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The agricultural and food value chain:
Entering a new era of cooperation

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Contents

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Executive summary

"Opportunities to take advantage of a rapidly changing agribusiness landscape abound".

Chris Stirling

The agriculture and food sector remains one of the few bright spots in an otherwise troubled global economy. With strong underlying growth drivers such as population, urbanization, and the rise of the middle classes, it is expected to remain so. Not only are the economic fundamentals strong, but so is the level of political support as food security tops government agendas.

At the same time, the sector is facing challenges driven by climate change, rapid technological innovation and new demands for biofuels and access to information. These forces are manifesting themselves through increased volatility, complexity and scrutiny throughout the value chain.

Furthermore, recent food controversies in the UK, such as the ongoing horsemeat scandal and the supplier of halal food found to contain traces of pork, further drive transparency and food security up the political agenda. These issues are not new, but as history shows, can have dire consequences, including the deaths of six babies linked to the 2008 Chinese milk scandal where milk and baby formula were adulterated with melanine. Thousands died or were seriously injured or disabled after the 1981 Spanish 'cooking oil' disaster, where years later it was determined that the contamination was most likely caused by farmers' overuse of chemicals and pesticides rather than the cooking oil itself.

To overcome these challenges and help prevent future tragedies, greater collaboration and cooperation both up- and down-stream will be required between various players in the value chain. The extent and structure of that collaboration will be a very important strategic decision. Options may include vertical integration at one end of the spectrum right through to relatively loose relationships at the other end. In addition to seeing greater cooperation between private players from different industries, we are witnessing more collaboration between the private and public sectors.

Opportunities abound for players at all stages of the value chain, but improvements to business intelligence, agility, and risk management strategies must first be realized.

Chris Stirling
Global Head of Life Sciences
KPMG International

Introduction

The goal of the global agribusiness value chain, which spans input companies through to the final consumer[1] and has a total value of around US$5 trillion, is to provide sustainable access to affordable food, feed, fibre and, more recently, fuel. However, this goal is getting harder to achieve every year due to several prominent challenges.

On the demand side, the growing global population and economic growth combine to generate more need for increased levels of crop and food production. Policies promoting biofuels have also added a significant new source of demand to the equation. Apart from such considerations affecting the quantity of demand, there are also drivers affecting its quality as the food chain and consumers increasingly consider the environmental and social dimensions of how food is produced. On the supply side, there is concern about declining levels of yield gain, whether due to the laws of diminishing returns or the effects of water shortages and global warming.

The agribusiness sector's complex value chain spans input companies, farmers, traders, food companies and retailers, all of whom must ultimately satisfy the varying demands of the consumer in a sustainable manner. The sector encompasses huge diversity and variety at each stage, from R&D-based input companies to generic manufacturers, subsistence farmers to high tech agroholdings, biotech boutiques and small and medium-sized enterprises (SMEs) to multinational corporations.

On the opposite page, Figure 1 maps this while Table 1 provides profitability metrics for the major sectors in the chain. While most reports on the sector tend to focus on specific parts of the value chain, the approach taken here is to look across the whole value chain, thus reflecting the tendency for it to become increasingly integrated. The participants of this value chain contribute to a total profit pool of around US$600 billion. Agribusiness is currently one of the few bright spots in the global economy, with high crop prices sustaining the income of farmers and businesses which sell to them, and high levels of R&D investment in certain sectors indicative of faith in its future.

[1] KPMG International, 2013

Figure 1: The agriculture and food value chain

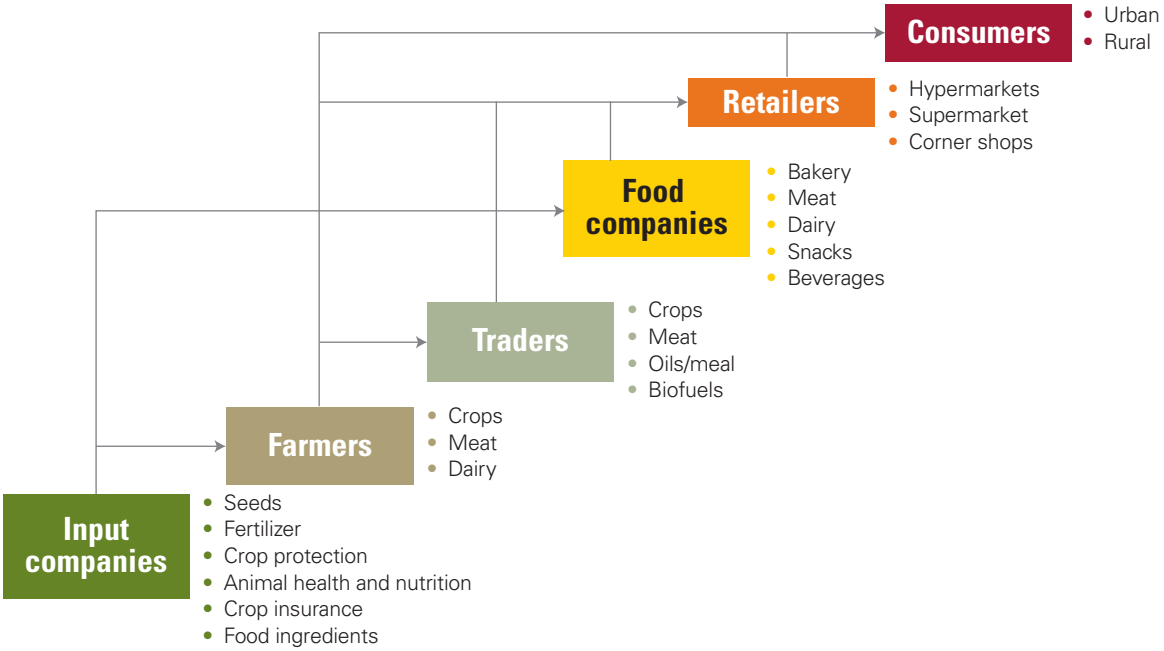


Table 1: Key profitability metrics for the agribusiness value chain

Sector	Input	Farmers	Traders	Food companies	Retailers
Sales: US$bn (*approx.*)	400	3,000	1,000	3,500	5,400
Number of players	100s	450 million	Tens	Thousands	Millions
EBIT %	15%	Variable	2–5%	10–20%	5%
R&D % sales	<1% (fertilizers) – 10% (seeds)	0%	<1%	1–2%	<1%
R&D spend: US$bn	10	–	Low	8	Low
Composition/ Sub-sectors	• Seed • Fertilizer • Crop protection • Machinery • Animal health and nutrition • Crop insurance • Food ingredients	• Grains • Fruit and vegetables • Meat • Dairy	• Handling • Primary processing • Secondary processing	• Bakery • Meat • Dairy • Snacks • Ready meals • Beverages	• Multiples • Discounters • Wholesalers • Independents
Range	R&D-based majors to generic manufacturers	Smallholders to agroholdings	Global agribusinesses to local middlemen	SMEs to multinationals	Corner shops to hypermarkets

Source: KPMG International, 2013

PART 01

Characterizing the agribusiness value chain

Volatility

The agribusiness environment is becoming increasingly volatile. This volatility stems from several different sources: the changing climate, political actions and social changes. The weather has been responsible for fluctuating yields and a supply shortfall which has put pressure on crop prices. This was what sparked the 2006 food crisis when drought in Australia led to a greatly reduced wheat crop which then had knock-on effects around the world and on other crops. Historically, while demand tends to be relatively smooth and predictable, supply is much more erratic, due mainly to the weather (see below).

Figure 2: Global supply versus demand for major grains and oilseeds*

Source: USDA PSD database, February 2013
*Maize, wheat, rice, soybeans, rapeseed, sunflowers, barley, rye, sorghum, oats

It is now generally accepted that with the advent of global warming we can expect more weather-driven volatility in the future as average temperatures and rainfall increase. Despite the extent of these extremes, assessing the timing and impact of global warming on agriculture is still very much a developing field.

