Egypt, Syria, Yemen, Saudi Arabia, and Oman, although these increases are largely intended as compensation for both higher energy and food prices. Some countries have used cash transfers to increase the purchasing power of the poor. Egypt recently expanded its small cash-transfer program, and Yemen has created a workfare program building on an infrastructure-based social fund and is reforming and expanding its cash-transfer program. One consequence of some of the actions taken so far, however, is that they will be difficult to remove or scale back. Increasing public-sector wages is a permanent and untargeted response, fueling inflationary pressure. When recipients become accustomed to the benefits of maintaining or, as in the case of Egypt, expanding food subsidies or rations, it can be very difficult to remove them, even if market prices fall. In the wake of the recent global financial crisis, Arab governments are expected to reduce food subsidies further in light of pressures to expand public expenditures to stimulate the economy.

Many countries in the region rely heavily on food subsidies as the primary safety net,  

<table>
<thead>
<tr>
<th>Table 3.1: Arab Countries Have Used Various Economy-wide Policies and Existing Social Protection Programs to Address the Recent Price Shock.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economy-wide Policies</td>
</tr>
<tr>
<td>Country</td>
</tr>
<tr>
<td>Egypt</td>
</tr>
<tr>
<td>Morocco</td>
</tr>
<tr>
<td>Tunisia</td>
</tr>
<tr>
<td>Yemen</td>
</tr>
<tr>
<td>Lebanon</td>
</tr>
<tr>
<td>Syria</td>
</tr>
<tr>
<td>Jordan</td>
</tr>
<tr>
<td>WBG</td>
</tr>
<tr>
<td>Iraq</td>
</tr>
<tr>
<td>Djibouti</td>
</tr>
</tbody>
</table>

Note: WBG is West Bank and Gaza.

12 Jordan eliminated other food and energy subsidies as part of a broader reform.
13 Cash transfers can be unconditional, given to everyone who qualifies based on predetermined criteria, or conditional, where cash is given in exchange for behavior modification (e.g., sending children to school).
including Egypt, Jordan, Syria, and Morocco, among others. In-kind food subsidies are particularly popular and many countries have expanded these subsidies in response to the recent price shock. While energy subsidies constitute by far the largest safety-net component in most countries, food subsidies absorb up to 2 percent of GDP in some cases (Figure 2.3).\textsuperscript{14} Subsidies have several disadvantages. First, they divert significant resources from alternative, more productive uses. Second, when they are not targeted, they are unnecessarily expensive, because most benefits are captured by the non-poor.\textsuperscript{15} And third, in-kind food distribution systems entail heavy administrative overhead and substantial wastes due to storage losses, and they encourage corruption, waste, and leakage of food to non-human uses.

Existing safety nets do not reach those most in need. Programs need to be targeted to the poor because they are most affected by price shocks, spending proportionately more on staple foods. Most cash-transfer programs in the region are small, amounting to less than 1 percent of GDP in most cases. Most programs use categorical targeting approaches. Households and individuals are entitled to benefits if they fall into eligible categories, such as single mother, widow, unemployed, elderly, or disabled. These categories are not limited to the poor, and do not necessarily cover the poorest sectors of the population. For example, Egypt’s social-assistance program covers less than 12 percent of the poor and has a benefit leakage rate to the non-poor estimated at between 48 and 60 percent in 2008 (World Bank, 2008k). In Yemen in 2005, the Social Welfare Fund cash-transfer program reached only 13 percent of the poor population. Of those who received transfers, 70 percent were not in the target group. The National Aid Fund in Jordan covered less than 20 percent of the eligible population in 2005, and of those who received aid, only 14 percent were actually eligible.

**How can Arab countries manage demand to mitigate the consequences of price shocks?**

Arab countries can improve the design of safety nets to dampen the effects of food-price shocks and prevent them from doing permanent harm. Simulations indicate that a sharp drop in poverty headcount, depth, and severity would be possible in many countries of the region if the current system of categorical transfers is replaced with transfers targeted through a proxy-means test\textsuperscript{16} coupled with geographic targeting (World Bank, 2009). Proxy-means testing typically does well in identifying the chronic long-term poor. By

\textsuperscript{14} In 2006–2007, energy subsidies were more than 11 percent in Syria and 7 percent in Egypt.

