

# The Future of the Food Industry

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## Enough to go round but millions still starve

Governments, the industry and NGOs are starting to work together to redress critical global imbalances, reports *Louise Lucas*

Food has never been such a global issue. Some 1.5bn overweight and obese adults share the planet with 870m chronically hungry people, and governments are grappling with the same challenges: how to produce more food from less land, slash waste and reduce price volatility, while battling erratic climate patterns.

UN projections illustrate the scale of that challenge against the background of an increasing population and lacklustre production growth: in order to feed the expected 2bn additional bellies expected by 2050, we will need to grow 70 per cent more food.

But, as data from the Food and Agricultural Organisation show that one in eight people go to bed hungry, it is clear that problems already exist. And far from being a poor-world

issue, hunger levels are rising in the developed world. In the US, a record 46.7m people used food stamps in July, while the UK is likely to reach its own milestone this year, as 200,000 families are expected to receive emergency supplies from food banks this year, according to the Trussell Trust. Luca Chinotti, an adviser with Oxfam, the charity, describes the fact that so many went hungry in 2010-12 – more than the population of the US, Europe and Canada – in a world that now produces sufficient food, as “the biggest scandal of our time”.

Citing the usual culprits – political inaction, lack of investment, land grabs and climate change – he insists: “We need a new approach to the way we grow, share and manage food and other natural resources.”

Farmers, manufacturers, govern-

ment and other policy makers are generally in accord; discrepancies lie over responses and the pace of change required. Many argue there is enough food, but say it is simply in the wrong place. In the richer parts of the globe, about a third of food is estimated to end up as waste, while in India poor storage means a similar amount or more of produce rots before it gets from the fields to processors.

Other suggestions that have been mooted are causing more angst. Technologies such as genetically modified foods are banned in whole swathes of the globe. Use of food crops for renewable fuels also raises hackles. This, together with speculators, has been blamed for the era of high and volatile food prices that peaked last year.

ActionAid, the non-governmental organisation, quotes research from

Tufts University showing that from 2005-06 to 2010-11, US ethanol expansion cost net corn importing countries \$11.6bn in higher corn prices – more than half of which was borne by emerging markets.

Noting that challenges include environmental concerns as well as food availability, Carlos da Silva, a senior agribusiness economist at the FAO, puts it this way: “Policy makers have to balance these, and sometimes they can be conflicting.”

For many, the answer is a new “green revolution”, a recreation of the agrarian revolution that began sweeping through countrysides and raising yields from the 1940s. Since the 1970s, investment has tailed off and, with it, productivity gains.

“I think the problems are bigger and more urgent than governments

seem to be reflecting,” says Roger Sylvester-Bradley, principal research scientist at Adas, the natural agricultural and environmental consultancy that has advised on UK government reports into food production. He suggests increasing government investment, although, like others, he also foresees a future where the cost of foodstuffs better reflects their toll on the environment and other resources.

As well as more cash, he would like to see it better directed. “Now, the frontiers of biological science have moved from the field into the lab and into minutiae,” he says.

During the current eurozone financial crisis, it is unsurprising few governments have the stomach to tackle food security in a co-ordinated way.

It will require agreement from



Energy debate: corn being harvested for biofuels in Missouri. Critics say such use keeps poor people hungry

Bloomberg

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## Ethical and practical concerns drive efforts to assist suppliers

### Co-operatives

Producers see the benefits of growers banding together, says *Andrew Bounds*

From cocoa growers in the Ivory Coast to wheat farmers in Britain, agricultural co-operatives are growing in strength.

The move has been encouraged not just by producers and governments, seeking greater efficiency and bargaining power, but big multinational buyers who need security of supply. With climate unpredictable and more mouths to feed, food companies have had to invest in suppliers.

For example, faced with falling cocoa supplies from farmers with no money to invest, and concerned over the use of child labour on various farms not controlled by the company in Ivory Coast, Nestlé of Switzerland introduced its Cocoa Plan. This trains farmers and gives them better quality plants to increase yields.

Between 2010 and 2012, the number of farmers enrolled grew fourfold from 9,500 to 40,000. Many are in co-ops and Nestlé has said CFA Fr1.7bn (\$3.3m) is expected to be distributed to co-operative farmers who are part of the Nestlé Cocoa Plan for the 2011-12 harvest.

In Kenya the effect has been even more profound. Fintea, a collection of co-operatives growing tea, was established after the violence that tore through the country after the disputed election in 2008.

Locals vandalised plants run by multinationals, which did not buy local tea, and smallholders had nowhere to take their produce, so it was left to rot.

Finlays, a merchant that blends 99 Fairtrade Tea for the Co-operative Group, the UK consumer-owned retailer, agreed to take tea if growers formed into co-ops. Joseph Cheruiyot, Fintea's chairman, says there are now 13,000 mem-

bers. The average they earn for their tea has nearly doubled from 22 Kenyan shillings (\$0.25) a kilo to 40. “It has brought peace,” he says, and the group now has two brands of its own. Chino Henriquez of the Apicoop in Chile goes even further, saying it survived thanks to a “miracle”.

Established by the church as a beekeeping project in 1981, by the end of the decade the honey producers were being squeezed by their main buyer, a local supermarket.

“We stopped selling to them,” he recalls. “It is better to sink with pride than give it away for nothing.”

Then a German buyer for Traidcraft, the NGO that paid a minimum price for goods under the Fair Trade principles, appeared at the co-operative. “He said he was looking for honey – and we had 50 tonnes of it.”