On the political front, volatility stems from government actions, for example the push towards biofuels which has had a major destabilizing effect on world markets since 2005. While growth in demand for food is modest (1-2 percent CAGR over the last 20 years) limited by population and economic growth, growth in demand for biofuels has been much greater and could in theory continue to grow at this higher level, although it is currently showing signs of leveling off.

Global warming

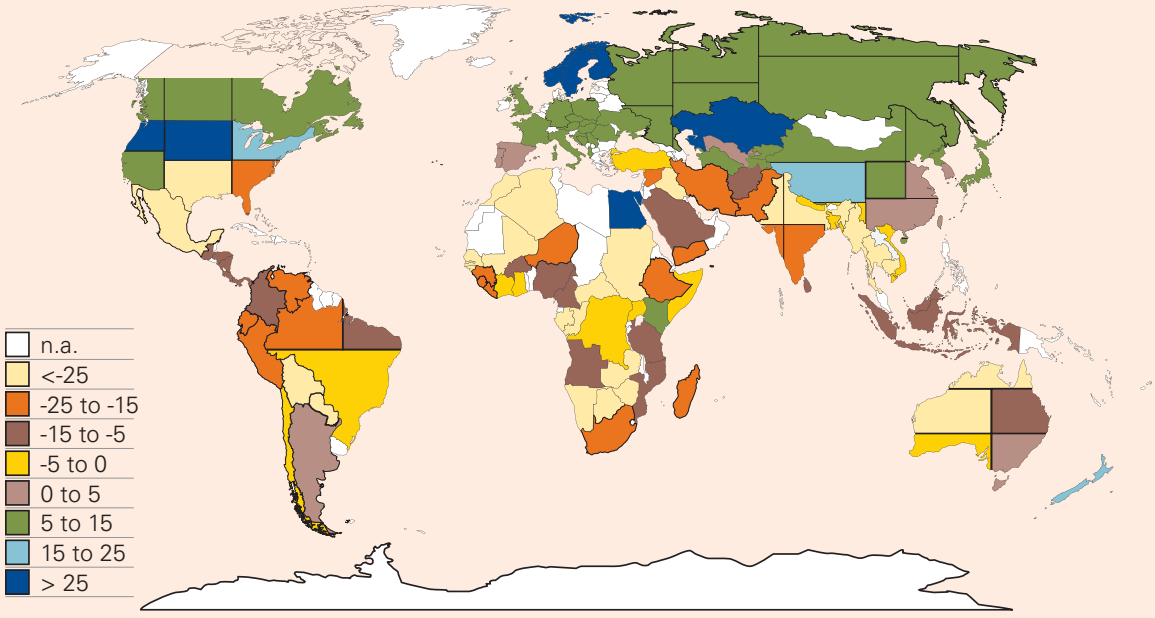
The impact of global warming on agriculture is the subject of much research and debate. The current conventional wisdom is that crop production will move towards the poles with countries such as Canada and Russia benefiting from the combined impact of increased temperatures, greater precipitation and the carbon fertilization effect. Meanwhile, countries closer to the equator, such as India and Africa, could be hit the worst as higher temperatures reduce crop yields. The effect, however, will vary significantly by crop as some are more susceptible to temperature increases than others. Overall, the impact on global crop production is uncertain. Wheat, for example, is already geographically constrained as it cannot be grown in tropical climates, is more vulnerable than corn. Any significant effects are likely to lead to major changes to the location of production as well as global trading patterns.

In addition to the impact on the overall level of agricultural production, global warming is also likely to result in more extreme weather patterns, with more droughts and floods which could lead to increased volatility in crop production and markets.

The upcoming fifth report on the topic from the Intergovernmental Panel on Climate Change (IPCC), due in 2014 will hopefully shed more light on the issue. In the meantime, various regional studies are being conducted, including studies on India and Central America which both point to significantly reduced production in each region. Additionally, an interim review commissioned by the World Bank and published in 2012[2] paints a more worrying picture than some previous assessments.

Figure 3: Climate change impact on agriculture

Impact on agricultural productivity with carbon fertilization (percent)



Source: Global Warming and Agriculture: William Cline, Peterson Institute for International Economics, 2007

[2] World Bank report Nov 2012 'Turn Down the Heat': https://openknowledge.worldbank.org/handle/10986/11860

Global warming will present different challenges and opportunities to different parts of the value chain, some of which are summarized in the table below.

Challenges and opportunities presented by global warming along the value chain

	Seeds companies	Fertilizer companies	Farmers	Traders	Food companies	Retailers
Mitigation and adaptation opportunities	Research targets: e.g. stress and heat tolerant crops	Increase nitrogen use efficiency	Choice of crops, carbon credits	Changing production and trade patterns	Carbon labeling	Carbon labeling

Source: KPMG International, 2013

Concern over greenhouse gas (GHG) emissions also figures prominently in agribusiness companies' environmental strategies, a focus which is slightly surprising given that other sectors emit GHGs far more intensively and agriculture is not included in the UN's Clean Development Mechanism.

Biofuels

Biofuels first became a significant factor in the transport market when Brazil started producing bioethanol from sugar cane in the 1970s in order to reduce dependence on imported oil and support the agricultural sector. The rate of growth further accelerated when the US government and the EU both increased their support for biofuels with mandates and subsidies in the early 2000s in order to reduce carbon emissions. In the US, there were additional motivations to increase energy independence and support rural economies. By 2011, bioethanol production accounted for 40 percent of US maize production and biodiesel production for around 30 percent of EU rapeseed oil production.

Since 2010 however, biofuel production has stagnated (see table below).

World ethanol fuel production (million litres)

	2006	2007	2008	2009	2010	2011	2012
Europe	1,627	1,882	2,855	3,645	4,254	4,429	4,973
Africa	0	55	65	100	130	150	235
North and Central America	18,716	25,271	35,946	42,141	51,584	54,765	54,580
South America	16,969	20,275	24,456	24,275	25,964	21,637	21,335
Asia/Pacific	1,940	2,142	2,753	2,927	3,115	3,520	3,965
World	39,252	49,625	66,075	73,088	85,047	84,501	85,088

Source: F. O. Licht

This is largely because US production from corn grain has approached the ceiling imposed by the authorities although it also reflects a downturn in Brazilian production.

As far as the future is concerned, prospects for biofuels which use food crops as a feedstock are not as bright as they used to be. In recent years the case for biofuels has been questioned on grounds of both food security and environmental impact. They have been blamed for contributing to the high levels of food prices, and in the case of biofuels derived from palmoil in Asia, for leading to loss of biodiversity. The original claims about their carbon footprint have been challenged. They have also faced economic problems as, in the case of corn for example, the crop feedstock accounts for around 70 percent of cost of goods sold (COGS), so when crop prices rise, depending on the relative price of oil, margins can become very thin and even negative.

In turn, these doubts are reflected in a reduction in support for biofuels both in the US, where subsidies and tax-breaks have been reduced, and in the EU, which has reduced its target for the amount of transport fuel provided by renewable energy from 10 percent to 5 percent by 2020. Only in Brazil, where the production economics are more favorable, does the future of biofuel look optimistic. Some forecasters see this driving the sugar cane area from its current level of 6 million hectares to over 9 million by 2015.

Apart from Brazil, significant future growth in bioethanol is predicated on the development of cellulosic bioethanol, derived from crop residues after harvest rather than grain. Progress towards this goal has been slower than originally anticipated as large scale, commercially viable production has yet to be achieved. There are several so-called 'second generation plants' under construction due to come on stream in 2013 and 2014, but the amounts they will produce are small and their commercial viability has yet to be proven.

