

Research Flash

Investment Ideas

The food security imperative

Private Banking

Introducing our thematic series on global food security

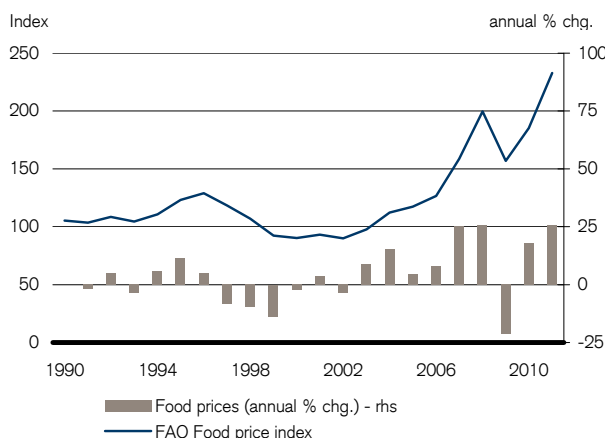
High food prices have recently propelled the issue of food security to the top of the list of future global challenges. In our view, governments will aim ever more carefully to secure food access for their growing population. We believe that the notion of food as a strategic resource should be the cornerstone for a deliberative set of policies, both at the national and the multi-lateral level, which will fundamentally reshape global agriculture. In our series on food security, we aim to identify these policies and their potential impact on the long-term prospect of a food-secure planet, which requires a new paradigm for agriculture that addresses the dual challenges of production enhancement and sustainable resource utilization.

The scope of the global food challenge

Over the last 5 years, food prices have been rising dramatically (see Figure 1). The short-term drivers of price volatility are complex and subject to ongoing debates. Among the potential factors are adverse weather conditions, a rising production of biofuels, trade policies, and an increased demand on commodity futures markets. However, the short-term variability of food prices has to be distinguished from its long-term trend, which will be characterized by a simple supply-demand problem: In

Figure 1

Food prices have risen dramatically since 2006



Source: FAO, Credit Suisse

Highlights

- According to the Food and Agriculture Organization (FAO), global agricultural production will need to grow by 70% by 2050 against the backdrop of higher input costs and scarcer resources.
- This target that can be met only by large-scale investments, both public and private, in agricultural productivity.
- Over the long term, we expect the emergence of new agricultural producers, most notably in Africa.
- About 30% of global food is lost during production or wasted during consumption.

Top investment ideas

Agricultural productivity

See our Investment Ideas on "Agricultural productivity", published on 24 November 2011.

Emerging agricultural producers

Forthcoming in December 2011.

Water efficiency

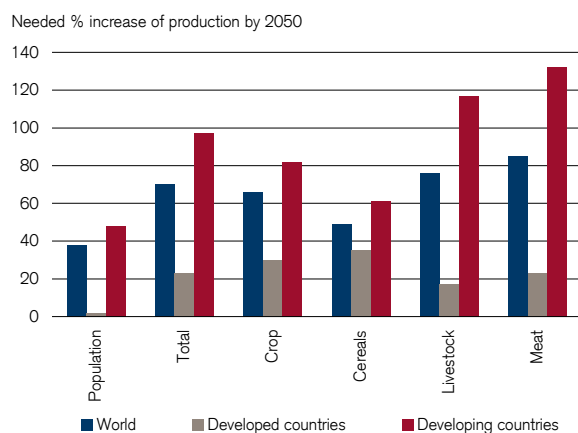
Forthcoming in January 2012.

Technologies to mitigate food loss

Forthcoming in February 2012.

Figure 2

Agricultural output has to increase by 70% to meet demand by 2050



Source: FAO, Credit Suisse

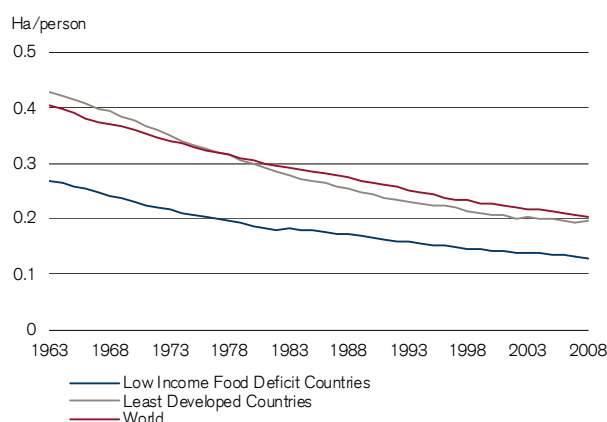
order to keep up with a steady increase in population and consumption, global agricultural production will need to grow by 70% by 2050, according to the Food and Agriculture Organization (FAO) (see Figure 2).¹

