Seeking answers to the food crisis

Julian Cribb, the author of a forthcoming book on the global food security crisis*, examines the main driving factors and ACIAR’s response to them.

On World Hunger Day 2008 the grim news arrived that 33 countries around the world had levels of hunger that were either alarming or extremely alarming, according to the International Food Policy Research Institute (IFPRI).

Significantly, this assessment did not include the recent hike in global food prices, nor the crash on financial markets.

“Rocketing food prices—some of which have more than doubled in two years—have sparked riots in numerous countries,” Time magazine reported. “Millions are reeling ... and governments are scrambling to staunch a fast-moving crisis before it spins out of control. From Mexico to Pakistan, protests have turned violent.”

“A brutal convergence of events has hit an unprepared global market, and grain prices are sky high. The world’s poor suffer most,” declared The Washington Post.

Starting with the ‘tortilla riots’ in Mexico, public unrest over food prices was reported by media in Malaysia, Indonesia, the Philippines, Bangladesh, India, Burkina Faso, Senegal, Cameroon, Morocco, Mauritania, Somalia, Ethiopia, Madagascar, Kenya, Egypt, Ivory Coast, Yemen, the UAE, Mexico and Zimbabwe. In Haiti riots forced the resignation of the Prime Minister and obliged the World Food Programme to send emergency aid to 2.3 million people. The UN’s Food and Agriculture Organization (FAO) declared that 37 countries were facing food crises due to conflict or disaster, adding that 1.5 billion living in degraded lands were at risk of starvation. The Economist succinctly labelled the food situation a “silent tsunami”.

World Vision Australia’s CEO Tim Costello called it “an apocalyptic warning” and President of the World Bank Group Robert Zoellick bluntly stated “What we are witnessing is not a natural disaster ... it is a man-made catastrophe.”

Joachim von Braun, Director-General of IFPRI, says the world has made only slow
progress in reducing hunger in past decades, with dramatic differences among countries and regions: “Population and income growth, high energy prices, biofuels, science and technology, climate change, globalisation, and urbanisation are introducing drastic changes to food consumption, production, and markets.”

Dr von Braun says the global financial crisis further complicates the picture: it actually brings some short-term relief for hungry people, as it contributes to reduced commodity prices, but the credit crunch makes access to capital difficult, including for agriculture, and that adds another obstacle for overcoming the food crisis.

At first the hunt for someone to blame focused on speculators, investors fleeing the Wall Street wreck, growth in biofuels, Chinese appetites, bad weather and other causes. The unarguable fact was that in seven years global grain stocks had sunk from 115 days supply to less than 50—the lowest level since records began half a century ago (though they have since improved slightly with the northern harvest).

In reality, the global food security crisis is complicated, driven by the confluence of profound forces acting on both food supply and demand.

ACIAR HELPS RAISE FARM PRODUCTIVITY

ACIAR’s response to the global food security crisis has been to increase efforts to raise the productivity of smallholder farming systems and to explore more productive crop mixes to improve nutrition for poor people, says deputy CEO and head of R&D at ACIAR Dr John Skerritt.

“For the poor who live on less than US$1 a day the consequences of the price increases are disturbing,” he says. “Typically these people spend about 70% of their total income on food. This compares with an average of less than 20% spent on food by people in developed countries. With the rise in food prices, poor families face a choice between devoting more of their slender incomes to buying essential foods, or else buying less food, or food of a poorer quality.”

Lifting productivity involves a wide range of research designed to lift the output of staple crops, develop crops that stand up better to pests, disease or climate variability and introducing second crops or enterprises into farming systems where there is an opportunity to do so. An example of this is growing a crop of wheat in Bangladesh during the Rabi (dry) season, following the traditional rice crop using spare water stored from the wet season (see page 18). Other ways to boost productivity include introducing better management of water and other natural resources.

“This approach fits both our goals of helping smallholder farmers to improve their livelihoods, and giving them a chance to grow crops for the market that will take them beyond subsistence agriculture,” Dr Skerritt explains.

In its current annual operational plan—developed with the food security crisis in view—ACIAR is laying particular weight on:

“With good research and care in engaging the communities as partners, you can introduce a new enterprise into these systems that will not only improve local food security but give the farming family a source of income they didn’t have before.”

— DR JOHN SKERRITT, DEPUTY CEO, ACIAR

Table 1 Global demand for food

<table>
<thead>
<tr>
<th>Regions</th>
<th>Asia</th>
<th>Latin America</th>
<th>West Asia and North Africa</th>
<th>Sub-Saharan Africa</th>
<th>OECD and Russia</th>
</tr>
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<tbody>
<tr>
<td>Food need 2000</td>
<td>100</td>
<td>272</td>
<td>154</td>
<td>262</td>
<td>–</td>
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<tr>
<td>Food need 2050</td>
<td>4,150</td>
<td>520</td>
<td>390</td>
<td>1,350</td>
<td>Same as 2000</td>
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<tr>
<td>Food need multiplying factor</td>
<td>2.34</td>
<td>1.92</td>
<td>2.5</td>
<td>5.14</td>
<td>–</td>
</tr>
</tbody>
</table>

Source: IFPRI, based on FAO and IMF data

On the demand side

POPULATION

Although the rate of growth in human numbers is slowing, the present upwards trend of 1.5% a year points to a population of about 9.2 billion in 2050—3 billion more than in 2000. This will mainly take place in poorer countries and in tropical/subtropical regions.