Political influences on supply and demand manifest when governments take actions to subsidize production, as they have to a large degree in the EU and US in the past, or to influence trade, for example by banning exports when there are concerns about domestic supplies as Russia has been known to do. The collapse of the Doha round of the World Trade Organization (WTO) trade negotiations increases the likelihood that such actions will take place in the future. At the same time, it opens the way for more bilateral trade agreements.

Another significant political influence could come from China. To date, China has had a policy of near (95 percent) self-sufficiency for its major crops: rice, wheat and maize. The notable exception is soybeans, where China has had to increase imports to satisfy growing demand for animal feed. If this were to be relaxed, it would have destabilizing impacts on world markets.

There is no doubt that politics play an increasingly important role in agriculture and, due to its inherently unpredictable nature, more political complexity means more potential volatility.

Where social forces are concerned, consumer reactions to food scares, such as the recent horsemeat issue in Europe, can be sudden and severe and have a large impact on demand for the foodstuffs involved.

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Amid all this volatility it has now become the conventional wisdom that crop prices will remain high and well above their long term historic levels – the continuation of the so-called commodity 'supercycle'.

High crop prices will impact players at different stages of the value chain in various ways. While farmers and those who supply them with seeds, crop protection, fertilizers and machinery, generally benefit the companies which purchase their outputs, food companies and retailers find their costs ever higher and must adopt strategies to increase efficiency and pass on price increases, etc. Meat companies, for which the costs of crop feed-stocks make up the greatest proportion of their costs, are particularly vulnerable. The impact on traders, who sit in the middle of the chain is more complex and will depend on their particular business model.

The impact of and possible reactions to volatility at each stage of the value chain are examined in more detail in the following section. However, certain strategies can be used to mitigate or adapt to volatility at all stages of the value chain:

- Be more agile – if the future is harder to predict, you must be better able to respond rapidly when changes occur. This approach has implications for organizational structure.
- Improve business intelligence and environmental scanning. Forewarned is forearmed. Look beyond your own sector to developments up and down the value chain to gain a greater understanding of possible external drivers and emergent disruptive technologies as the chain becomes more integrated.
- Diversify, though going too far beyond the 'core' introduces risks of another nature. 'Adjacency' might be the best approach.

The agribusiness chain is already highly complex, but various drivers are conspiring to make it even more so.

Complexity

The agribusiness chain is already highly complex, but various drivers are conspiring to make it even more so. There are many different crops and food types, each with its own distinctive and often fragmented supply chain. There is also huge variety within each crop in terms of how and where it is produced, and by whom. Environmental factors play an important part in production and vary by region and by year.

New objectives

New objectives for agriculture have been introduced: whereas the primary purpose was to provide food, feed and fibre, the sector is now being asked to provide increasing supplies of biofuels, contribute to rural development and provide amenity and 'ecosystem services'. There is also talk of agriculture providing bio-materials to underpin the 'bio-economy' of the 21st century. In the jargon, agriculture is becoming increasingly 'multi-functional'. Another driver for change is the increasing emphasis being put on the health dimension of food as more people in the world now suffer from obesity than malnutrition. Governments are considering ways of intervening in the food chain to mitigate this trend while the development of functional foods is becoming an integral part of many food company strategies.

New solutions

Technological advances, particularly in plant genomics and IT are creating all sorts of new possibilities for agriculture. There has been a consistently high level of R&D investment across the value chain (see below) which has resulted in a continuous stream of innovation.

Table 2: Private R&D spend in the agriculture and food chain

Sector	R&D spend 1994: US$m	R&D spend 2010*: US$m	CAGR %	R&D % sales 2009*
Crop protection	2,296	3,116	2.1%	6.4%
Seeds and biotech	1,130	3,726	8.3%	10.5%
Machinery	920	2,394	6.6%	2.7%
Fertilizer	61	100	3.4%	<1%
Animal health	664	941	2.4%	8.6%
Animal breeding and genetics	196	339	3.7%	7.3% (in 2006/7)
Animal nutrition	314	410	1.8%	n/a
Total crop and animal inputs	5,581	11,026	4.6%	n/a
Food manufacturing	6,016	11,480 (in 2007)	5.5%	1-2%

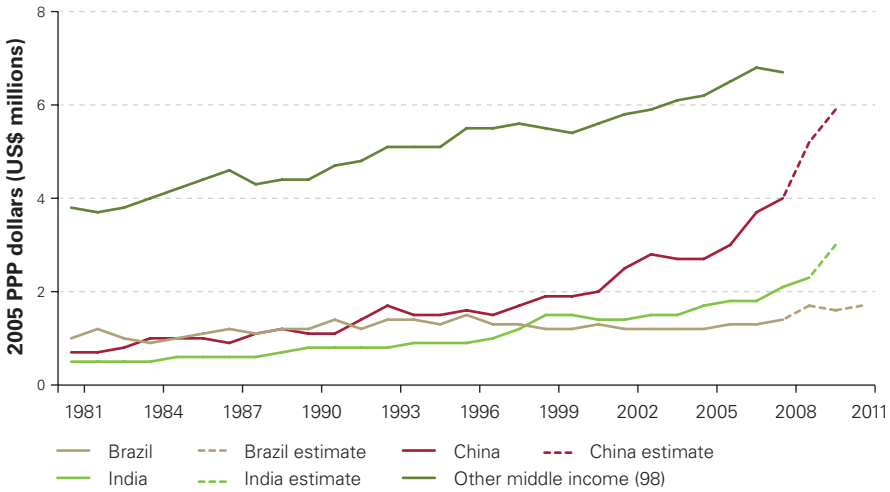
*Unless otherwise specified

Source: 'Research Investments and Market Structure in the Food Processing, Agricultural Input and Biofuels Industries Worldwide'; USDA, Dec 2011

An increase in private sector investment in agriculture is mirrored by what has been happening in the public sector, with governments, especially those in emerging markets, significantly boosting their investment in recent years. China, in particular, has greatly increased its investment in agricultural R&D and now spends almost as much as the US. Moreover, collaboration between the public and private sectors is growing, with several initiatives to increase the level of public-private partnerships in agriculture. Gone are the days when the private sector was distrusted by donors, academics and NGOs as the public sector and society recognize that their objectives can only be realized with private sector resources and skills.

China, in particular, has greatly increased its investment in agricultural R&D and now spends almost as much as the US.

Figure 4: Public sector spend on agricultural R&D



*Note: Dotted lines for Brazil (2009–11), China (2009–10) India (2009–10) indicate preliminary estimates
Source: 'ASTI Global Assessment of Agricultural R&D spending'; Nientke Beinteme et. al; IFPRI, 2012

Biotechnology, whether based on genetic modification or 'native traits', is producing a stream of new traits and expanding the possibilities of what can be achieved. Advances in IT are driving the growth of precision agriculture and transforming both the way in which information flows along the value chain and how transactions are conducted. These technological drivers have ramifications throughout the value chain: biotechnology presents the farmers with new tools and choices and drives the need for increased traceability. IT presents new options and opportunities for farmers, but also changes the nature of food company and retailer interactions with consumers, particularly through social media.

New markets

New customer segments are emerging: the growth of the emerging markets in both population and economic terms drives the level and composition of demand for agricultural and food products. The latest Food and Agriculture Organization (FAO) forecasts predict that overall food demand will increase by 1.1 percent a year between 2006 and 2050, or by 70 percent of the whole period. The primary drivers of this demand are Africa, due mainly to population growth, and Asia, due to both population and GDP growth.

