The United Nations has named a baby girl, Danica May Camacho, born October 31st in Manila, as the seven billionth inhabitant of the planet. The news highlights population growth and its challenges, particularly food production. The Organization for Economic Cooperation and Development (OECD) predicts that world food supply will have to increase 20% over the next 10 years to stay even with demand, especially in emerging countries and Asia. And the OECD says Brazil’s food production will have to contribute 40% of the total.
A quiet revolution over the last two decades has made Brazil the third largest agricultural exporter in the world, second only to the countries of the European Union (EU) and the United States. This impressive position is due not only to such natural resources as plentiful soil, water, and sunlight but even more to technological advances.

Yet despite high productivity and enviable potential for expansion, Brazilian agriculture has some negatives, from livestock exposure to foot and mouth disease to structural obstacles to production, such as expensive credit, high taxes, unresponsive labor laws, poor infrastructure, and environmental controversies.

Brazil is the top exporter of major commodities like sugar, orange juice, tobacco, chicken, and beef and second in shipments of soybeans. Its largest trade surplus, in fact, is in agricultural products: US$50 billion in 2010.

**REAL PLAN PLUSES AND MINUSES**

Marcos Fava Neves, professor of planning and strategy, University of São Paulo State, and coordinator, Markestrat, associates the advance of agribusiness to the Brazilian Real Plan, which introduced a new currency (the real), curbed hyperinflation and stabilized the economy in 1994. Former minister Roberto Rodrigues points out that at the time the government opened Brazil up to international competition without any protection. “This caused a wave that wiped out thousands of producers,” he says, but it also “brought about a great improvement in competitiveness, supported by technology and management.”

“All this, together with global demand for grain and food, led to an explosive growth of agribusiness in the last 15 years,” says Neves. He predicts that Brazil’s agricultural exports will rise from the current US$76 billion to about US$200 billion in 2020. “The correspondence between consumption in Asia and production in Brazil makes this inevitable. It might be faster, if we adopt the correct public and private strategies, or slower. But it will happen because Brazil is the leading global food producer.”

Elibio Rech, the Embrapa researcher who coordinated development of the first transgenic soybean in Brazil, sees no threats to Brazil’s comparative advantage in soybeans. “Genetic engineering has already developed varieties that increase photosynthesis and assimilation of nutrients by plant roots. But the problem is cost,” he says. “Without water, you cannot plant. Africa and China have little water.”

This does not mean, however, that the technology race in Brazil will slow down. Rather, more and more institutions are seeking capital to expand research. Take the
Brazilian Agronomic Institute (IAC), linked to the Agency of Agribusiness Technology of the Department of Agriculture and Supply of São Paulo state. With an uninterrupted history of 124 years, IAC research has been vital at critical moments when Brazilian agriculture has had to cope with, for example, citrus diseases in the 1940s, sugar cane mosaic in the 1950s, and coffee leaf rust in the early 1970s. “Thanks to our understanding of soil and climate, for example, the IAC was able to develop coffee varieties adapted to warmer regions,” explains agronomist Hamilton Humberto Ramos, IAC director general since March. “Climate change is a major focus of attention today, as we move forward to solutions for the problems of the future.”

Ramos sees one of his responsibilities to be seeking new resources from private enterprises. In 2010, of the R$25 million needed to support the budget, only half came from the private sector, with the rest from federal agencies and funds from other states. “My intention next year is to increase fundraising by 5% to 10%,” he says. For him, intensified partnerships with companies will bring another benefit: to promote the use of seed varieties developed at the institute. “Today, it is the researcher’s job to advertise in Brazil,” Ramos says. “Thus, a partnership with the private sector would facilitate the spread of these varieties. In addition to improving the image of the institute, it improves farmer incomes. It would be good for everybody.”