\textsuperscript{15} Yemtsov (2008) estimates that in Egypt a person in the poorest quintile receives 3 times less in terms of subsidies than someone from the top 20 percent of the distribution and in Morocco the poor are receiving only 10 percent of what the government spends on universal price subsidies, while 90 percent goes to subsidized goods consumed by the non-poor.

\textsuperscript{16} Proxy-means testing involves determining a set of observable characteristics that are correlated with poverty to identify the eligible population without relying on direct income measures.
increasing the budget dedicated to such programs away from generalized subsidies, the impact on poverty reduction can be substantially increased. Most Arab countries have the household data sets required to establish the necessary targeting formula, and many are already adopting or considering this approach.

Countries can employ cash transfers to protect those most in need. Cash transfers may be more cost effective than in-kind subsidies. In comparison to in-kind subsidies, cash transfers do not distort commodity markets, typically have lower administrative costs, are amenable to payment systems that limit fraud and diversion of benefits, and allow beneficiaries sovereignty over what is purchased. Conditional cash transfers are a program option that could foster human capital development and help break the cycle of poverty. For example, transfers could be made conditional on a child attending school. Brazil’s Bolsa Familia and Mexico’s Progresa/Oportunidades are examples of successful large-scale conditional cash-transfer programs.

Countries can strengthen program coordination and enhance payment mechanisms to improve resource efficiency. At the policy level, program coordination needs to be improved to reduce overlapping beneficiaries and mandates that waste resources. For example, safety nets in the West Bank and Gaza are provided through a complex web of programs supported by the government, international donors, NGOs, and charitable organizations, some of which have the same target populations. At the program level, improvements can be made in the payment mechanisms used to distribute benefits, and in administrative operations and staffing. Egypt is piloting an electronic “smart” card for its ration system that will eventually include cash transfers and other benefits such as health insurance. The smart card can be used to track and distribute benefits through banks. However, smart-card implementation may be more difficult to deploy in rural areas, where limited education and access to infrastructure may reduce usage rates.

Arab countries need to implement safety nets that are flexible enough to be scaled up when shocks strike and scaled down when they recede. This is important because scalability enables relief for the vulnerable when prices are high and a reduction in the fiscal burden when prices are low. If possible, existing targeted cash-transfer programs should be the prime candidates to be scaled up. These include poverty-focused social assistance, as well as social pensions, unemployment assistance, and disability pensions. Where public workfare is already part of the safety net, it may be useful to expand program reach. The next most desirable candidate would be food stamps or other near-cash assistance that could be targeted

---

17 Cash assistance is provided to poor families conditional on behavior, often including keeping children in school and maintaining health regimes.
18 The World Food Programme (WFP) in Yemen has introduced school-feeding programs targeting girls’ schools, which had a significant impact in enticing parents in several rural communities to send their daughters to school (IRIN, 2005).
and scaled up or down. Direct subsidies and food distribution would be the least desirable option, only advisable when food markets are functioning poorly or when subsidies are the only available safety net.

In addition, countries can provide people with better access to family-planning services. Arab countries have among the highest population growth rates in the world. The combined population of Arab countries was 73 million in 1950 and, at 333 million, is over four times greater today. It will nearly double again by 2050, increasing to approximately 600 million. A growing young population requires access to sufficient resources to maximize its contribution to society. However, a rising population also adds to the growing need for food imports. It drives up public food-subsidy bills, which can be significant when they are for basic goods and services that everyone in the population uses. Higher incomes, urbanization, and education are often identified as key factors contributing to long-term reductions in birth rates. However, access to family planning services has proven to be very effective in speeding up long-term demographic trends. Demographic trends and widespread access to family planning are already having significant impacts on reducing population growth rates in several Arab countries such as Tunisia, Lebanon, Morocco, Algeria and Egypt. The widespread provision of family planning services in Arab countries that continue to have high population rates, such as Yemen, Jordan and Mauritania, could have significant long-term benefits for a range of socio-economic issues, including food security.