The 300-strong Apicoop, now also supplies the Co-operative Group, which has additionally helped fund a blueberry processing plant so it can buy fair trade fruit in winter.

The Co-op has committed to sourcing solely fair trade goods where possible, and going “beyond fair trade” in

mature markets such as bananas and chocolate, says Brad Hill, consumer policy manager at the Co-op.

It is also contributing to a global investment fund that will provide loans to co-operatives in developing countries at reasonable rates for capital and infrastructure projects.

Some 75 per cent of Fair-trade goods are produced by co-operatives, which have 887,000 members. Multina-

tionals such as SABMiller, the brewer, find co-operatives easier to deal with and they can share best practice. It works with NGO partners such as IFDC in Mozambique and Farm Africa in South Sudan.

In countries such as Uganda there are lower excise duties for beverages made from local produce, which allows SABMiller to sell them for less and mar-

ket to those who may otherwise drink cheap locally brewed moonshine, which is often dangerous.

Mark Bowman, managing director of SABMiller Africa, says: “There are, of course, sound commercial reasons for SABMiller to buy crops locally – it helps reduce transport costs and guarantees both supplies and their quality. For us it goes beyond the immediate bottom line. Africa’s wider development matters to us. In the long term, too, increasing farmers’ yields boosts incomes and, in turn, wider prosperity, so consumers have spare cash to spend, which is in everyone’s interests.”

Many co-operatives have launched brands to capture more of their products’ value, such as Ocean Spray fruit juices in the US and Divine chocolate in Ghana.

Arla Foods, a Danish co-op, recently merged with Milk Link, the UK’s largest agricultural co-op. Arla Foods has invested more than £500m in the UK dairy industry to date, where it has established brands such as Cravendale milk, and Lurpak and Anchor butters.

Half of Britain’s 300,000 farmers are in co-operatives, with a combined turnover of more than £4bn. They include First Milk, with £564m turnover, and the Openfield group of grain producers with £626m. Scotlan Pigs, a co-op of Scottish pig farmers, is the biggest meat producer, with a turnover of about £58m. Four of the 10 biggest UK co-ops are agricultural.

David Button, chair of Co-operatives UK, an umbrella group, says the UK had less experience than of agricultural co-ops than Europe, so they tended to be small and less export oriented. He says they are vital to improve quality and provide pooled facilities. However, he says: “A member farmer has to sell to the co-op, even if he can get a penny a kilo more down the road. I think the livestock farmer has more of the trader mentality. It’s always been hard to get them into co-ops.”



Joseph Cheruiyot, chairman of Fintea Growers Co-operative News



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## The Future of the Food Industry

# Business works with NGOs for the common good

### Ethical sourcing

Industry has come to realise the value of respecting growers, says *Louise Lucas*

Suits are old hat for executives at food and drink manufacturers. Today directors are just as likely to be in rubber boots or lab coats – and their reading matter geopolitical or scientific rather than a glossy tome of ad campaigns.

The growing importance of farming to the likes of Nestlé, the world's biggest food company, or fast-food chains such as McDonald's and Starbucks, is evident in a host of initiatives, from model farms, where new methods are tried out, to deals with farming co-operatives in Africa and Brazil. "One thing Nestlé does not do is own land farms," says José Lopez, who heads

up operations for the Swiss-based food group.

"But we cannot be simply receiving that process without making sure that the farmer will stay in business; that this is an incentive for quality."

Hence the much-touted win-win scenario. Farmers receive better training and payments – not to mention a guaranteed market, which facilitates their ability to borrow – while the companies receive security of supply at the required quality, with less pricing volatility.

These common alignments, being further shared by governments and civil society, have resulted in some unlikely bedfellows.

The non-governmental organisations that used to rail against "big business", scaling Unilever's headquarters and running spoof ads showing an orangutan's finger inside a Nestlé-made Kit Kat wrapper, are now joining both manufacturers and others

in the quest to make farming more sustainable.

For example, Unilever, the Anglo-Dutch consumer products group, has been working with Greenpeace to incentivise companies to move to sustainable palm oil and end deforestation.

Meanwhile, Nestlé is partnering with the Fair Labor Association, a non-profit organisation dedicated to eliminating sweatshop employment, in probing its Ivory Coast supply chains.

However, the big challenge for branded manufacturers will be to find a way to work with their traditional rivals.

"The trick is whether branded manufacturers can really partner, and focus on the same programmes and interventions," says Barry Parkin, global commercial head for Mars, the privately owned confectionery group.

Cocoa growing would be a good place to start. Yields have stayed static over the

past 50 years, while in that time corn yields, for example, improved twelvefold.

Extrapolating current demand trajectories implies a cocoa deficit in 2020. This is despite the proliferation of programmes to reverse this trend, from training farmers to building schools.

The farm-to-fork relationship is what binds producers to the workers who till the ground

Kraft alone – whose three chocolate-based brands turn over more than \$1bn a year – has a four-page fact sheet documenting its various partnerships and programmes, replete with acronyms and multimillion dollar investments.

Nestlé's cocoa plan –

including SFr110m (\$116m) of investment over the next decade – even has its own website. Like its peers, it works with a long list of NGOs and trade bodies.

Mars has been equally prolific, and pioneered steps in certifications that have now been followed by Italy's Ferrero and Hershey of the US.

Extensive scientific research has gone into growing better plants capable of increasing yields up to fivefold. Yet the difficulty of reaching millions of smallholders, often in remote places and with only basic education, has meant that the programmes have had only a minimal impact on overall yields so far.