While available land has been constantly declining in per capita terms over the last 50 years (see Figure 3), productivity growth has also been slowing: A recent study by the journal Nature suggests that global crop yields increased by only 20% between 1985 and 2005, compared to 56% between 1965 and 1985.² The Organization for Economic Co-operation and Development (OECD) attributes the slowdown to an expansion toward marginal land, a diminishing technology progress, and rising costs for resource inputs.

Yield enhancement should be especially challenging in developing countries due to faster population growth and the fact that productivity is positively associated with income (see Fig-

Figure 3

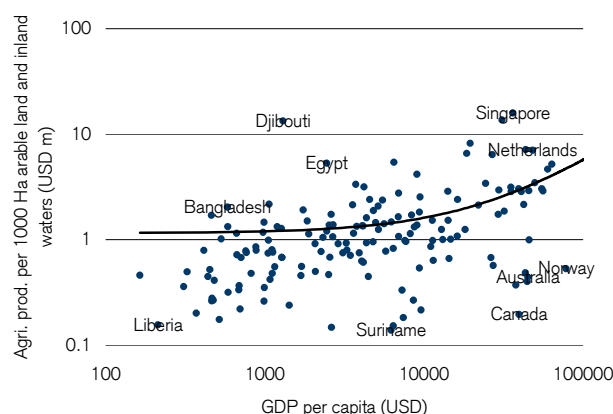
Land availability has declined steadily over the last 50 years in per capita terms



Source: FAO, Credit Suisse. Last year available: 2008

Figure 4

The positive association between income and agricultural productivity



Source: FAO, IMF, Credit Suisse. Last year available: 2008

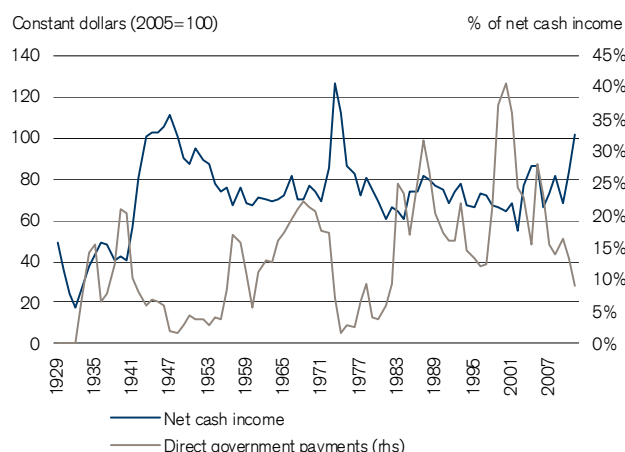
ure 4). FAO estimates that these countries need to double their agricultural output by 2050, which will require an annual investment of over USD 200 bn, roughly the size of the GDP of Ireland or the Philippines.

Higher farm income is a catalyst for investments

Costs and benefits of high food prices are unequally distributed. In the short term, the income of farmers with a marketed surplus tends to increase as a consequence of higher food prices, which in turn should spur agricultural investments. In the longer term, especially throughout the OECD countries, farmers are currently experiencing a window of profitability in the wake of fading subsidies. For decades, agriculture had rarely ever been productive without the substantial support of government subsidies. While the current drop in subsidies to their 30-year low in 2010 (USD 227 bn) is potentially explained by high farmers' income rather than indicative of a general trend, a future reduction in subsidies appears to be a logical consequence of stretched public finances throughout