Last, Arab countries can educate families about the benefits of a well-balanced diet to sustain long-term health benefits. A well-balanced diet rich in vitamins and minerals and high in fiber can help reduce the risk of health problems such as malnutrition and non-communicable diseases. As incomes increase, diets will improve. Nonetheless, the trend towards diet diversification can be accelerated through education programs targeting children, who are the consumers of today and tomorrow, and women, who play a key role in determining the composition of household diet. A primary objective of such programs would be to inform families about the nutritional composition of staple foods. For example, estimates indicate that approximately 40 to 45 percent of the nutritious value of white flour products, from vitamins to fiber, is lost during bleaching and other processes (The North African Journal, 2008). Nutritional education programs could highlight the nutritional benefits of consuming whole wheat flour products over white flour products.
4. Optimizing Investments to Increase Productivity and Profitability

Increasing agricultural productivity is the second pillar of the food-security strategy. Higher productivity can increase the purchasing power of the rural poor, increase foreign-exchange earnings, and reduce import dependence.

Food production in Arab countries is limited by scarce land and water resources. There is little room for expansion of arable land or irrigation, so the emphasis must be put on increasing productivity in terms of yields and value per unit of land and water. Increasing productivity requires investment in research, extension, and technology transfer. Key messages of this chapter are:

- Increasing productivity is the critical counterweight to increasing demand for food and production constraints.
- Investment needs to be targeted to ensure that water is put to its highest-value use.
- Research and development can lead to new technologies that will drive up productivity.
- Investments in rural livelihoods will help rural communities make the most of their resources.

What role will productivity play in addressing increasing demand for food in Arab countries?

Productivity gains will remain the critical counterweight to increasing demand for food. The evidence presented in Chapter 1 suggests that there are a number of persistent structural factors that may keep agricultural commodity prices high in the future. However, it may be possible to gain more insight into what the future holds by looking back at the last 100 years of wheat prices (Figure 4.1). Since the early 1900s, real wheat prices in the United States have trended downward, driven by expansion and technological change. In the 19th and the first half of the 20th century, this increase in productivity was primarily due to an expansion of the area planted. In the second half of the 20th century, the increase came mostly from intensification arising from investment and ingenuity (Evans, 1998).
While agricultural land continues to expand, the rate of expansion has been slowing. Similarly, decompositions of productivity gains point to research and development as major causes of growth since the 1960s. The green revolution provided productivity gains that eased high food prices after the 1970 oil shock. However, as prices declined through the first half of this decade, so too did worldwide investment in agricultural research and development (World Bank, 2008e).

**Figure 4.1: Historically, the Price of Wheat Has Gone Down**

How can Arab countries make the most of scarce water resources?

Non-agricultural water demand is growing rapidly. Today approximately 85 percent of all abstracted surface water and groundwater in Arab countries is already used for irrigation, and this number must decrease. Although advances have been made, creating new water for irrigation using desalinization and wastewater recycling is not economically viable for most agricultural activities. The use of treated wastewater to irrigate food crops can also be problematic, because it often encounters public resistance, although this is changing (World Bank, 2007). Using wastewater for the irrigation of non-food crops should still be encouraged, because it frees up water for other uses. Water harvesting is another way to increase water supply for irrigation. It is important to recognize that desalinization, wastewater recycling, and water harvesting have their limits. Together they could amount to 20–25 percent of abstracted water, but they come at a high cost with limited use.

Policies that lower the cost of water to farmers encourage non-beneficial and low-value

---

19 Water harvesting refers to practices and structures for capturing storm water, including the construction of small dams.
use. Water and energy subsidies that reduce the price of water encourage farmers not to maximize the value of water (World Bank, 2007). First, water is lost to non-beneficial use when flood irrigation is used instead of water-saving irrigation systems like sprinklers and drip. Second, farmers choose crops with low value added per drop of water. For example, vegetable production yields six times more value added per drop of water than wheat production, and ten times more value added per drop than beef production. When farmers are encouraged to pay the full cost of water, they voluntarily switch their use of irrigated land from low-value crops such as wheat to higher-value crops such as fruits and vegetables. In addition, they have incentives to invest in water-saving irrigation technologies.