Changing the system – to enable manufacturers to reach millions of farmers, rather than the hundreds of thousands reached by training, and the far smaller numbers reached using the full package of assistance – requires teamwork among the companies.

Mr Parkin, who calls this "the hardest partnership to create", lists the obstacles as natural competitiveness, confidentiality issues and concerns over antitrust.

But, he says: "The basic values and belief systems are the same, and there are already some good signs of alignment in activity."

Corporate ties are stronger vertically between manufacturers of branded goods and agri-business companies such as ADM, Cargill and Olam.

The push on farming is not restricted to emerging markets. Industry is also firmly on the case in Europe, where farmers are under increasing pressure from rising input costs and changing regulations.

Hence McDonald's has its many flagship farms in Europe, training programmes in the UK and – in a bid to show its friendly, non-processed side – a series of ads in the US, which some have dispar-

aged as "farmwashing", a charge the burger chain denies.

"UK farming is consistent with global farming," says Ian Hope-Johnstone, PepsiCo's director of agricultural sustainability. "It is desperately trying to manage some of the challenges, both traditional and new."

These include managing the marketplace and securing sales for their crops, often while battling erratic weather conditions and volatile global prices.

McDonald's is also investing in British farming, and has introduced training programmes to encourage young farmers into the industry.

The motive for this is simple: the farm-to-fork relationship that binds them to the workers who till the ground.

"The health of farmers is important to us," says Brian Mullens, UK chief financial operating officer for the burger chain.

# Enough, but millions starve

Continued from Page 1

countries with vastly different dynamics – urbanising China, where farmers are fleeing the countryside; car-happy America – and a somewhat weak food chain with fragmented links.

At the bottom are the people who till the land. Many are subsistence farmers, barely eking out their own living, with some of the highest suicide rates of any employee sector.

Unlike other labour forces, farmers are not organised, and many operate as single families. As poor credit risks, whose income is at the mercy of the weather and often fickle customers, many have limited access to short-term credit, and virtually none to long-term loans.

This is where manufacturers are stepping in. As corporate head of agriculture for Nestlé, the world's biggest food company – and himself a former farmer – Hans Jöhr spends much of his time down on the farm.

"We try to help farmers to create more interesting business models," he says. "So they have a better income, so smallholder farming becomes more attractive again and retains people."

Thus Nestlé, like its peers, employs vast teams of agronomists who train and provide technical expertise to farmers. It also helps them access funds at non-exorbitant rates, and provides a guaranteed market for their goods.

Co-ordination is growing between industry and NGOs, but it still falls short of what is needed. Nor are these the only stakeholders to be letting concerns such

as competitive rivalry stand in the way. Equally fragmented, say some, are food agencies tasked with battling hunger. Yet no one is under any illusion. Softening on the promotion of bio-fuels, more involvement by manufacturers, and government policies to fight hunger are all steps towards tackling food shortages.

Earlier this year, Bill Gates, the Microsoft founder turned philanthropist, broke a taboo in the development community by publicly accusing UN agencies of allowing infighting and inefficiency to undermine their role.

Mr Gates, who has donated some \$2bn to food security in the past decade, and plans to give another \$2bn in the next five years, told an audience of the three agencies in Rome that the current system was "outdated and inefficient".

"Countries, food agencies and donors aren't working together in a focused and co-ordinated way to provide the help small farmers need, when they need it," he said.

Depending who you speak to, there are far more culpable parties than policy makers and governments.

Traders at investment banks and funds come in for a regular bashing whenever commodity prices rise, even though the charge that they are responsible for much of the escalating prices is not watertight.

The energy industry and governments that have mandated use of biofuels from sugar cane and corn – "taking food from bellies and putting it into motor tanks", critics say – also have a case to answer.

Many realise as much, hence a backpedalling on regulations. In October, for example, the European Commission moved to limit the use of crop-based biofuels in a revised directive. If adopted, this would allow EU member states to count them towards only half of a 10 per cent target for renewable energy, requiring them to meet the rest through more benign types of biofuels harvested from waste.

"There's still a long way to go," says the FAO's Mr da Silva.

# Controversy dogs farmers' steps to meet rising demand

Infrastructure *Louise Lucas* says improved working methods are key to better productivity, but not everyone agrees on how achieve them

For farmers, these are the best and worst of times. They face a huge opportunity: the global population is expanding faster than any other single industry segment and every single one of them will need to eat and drink. More than 2bn people rely on agriculture for a living, according to some estimates

But the challenges are equally eye-watering. Many of the 500m smallholders who produce up to 80 per cent of the emerging world's food, are barely scratching a living. Often denied credit, they cannot expand or invest in more modern farming techniques.

In Europe, changing regulations are set to remove subsidies and add costs. US farmers have just emerged from the worst drought in decades. As a result, many are culling livestock as they can no longer afford to feed them, as are their European peers.

And everywhere, perhaps unsurprisingly, people are leaving farms in droves. Youngsters are heading to cities, and those remaining are edging closer to retirement. In Japan the average farmer is over 65, in the UK they are pushing 60, and in the US 55.

Stakeholders – in theory all of us who eat, but in practical terms governments, civic society and manufacturers who process farmers' produce – are tackling the challenges on several fronts. These range from grouping farmers together to improving the basic farming inputs and methods.

Co-operatives are back in vogue, as the UK Foresight Project on Global Food and Framing Futures notes, two or three decades after many state-

backed co-operatives and marketing organisations were dismantled.

That process, it says, led to the emergence of a large number of producer organisations, multiplying over the past 25-30 years to the point that an estimated 250m small farmers in developing countries belong to some sort of farmers' association.