Figure 5

Subsidies and farm income in the USA



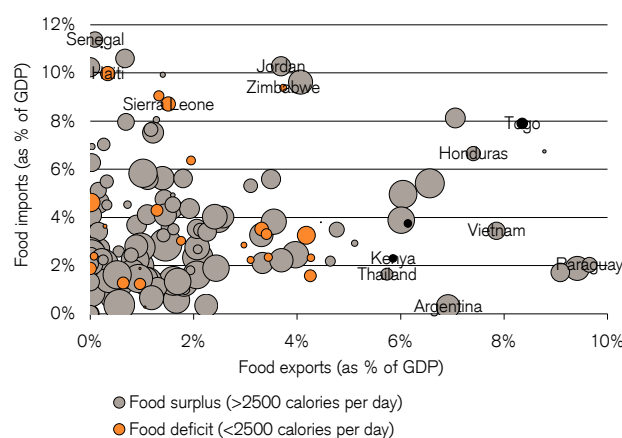
Source: USDA, Credit Suisse

1 Conforti, Piero. ed. 2011. Looking ahead in world food and agriculture. FAO.

2 Foley, J.A. et al. 2011. Solutions for a cultivated planet. Nature.

Figure 6

Food supply and trade: Malnourishment is not solely a problem of import dependence



Source: FAO, IMF, World Bank, Credit Suisse. Last year available: 2008

the OECD region. Accordingly, we expect farmers to take the opportunity to address long-term spending priorities. Especially in the USA, the inverse relationship between subsidies and farm income has existed historically (see Figure 5). However, the rationale for farmers to invest should be strong at present, given the coincidence of dollar depreciation, higher world prices, and a public debt burden that almost certainly will take its toll on subsidies.

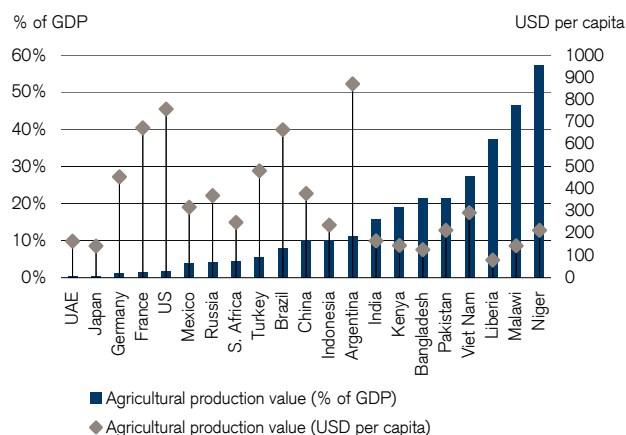
Food prices and poverty

High food prices also tend to worsen poverty, malnutrition and food insecurity due to the fact that households in poorer regions are on average net food buyers. In Bangladesh, Guatemala, Malawi, or Vietnam, the lowest expenditure quintile of the population spends 60%–70% of the household budget on food.³ While exporters should generally benefit from higher world prices, net food exporting developing countries have often failed to reduce poverty and malnutrition (see Figure 6), mostly because their agricultural outputs are highly concentrated and subject to the pressure of other low-income export competitors. It is widely commented that this structural problem has partially been rooted in developed country protectionism that has long prevented these countries from building up their higher value-added agricultural sectors.

The foundations for agriculture-induced growth in low-income countries are strong: Over half the economically active population works in agriculture in low-income countries (see Figure 7). In raising poor people's income, GDP growth originating in agriculture has been estimated to be at least twice as effective as growth originating in other sectors.⁴ The World Bank estimates that meeting the Millennium Development Goal of halving poverty by 2015 would require only about USD 3.8–4.8 bn in incremental public investments for sub-Saharan Africa.⁵ Yet, the sector suffers from chronic underinvestment,

Figure 8

Agricultural production: Economic size and per capita value



Source: FAO, Credit Suisse. Last year available: 2008

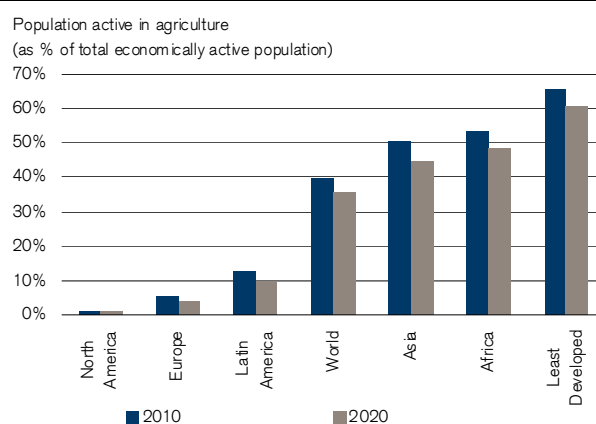
thus failing to reduce poverty and release agriculture's full potential.