Encouraging farmers to replace cereals with high-value crops has mixed implications for food security. The World Bank’s World Development Report (2008e) argues that the top agricultural priority for the majority of Arab countries is to diversify production out of staples and into high-value crops (like fruits and vegetables) for export. High-value crop production gives landowners more entrepreneurial opportunities, creates more employment for women and landless workers, and raises agricultural wages. In countries that have a mix of rain-fed and irrigated agriculture, such as the Maghreb countries, the Mashreq, and Sudan, water pricing could create a natural split; cereal would be grown primarily under rain-fed conditions, and high-value crops under irrigation. This would increase dependence on imported cereals, but it would also generate more foreign exchange from high-value crop exports that would cover the cost of additional cereal imports. This would also be more profitable for farmers and leave them disposable income with which to buy staples. This is not to say that countries that depend entirely on irrigation should stop growing cereal where it is economically viable and sustainable, as in the Nile Basin of Egypt. In Gulf countries, where irrigation water is more limited, cereal production might be eliminated completely in favor of more efficient high-value crops.

Arab countries will need to import much of their cereal, even in cases when they produce some domestically. There is a complex balance of advantages and sacrifices involved in either importing less cereal, or having more agricultural export earnings with which to import. The tradeoffs between these options need to be carefully evaluated when considering water policy that shapes production choice. This tradeoff is unique in each country, depending on its food needs and agricultural potential.

**Why is investing more in rain-fed agriculture critical to Arab countries?**

Despite predominately dry climates, many Arab countries depend mainly on rain-fed agriculture. In Algeria, Iraq, Jordan, Lebanon, Libya, Mauritania, Morocco, Sudan, Syria, Tunisia, and Yemen, rain-fed agriculture is practiced on more than half of all arable land (AOAD, 2007). In the Maghreb, Sudan, and Yemen, at least 80 percent of cereal
production is rain-fed, and in the Mashreq, from one-half to two-thirds of cereal production is rain-fed (FAO, 2008b).

Rain-fed agriculture in Arab countries is in danger due to climate change. Climate change models indicate that average yearly rainfall could decrease by 10 percent in the next 50 years (World Bank, 2008f). Droughts and heat waves will become more frequent as weather cycles speed up. As a result, rain-fed yields will fluctuate increasingly over time, and average yields will begin to trend downward, decreasing by 20 percent in Arab countries overall and by almost 40 percent in Algeria and Morocco (World Bank, 2007a). It is usually the most marginalized farmers and herders who depend most on rain-fed agriculture, particularly in the drier areas. These groups will be further marginalized and impoverished by the negative effects of climate change.

Helping rain-fed farmers adapt to climate change requires investment in new technologies. Research into conventionally bred and genetically modified drought-resistant crops is essential for keeping rain-fed agriculture economically viable (El Obeidy, 2006). Conservation tillage has the potential to increase and stabilize yields in the face of frequent droughts (World Bank, 2008e). Trials on rain-fed wheat in Morocco have generated increased and more stable yields than conventional tillage systems (Mrabet, 2002; 2008). Some experts argue, however, that agricultural research will not keep up with climate change, and that public resources may be best spent in other areas that offer people an alternative livelihood to agriculture.

**How can Arab countries increase productivity?**

Arab countries can increase public investment in agricultural research and development. Arab countries invest approximately $1.4 billion annually in agricultural R&D (Pardey et al., 2006), or 0.66 percent of agricultural GDP (AgGDP) (Alston et al., 2000). This is slightly higher than the developing-country average of 0.53 percent, but far below the recommended investment level of 2 percent of AgGDP (Gana et al., 2008), as well as the level of investment of developed countries, which averages 2.36 percent of AgGDP (Alston et al., 2000). Besides the atypical Bahrain, which invests 18 percent of its small AgGDP in R&D, regional leaders are Libya, Jordan, and Morocco (Table 4.1). It is not only developed countries that invest highly in agricultural R&D; Brazil invests 1.7 percent of AgGDP, 1.4 percent of which is invested through government agencies (FAO, 2008b). Arab countries increased spending on agricultural R&D by only 0.05 percent of AgGDP from 1981 to 2000, whereas developed countries increased their spending by 0.95 percent (World Bank, 2008e).