Such groupings enable small farmers to obtain inputs at better prices, reduce transaction costs, spread risks and thus more easily obtain bank loans, as well as giving them more bargaining power with buyers.

Jim Paice, former UK agricultural minister, said the UK outcry over milk prices – which saw thousands of farmers descend on Westminster and resulted in buyers backing down on proposed cuts in payments to dairy farmers – illustrated the power of a collective voice.

"Farmers have demonstrated they can come together in adversity," he told a gathering of 300 dairy farmers in Cumbria in August. "I hope they will demonstrate they can come together for the long-term structural benefit of this industry."

For Chris Brett, global head of sustainability for Olam, the agri-business group, the answer is "getting farmers more and more connected" and, as a company, delivering additional farming services and advice, often by mobile phone.

The other weapon seen as essential for farmers, especially small holders, is science. Superior seeds, resistant to pest, disease and even weather conditions, both increase productivity and make farming a better business.

high rates of malnutrition that tend to be worst hit. People in Chad, Ethiopia and Angola spend up to 60 per cent of their weekly budget on food – much of it imported. The most vulnerable are hit the hardest by price rises.

How do we address this? There probably is no perfect answer but I passionately believe there are some very clear actions we should all be taking. The following three, drawn from my experience as the chairman of the B20 Taskforce on Food Security, which provided recommendations for the G20 in Mexico this year, should sit at the top of our collective to-do list.

First, we should eliminate the use of unsustainable biofuels. Most first generation biofuels are neither environmentally efficient nor cost effective ways to reduce greenhouse gas



Syngenta, the Swiss-based agricultural group, has a mandate to do just that. Michael Mack, its chief executive, puts it this way: "Over time the challenge of the world is going to be to see if we can make a bigger grain pile on a smaller farm."

"You can get 10 times more tomatoes on a tenth of the land in India, but you need to get into greenhouses and that requires more investment."

The company, as are others in both the private and public sector, has already made strides with rice. When grown in paddy fields, rice is susceptible to all manner of fungi, insects and killer weeds. It also requires heavy labour, so every seven or 14 days the farmer is out, barefoot and with a backpack sprayer.

Now better chemicals, sprayed by a lawnmower-like machine, mean less work, less waste and higher yields.

Syngenta prides itself on a 3:1 return rate. For every extra \$1 of value Syngenta creates for itself, the farmer gets \$3. Could the company not effectively put itself out of business in an ideal world that needs no pesticides and minimal seeds?

"If by 2014 the world sprayed one-tenth of the amount of pesticides and grew more, why would a company

like mine not commit itself to doing that?" he asks.

But Monsanto, which makes genetically modified seeds, faces claims of tying farmers into a system and a series of payments from which they cannot easily escape – allegations the US company denies.

No less controversial are the more natural methods of improving productivity. In Oxfordshire the FAI farm, which produces meat and eggs for McDonald's as well as trialling new methods of farming, has played host to several such ideas.

Hens, for example, are apparently happier pecking away under a shady awning of trees. The same shady atmosphere appeals to dragonfly, which the hens feast off and, in their bucolic bliss, they forget to peck each other and also produce more eggs.

Likewise livestock are fed a mixture of grass silage. This is cheaper than the drought-inflated corn and soya, and, as the cows have to walk up and down to get their grass it is viewed as healthier all round.

However, others argue that the quality of milk or meat is affected: underlining the one indisputable fact that for farmers, like economists, common consensus is a rare commodity.

UK farmers protesting this summer over supermarket price cuts  
Tim Scrivener

'The challenge will be to make a bigger grain pile on a smaller farm'

# Now is the time for action to achieve global supply security

### Opinion

Paul Polman

Is it because the warning bells ring so loudly that no one seems to hear them? What with elections and the euro crisis, there are plenty of distractions.

But there will be 200,000 more mouths to feed around the world tomorrow – literally. To meet demand, we will need to produce the same amount of food in the next 40 years as we did in the past 8,000. But global wheat production is expected to fall more than 5 per cent this year, and the UN's Food and Agriculture Organisation (FAO) says.

The challenges of food security – of providing a lot more, with a lot less – are complex, immense, frightening and urgent. They are urgent because our task is not only planning for 2050, when we

will need to feed an extra 2bn people. We also have to act for today, when 870m people will go to sleep hungry.

There has been a 20 per cent drop in wheat yields in the US this year. The EU harvest is down by 6m tonnes – in Russia and Ukraine it will be reduced by more than 35m. The FAO predicts global wheat supply in 2012-13 will fall to 661m tons. Consumption stands at 688m tons.

Pressure on the world's resources is intensifying. Increased competition for these resources has been compounded by the effects of severe weather conditions. Since 2000, food prices have more than doubled because of soaring demand, with desertification, floods and drought adding significant volatility to the trend of food price inflation. To make matters worse, it is countries with already

emissions, and the demand they place on land is destabilising world food supply and increasing prices. I was encouraged to hear the European Commission say in October that it plans to limit land conversion for biofuels, but it is a small step.

Second, we need increased investment in those parts of Africa and Latin America where the last remaining serious agricultural expansion potential lies, or wherever current yields are threatened. Governments and businesses need to direct investment towards strengthening whole value chains and improving support for smallholder farmers, particularly women. In the developing world, they make up 43 per cent of farmers – rising to 50 per cent in eastern Asia and 80 per cent in sub-Saharan Africa – but they have less access to the

land, water rights, finance and education that could increase productivity. Aiding smallholder farmers is one of the most efficient ways of alleviating poverty, which makes it even more critical.