Similarly, in January 2011 the Center for Sugarcane Technology (CTC), in Piracicaba, São Paulo state, changed its status from a non-profit to a corporation, with Coopersucar and Cosan as the main shareholders. “We spent the first few months … adapting the documentation,” says Osmar Figueiredo Filho, CTC director of markets and opportunities.

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**Brazilian exports of selected agricultural products, 2010**

<table>
<thead>
<tr>
<th>PRODUCE</th>
<th>World’s exports (tons)</th>
<th>Brazil’s exports (tons)</th>
<th>Main exporters</th>
<th>Brazil’s ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soybeans</td>
<td>98,258,000</td>
<td>29,073,000</td>
<td>U.S., Brazil, Argentina</td>
<td>2°</td>
</tr>
<tr>
<td>Sugar</td>
<td>51,824,000</td>
<td>28,000,000</td>
<td>Brazil, Thailand, Australia</td>
<td>1°</td>
</tr>
<tr>
<td>Cellulose</td>
<td>44,314,000</td>
<td>8,229,000</td>
<td>Brazil, Canada, U.S.</td>
<td>1°</td>
</tr>
<tr>
<td>Orange juice</td>
<td>1,472,000</td>
<td>1,199,000</td>
<td>Brazil, U.S., Mexico</td>
<td>1°</td>
</tr>
<tr>
<td>Tobacco</td>
<td>2,652,000</td>
<td>677</td>
<td>Brazil, India, China</td>
<td>1°</td>
</tr>
<tr>
<td>Beef</td>
<td>7,253,000</td>
<td>1,731,000</td>
<td>Brazil, Australia, U.S.</td>
<td>1°</td>
</tr>
<tr>
<td>Chicken meat</td>
<td>8,666,000</td>
<td>3,800,000</td>
<td>Brazil, U.S., European Union</td>
<td>1°</td>
</tr>
</tbody>
</table>

Sources: USDA, FAO, Abiove, Brazil Ministry of Agriculture, Bracelpa, CitrusBR, ITGA, Abiac, and Ubrafe.
“This year, our budget was R$80 million, and we want to enhance it.”

Neves believes that technology could still advance many areas of Brazilian agriculture; he cites initiatives such as genetically modified (GM) foods, better use of land, and asset and equipment sharing. “The importance of safe GM, sanctioned by the National Technical Commission on Biosafety (CTNBio), has already been demonstrated. The new GM beans that Embrapa has just developed, free of typical diseases, mean a huge gain for society worldwide,” Fava Neves says. “Imagine reducing the cost and pollution of pesticides in African countries, for example.”

**THE ENVIRONMENT QUESTION**

The magnitude of the numbers for some sectors may mask shortcomings and difficulties. Take livestock. Using figures from the U.S. Department of Agriculture and Brazil’s Ministry of Industry, Development and Trade, the Brazilian Association of Meat Export Industries (Abiec) shows that Brazil is now the second largest producer of beef, with its estimated volume of 9.7 million metric tons in 2011 behind only the 12 million metric tons of the U.S. This year its beef exports should reach 1.650 million metric tons. But the sector is not without problems. The first is vulnerability to FMD (foot and mouth disease), which restricts beef trade with markets like the U.S., Japan, and South Korea. “It will take a determined effort by the Brazilian government to solve the problem,” says Fernando Sampaio, Abiec director and coordinator of sustainability. Another is productivity. Sampaio points out that the United States, despite 50% fewer cattle than Brazil, has about 20% higher production. Among other factors, he says, the U.S. cattle are raised in confinement. “Still,” he adds, “we have the greatest potential to grow because our technology in genetics and nutrition is among the best in the world. … We can gain in productivity by making better use of both pasturage and herd size.”