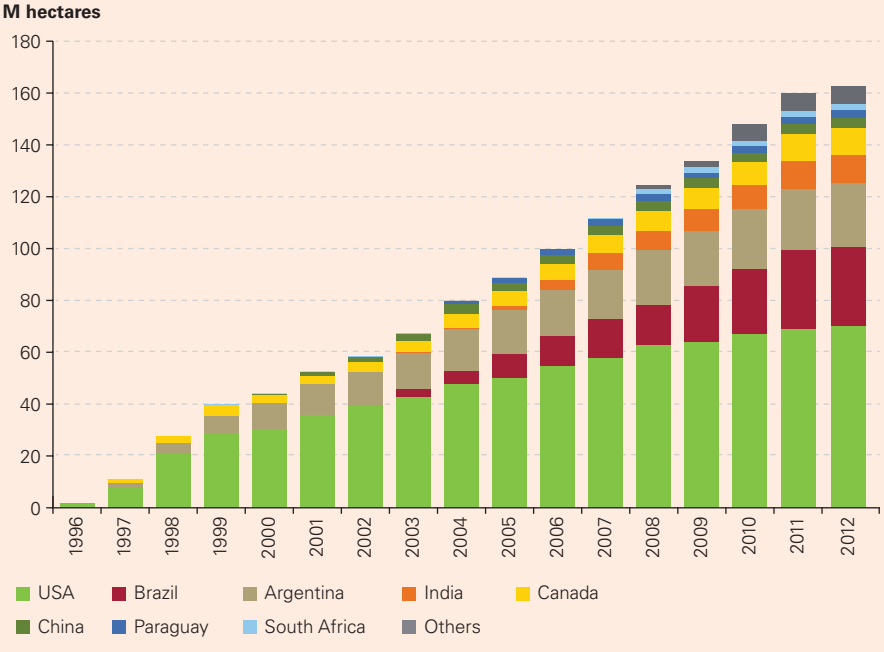
Whereas GM was the initial focus of the biotechnology revolution, increasing emphasis has recently been accorded to the 'native traits' approach.

Biotechnology

Biotechnolgy is an umbrella term which covers both genetic modification (GM) of crops, where new genes are introduced which could not occur naturally, and advanced breeding techniques such as marker-assisted selection, which accelerate the development of naturally occurring genes, or 'native traits'. Whereas GM was the initial focus of the biotechnology revolution, increasing emphasis has recently been accorded to the native traits approach.

Despite opposition from some quarters which continues to exclude significant GM penetration in the EU, the former Soviet Union and Africa, the rise of GM has been rapid (see below). GM crops now account for 82 percent of the global cotton area (herbicide tolerance and insect resistance), 75 percent of soybeans (herbicide tolerance), 32 percent of maize (herbicide tolerance and insect resistance), and 26 percent of rapeseed/canola (herbicide tolerance).

Figure 5: GM crop areas



Source: ISAAA, 2012

GM's rate of growth shows no sign of abating:

- There are many markets where existing traits have yet to be launched but the necessary political and/or regulatory framework does not yet exist.
- The industry pipeline is full of new traits and the level of R&D investment (over 10 percent of sales) remains higher than any other sector apart from pharmaceuticals.

- Fundamental research into crop genomics is resulting in an ever increasing number of crops having their genomes mapped – around 20 at the last count – and providing the basis of understanding upon which further new traits can be developed.

The main barriers to an even faster rate of GM crop penetration are the absence of bio-safety regimes in some countries – for example most countries in Africa – and the continued opposition from many NGOs. In several countries, the necessary bio-safety evaluation systems are in place and GM crops have been approved as safe to plant but introductions have been delayed by political opposition.

So far, no GM trait has been introduced into a major food crop. [Maize, soybeans and canola are used mainly for animal feed]. However, traits for rice already exist and are awaiting approval, while wheat is increasingly becoming a research target.

One consequence of the continuing concern over GM crops is that it is encouraging the spread of identity-preserved channels. In order to extract value from their new consumer traits, such as enhanced oil quality in oilseeds, input companies are having to set up production contracts with farmers and traders. In the EU, GM crops must be labeled, creating a need for tracking and traceability. In the US, a proposal to label GM traits in California (Proposition 37) was rejected in 2012.

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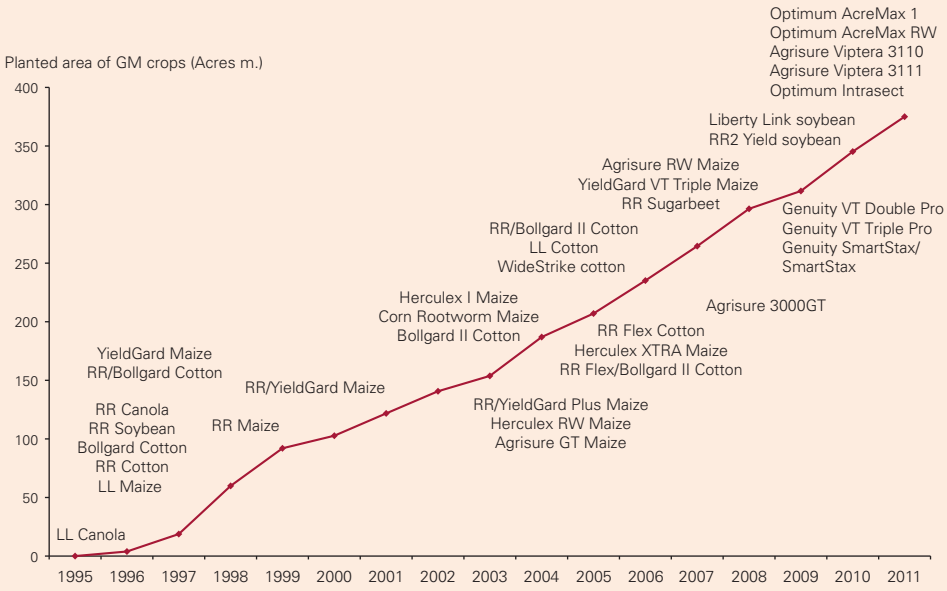
Figure 6: GM trait introductions since 1995



Source: Phillips McDougall, 2012

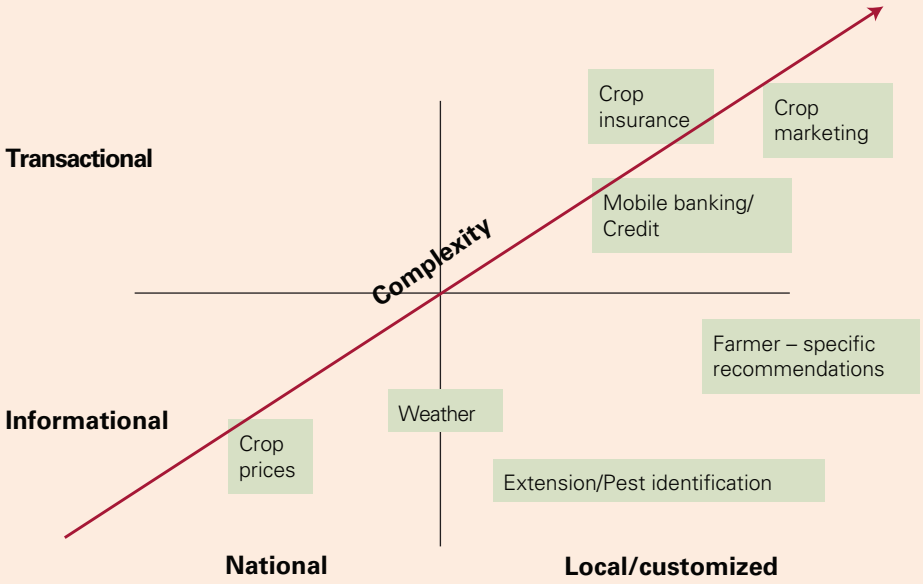
The impact of IT

As in other sectors, IT is having an increasingly important impact throughout the agribusiness value chain. For input suppliers, it is creating new innovation platforms, as with bioinformatics and seeds or precision agriculture. For farmers the explosion of mobile phone ownership facilitates access to better market and agronomic information on crop prices and weather conditions, and financial resources and products such as credit and insurance. It is having an especially strong impact with small farmers where IT is redressing some of the information asymmetries they suffered from in the past, allowing them to improve the efficiency of their transactions. In the case of food companies and retailers, social media has become an integral part of their marketing strategies and engagement with customers. IT not only impacts individual stages in the value chain but also helps integrate them by tracking the progress of crops and foodstuffs from production to consumption, providing the information needed for traceability.