Third, developing country governments need to create long-term partnerships with the private sector, donors and civil society, to stimulate



Paul Polman Charlie Bibby

investment in commercial agriculture. The Copenhagen Consensus concluded that an investment in fighting malnutrition would benefit people more than any other type of investment – with a return of \$30 for every \$1 invested. And the World Bank found that an investment in nutrition can translate to a 2.3 per cent increase in a nation's GDP each year, breaking the cycle of poverty that traps families and nations.

It is only by working together that we can achieve this, and there are good examples of projects to be found. But we need more of them, fast.

Little progress will be made unless we combine the brainpower, energy, commitment and expertise of businesses, governments and NGOs and work in partnership towards these three major ambitions. This will need collective

international leadership. Future G8 and G20 presidencies must keep agriculture centre stage. Business and political leaders must continue to drive initiatives, such as the World Economic Forum New Vision for Agriculture. The UN High Level Panel on the Post-2015 Development Goals – of which I am a member – also gives us a unique opportunity to cement

meaningful international targets to support agricultural development. But, above all, securing the future of agricultural development needs individual commitment and action on the ground. All of us, individuals, companies, policy makers and consumers, have a responsibility to act together, and the time to act is now.

The writer is chief executive of Unilever

## The Future of the Food Industry

# Phones give farmers an edge when in the field

**Mobile devices** Different applications are helping agricultural workers make decisions while outdoors, says *Jessica Twentyman*

Like most livestock farmers, Robert McOuat would prefer to spend as little time as possible being stuck in his office. He would much rather be out on the land at his farm in Forno, Perthshire, tending his 550 ewes and 60 beef cows.

Until recently, however, time in the office was unavoidable because that was where he checked the latest market prices for lamb and beef on his computer. But now he can do this via a mobile application, launched in October by Quality Meat Scotland (QMS), the public-sector body responsible for supporting and promoting the Scottish red-meat industry.

Using the QMS app means that Mr McOuat has the information he needs ready to hand on his iPhone as he is involved in the day-to-day care of his animals. As a result, he can make instant decisions about which of them will fetch the best price at market.

"From November through to the start of January, I sell between 30 and 40 lambs every week," he explains. "The app is simple and quick to use and it allows me to look at the

performance of different weight bands of lambs and make a judgment call about whether to sell more light, medium or heavy lambs, week by week. If the trade for light lambs is weaker, say, I'll hold them back to put on a few more kilos."

It also helps him to decide at which market to sell his lambs, he adds, because prices at different ones can often vary by between 3p and 4p per kilo in any given week.

According to Stuart Ashworth, head of economic services at QMS, more farming organisations are launching mobile apps, for the simple reason that their audience tends to be based outdoors for much of the day. "Given the long hours worked and the remoteness of farms, a mobile phone is already an essential part of the kit for many farmers," he says.

While using a mobile app will not in itself improve arable yields, the information it can convey might help farmers to achieve that goal, if it is applied in the right way and at the right time, according to Lisa Challis, customer relations manager at Bayer Crop Science UK.



At Cereals 2012, she explains, an annual show held each June in Lincolnshire for the arable industry, the company launched three mobile apps. The first, Bayer Product Manual, is simply a mobile version of the company's product guide, which farmers and agronomists turn to for advice on how to use the company's products safely and legally. The other two, Pest Spotter and Weed Spotter, are designed to help them identify problems that could impact crop yields.

"We already knew that this information was popular and widely used by our customers, first in our range of printed books, and more recently on our website. But, by mobilising the information, it becomes far more effective, because it's instantly accessible at the point of need," says Ms Challis. Since their launch in June, the apps have been downloaded more than 9,000 times.

But it is in the developing world that mobile phones may have the

biggest effect on farming and food production – not through mobile apps, since few farmers in the rural regions of these countries have access to data services, but through simpler, text-based services.

An example of this is Nokia Life, a range of "livelihood and life improvement" tools for emerging markets, which fall into three categories: health, education and agriculture. In India, where Nokia Life was first launched in 2009, the agriculture part of the service is the most popular of the three, according to Jawahar Kanjilal, global head of Nokia Life services. Since 2009, they have been rolled out across Indonesia, China and, most recently, Nigeria.

For a fee of about US \$1 per month – for example, 60 Rupees in India and 5 Yuan in China – subscribers to the agriculture service receive daily updates that include growing advice, tailored specifically for their region and the crops that they grow,

**Price movements:** Robert McOuat uses his iPad to keep track of market prices QMS

weather forecasts and market prices for the specified crops in markets closest to them.

It is a price that K. K. Mathai, a retired engineer who grows pineapple, banana and vegetables on his own land in Kerala, India, is happy to pay. "I consider this an agricultural input cost. The agriculture service has been of great use to me, helping me to negotiate better on my produce. There has also been a noticeable improvement in my farm output," he says.

He would like to see a feature that would enable him to upload a picture of a pest-infected crop to the service and receive a diagnosis and treatment advice by reply, he says.

But otherwise, he is a satisfied customer: "I can make decisions much more quickly and confidently – about what to plant and when, and also what I can expect to charge for fruit and vegetables, based on prices from surrounding areas. There is simply less guesswork."

'I can make decisions more quickly and confidently about what to plant and when and what I can expect to charge'

# Growers and supermarkets face challenge of worsening weather

## Climate

**Drought and floods have played havoc with this year's crop,** says *Andrea Felsted*

From the worst drought in the US in at least half a century to the UK being drenched by its wettest summer since records began, farmers everywhere have been grappling with severe weather conditions this year.