---

20 Around 0.50 percent goes to national laboratories, the rest to other public sector research institutions.
21 There are signs of improvement as recently Qatar, Tunisia, and UAE have made some progress in
Countries can enhance incentives for agricultural researchers in Arab countries. The number of agricultural researchers in Arab countries is relatively high, but they are under-funded and ill-equipped. In 1999, there were 14 full-time agricultural researchers per 100,000 rural residents of Arab countries (Table 4.1). Leaders in this respect are atypical Bahrain, with 457 researchers per 100,000 rural residents, Libya, with 83, and Lebanon, with 66. This compares well with countries that have high agricultural development, such as Argentina (with 45 researchers per 100,000 rural residents), Brazil (with 11), and Mexico (with 12) (Table 4.1). However, funding per researcher in Arab countries is much lower, so researchers tend to have lower salaries and fewer resources, making them less productive than researchers with better funding (Casas et al., 1999). For scholars with promoting public sector R&D (Gana et al., 2008).

22 Bahrain’s relatively small rural population inflates this figure.

---

**Table 4.1: Agriculture Research and Funding in National Agricultural Research Institutions**

<table>
<thead>
<tr>
<th></th>
<th>Potential researcher years (PRYs)</th>
<th>Funding (millions of 2000 US$)</th>
<th>PRYs/100,000 rural residents</th>
<th>Funding as percent AgGDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria</td>
<td>575</td>
<td>14</td>
<td>8</td>
<td>0.4</td>
</tr>
<tr>
<td>Bahrain</td>
<td>32</td>
<td>3</td>
<td>457</td>
<td>17.9</td>
</tr>
<tr>
<td>Egypt</td>
<td>6,710</td>
<td>68</td>
<td>27</td>
<td>0.5</td>
</tr>
<tr>
<td>Iraq</td>
<td>770</td>
<td>—</td>
<td>30</td>
<td>—</td>
</tr>
<tr>
<td>Jordan</td>
<td>198</td>
<td>6</td>
<td>35</td>
<td>1.2</td>
</tr>
<tr>
<td>Lebanon</td>
<td>83</td>
<td>4</td>
<td>66</td>
<td>0.4</td>
</tr>
<tr>
<td>Libya</td>
<td>261</td>
<td>13</td>
<td>83</td>
<td>1.6</td>
</tr>
<tr>
<td>Morocco</td>
<td>606</td>
<td>40</td>
<td>6</td>
<td>0.9</td>
</tr>
<tr>
<td>Sudan</td>
<td>595</td>
<td>3</td>
<td>3</td>
<td>0.1</td>
</tr>
<tr>
<td>Syria</td>
<td>1,058</td>
<td>15</td>
<td>22</td>
<td>0.4</td>
</tr>
<tr>
<td>Tunisia</td>
<td>368</td>
<td>15</td>
<td>16</td>
<td>0.6</td>
</tr>
<tr>
<td>UAE</td>
<td>73</td>
<td>—</td>
<td>46</td>
<td>—</td>
</tr>
<tr>
<td>Yemen</td>
<td>245</td>
<td>6</td>
<td>3</td>
<td>0.8</td>
</tr>
<tr>
<td>Arab world</td>
<td>11,574</td>
<td>187</td>
<td>14</td>
<td>0.5</td>
</tr>
<tr>
<td>Brazil</td>
<td>3,943</td>
<td>924</td>
<td>11</td>
<td>1.4</td>
</tr>
<tr>
<td>Argentina</td>
<td>1,858</td>
<td>270</td>
<td>45</td>
<td>1.0</td>
</tr>
<tr>
<td>Mexico</td>
<td>3,097</td>
<td>357</td>
<td>12</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Sources: Casas et al. 1999; IFPRI 2008b.

1 A potential researcher year is the equivalent of one year’s worth of research. This unit is used since many researchers have a position that also consists of teaching, extension, and consulting, making them only part-time researchers.