Value chain segment	Input companies	Farmers			Traders	Food companies	Retailers
		Planting	Growing	Selling			
• IT applications and benefits	• Bioinformatics/ crop genetics	• Credit	• Agronomic advice • Weather information	• Crop prices • Combining with other growers • Identifying buyers • Market access • Crop insurance	• Traceability	• Social media/engaging with customers • Traceability	
		Precision agriculture					

While the benefits of IT are being felt throughout the agri-food chain, the way in which IT is being used is becoming increasingly sophisticated, moving from general applications centering around the provision of information, such as crop prices and the weather, to more customized and transactional types of use, such as crop insurance, as shown below.

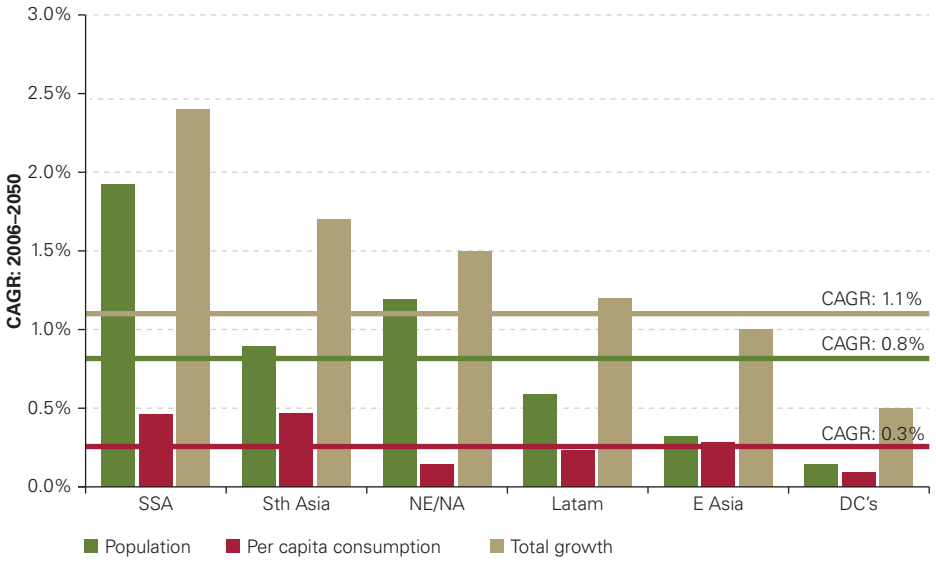
Figure 7: Type of IT intervention in agriculture



Source: KPMG International, 2013

IT not only impacts individual stages in the value chain, but also helps integrate them by tracking the progress of crops and foodstuffs from production to consumption, providing the information needed for traceability.

Figure 8: Growth in food demand: 2006-2050

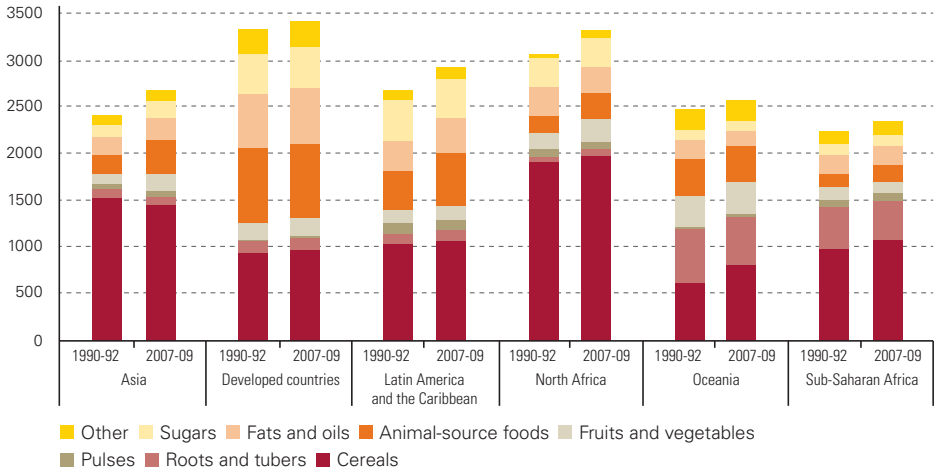


Source: N Alexandratos and J Bruinsma, 2012, *World Agriculture Towards 2030/50: the 2012 revision*, ESA Working Paper No. 12-03, Rome, FAO

With GDP growth comes an increase in the level of urbanization and the rise of the middle classes. Both of these drive accompanying changes to the composition of demand, with some crops and foodstuffs increasing their share, notably meat, dairy products and vegetable oils, and others, such as staple cereal crops losing out (Fig. 9). The fact that in 2012 China produced more corn than rice is illustrative of this and represents a significant milestone. There is also a slow trend towards diversification of diets (Fig. 10).

Figure 9: Diets diversifying, but slowly

Contributions to total dietary energy supplies (kcal)



Source: FAO, WFP and IFAD, 2012. *The State of Food Insecurity in the World 2012. Economic growth is necessary but not sufficient to accelerate reduction of hunger and malnutrition,* Rome, FAO

A related GDP-driven trend is the growth in demand for value-added, often processed food products which meet the need for convenience and new tastes, creating opportunities for the food manufacturing sector. Most major food companies have already targeted the emerging markets for growth.

As well as affecting the quantity and composition of demand, economic growth will bring with it new demands in the area of how the food is produced – more information and traceability. This is addressed in the next section.

These demand trends then beg the question: who will supply the demand? This is more difficult to anticipate as it will depend on less predictable (than demand) supply factors. Russia, the Ukraine and many African countries have the potential to increase their agricultural production and the extent to which they do so will have implications for global trade patterns. It will also play out differently at each stage of the value chain and each of these therefore needs to be addressed separately. For example, the EU is a net importer of primary products and next exporter of manufactured food. However one common/universal theme across the value chain is the increasing importance of the emerging economies as both markets for foreign and domestic companies and possible supply and R&D bases for both.

The growth in demand for products which meet the need for convenience and new tastes is creating opportunities for the food manufacturing sector.

While Afica's constraints should not be underestimated or belittled, there is indeed much scope for optimism.

Africa: the sleeping giant

African agriculture has been the subject of a great deal of interest, political attention and recently, optimism. In 2009 the World Bank issued its book 'Awakening Africa's Sleeping Giant'[3] which compared Africa's agricultural potential favorably with that of Brazil and Thailand. There is no question that with over 50 percent of the population still living in the countryside, development of the agricultural sector is fundamental to both Africa's overall economic development and poverty reduction. It has been estimated a 1 percent increase in crop yields results in a 0.5-0.8 percent reduction in poverty. The question is whether these high expectations can be met.

The challenges and obstacles which have held African agriculture back are considerable: yields are the lowest in the world and have been growing relatively slowly. As a result imports for staples such as wheat and rice have been rising steadily. The reasons are many and complex: lack of land rights; limited credit availability; low levels of investment and input usage, whether in quality seed, fertilizers, crop protection products, irrigation or machinery; poorly developed infrastructure and supply chains; and low levels of inter-regional trade, hampered by bureaucratic barriers.

At the same time, there are many reasons for optimism: the business climate is improving; there is huge political commitment (e.g. from the G20); Africa leads the world in the mobile phone revolution which can beneficially impact agriculture at various points in the value chain; the continent has the largest land bank, over 200 m hectares of currently unused land, an estimated 60 percent of the global total, which could be turned to agriculture. This surfeit of land also partly explains why most production increases have come from increased area, rather than yields.