Whether this is the result of long-term climate change or not, farmers have had to adapt to the inclement weather, while supermarkets, faced with shortages of some produce, are being forced to realign their supply chains to guard against empty shelves.

The British farming season was disrupted by a drought through to about April, followed by torrential rain in June and July.

But the weather disruption was not confined to the UK. In the US, corn farmers abandoned fields greater in area than Belgium and Luxembourg after the hottest July in US history irreparably damaged their crops.

Russia, Ukraine and Kazakhstan, important crop growing areas, suffered a drought and a very dry winter. This was also the situation in central Europe, says Guy Gagen, chief arable adviser for the National Farmers Union.

In Poland, there was not

enough snow to cover crops in winter, which meant that when a cold snap came in February, plants suffered "winter kill" from the freezing temperatures.

"The point about farmers is they have to adapt to the weather every single day of the week," says Mr Gagen.

But it is not just farmers who are being forced to change the way they operate. Supermarkets have sophisticated supply chains, and these are being disrupted by the unusual weather patterns.

J Sainsbury, Britain's third biggest supermarket chain by market share, is experimenting with "ugly" or misshapen fruit and vegetables, given shortages of some staples.

Judith Batchelar, director of the Sainsbury's brand, says the supermarket, which works with dedicated British farms, is facing challenges when it comes to the apple, potato and carrot harvests.

"The potato crop has been decimated this year. It will probably be about 60 per cent of what we would expect from the regular crop," says Ms Batchelar.

But the growing conditions mean that many potatoes will have defects, such as split skins or holes in the middle. Similarly, rain at the end of the growing season will provide some "whopper apples" while carrots have grown long and thin.

Sainsbury's is aiming to sell as much of the British crop as it can. "However, some of this product is

pretty ugly looking. We have been trying to take as much of the crop as possible, in what we call ugly fruit and veg.

"Our challenge is to see how much ugliness customers will accept in their fruit and vegetables," says Ms Batchelar.

"Customers have said that beauty is more than skin deep as it were, and actually they understand some of the challenges that British farmers have had this season," she adds. "It's almost a living experiment, as we have never had

'Our challenge is to see how much ugliness customers will accept in their fruit and vegetables'

such challenges in terms of unusual appearance of the crop."

But the issues are not confined to appearance. The weather may have resulted in degenerative defects, such as rots and mould, or the crops may not store well over the winter.

"It's more than just ugly," says Ms Batchelar.

Alternatively, the produce could just be so ugly that consumers would not want to buy it.

"It's not quite as simple as saying we will take the entire crop, however ugly it may be," adds Ms Batchelar. "It's probably still too early to suggest that this is

the result of climate change," says Mr Gagen.

"Whether it is climate change or not, there are certain lessons we can learn, even if we are going through a period of unsettled and difficult weather."

He would like to see more practical, or "use-inspired" research into the issues around food production and the environment, so that farmers can apply this to the problems they face every day.

But there are some upsides to the changing weather patterns. The warmer temperatures have made it possible to grow strawberries and asparagus for longer in Europe, while in England, vineyards are flourishing.

The UK is growing crops such as figs, blueberries and kiwi berries.

A farm in Colchester is even growing kaffir lime leaves for Sainsbury, which are put in curries and cannot be brought into the European Union.

Mr Gagen suggests that warmer temperatures could mean more land to grow crops opening up in countries such as Canada and Russia, which may enjoy fewer winter months and a longer summer growing season.

"Definitely there are upsides to this if you plan ahead," says Ms Batchelar. "The biggest upside though, is that climate change is a challenge to the way that we do things, which means that actually, it's an opportunity to look at doing things better."



# Hunger in Syria

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## The Future of the Food Industry

# Coffee needs to be served with credentials

**Certification** These days, consumers, farmers and roasters are all behind the new boom in sustainable production, says *Sarah Murray*

Two words seen increasingly frequently on the labels of coffee products are “sustainably grown”. They reflect the demands of ethical consumers and the buying practices of large companies, which are keen to meet this demand with coffee that has “credentials”. But they also represent something else – a big opportunity for smallholder farmers.

Given the proliferation of coffee labelling, certifications, codes and corporate sustainability programmes, consumers could be forgiven for being confused. Different certifications come with different standards.

For example, Fairtrade certified coffee guarantees farmers a minimum price for their products and connects them with importers, cutting out the middlemen. Farmers must follow social standards, such as promoting healthy working conditions and not using child labour. However, to become Fairtrade certified, farmers must be part of a co-operative.

Under its certification, the Rainforest Alliance, a US-based non-governmental organisation (NGO), does not guarantee farmers a minimum price for their beans. Instead, the organisation helps farmers to introduce more efficient and sustainable farming practices that allow them to increase crop quality and give them more bargaining power with buyers looking for high-quality beans.

Unlike Fairtrade coffee, farmers do not have to be part of a co-operative to become certified by the Rainforest Alliance, which means that large brands such as Kraft and Nestlé can participate.

Meanwhile, 4C, otherwise known as the Common Code for the Coffee Community has members that include farmer groups, traders, roasters, retailers and NGOs. The organisation's code of conduct helps growers, and in particular smallholder farmers, to adopt sustainability standards.

Solitaire Townsend, chief executive of Futerra, a sustainability communications agency, says that different labels and certification schemes are also important to coffee consumers, who have long paid attention to the quality of what they buy.