Emerging producers: The role of trade and innovation

According to a report from the World Bank, most of the land that could potentially be used for expansion is located in developing countries, especially in sub-Saharan Africa (see Figure 9).⁶ Fertilizer, pesticides, and herbicides are among the preferred options to increase short-term productivity as they become affordable to farmers in developing countries (see Figure 10). In the longer run however education and innovation should be essential cornerstones of agricultural policy. Only a few countries have started to devote substantial efforts to agricultural research and development (see Figure 11). Ghana, Kenya, Rwanda, and Uganda are among the most innovative

Figure 7

In low-income countries, over 50% of the economically active population work in agriculture



Source: World Bank, Credit Suisse

3 FAO. 2011. The state of food security in the World.

4 World Bank. 2008. World Development Report.

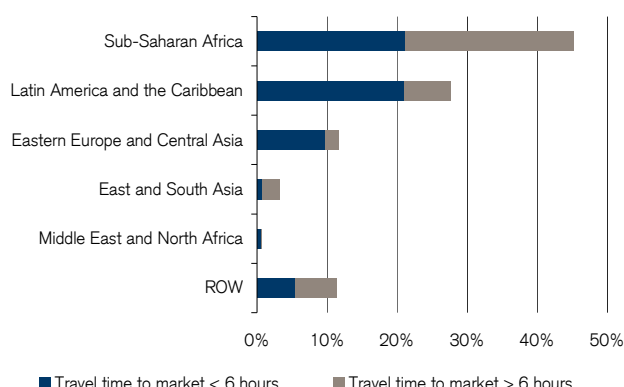
5 World Bank. 2009. Agriculture Action Plan: FY2010–2012.

6 Fischer, G., and M. Shah. 2010. Farmland Investments and Food Security. World Bank.

Figure 9

The largest part of available land for expansion is found in developing countries

Share of land available for expansion.



Source: OECD, World Bank, Credit Suisse

economies in this regard. Furthermore, the remote location of new land and its long distance to markets will require large-scale infrastructure investments.

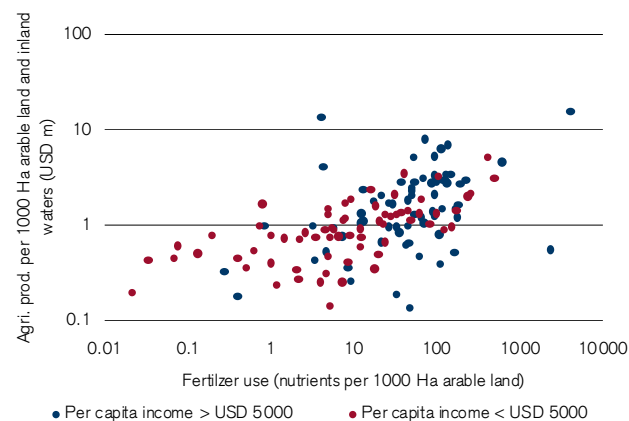
Finally, unleashing emerging agriculture's full potential will depend on richer countries' willingness to liberalize market access and reduce direct payments to domestic producers. We believe that if it were to materialize, the completion of the Doha Round could well prove to be the start of a new era of agriculture.