By mapping the various initiatives which are being taken and positive developments against the above-mentioned constraints it is possible to see that many of the factors which have historically held back African agriculture are indeed being addressed. While the constraints should not be underestimated or belittled, there is indeed much scope for optimism.

However, even if African agricultural productivity does show an uptick, such is the rate of growth in demand, driven by both population and GDP growth, that it is likely Africa will continue to import an increasing amount of its food. In this scenario there are opportunities for local farmers and companies to increase the level of domestic production and for exporters and traders to benefits, from new opportunities regarding Africa.

[3] 'Awakening Africa's Sleeping Giant: Prospects for Commercial Agriculture in the Guinea Savannah Zone and Beyond', World Bank, 2009

Table 3: Reasons to be cheerful about African agriculture

Value chain link	Constraint	Current situation	Initiatives/trends
Supply	Land ownership	Land rights poorly defined	
	Credit availability	Lack of availability	• Microcredit schemes • Warehouse Receipts Programs (e.g. of World Food Program) • Mobile phone use for financial transactions
	Irrigation	Only 4 percent arable land irrigated: lowest level of any continent	• 'Corridor 'projects • Foreign Direct Investment
	Seeds	Poorly developed private markets: lowest level of use of commercial seed	• AGRA's seeds program (PASS) • AGRA's agro-dealer networks
	Fertilizer	Lowest use/highest prices/limited local industry	• AGRA's soil health program • AGRA's agro-dealer networks
	Crop protection	Low usage	• AGRA's agro-dealer networks
	Machinery	Lowest incidence of tractor use	• Increasing interest from machinery companies (e.g. AGCO)
	Extension	Low provision; poorly developed	• Use of mobile phones to give advice Increasing Public Private Partnerships (PPP's) with an extension component
	R&D	Low levels of R&D Some of the major crops are of relatively limited interest to the rest of world and private sector, so there is limited 'spin-off' potential from R&D conducted elsewhere	• CAADP[4] • PPPs • Foundations (e.g. BMGF; SFSA) • South-South cooperation (e.g. EMBRAPA program in Africa) • Net increase in public spending on R&D in 'Noughties' (IFPRI)
Demand/market access	Poorly developed infrastructure	Roads, rail, ports, storage	• Foreign Direct Investment, particularly by China • Corridors • Growth in certification schemes
	Supply chain	Lowest level of retailer penetration in the world	• Growth of middle classes and GDP/capita • Increasing ease of doing business • Growth in certification schemes, such as 'Fairtrade', integrating small farmers into value chains and improving their remuneration
	Storage	Inadequate storage facilities: large post-harvest losses	• 'Triple bagging' for cowpeas • USAID guide to storage
	Low level inter-regional trade	Lowest in the world: 12 percent total trade	• Reduction in trade barriers • Various trade groupings (e.g. EAC)
	Poorly developed local processing industry		• PPPs to encourage SMEs

Source: Prognoz, 2012

[4] Comprehensive Africa Agriculture Development Program

The level of FDI in CIS agriculture is increasing with western companies investing across all sectors: seeds, machinery, food processing.

CIS: eastern promise

As in the case of Africa (see previous pages), though on a lesser scale, Russia and other countries of the Commonwealth of Independent States (CIS) also suffer from a considerable yield gap compared to other countries in spite of a surplus of agricultural land. Many of the reasons for low productivity are also similar – poor infrastructure and lack of access to quality inputs. The main difference is that Russia and the CIS countries can and have produced large export surpluses, particularly of wheat. On more than one occasion the US Department of Agriculture has identified the significant potential of CIS countries to increase their wheat exports to levels of 50-60 mmt. This would introduce a major new source of supply into the world market and could potentially be very destabilizing. However, the market could accommodate this extra production if Russia were both to take share from other exporters, such as the US where wheat production has been on a downward trend, and take the lion's share of the demand growth in Africa, the Middle East and Asia.

There are many encouraging signs:

- Port capacity, a major constraint, is being expanded.
- The level of FDI in agriculture is increasing with western companies investing across all sectors: seeds, machinery and food processing.
- Organization of local industry is being improved with the establishment of large agro-holdings and government support in the form of subsidies and the creation of state-owned grain companies.

Together, these factors bode well for CIS export prospects, and could contribute to a continuing shift in global trade patterns.

A major risk, however, is intervention by the government to ban or otherwise control exports in years when production is reduced, as this undermines Russia's credibility as a reliable supplier.

As a result of the considerable and increasing complexity of the agri-food chain companies are faced with ever more strategic choices in terms of:

- Which crops to engage with and how great a range to cover. Technology (traits) and politics (e.g. regarding biofuels) are opening up new opportunities.
- Which sectors to address:
  - How far do they want to stray from their core business?
  - Are there any synergies?
- How far to engage with emerging markets. There is no doubt that most growth is there but there are risks attached.
- How far to use emerging markets as a resource base.
- How seriously to take emerging market companies as a source of competition in their home markets and abroad. Most of the largest companies in all sectors remain based in the developed world – only 6 of the top 100 food companies are based in the emerging markets and only one of the top 100 retailers. Emerging market companies however, are growing rapidly and becoming more involved with overseas markets. Having long been significant investors in African agriculture, the Chinese the are now increasingly turning their attention to the European food sector.
- How far to vertically integrate.

Consumers want to know about the content and safety of their food, but also how it is produced and what the environmental and social impacts are.

Scrutiny

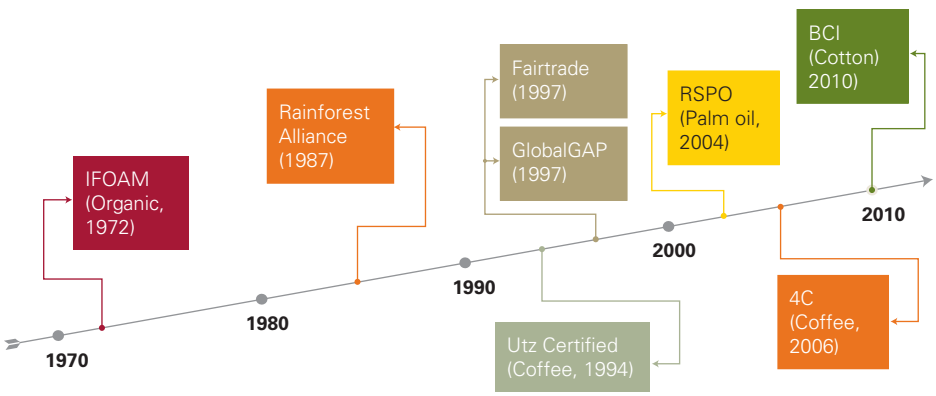
Various drivers are creating pressure to increase the traceability of and information about the food we eat.

First, concerns over food safety have been fanned by events like the BSE crisis, melamine in Chinese milk, E coli in German beansprouts and, most recently, horsemeat contamination of beef in Europe. These have been behind the formation of bodies like the European Food Safety Authority, and also provide opportunities for Western companies to apply their knowledge and expertise in emerging markets. This is reinforced by increasing interest in the nutritional and health properties of the food we eat.

Second, the rapid rise of GM crops, which have achieved significant penetration in some countries and crops, has resulted in labeling requirements in around 40 countries, particularly in Europe, but also in China and Russia. As the crops where GM has so far achieved significant penetration are commodity crops, this creates new requirements for identity preservation, and can be a barrier to trade. Having said that, other countries, notably the US, are strongly opposed to labeling for GM crops. The US position was reaffirmed by the rejection of GM labeling in a vote in California in November 2012.