“Coffee is increasingly a way of life,” she says. “Obsession with source, smell, taste, size and foam says as much about you as what you



**Matter of taste: a Colombian bean grower. Interest in the livelihoods of farmers is increasing among consumers** AP

wear or what you drive. Interest in sustainability is intrinsically linked to that obsession.”

In addition to their concern about the environmental footprint of their coffee, interest is growing among consumers in the farmers' livelihoods.

“Consumers have long judged the quality of coffee on the quality of the supply, the quality of the bean,” says Ms Townsend. “It's a small step from there to quality of life for farmers and communities.”

Even without consumers' appetite for sustainably produced coffee, rising global demand is creating a growing market for the farmers. Coffee prices, while down from their peak in 2010, are still relatively high.

Added to this are commitments from the large global roasters to buy increasing amounts of ethically and sustainably grown coffee beans.

“You have companies working on sustainable and traceable sources of coffee, and big roasters, such as Kraft

and Nestlé, looking for low-input, certified commodities,” says Mike Kubzansky, head of the inclusive markets initiative at Monitor Group, a strategy consultancy.

Kraft, for example, has said it will source 100 per cent of the coffee beans used in all its European coffee brands sustainably by 2015.

Nestlé, meanwhile, has announced plans to double the amount of Nescafé coffee bought directly from farmers and their associations between 2011 and 2015.

“The roasters have made massive commitments to sustainable sourcing,” says Mr Kubzansky. “Now they need to get the supply behind that.”

Doing so will not be easy. For low-income smallholders without access to credit, the challenge is that while livestock or crops such as maize provide a relatively quick return on investment, coffee bushes take several years to establish.

However, the good news for these farmers is that the realities of coffee cultivation – at high altitudes on rugged terrain and carried out by hand – mean they are not about to be replaced by industrial producers.

“It's a very labour intensive and specified production landscape,” says Alex Morgan, senior manager of sustainable agriculture at the Rainforest Alliance, and a coffee expert. “So it's not something that lends itself to large-scale production as a crop.”

Some multinationals are starting to work directly with smallholders to promote sustainable farming practices for this reason.

The trading houses and exporters that supply big roasters are also providing support for coffee farmers, establishing farmer groups and offering training in sustainable agricultural practices.

Meanwhile, some brands, including Nestlé and Kraft, have formed partnerships with organisations such as the Rainforest Alliance.

But whether driven by labels, certification or by the desire by companies to be seen as responsible producers, rising demand for sustainable and ethical coffee could benefit farmers in some of the world's poor rural areas.

“We're seeing more of the large roasters getting serious about sustainability,” says Mr Morgan. “And that drives positive change on the ground.”

‘Coffee is increasingly a way of life. Obsession with it says as much about you as what you wear or drive’

## Demand for nimbler ways to battle hunger

### Food agencies

Donors have called for UN bodies to be more efficient, says *Sarah Murray*

Given the likelihood of higher global food prices following severe drought in the US farming belt and the failure of Russian wheat crops, the need for UN food agencies work to effectively promote food security has never been more urgent. Yet this need coincides with intense scrutiny of these agencies, with some questioning their ability to tackle world hunger.

The UN addresses food security through three Rome-based agencies – the Food and Agriculture Organisation (FAO), the World Food Programme (WFP) and the International Fund for Agricultural Development (Ifad).

Together, they have an annual budget of about \$4.5bn. Yet some say this money could be more effective if agencies were better at collaborating.

The loudest voice has been that of Bill Gates, the Microsoft founder turned philanthropist. At an Ifad conference earlier this year, Mr Gates said the food agencies were not working together to provide smallholder farmers with they help they need.

Amir Abdulla, the WFP's deputy executive director and chief operating officer, disagrees. “Collaboration extends across a wide range of activities including food security analysis, assessment, disaster risk reduction and monitoring,” he says. “And WFP and FAO have continued to co-operate closely following the Haiti earthquake and Pakistan floods to help smallholder farmers return to production.”

Yet Mr Gates is not alone in expressing frustration at

the way large public sector agencies operate. “You have all these different organisations with layer upon layer of management,” says Ray Jordan, chief executive of Self Help Africa, a non-profit organisation.

“If that was the supply chain in any multinational, they would have half of those things stripped out.”

Oxfam, the anti-poverty charity, also urges greater inter-agency collaboration. “There are extremely good people in those agencies,” says Penny Lawrence, Oxfam's international programmes director. “It's not a problem with the theory but with implementation and how they work together on the ground.”

Oxfam also argues for more nimble approaches to battling hunger. In Malawi, for example, it has been lobbying the WFP to distribute cash instead of food and bring essential supplies in from elsewhere in the region via local traders.

“You can distribute cash to keep the market going

‘We can't let reform lead to a smaller total budget for addressing hunger’

Raj Kumar  
Devex

and, in an extended hungry season, you can keep the system going, so the recovery takes place more quickly,” explains Ms Lawrence, who is also chair of the board for the International Council of Voluntary Agencies.

However, she acknowledges that changing the system requires more than the UN agencies to act, particularly given the fact any shift in strategy – such as distributing cash rather than food – requires donor agreement and the redesign of supply chains. “In fact,



**Outspoken: Bill Gates at this year's Ifad meeting in Rome** AP

it's the whole chain that needs to be looked at,” Ms Lawrence says.

Part of the problem is that the nature of the global food challenge has altered from the days when the three UN agencies were founded.

“We're in a new era now, and food productivity is not just a problem for Africa – it's a problem for the whole world,” says Raj Kumar, president of Devex, an online recruiting site for the global development community. He adds: “If smallholders don't become part of the supply chain, it'll be a problem for developed countries too.”