The importance of water

Access to water is at the heart of food security. According to the World Bank, 2.8 billion people are currently at risk of water shortage. While its abundance has often been regarded as fortune, the management of water as a scarce resource has long been neglected even by water-scarce regions. Agriculture still accounts for the dominant share in global water withdrawal, both in water-abundant and drier regions. In terms of per capita withdrawal, water is still used excessively, for instance in Saudi Arabia, Vietnam, or Kazakhstan (see Figure 10)

Figure 10

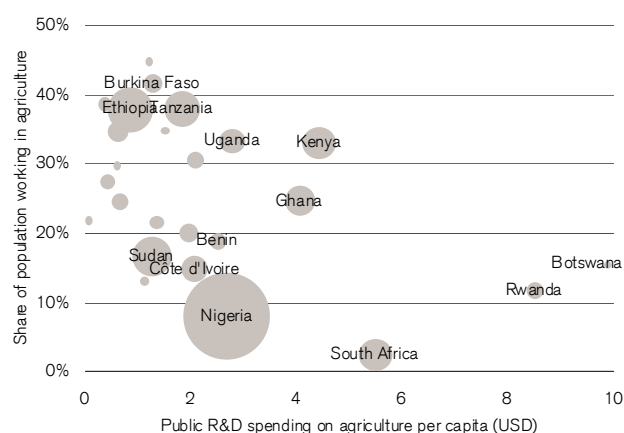
Fertilizer is increasingly used in lower income countries



Source: FAO, Credit Suisse. Last year available: 2008.

Figure 11

Agriculture in sub-Saharan Africa: R&D spending, labor input (bubbles indicate market size)



Source: FAO, IFPRI, IMF, Credit Suisse. Last year available: 2008

12). Irrigation systems have rendered large areas accessible to production, and there is enormous potential for further expansion.

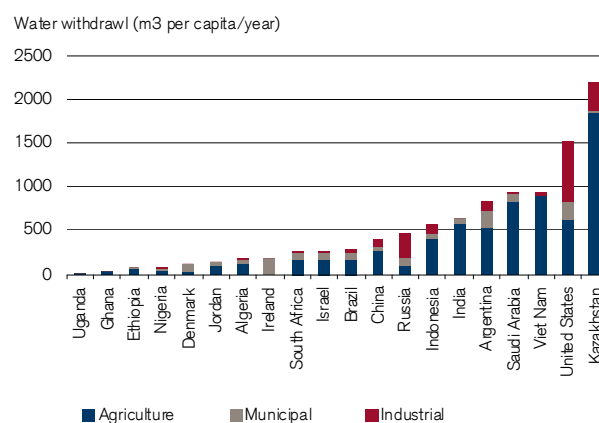
While a large part of water insecurity is linked to the adverse consequences of climate change, access to water has historically been at the center of international conflicts, for instance between neighboring up-and-downstream countries. This renders irrigation-intensive countries, which are highly dependent on renewable water resources originating from outside sources, such as Egypt, Uzbekistan, Bangladesh, or Pakistan, vulnerable to conflicts (see Figure 13). Altogether, given the water-related needs of the coming decades, we expect governments to formulate grand strategies targeted at sustainable water management and a reduction of interdependence and political vulnerability.

Cross-border investments into agriculture

As a result of increased water scarcity and national security considerations, several resource-scarce countries are trying to

Figure 12

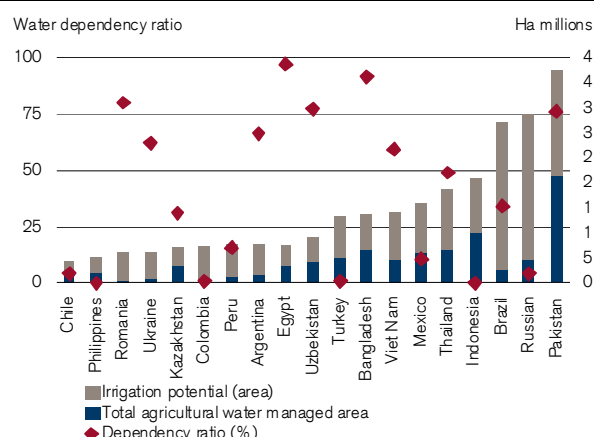
Agriculture accounts for the largest proportion of global fresh-water consumption



Source: FAO Aquastat, Credit Suisse

Figure 13

Irrigation potential and water dependency ratios



Source: FAO Aquastat, Credit Suisse

secure access to resources by means of physical investments in the form of foreign direct investments (FDI), for instance in agricultural production or infrastructure, or more direct land leases and even purchases. Since land is still abundant in many countries, especially in Africa and Latin America, several potential recipient countries are currently considering outside investments.