Figure 1 Surge in prices

Commodity prices (US$ton)

Source: IFPRI, based on UN and IMF data

Figure 2 World total grains, days of supply 1960-61 to 2006–07

Source: National Farmers Union Canada
Not to everyone’s taste, but food is food. These fried spiders have become a regional delicacy in Cambodia where people purportedly discovered the arachnids’ edibility during the desperate years of starvation under the Khmer Rouge rule. They are a species of tarantula called ‘a-ping’ in Khmer and are about the size of a human palm.

CONSUMER DEMAND
Demand for protein food such a meat, milk, fish and eggs from consumers on better incomes, mainly in India and China, but also in South-East Asia and Latin America is rising rapidly. In China alone, meat intake per head has tripled in the past 15 years from 20 to 60 kilograms, requiring a 10-fold increase in grain to feed the animals and fish. Overnourished western societies continue to gain weight. The average citizen of Earth eats one-fifth more calories than he or she did in the 1960s—a ‘food footprint’ expanding by the day.

This combination of population growth and expansion in consumer demand points to a global requirement for food about 110% larger than today by 2050, with the heaviest needs as shown in Table 1 (page 5).

On the supply side

WATER CRISIS
Farmers presently use 70% of the world’s readily available fresh water to grow food. Rivers, lakes and groundwater resources are drying up in key foodbowl such as the North China Plain, the Indo–Gangetic Plain and the US mid-west. On present trends megacities will swallow half or more of the available fresh water.

To meet the increased demand, the world will have to find an additional 2,000 cubic kilometres more water a year, warns Dr Colin Chartres, Director-General of the International Water Management Institute. He cautions that the ‘food crisis is as much a water crisis’.

LAND SHORTAGES
Shortages of good farmland are emerging. A quarter of the world’s farmland is now seriously degraded, says the FAO. Cities have sprawled, smothering an area of fertile soils half the size of China in concrete and asphalt. Recreational land uses (such as golf courses), conservation and reforestation are also diverting food-producing country out of agriculture. Some land is badly affected by toxic industrial pollution. Only in Brazil and Russia do large potential new areas of farming land exist. For the past two decades expansion in farmland has failed to keep pace with growth in food demand by a factor of 10.

FOOD WASTE AND NUTRIENT LOSSES
Civilisation produces 4,600 calories of food per person per day, and wastes 2,600 of them, says the Stockholm Water Institute. Globally about half of the fertiliser applied on-farm—100 million tonnes—does not reach the target crops or pastures. In wealthy countries half the food produced is lost or thrown in the garbage and most of the nutrients in the waste stream are also discarded. Although there is ample raw material for making fertiliser in the near term, scarcity of both oil and phosphorus point to shortages and unaffordable fertiliser prices as the century advances. Indeed, the world may already have passed ‘peak phosphorus’.

ENERGY LIMITS
Current trends around peak oil indicate that fossil fuels may be unavailable for agriculture globally within 20–30 years, either through scarcity or high prices. As a result many farmers are moving to biofuels, which could see the world burn about 400 million tonnes of grain by 2020. The World Bank attributes 75% of the recent surge in food prices to the impact of biofuels production in competing for land, energy and fertiliser. The surge in oil prices over...
2007 and the first half of 2008 also caused big lifts in the price of fertilisers and farm chemicals, forcing many farmers to cut back on fertiliser use, just at the time when greater productivity was needed.

OCEANS
With 29% of fisheries already collapsed, leading scientists have warned of the total collapse of sea catches by the 2040s. Coral reefs, which support about 500 million people, are at high risk due to climate change and acidification. While fish farming has grown strongly it faces water-quality problems (sediment, nutrients and toxic chemical runoff); it also takes 5 tonnes of other fish or 10 tonnes of grain to grow a tonne of farmed fish. All this points to unsatisfied global demand for fish protein falling on land-based agriculture.

TECHNOLOGY
For two decades the engine of the modern food miracle—global scientific research—has been running down, as seen in the decline in annual yield gains in developing countries. A report by the Consultative Group on International Agricultural Research (CGIAR) in September 2008 found that funding for international agricultural research has not increased in real terms since 1976, although the world’s population has doubled, and the main agricultural research countries have all cut back their national efforts, as have some developing countries. Farmers worldwide are heading into a technology pothole, with less new knowledge available in the medium term to help them lift output.

CLIMATE
The climate is becoming more variable and also changing, with potential for drought to grip half the planet by the second part of the century. Storms, floods, droughts and sea-level rise are expected to become more frequent and intense, with rising and unpredictable impacts on food security, refugeeism and conflict. Food production in Africa could fall by half and in South Asia by 30% by 2030, the World Bank has said. Defence planners are warning already of the risk of food wars.

ECONOMICS, POLITICS AND TRADE
Limited progress with trade liberalisation and removal of farm subsidies continue to distort world markets, sending the wrong price signals to farmers and deterring investment in improving production, according to a 2008 report by Dr Andy Stoeckel released by the Rural Industries Research and Development Corporation (RIRDC). The world financial crash is also expected to cut into agricultural investment and undermine higher commodity prices. Speculators have destabilised commodity markets, making it riskier for farmers to take production decisions. Some countries discourage or ban food exports, others tax them. Still others subsidise biofuels, diverting their farmers from growing food. A web of health, safety, labour, food and environmental regulation is hampering food output.

This shows that major constraints to raising production are coinciding with and feeding into one another at the same time as the greatest peak in demand for food in history. This confluence is producing sudden and sharp spikes in food prices, which affect everyone, but hit hardest the world’s poorest billion citizens.


“ACIAR ... is held up internationally as an innovative example of support to agricultural science for development that pays high returns and benefits poor farmers and consumers in developing countries and also in Australia.”

– DR DENNIS BYERLEE, CO-AUTHOR, WORLD BANK’S WORLD DEVELOPMENT REPORT 2008