---

---

---

---
Ph.D.s, the financial incentives to enter public-sector research at National Agricultural Research Institutes (NARIs) are generally inferior to the incentives to enter academia and focus on teaching. Those who do enter NARIs are often ill-equipped to be efficient in their research because of low investment in information technology and support staff (Gana et al., 2008). Raising researcher salaries and increasing resources will attract the best and the brightest researchers to agriculture, and will drive the innovation that will increase Arab agricultural productivity.

In addition, Arab countries can develop innovative strategies that encourage private-sector investment in agricultural R&D. Since agricultural research produces mainly public goods, it is difficult to incite private-sector investment. Nevertheless, there are several steps that can be taken to strengthen the investment climate. Stronger intellectual property rights for improved varieties and other agricultural innovations would help businesses privatize the returns to their investments. In Latin America, competitive funding for R&D has become common. Private firms are allowed to compete for public funds, which they can use to conduct research with private co-financing. Another method that governments can use to encourage private investment is to offer rewards for certain innovations, such as drought-resistant wheat varieties, that are developed by the private sector. Yet another approach is to encourage innovation by letting farmers apply for grants to implement new technologies and techniques. This type of grass-roots, farmer-led R&D has spurred technology dissemination and increased incomes in several countries, including Albania (World Bank 2008i). In the end, a partnership between public, private, and farmer-led research will be required to enhance R&D in Arab countries (World Bank, 2008e).

Last, countries can promote a multi-lateral research agenda to increase the number of beneficiaries from a common research agenda. The League of Arab States (LAS) and United Nations Development Program (UNDP) recommend a regional R&D fund with a committed long-term budget (LAS-UNDP, 2008). The inability to capture returns to research from beneficial spillovers is a major consequence of underinvestment at the national level (Alston, 2002). Because many Arab countries share the same agricultural goals (primarily food security) and challenges (such as water scarcity and climate change), a multi-nation research agenda could increase the number of beneficiaries from a common research agenda. Such a program would be well situated to incorporate indigenous knowledge into its research agenda. Because indigenous technologies are developed from the ground up, they are well adapted to the needs of the end-user (Warren and Rajasekaran, 1993). The International Center for Agricultural Research in Dry Areas (ICARDA) has a mandate that covers most Arab countries. The Arab Center for the Studies of Arid Zones and Dry Lands (ACSAD), established by LAS in 1968, has a mandate similar to ICARDA and covers all Arab countries. An independent Arab agriculture fund could work with ICARDA, ACSAD, NARIs, and other research organizations to achieve the objectives of its contributors.
What can be done to improve dissemination of knowledge to farmers?

Arab countries can couple investments in R&D with improvements in extension to enhance food security and to ensure the success of smallholders. Agricultural extension in Arab countries is underperforming. In the poorest Arab countries—Somalia, Sudan, and Yemen—extension is virtually non-existent. A successful extension agenda must reach large and small farmers alike. Large farmers have the greatest productive potential per farmer, and will be able before others to afford innovative, but expensive, technologies. Smallholders may produce less food per hectare and per farmer, but they make up a large proportion of the target population; extension’s biggest failure has been not providing them with basic information (Gana et al., 2008). Smallholders often struggle to stay competitive because they lack basic technical and marketing information. Extension is necessary to help them produce and market crops with more value added, which will generate more economic opportunity for both the farmers and their communities.

Countries can also invest in rural livelihoods to enhance food security and improve farmer welfare. Household assets, such as land, physical capital, education, and health, are crucial factors in the ability of farmers to secure rural livelihoods and to participate and compete in agricultural markets (World Bank, 2008e). Enhancing access to these assets is critical to improving purchasing power and will require significant public investment. Making smallholder farming more productive and profitable will also go a long way towards improving the purchasing power of rural households. A broad array of tactics can be used to achieve this, including investing in rural infrastructure, making product markets work better, improving access to financial services, enhancing the performance of producer organizations, and arranging payments for environmental services.
5. Reducing Exposure to Market Volatility

Even if Arab countries can successfully address demand and increase productivity, they will remain net importers of cereal, and will therefore be exposed to the risks of thin markets and high prices. Reducing exposure to cereal-import volatility is the third pillar of the food-security strategy. A number of risk management strategies are at the disposal of Arab countries, each with advantages and disadvantages for reducing price and quantity risk. Each Arab country faces a different mix of quantity and price risk, depending on its ability to produce food domestically and its natural endowment of oil and other natural resources. Each country therefore needs its own tailor-made risk management strategy. Key messages of this chapter are:

- Improving supply-chain efficiency can greatly reduce cost and improve distribution.
- Developing virtual stockpiles is a more cost-effective and flexible strategy to address quantity risk than physical stockpiles.
- Investing in infrastructure used to produce, store, and transport food can reduce exposure to cereal-import volatility.