The choice of Brazilian livestock farmers to avoid confinement has been questioned, for environmental reasons and to free cattle ranges for more productive crops. According to Sampaio, the mathematical models of the Institute for International Trade Negotiations (Icon) estimate that over the next 30 years, supplying domestic and export demand for soybeans, cotton, sugarcane, eucalyptus, and some crops will require freeing up about 15 million more hectares. “More than 10 million acres of old pasture areas can be freed by efficiency gains in livestock. The other lands will come from arable land in the Cerrado, not the Amazon, where legislation and the cost of opening new areas make it unprofitable,” Sampaio says, noting that the country has a good track record of sustainability. “Even after 200 years of raising livestock we have retained
Brazil is now the second largest producer of beef; its estimated volume of 9.7 million metric tons in 2011 is behind only the 12 million metric tons of the U.S.

85% of the Amazon, 87% of the Pantanal (tropical wetland), 63% of the Caatinga (Brazilian Northeast savanna), 60% of the Cerrado (Brazilian Midwest savanna), 41% of the Pampas (South American lowlands), and 26% of the coastal Atlantic forest. Europe has preserved only 0.3% of its original forests. Renewable water per capita is also higher here than in other meat-producing regions of the world."

In 2009 a Strategic Affairs Secretariat of the Presidency study identified 200 million hectares that were abandoned or used for low-productivity livestock farming. "We’re still a country with just 1.3 head of cattle per hectare. We need to bring in technology and skilled labor," says Elbio Rech of Embrapa.

Glauber Silveira, president of the Association of Producers of Soybeans and Corn of the Mato Grosso state (Aprosoja), says that the same hectare could produce 10 tons of grain, although he realizes for some degraded areas the high cost of recovery may not pay off. "In Brazil, we could release at least 25 million of hectares of pastures and increase agricultural production by 80% without opening any new areas," says Silveira, pointing out that in Uruguay repurposing pasture for soy has claimed about 1.1 million hectares. "But it has to be profitable," he says.

Although Brazilian soybean cultivation is a world productivity — 50 bags per hectare in the 2010/11 crop — farmers in the Midwest must spend heavily on technology and other investments to compensate for poor soil. "Our production cost is higher than in other countries," Silveira says. "The United
States uses 30 kg of fertilizer per hectare and Argentina 40; we use 450 kg. And we have to import it because high taxes discourage production of fertilizer in the country,” he explains. To make matters worse, financing is scarce.

**THE HIGH COST OF INEFFICIENCY**

Soybeans have been the main commodity exported since the 1980s, when they displaced coffee. According to Aprosoja, in the past 10 years area planted in soybeans rose 48%, but production grew 200%. “We made great strides, especially in biotechnology. But to extend that advantage it is necessary to open roads, improve logistics, take care of ports and railroads,” Silveira says.

Ignez Lopes, coordinator of the Center for Agricultural Studies of the Brazilian Institute of Economics of Getulio Vargas Foundation (IBRE), explains that “because agriculture is unable to pass on higher costs to prices, any inefficiency burdens production, especially for small farmers,” she says. She explains that the tax burden — estimated at 37% for the sector — and appreciation of the Brazilian real both cut profit margins.

The Institute for International Trade Negotiations estimates that over the next 30 years, supplying domestic and export demand for soybeans, cotton, sugarcane, eucalyptus, and some crops will require freeing up about 15 million more hectares.

### Soybeans: Changes in productivity and acreage, 2004-2009 (% change)

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>Planted area (millions of ha)</th>
<th>Production (metric tons/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>3.7</td>
<td>-4.8</td>
</tr>
<tr>
<td>Brazil</td>
<td>4.0</td>
<td>39.0</td>
</tr>
<tr>
<td>China</td>
<td>5.8</td>
<td>11.8</td>
</tr>
<tr>
<td>France</td>
<td>-0.7</td>
<td>0.5</td>
</tr>
<tr>
<td>Japan</td>
<td>-4.7</td>
<td>-2.3</td>
</tr>
<tr>
<td>Russia</td>
<td>2.4</td>
<td>19.5</td>
</tr>
<tr>
<td>European Union</td>
<td>15.6</td>
<td>-10.7</td>
</tr>
<tr>
<td>U.S.</td>
<td>-0.1</td>
<td>8.9</td>
</tr>
</tbody>
</table>

*Source: Aprosoja, 2011.*
Although Brazilian soybean cultivation is a world leader in productivity, farmers in the Midwest must spend heavily on technology and other investments to compensate for poor soil.

