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Food & Agricultural Outlook

The UN Food & Agriculture Organization (FAO) estimates that food demand will rise 70% globally by 2050, and double in developing countries. The projections show that cereal output will need to rise by almost 1bn tones (43%) and meat output by over 200mn tones (74%). Meeting the needs of the changing composition and volume of food demand is a key challenge for policy makers and the agricultural sector. With reference to Standard Chartered Bank's report – the end of cheap food, this article discuss the main factors affecting the output and prices of the agricultural products.

Income growth, urbanization & dietary convergence

Given the changes in global per-capita income and the rise of an affluent middle class in large lower-income economies like India & China, there has been a noticeable shift towards higher-value food items such as edible oils and meat protein. Since diets rich in meat require food grains and meats, they actually demand more cereal than diets based on direct cereal consumption. In 2000, China's household surveys showed that per-capita red meat consumption in urban areas was 40% higher than in rural areas. Per-capita fish consumption in urban areas was three times higher, and egg and poultry consumption was more than 2.5 times higher than in rural areas. Rapid rate of urbanization is expected to significantly alter consumers' diets as urban incomes are higher. By 2050, more than 70% of the global population is expected to be urban, boosting consumption of meats, fruit, vegetables and processed food products.

Increasing agriculture output is possible, but at a higher cost

There are three ways of increasing agricultural outputs – by expanding acreage, improving yields, or increasing the frequency of cropping. Of these factors, improving yields has been the most important over the last 50 years, accounting for 75% of the increase in output. Current projections that agriculture output gains are achievable assume a significant increase in yield over the forecast period. However, studies suggest that yield growth rates are now slowing. It is largely due to a corresponding deceleration in agriculture investment, which is in turn a function of low prices. The level of improvement in yields now required will only be possible with substantial research and development. A study by the FAO suggests that USD 9.7 trillion needs to be invested by 2050.

Of even more concern is the distribution of arable land. The suitable land is predominantly located in Latin America, Sub-Saharan Africa, and industrial countries. The Middle East and Asia are relatively less endowed, and in some countries, current output has been pushed beyond the limits of rain-fed agriculture with the use of extensive irrigation. So, particular region in the world will become increasingly reliant on imports for food. The Middle East and North Africa have already reached that point, while Asia is currently pushing the limits and is likely to become increasing import-reliant in the future.

Energy security is likely to compete with food production

Demand for liquid biofuels (ethanol and biodiesel) has grown sharply in recent years in response to higher energy prices. In absolute terms, consumption has risen from 10.3 million tones of oil equivalents (mtoe) in 2000 to 24.4 mtoe in 2006. US demand rose by 23.3% p.a. on average between 2000 and 2006, and the US overtook Brazil as the largest consumer of biofuels in 2004. The international Energy Agency (IEA) expects biofuels' share of total supply of road transport fuels globally to rise from around 1.5% currently to 5% by 2030, driven by continued high energy prices and supportive government policies.

Competition between the biofuel and food sectors for food commodity inputs will put upward pressure on prices going forward. Prices are also likely to become increasingly correlated with energy prices as the biofuel sector expands. Overall, agriculture commodity prices have become much more correlated with macro factors such as USD weakness, equity prices, as well as change in energy prices.

Climate change threatens water supply and agricultural yields

The earth's climate is changing, probably as a result of the increase in emissions of CO₂ and other greenhouse gases (GHG). The intergovernmental Panel on Climate Change (IPCC) estimates that the earth's average temperature will rise by between about 1- 4 degree Celsius by the year 2100. Sea levels will also rise by 0.5-1.0m by 2100. These estimates are conservative, as numerous other studies predict quicker temperature changes or much greater sea-levels rises (ranging from 2m to 7m). We expect substantial inundation of coastal land and significant changes to climate condition for agriculture.

