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# RSIS COMMENTARIES

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## The Rising Challenge of Food Security

By Barry Desker

### Synopsis

*Demand for food is expected to increase, outpacing supply. As this situation worsens in the years ahead, the world will be burdened by the growing problem of food security. Expect more debate on this front in the years to come.*

### Commentary

THE WORLD is being haunted again by the spectre of a global food shortage. Demand for food over the next decade is expected to increase by one per cent annually but global food productivity gains have declined from two per cent between 1970 and 2000 to one percent today and continuing to decline.

A 2011 study reported that the world had consumed more than it had produced for seven out of the past eight years. These concerns will lead to growing attention to the nexus between food, water and energy resources, especially as climate change is expected to have an increasing impact globally.

### Need for integrated approach to food security policy

Nineteenth century economists struggled with the Malthusian dilemma: as populations rose, it was assumed that a forced return to subsistence agriculture would act as a check on population growth. The reality was that the opening of new agricultural land, technological innovation and higher yielding crops resulted in a capacity to feed an ever growing population.

However, as once autarkic economies such as China and India have opened to global trade and more wealthy societies are eating more protein, consuming more calories and enjoying more varied diets in recent years, there is growing concern with the fragility of the global food system. These concerns were highlighted by the spike in food prices and disruptions in food supply during the 2007-2008 global food crisis.

My colleagues at the RSIS Centre for Non-Traditional Security Studies have emphasised that robustness in food security systems is critical and that governments need to work with the private sector and other key stakeholders. Instead of piecemeal strategies, an integrated and holistic approach to policy formulation and implementation is critical to deal with the four dimensions in food security: availability, physical access, economic access and utilisation.

Although agricultural issues appear distant from an urbanised Singapore, food security is politically sensitive precisely because we are dependent on international markets for our food supply. Sharp increases in the price

of key food imports, export bans by major food suppliers and difficulties in obtaining adequate supplies could have significant domestic ramifications.

### **Three trends to watch**

Three trends warrant attention.

Firstly, over the next decade, rapid urbanisation will increase the problem of managing food production. In Asia, major cities such as Jakarta, Bangkok and Yangon are located in fertile rice growing regions. Urban sprawl is taking over some of the most fertile lands in the surrounding countryside as rural migration to urban centres occurs. Rapidly increasing urban populations will lead to growing pressures on governments to curb food price rises, undermining the incentive for rural populations to increase food production. This phenomenon is replicated around the world.

Secondly, this is often accompanied by mistaken agricultural policies such as Indonesia's encouragement under President Soeharto of rice consumption in the islands of eastern Indonesia. This led to shifts in food preference by the local population, even though these areas are better suited to growing root crops such as cassava. Elsewhere, food exporters like Argentina implemented export controls when local supply shortages occurred as farmers responded to global price increases.

This resulted in food importing countries seeking long term supply contracts and negotiating purchases of agricultural land in poverty-stricken economies. In recent years, this has been a significant cause of unrest in African and Asian countries such as Mozambique, Zambia, Myanmar and Cambodia as Chinese companies have purchased huge tracts of agricultural land. At the same time, price support schemes such as Thailand's above-market purchases of rice produced rice mountains as the government is reluctant to sell on world markets at a substantial loss.

Thirdly, there is a negative impact on global food supply as major grain exporters such as the United States, Canada, Argentina and Brazil encourage biofuel production through high government subsidies. The diversion of grain production to produce biofuels is occurring at a time when there is rising demand for protein and cereals by a growing middle class globally. This "fuel/grains" trade-off will lead to grain prices fluctuating in global markets at prices higher than current levels.

### **Energy and food security nexus**

Although it was earlier anticipated that energy security and food security would be competing objectives, the rise of the shale oil and gas revolution has changed the global outlook. The US will soon be self-sufficient in oil and natural gas, Australia could rival Qatar as an exporter of gas and Europe is re-thinking its opposition to exploiting its shale resources.

Questions are being raised whether biofuel policies established as a response to energy supply panics will be re-thought as governments become aware of the negative impact on food supply. There is a policy lag as farmers will continue to push for biofuel subsidies even though the rationale for such subsidies has disappeared. In the US, for example, 30 to 40 per cent of the corn crop is diverted to biofuels annually and the influential American farm lobby will seek the retention of current subsidies.

We should expect greater attention to food supply over the next decade. A critical issue will be water management as agriculture uses 70 per cent of global freshwater resources, primarily through the farming of livestock. With rising incomes, there is a shift to meat-based diets, especially in East Asia, leading to rising demand for meat products.

The issue of water management will assume growing importance as water scarcity will be a constraint in expanding food production. Pricing is a critical issue. Most governments charge farmers 10 to 20 per cent of the price paid by industrial users or households for water consumption. This leads to sub-optimal use of scarce water resources such as the growing of water-intensive crops in semi-desert conditions. With water scarcity, conflicts over access to water between countries as well as between farmers and ranchers within states will also attract attention.

### **Challenge of food-price inflation**

If food-price inflation occurs, the greatest impact will be felt by food import dependent countries like Egypt and Bangladesh. There will be pressure to increase food subsidies for basic foodstuffs but their governments will find it impossible to accede. Rising powers like China and India will face similar pressures but could shield themselves through policies of self-sufficiency, increasing subsidies for vulnerable groups within their domestic

population and imposing export bans to stabilise domestic prices.

Globally, the challenge of higher food prices will result in innovation and experimentation. Advances in molecular biology such as the transfer of genes from one plant species to another to produce crops with new or improved features offer the most promise for significant increases in food production. Although there is strong resistance to genetically modified (GM) crops, especially from the European Union and Japan, food price pressures will lead to greater acceptance elsewhere.

There are already commercially available herbicide and insect-resistant soybean, cotton, corn and potato species and on-going research on rice and canola is likely to result in commercial applications within the next five years. Salt-tolerant and drought-tolerant crops, micro-irrigation systems and hydroponic greenhouse technologies are significant new directions of research while techniques aimed at reducing inputs such as seed, fertiliser and water will reduce the negative environmental impact of farming and increase yields.

Concurrently, automation of farming processes will lead to greater efficiency, reduce manpower demands and lower costs of production. As there are major losses during post-harvest storage and transportation, significant increases in food crops for consumption could be obtained through better storage facilities and greater efficiency in food distribution and supply chain networks.

Policymakers and observers of international affairs tend to focus on 'hard' security issues such as great power rivalry, nuclear competition, territorial conflicts and competing maritime claims. But issues like food, energy and water security affect many more people and have an immediate domestic impact. The challenge of ensuring food security will command attention over the next decade as we live in an era where productivity gains in food production are falling and food surpluses are declining. Expect more debate on this issue.

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