Third, consumers want to know not just about the content and safety of their food, but also how it is produced and what the environmental and social impacts are. As people ascend the economic ladder their requirements in this respect become ever more demanding. This has resulted in the introduction of voluntary certification schemes such as 'Fairtrade' and 'The Rainforest Alliance'. Increasingly food companies are adopting these schemes and making commitments to improve the sustainability of their sourcing and operations. There has been a proliferation of such schemes over recent years, as well as a diversity of approaches. Fig. 10 gives a timeline for some of the major schemes introduced over the last 40 years. The proliferation and variety of schemes reflects the environmental and social impact of agriculture which is greater (and more complex) than that of any other sector. Concern over this aspect of agriculture is also reflected in the widespread adoption of the concept of 'Sustainable Crop Production Intensification' an approach designed to balance the need to increase productivity with the need to minimize negative environmental impacts. This is promoted by the FAO among others and widely supported throughout the private and public sectors.

Figure 10: Standards and certification timeline for transparency initiatives



Source: 'Understanding the impact of changing consumer demand and consumption patterns', Jonathan Shoham, Crop World 2012

Environmental footprint and sustainability

Agriculture has a larger environmental footprint than any other sector, having a major impact on water, land, biodiversity and the atmosphere:

- It accounts for around 70 percent of freshwater demand and also impacts water quality. Water scarcity and its impact on agricultural productivity is becoming an increasing cause of concern.[5]
- It accounts for around 38 percent of global land area (pasture: 26 percent; arable: 12 percent) and is the main cause of soil erosion.[6]
- It accounts for 14 percent of greenhouse gas emissions.[7]

Environmental considerations play a major part in strategies relating to agriculture whether at the level of the individual company or global institutions. At the company level this is reflected in the rapid adoption of GRI reporting and improvement in CSR activities, with setting, publication and monitoring of targets. At the institutional level good environmental practice is becoming an increasingly integral part of agricultural policy. For example in the EU farmer subsidies are being made increasingly conditional upon good agricultural practice. The potential for appropriate policies to mitigate adverse environmental impacts is well illustrated by the case of fertilizers where legislation in the EU has led to more efficient and judicious use and reduced the amount of fertilizer used per unit output of crop. This can be contrasted with China, for example where the fertilizer use intensity continues to increase and is indicative of highly inefficient use of the products.

Whereas there used to be a polarization of views between those who believed intensive agriculture was the answer to feeding the world and those who supported a return to extensive, organic systems, there now appears to be a reconciliation of these views with the new way forward being sustainable crop production intensification. This recognizes that high-input systems using commercial seed, fertilizer and crop protection chemicals are necessary but that at the same time they should be used judiciously with every attempt made to minimize their adverse environmental impact.

Environmental considerations play a major part in strategies relating to agriculture, whether at the level of the individual company or global institutions.

[5] 'Charting Our Water Future', The 2030 Water Resources Group, 2009

[6] FAOStat, 2012

[7] IPCC, 2007

The rapid increase in penetration by large retailers brings with it more sophisticated and efficient supply chains which permit ever improved traceability and information provision.

Accommodation of the above pressures is facilitated by advances in technology and the supply chain. The rapid increase in penetration by large retailers brings with it more sophisticated and efficient supply chains which permit ever improved traceability and information provision. At the same time new lifecycle analysis tools and methodologies are being developed which improve the accuracy and detail of information on the environmental and social impacts for food production. An example of this can be found in the development of carbon labeling. The Sustainability Consortium in the US is playing a leading role in this area. Table 4 looks at drivers of and responses to the ever increasing requirements for scrutiny along the agri-food chain.

Table 4: Causes, effects and potential future developments in the area of scrutiny

Driver (examples)	Specifics	Response	Current situation	Potential future developments
Food scares (contamination or mislabeling	Food safety	European Food Safety Authority increased testing	Western companies welcomed into some EMs because of their high safety standards	Ever increasing traceability
Health concerns (obesity)	Nutritional content	Regulation (e.g. pesticides) labels	• Debate of schemes 'fat taxes' in Denmark • Banning 'super-size' sugary drinks in some US cities	More government intervention
GM crops	• Consumer choice • Value extraction	Labels Identity preservation	• Labels in over 40 countries • Mainly commodity crops	More labeling, identity preservation
Ethical concerns: • Environmental • Social How food is produced	• Organic; Fairtrade etc. • Animal welfare	• Cross-compliance Agri-environmental schemes • Voluntary standards • Nitrate directive (EU)	• Proliferation of schemes • Voluntary schemes confined to cash crops and penetration still low	• Voluntary standards • Penetration • Scope e.g. Carbon labels • Rationalization of schemes

Source: IFOAM, 2013

Organic production has only 1-2 percent global market penetration and is far better established in Europe than anywhere else.

Despite these developments, penetration of voluntary standards is still very low. Organic production has only 1-2 percent global market penetration and is far better established in Europe than anywhere else. Other more recent certification schemes such as Fairtrade and the Rainforest Alliance account for well under 1 percent of global consumption, although still growing fast. More significant in terms of impact are some of the mandatory directives and policies which have been introduced, particularly in Europe, where for example, the nitrogen directive has led to significant reductions on the amount of fertilizer overuse and pollution, and farmer subsidies are being made increasingly conditional upon environmental compliance.

There are choices which are common to different stages in the value chain:

- 'Make or buy': should companies adopt existing standards and certification schemes or develop their own. Most companies elect for the former although some of the larger ones also do their own thing.
- If they buy into existing schemes which should they choose? To some extent the choice will depend upon their business profile, product range and environmental impact, but there will still be considerable discretion within these constraints.
- What reporting format should they follow: for example having a separate corporate social responsibility report or integrating it into the annual report? Having said that, GRI[8] has become a de facto standard.

Such considerations are important as they can affect the attractiveness of a company to investors, potential employees, customers and as a potential M&A target. Moreover the rapidly evolving nature and complexity of this area offers opportunities for differentiation and distinctive positioning.

The sustainability dimension is not only a matter of managing reputational threat but can also lead to identification of new business opportunities and lead to improvements in business efficiency. The process of lifecycle analysis can in itself lead to a better understanding of product and business processes.

[8] Global Reporting Initiative of the UN

PART 02

Implications for stakeholders

Input companies

The input sector spans a wide variety of product segments which can be seen as setting the genetic potential of crops and animals: providing them with nutrition; protecting them against diseases, pests and weeds; improving the efficiency with which they can be cultivated and harvested; and providing services to farmers, such as credit or insurance.

Table 5: Input industry product sectors

	Genetic potential	Nutrition	Protection	Growing and harvesting	Finance and services
Crops	Seeds	Fertilizers	Crop protection products	Machinery Irrigation Equipment	Credit Insurance
Animals	Genetics	Animal feed	Animal health products		

Source: KPMG International, 2013

In general, this stage of the value chain has fared well over recent years, benefiting from the high level of crop prices and farmer incomes, and taking advantage of the new opportunities afforded by technology.

Many sectors invest significantly in R&D; seeds/biotech is one of the most R&D-intensive sectors. There is increasing R&D collaboration between the private and public sectors, driven by the high propriety being accorded to food security issues.

Technology is leading to a blurring of the boundaries between some sectors - for example there is increasing integration of crop protection and seeds, driven partly by advances in biotechnology – and a tendency to take an increasingly holistic and 'systems' view of crop production.

Nearly all sectors have been increasing their engagement with emerging markets which are growing in importance as a percentage of sales.

Overall, it is an exciting time for the input industry with large numbers of new opportunities and a strong political tailwind provided by the food security agenda. The challenge is to have a clear view of the agribusiness landscape, as illustrated below.

The challenge is to have a clear view of the agribusiness landscape which provides the background against which to develop and implement strategies.