Francisco Turra, CEO of the Brazilian Poultry Union (Ubabef), agrees with Lopes that taxes and real appreciation depress agricultural competitiveness. In 2010 Brazil ranked third (12.2 million metric tons) in world chicken production, after China (12.5 million) and the United States (16.6 million).

Since 2004 Brazil has been the world leader in poultry exports, followed by the U.S. and the EU. In 2010, it shipped 3.8 million tons to more than 150 countries, an increase of 5% over 2009. And “the demand for animal protein is increasing worldwide,” Turra says. “In Africa, for example, rising incomes have stimulated consumption of food, especially chicken. Rabobank, which specializes in agribusiness, predicts that by 2030 poultry consumption will expand by 60% and it will become the most common animal protein at the table, surpassing pork around the world.”

FEA-YSP’s Neves warns, however, that Brazil’s comparative advantages are decreasing because the country is not addressing critical bottlenecks or working to boost production: “Today, investment decisions are made by multinationals, which are finding more favorable and friendlier conditions in other countries than in Brazil. For now, we are still in a comfortable situation, with capital inflows reaching record highs. In the medium and long term, however, we are vulnerable because we have not made any progress in the reforms we need to make the country more competitive.”

Urgently needed, Neves believes, are tax reduction and simplification, and labor reform, because structural factors make it hard to hire workers. But his greatest concern is infrastructure. “It’s a disaster,” he says. “Why build a bullet train [between São Paulo and Rio de Janeiro cities] when we could use the money to establish a route from the Brazilian Midwest to the Pacific coast and Asia, which is the major export market for food and bioenergy in the world?”

SUPPORTING SMALL FARMERS
According to the last IBGE Agricultural Census in 2006, 4.4 million family farms account for 84% of Brazilian agriculture. An IBRE study found that 3.3 million small farmers get federal support and credit through the National Program for Strengthening Family Agriculture (Pronaf). These properties account for 18% of the total area of Brazilian agriculture.

Even though the numbers are modest compared to large producers, small farmers contribute considerably to the basic food basket of Brazilians. Lopes points out how they are integrated with large agribusinesses: “Livestock producers, for example, benefit from the competitive price of corn to feed their animals, and often work in an integrated system with large companies with supply
contracts that guarantee a certain price stability against market price volatility.”

Embrapa’s Rech emphasizes the need to intensify efforts to bring more technology and better management to small farmers. “What we have to show the world is that we can innovate in the least efficient and most needy sectors,” he says. “If we want to increase production, we have to think about public policies to strengthen small farmers. This will imply reducing carbon emissions, application of pesticides and fuel, taking the whole country to sustainable agriculture.”

In its 2009 document, the Presidency SAE agrees, arguing that an effective agricultural policy should not only consolidate Brazil “as a major agricultural exporter” but also “enhance complementarities between corporate and family farming.”

Considering that about 90% of Brazilian farms record gross sales of less than R$240,000 a year (US$140,000), Ignez warns that small farmers would be disproportionately punished by the environmental regulations being discussed as part of the Forest Code reform: “Treating corporate farming and small farmers under the same conditions may undermine the sustainability of small farms and become a disincentive to new investment.”

Neves argues that this is the time to eliminate ideological biases: “There is much talk about income distribution, but very little about creating income. The National Indian Foundation (Funai) wants 20% of Brazil’s territory to be indigenous area, and conservationists want 80% of Brazil’s territory to not be exploited. … It is worth asking them how we would then generate income and export products. Brazil is well positioned to produce and export food and bioenergy in an entirely sustainable manner, for it is today one of the most competitive countries in the world in this segment.”