The key threats to food production arising from rising temperatures are availability of water and negative changes to yields. There will less predictability and more concentration of rains, which is exactly the opposite of what is required for agriculture. Changing weather patterns have implications for land and yields. Agriculture and agricultural techniques need to adapt to climate change. This will require that investment in farming be prioritized within the objective of overall economic growth to ensure adequate infrastructure to cope with more volatile conditions. To maintain or improve yields under these non-traditional conditions will require the adoption of non-traditional techniques and methods, including a focus on genetically modified crops. Changing weather patterns and their adverse impacts on output may also require looking beyond current land supply to alternative land supply with less vulnerability to adverse weather, or investing in adaptive infrastructure, such as rainwater storage and irrigation to cope with less frequent, heavier downpours.

China's economic growth will drive increased food imports

China is the global powerhouse in terms of agriculture production, consumption and trade. It accounts for 20% of total production of corns, 30% of rice production, and 17% of wheat production. It accounts for 20%, 30% and 16% of global consumption of corn, rice and wheat respectively. China is the primary export destination for soybeans, aborting 70% of US soybeans exports and 50% of global exports.

China is generally self-sufficient in grains (wheat, rice and corns), with total production of around 500 mt. Overall, grains stocks in China appear sufficient to meet consumption this season. However, severe drought conditions last year in the grain producing regions of Inner Mongolia, Xinjiang, Jilin, Shanxi and Liaoning risk adversely affecting total autumn grain output. A 5% shortfall in the overall harvest would potentially require 20% of current global grain exports to meet China's annual needs, though domestic stocks would be drawn down first.

As China continues to grow, demand and supply will struggle to keep up. This would be a problem for any country. For China, the world's biggest consumer and producer, a small deficit can result in huge demand for imports and a big impact on world traded food prices.

India's volatile weather will increasingly impact food prices

The world's second most-populous nation, India plays a central role in global food production and consumption. The government purchases around 30% of India's grain production on average for sale at highly subsidized prices under the Public Distribution System (PDS). India is the world's second-largest consumer of wheat, rice, and vegetable oils after China. It is also the largest consumer of sugar.

Like China, India is typically self-sufficient in grain (rice, wheat and corns). However, the country's crop output tends to be volatile, especially for rain-fed crops like rice. 2009's poor monsoon rain have high lightened this risk, with official data showing that rains were 25% below normal as of October. India's total rice ending stocks are currently forecast to be at the lowest level since 2004/2005, making it unlikely that India will remove the export restrictions on the popular non basmati rice which it imposed in April 2008.

India's role in the current supply/demand imbalance of the sugar sector is a cause of major concern in agricultural commodity markets. India's potentially large sugar import requirement as a result of below-normal rains has pushed sugar prices to near 30-year highs. Ongoing uncertainty about India's import requirements in the 2009/10 season has resulted in a delicate balance in world sugar supply.

Looking at long-term demand and output trends, India's sugar balance is likely to remain negative, widening from a deficit of 6.2mt in 2010 and 52mt in 2050. This assumes a growth rate of 2% per annum, which is the average annual growth rate in consumption over the past decades, and a rapid population growth (with India's total population bypassing China's in 2031).

India's ability to meet its growing food needs will depend largely on land supply and availability. So far, the signs have been good. Aggregate harvested land for corn, rice, wheat and soybeans has grown by around 16% since 1990 and the now accounts for 14% of global harvested areas for those crops, compared to 13% in the 1990/91 season. However, harvested area is still relatively volatile from year to year due to climatic conditions, and continuing urbanization will reduce arable land supply. The potential upside for yields is greater in India than in China and more developed agriculture producers, and emphasis needs to be placed on improving yields through technology and mechanization. However, social issues have hampered development on this front so far, and these will not disappear overnight.

Global demand will be dominated by Asia

Although we have focused on China and India, trends in these two Asian giants reflect wider developments across Asia, where changing demographics will test the food system. According to UN estimates, the urban population in the Asia-Pacific region is expected to grow by 45% between 2000 and 2020, with China, Vietnam, Indonesia, and Singapore growing the fastest. Rising per-capita incomes are likely to lead to increased consumption of higher-protein diets and livestock, requiring more grain production. We expect Asia to dominate global demand for feed grains through to 2050. Moreover, changes in rural/urban population dynamics are likely to pressure arable land supply.

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