How can Arab countries ensure a steady supply of reasonably priced cereal imports?

A comprehensive review of national cereal-procurement methods may reveal simple ways to generate substantial savings. One cost effective way to generate savings is to improve procurement. Countries that import large quantities of cereal should review national procurement legislation and methods to determine if they are inflexible, outdated, and costly. An example of archaic procurement among Arab countries is Yemen, which does not consider price or use sophisticated measures to determine import quantity when issuing tenders, instead simply scaling up from previous years (World Bank, 1995). Characteristics of modern food-procurement systems include electronic tendering, bidding, credit, and transaction-risk mitigation.

Legislative and organizational changes in national procurement rules can enable economies of scale and risk management in procurement. Arab countries represent the single largest group of importers. Thus, by relaxing national legal constraints that prohibit multinational procurement, they could take advantage of economies of scale in food.
procurement and reduce cost. Arab countries can also take better advantage of economies of formal markets for risk. Another reason they do not always receive the best prices and definitive quantities of food imports is that they do not use formal risk markets to insure transactions as much as OECD countries, China, India, and other emerging economies. Large trade transactions present substantial risk, and in a world of limited supply and competitive procurement, Arab countries are at a considerable disadvantage in ensuring their food security compared to countries that hedge risk. It is possible to overcome this by partnering with multinational companies with extensive experience and a wide network of established trading partners, or by using financial markets to insure transactions (World Bank, 2008g).

Underperforming logistics are a problem throughout the region. Improving logistics in the supply chain is particularly important for countries that import large quantities of food, because it reduces costs and improves distribution. Ultimately, this enables more food to reach consumers at a lower price. The GCC countries place well in the World Bank’s Logistics Performance Index (Table 5.1), but poorly compared to other high-income countries. A possible explanation for this is that because oil exports are so dominant in the economies of these countries, there has been relatively little pressure from the private sector for trade and transport reform. There is great variation in logistics performance in the Maghreb. Algeria is one of the bottom 10 countries ranked worldwide, whereas Mauritania is in the top half and is ranked sixth among low-income countries. Despite sharing similar good relations and close ties with the EU, Morocco vastly underperforms compared to Tunisia. Both countries implemented exemplary customs and port reforms. Tunisia, however, was quicker to improve domestic logistics like trucking and warehousing, and also implemented an electronic data exchange to simplify customs clearance (World Bank, 2007b).
Improved monitoring of world and regional cereal supply and demand will help Arab nations foresee price shocks, allowing them to adjust imports accordingly. Although it was impossible to imagine the full magnitude of the recent food-price shocks on Arab countries, some of the factors that caused it would have been picked up by appropriate monitoring systems. Production and stock projections for the major wheat-producing countries are readily available. For instance, the United States Department of Agriculture publishes monthly wheat outlooks online that project production, stocks, and prices. Moving forward, policymakers would benefit from the introduction of systems to continuously collect and assimilate real-time information.

Monitoring domestic supply and demand within the region is challenging because rural people are widely dispersed. By the time it is known that local stocks or production are too low, it could be too late to avert a crisis. The League of Arab States proposes a regional food security monitoring and early warning system that will help to determine the quantity and location of assistance that will be needed in response to a food shortage (LAS-UNDP, 2008). Such a system could collaborate with global institutions that already monitor food supply.\textsuperscript{23} The creation of weather stations will help predict where shortages may occur, as well as how much cereal these areas will need in order to stabilize prices (World Bank, 2008c, 2008h). Local information can then be aggregated so that policymakers will know how much cereal will need to be imported, and where it will be most needed.