While FDI can be associated with spillovers of technology and skills, direct land acquisitions are often deemed controversial. Along these lines, we argue that private investors seeking exposure to agricultural FDI and land should integrate stringent ESG (environmental, societal, and governmental) criteria alongside the more traditional macroeconomic and financial criteria. Looking for cross-boarder acquisition targets is an alternative way to get exposure to these trends for the more mature agricultural markets (see Figure 14).

Addressing food waste

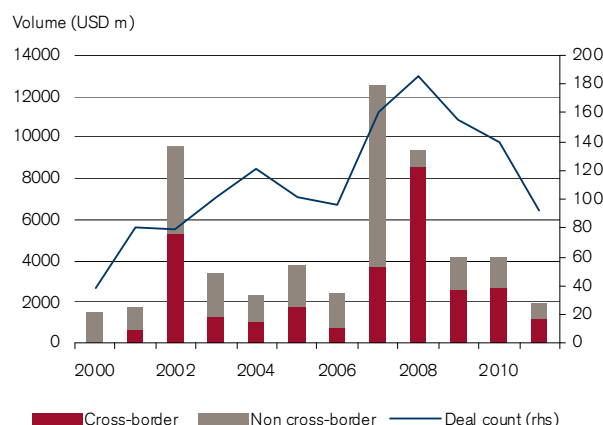
According to a recent publication by FAO, roughly one-third of the edible parts of food gets lost or wasted.⁷ With the exception of meat in sub-Saharan Africa, the production stage accounts for only a small share in total food loss (see Figure 15). In high-income countries, food is typically wasted during consumption while in low-income countries the wastage typically occurs during processing and distribution. The implications are intriguing. Advances in processing technology and efficient distribution and storage systems could very much compensate for agriculture's diminished ability to grow. At the consumption stage, the reduction of food wastage should remain a key challenge, especially in the wake of rising household income in developing countries.

Conclusions

The global challenge of food security can be met only if agricultural productivity is increased, resources are used more efficiently, and food loss and wastage are diminished. The

Figure 14

Acquisition of agricultural industries: Cross-border transactions are becoming the norm

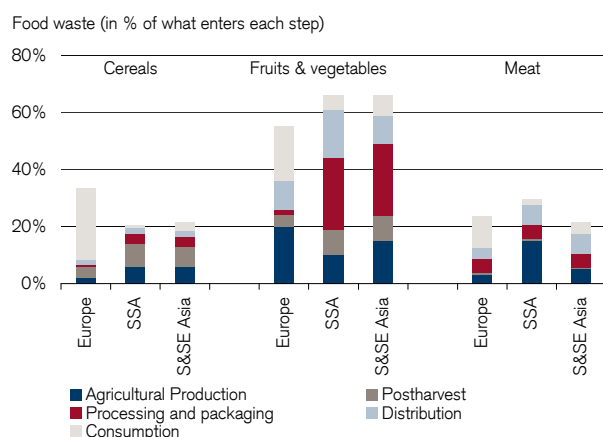


Source: FAO, OECD, Credit Suisse

notion of food as a strategic resource implies that domestic and international priorities will likely continue to be in conflict, as governments try to insulate their industries from foreign competition and their consumers from higher food prices. Nevertheless, we believe that over time world markets should become increasingly open, giving rise to emerging agricultural producers, most notably in Africa. In developing countries, agriculture will not only be an engine of growth but will also bear the potential to reduce poverty.

Figure 15

Food waste: A world of difference



Source: FAO, Credit Suisse

7 FAO. 2011. Global food losses and food waste.

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Abb.	Description	Abb.	Description	Abb.	Description
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CFO	Cash from operations	EV	Enterprise value	P/E	Price-earnings ratio
CFROI	Cash flow return on investment	FCF	Free cash flow	PEG	P/E ratio divided by growth in EPS
DCF	Discounted cash flow	FFO	Funds from operations	ROE	Return on equity
EBITDA	Earnings before interest, taxes, depreciation and amortization	IBD	Interest-bearing debt	ROIC	Return on invested capital

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HOLD:	variation between -10% and +10% in absolute share price
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