However, Mr Kumar argues for a reshaping of the UN food agencies rather than their eradication. “We can't let reform of these agencies lead to a smaller total budget for addressing hunger and malnutrition,” he says.

Efforts are certainly being made to change the status quo. WFP's executive director, Ertharin Cousin, has said that the three Rome-based agencies will collaborate more closely on a range of issues, from administrative efficiencies to working in the field.

Meanwhile the organisations that make up the UN's Inter-Agency Standing Committee, a forum for co-ordination, policy development

and decision-making, have launched an initiative examining how UN agencies can work more effectively with each other, as well as with non-governmental organisations.

Known as the Transformative Agenda, the initiative focuses on improving leadership, as well as increasing the accountability and co-ordination of the planning and management aspects of humanitarian responses.

This will be easier said than done. “You can see people are trying to make that work within agencies,” says Ms Lawrence. “But making it work across agencies is more challenging.”

Nevertheless, pressure from donors could be a catalyst for change. “Ultimately it comes down to he who pays the piper,” says Mr Jordan. “And the international donor community can create incentives for collaboration.”

Mr Kumar says this means donors putting money where their mouths are, and he points to Mr Gates as an example of someone doing this.

“He isn't just saying these agencies need to be more efficient, he's putting money into them,” adds Mr Kumar. “He understands that the world needs these institutions, but that they could be more effective.”

## Report calls for more use of research to improve crops

### Scientific contributions

UK agriculture lacks ‘blue skies’ thinking it once had, says *Charles Batchelor*

Science has made a considerable contribution to the 2 per cent annual increase in global crop yields achieved in recent decades.

Conventional plant breeding has long been the traditional way of boosting plant performance but it has been joined in recent years by the technique of genetic modification (GM).

GM – also known as biotechnology or transgenics – remains controversial and has provoked consumer resistance in many European countries.

Its use is subject to strict controls in the European Union but its widespread acceptance in Asia and the Americas is beginning to pose serious problems for European growers and food processors.

A further concern for farmers in the UK is a perceived lack of the sort of long-term “blue sky” research and development for which the country was formerly renowned.

The European butter mountain and wine lake of the 1980s persuaded policy makers that food surpluses were the problem.

But forecasts of a world population of 9bn by 2050 have changed all that. This has prompted the publication today of Feeding the Future, a report backed by UK farming and agriculture support groups that sets out research and innovation priorities up to 2030.

It warns of “a serious lack of R&D in agriculture and the urgent need to increase food production in a sustainable way. Despite some cross-sector initiatives there is a lack of ‘big picture’ strategic direction.”

“It is research and development that drives yields,”

says Ian Ashbridge, spokesman for the Institute of Agricultural Management, a contributor to the report.

“We have lost the blue sky R&D that was a hallmark of the 1970s and 1980s.”

“Wheat yields were increasing then but the graph has flattened out in the past 15 to 20 years.”

The qualities that plant breeders and GM developers seek to create range from increased yields through pest resistance to tolerance of drought conditions, of increased salinity in groundwater and temperature fluctuations.

Providing seeds with an inbuilt resistance to pests such as the orange wheat blossom midge and the corn rootworm means that fewer pesticide treatments across a field are needed and spares the pests' natural enemies, such as spiders, ground beetles and wasps.

Reduced spraying also saves on diesel and reduces soil compaction.

Conventional plant-breeding makes use of plants' normal processes of sexual reproduction.

It can be as simple as using a brush to transfer pollen from the male anther of the seed plant on to the

female stigma to blend the positive qualities of both plants.

A drawback of this method is that it can take years to achieve the right match and produce a reliable seed in commercial quantities.

GM, in contrast, involves inserting genes from a different species into a plant or animal. This can occur naturally but when done artificially the gene is attached to a virus or

Even after EU approval, GM crops can wait years for member states to ratify their use

inserted physically with a small syringe or fired from a gene gun.

GM allows a more targeted range of characteristics to be added to a plant but its critics say it increases the use of pesticides and makes farmers dependent on a small number of large seed producing companies.

To date, only one variety

of crop has been approved for use in the EU, Bt maize, incorporating protein from the soil bacterium *Bacillus thuringiensis*, which provides resistance to the maize borer.

A survey by the European Commission's Joint Research Centre showed higher average yields, though the improvement was statistically significant, reaching 11.8 per cent, in only one of the three regions in Spain where it had been planted.

Of concern to Monsanto and other GM seed producers is the slow approvals process in the EU.

Even after approval by the European Food Safety Authority, GM crops can wait years before member states to ratify their use.

The Feeding the Future report is agnostic on the question of GM, says Chris Pollock, the principal editor.

The report simply calls for the better use of data “in the effective precision breeding of plants and animals”.

But while conventional precision breeding techniques are still in use “how that changes in the future depends on political decisions as much as scientific ones”, says Prof Pollock.

“Global GM acreage has been going up by 10 per cent a year and it is now almost impossible to find seed maize that is not GM.”

“How much longer will people have the luxury of not buying GM foods?”

But genetically manipulated crops are no panacea. The corn rootworm has begun to develop resistance to GM crops in the US mid-west prompting Monsanto and independent crop experts to warn against over dependence on just one method of fighting pests.

Traditional farm management practices such as crop rotation, selective spraying, and timing crop maturity and harvest to avoid periods of severe infestation, also have a role. Science, it seems, does not have the complete answer.



**Green stuff: GM corn growing in Shropshire, UK**

Alamy