**What are alternative stockpiling strategies?**

\textsuperscript{23} USAID (Famine Early Warning System), FAO, and WFP collaborate with local institutions worldwide to monitor potential food shortages.
Countries need to tailor their stockpiling strategies to their specific needs. Food stocks serve multiple purposes: as rapid emergency food aid in times of crisis, as working stocks for regular distribution, and as buffer stocks to stabilize domestic prices (Dorosh, 2008). Each country must assess how useful each of these purposes is for their needs. Key factors in making this assessment are national consumption, variability of domestic production (increasing with climate change), storage costs, size of the country relative to the international market, risks of production shortfalls and high prices to the poor, and thinness of international markets. For example, Morocco and Syria would need to gauge domestic production based on rainfall at critical times during the growing season, and adjust their stockpiles accordingly. Since production varies by region within these countries, they would need to transport cereal stocks internally based on where production shortfalls were expected. In contrast, UAE and Bahrain know the quantity they will have to import (100 percent) without considering domestic production. Their stockpiling strategy would focus on world production and on buying and stocking when quantities are high and prices are low. Since these countries are small, they could conceivably hold their stocks in a central location. Alternatively, they could arrange to access stocks held in a neighboring country, like Saudi Arabia, with more stockpiling infrastructure.

Countries can employ financial risk-hedging instruments as a cost-effective complement to physical stockpiling. Financial instruments can be used to create virtual stockpiles, ensuring cereals at a certain price without many of the costs associated with physical stockpiles. These methods avoid the high cost of physical stockpiles of perishable materials. Financial instruments also improve budget planning by allowing importing countries to lock in prices ahead of time. The two primary financial instruments used to establish virtual stockpiles are futures contracts and options. Some importing countries continue to use conventional contracts with established suppliers, while using futures and options as an added price-security measure.

What alternative strategies can Arab countries employ?

Arab investors are increasingly buying or leasing land in poor but land-abundant countries to secure their food supply. This strategy is often described as a win-win. The investor country acquires land and guaranteed access to the food produced on it, while reaping high

---

24 Every level of the supply chain uses stockpiling to improve food security. Farmers, whether net producers or net consumers, stockpile if they think prices will rise. Urban consumers stockpile in times of expected scarcity. Large corporations and governments stockpile to take advantage of high prices or depress prices on domestic markets (World Bank, 2008h).

25 Deterioration, handling, transport, rotation (constant procurement and off-take), and opportunity cost of capital all pose economic barriers to stockpiling. This means that bigger stocks lead to bigger distributions programs and a larger fiscal deficit (Dorosh, 2008).

26 Options on a terminal market offer more flexibility than futures; they insure the buyer against higher prices, but if the material is not required, there is no obligation to take it. A futures contract on a well-regulated terminal market can act as an insurance policy.
financial returns to its investment. At the same time, the recipient country gets an infusion of capital into its agricultural sector, leading to economic development. For this to truly be a win-win arrangement, however, it is imperative that the investor country protect the recipient country’s citizens from nationalization or expropriation, labor abuses, and loss of their own food security.

Countries can also invest in the infrastructure used to produce, store, and transport food abroad. This could be permanent infrastructure, such as ports, silos, and roads; mobile infrastructure, such as boats, trucks, and inputs such as fertilizer; or intellectual infrastructure, such as patents to seed varieties and other technologies. Buying land may be unnecessary if an investor can supply and control the infrastructure and technology necessary to produce, transport, and store the food. The recipient would still increase the productivity of its land and labor, and could potentially benefit from the arrangement without upsetting the local population by selling land, while the investor would have its capital less tied up, and would not incur the political risks associated with land purchasing. The Gulf countries would benefit from this strategy, because they would create supply-chain synergies if they both produced oil and controlled the primary production factors dependent on petroleum. If these assets are properly diversified, they also minimize the problems associated with weather and political risk mentioned in the previous paragraph. Bonded warehouses could be constructed in Arab countries, allowing the physical stores tied to international commodity markets to reside inside the region. This would reduce apprehension about purchasing hedges tied to physical wheat located at distant terminal markets and would encourage more trading of the commodity.
References


Bank.