Table 6: Implications of volatility, complexity and scrutiny for the input industries

Driver	Aspects	Forecast	Opportunities
Volatility	Crop price volatility Global warming	Strong continued growth of the seed sector will pull through other inputs	New demands for crops adapted for drought, heat and salt tolerance Insurance products
Complexity	New technology Emerging markets as an opportunity, resource base and source of competition	• Continued growth in penetration and number of GM crops • Reversal of declining rate of yield gain • A blurring of the boundaries between some sectors – e.g. seeds and crop protection; crop protection and fertilizers • More collaboration • Continued high rate of innovation • Continued strong emerging markets growth	New products and business areas Africa
Scrutiny	Regulatory requirements Product stewardship	Ever more stringent regulation of products (crop protection; fertilizers)	Engage with customers to ensure responsible use of products (stewardship)

Source: KPMG International, 2013

Farmers

There are around 450 million farmers globally. The sector is extremely diverse and can be segmented by farm size, crops grown and level of sophistication. Farm sizes can vary from an average of less than 1 hectare in China to hundreds of thousands of hectares in Russia or Argentina. There are around 400 million smallholders, with an area of under 2 hectares. On average, each of these farms support a family of 4-5, leading to a farm population of around 2 billion. Farming therefore represents the largest employment sector in the world. Development of these small farms in emerging economies is fundamental to the overall progress of economic development in a process known as 'agricultural transformation'.

After being thought of as somewhat of a 'backwater' business during the 1970s, 80s and 90s, farming is now an attractive growth industry, reinvigorated by new technology and concerns over food security.

Farming is the most risky activity in the value chain, subject as it is to the vagaries of the weather (amplified by global warming) and market volatility. However, in good years it is also potentially the most profitable.

Until recently farming was the most heavily subsidized industry in the world[9], with farmer support in OECD countries totaling around US$280 billion. There has been a gradual reduction in OECD subsidies, as a result of continuing pressure from the WTO, although subsidies in emerging economies have been increasing in recent years.

The farming sector is subject to certain inexorable demographic forces. In all regions (apart from Africa) the rural population is declining as people migrate to the cities. This leads to a process of farm consolidation and also reduced labor availability in the countryside which stimulates greater labor productivity.

After being thought of as somewhat of a 'backwater' business during the 1970s, 80s and 90s, farming is now an attractive growth industry, reinvigorated by new technology and concerns over food security.

The table below looks at how the trends towards volatility, complexity and scrutiny affect farmers.

Table 7: Implications of volatility, complexity and scrutiny for farmers

Driver	Aspects	Forecasts	Opportunities
Volatility	Crop prices	• Crop prices remain high and volatile • Spread of commodity exchanges (e.g. in Africa)	• Bodes well for farmer incomes • Hedging
	Global warming	Adaptation through changing crop patterns	Carbon credits
Complexity	• Biotechnology • IT • Precision agriculture • 'Multi-functionality'	• Continued growth in GM crops • Spread of precision agriculture • Better and more sources of agronomic advice and market information	• New potential revenue streams • Reduction in 'information asymmetries' between farmers (in DCs and EMs)
Scrutiny	• Cross-compliance • Standards and certification	• Gradual increase in cross-compliance • Spread of GAP, 'Fairtrade' etc encouraged by food companies and retailers	Premium prices
	Identity preservation to extract values added e.g. from new traits	More contract growing	Guaranteed markets

Source: KPMG International, 2013

[9] Source: 'Agricultural Policies in OECD Countries: At a Glance', OECD, 2006

Traders

Traders occupy a pivotal position in the agribusiness value chain and to some extent their performance can be seen as indicative of the sector as a whole. Traders come in many different shapes and sizes with respect to business portfolios, geographic presence, degree of vertical integration and ownership. Some have significant food processing operations.

Traders have a vital role to play in provision of the infrastructure investment required to meet the growing production in and demand from emerging markets.

Due to the combined impact of global warming on the distribution of crop production and economically or politically driven regional changes in supply and demand, overall production has the potential to take off and move towards very different patterns from those of today. Traders would play a vital role in facilitating such a change.

Traders come in many different shapes and sizes with respect to business portfolios, geographic presence, degree of vertical integration and ownership.

Table 8: Implications of volatility, complexity and scrutiny for traders

Driver	Aspects	Forecasts	Opportunities
Volatility	Crop prices	High and volatile	• Superior business intelligence • Hedging
	Global warming	Movement of production from the equator towards the poles: shifting trade patterns	Realign infrastructure to meet new potential trade flows
	Biofuels	Slow-down in growth	Re-evaluate investment decisions
Complexity	Emerging market trends	• Decreasing Middle East/ North Africa self-sufficiency • Increasing CIS exports	• Secure new sources of supply • Opportunities to offer services to farmers
	Bio-materials	The 'bio-economy' only develops very slowly	Collaborations with input companies
	Move from global trade agreements (WTO) to more regional trade agreements (RTAs)	Proliferation of regional trade agreements	New or changing trade flows
Scrutiny	GM	Growth in GM areas and labeling requirements	More traceability
	Standards and certification	• Spread of 'GAP' etc. • 'Fairtrade' etc opportunities (from low base)	More traceability
	Food safety	Becoming ever more important and high profile	FDI opportunities in emerging markets

Source: KPMG International, 2013

Food companies

Much of the value added in the food chain happens at this stage and margins are commonly in the range of 10-20 percent. Within the food processing sector there are several distinct subsectors each with its own characteristics, for example meat, dairy, beverages, sugar, snacks and food service. Companies can vary in size from large multinationals, several of which employ over 100,000 people, some of which can trace their origins to the 19th century, to SMEs.

Although western companies still dominate, emerging market companies are rapidly rising up the league table. As crop and livestock prices represent the major element of COGS, profit is very susceptible to changes in price.

Health and wellness is also becoming increasingly important. The $1 billion brand has a certain 'caché' within the industry. Various forces – increasing concern over costs, security of supply and traceability – are pushing companies towards ever closer links with suppliers.

These and other developments are examined in the table below:

Table 9: Implications of volatility, complexity and scrutiny for food companies

Driver	Aspects	Forecasts	Opportunities and threats
Volatility	High crop prices	Commodity 'super-cycle'	• High input prices make strong branding and pricing strategies of paramount importance • Efficient supply chain management
	• Volatile prices • Security of supply • Climate change	• Increasing volatility • Failure of Doha round of WTO increases chance of unilateral trade actions by countries	• Diversify sources of supply • Engage with smallholders • Hedging • Get closer to farmers, e.g. by offering agronomic advice
Complexity	Emerging markets	• Main source of growth • Local competition	• FDI • Adapt products to local tastes
	IT	Channel fragmentation	Use of social media to communicate with customers
	Lifestyle changes	• Demand for convenience foods • Health and wellness considerations	• New product development • Growth of functional foods
Scrutiny	• Food safety • Ethical production	Sustainable sourcing	• Traceability • Collaboration with suppliers • Make vs buy, for certification schemes • Labeling • Waste/packaging recycling

Source: KPMG International, 2013

Various forces – increasing concern over costs, security of supply and traceability – are pushing companies towards ever closer links with suppliers.

Retailers

As with the other stages of the agri-food value chain, retailers can vary greatly in their characteristics, size and format. Food on average accounts for around 50 percent of retailer's sales. Margins are low and supply chain efficiency is paramount.

Retailer penetration varies greatly by region, with the developed markets almost saturated with the top five retailers commonly accounting for around 80 percent of food sales. Penetration in the more developed emerging markets is well over 50 percent[10], but it is only just beginning to take off in the least developed markets, driven by GDP growth and urbanization.

[10] 'The Rapid Rise of Supermarkets', W Bruce Traill, 2006

The rapid growth of retailers in emerging markets will lead to more efficient supply chains, including less waste, lower prices for the consumer and safer food. The recent opening up of India to foreign retailers could result in a greatly improved supply chain there. Although many retailers are expanding internationally, others are primarily home-based and growing rapidly on the back of their domestic markets: China overtook the US as the world's leading grocery market in 2011. This sector is not as global as the other stages in the value chain.

Depending on the food type, retailers may source products from any of the three previous steps in the value chain: food companies, traders and farmers. As the primary interface with the consumer, in addition to responding to consumer preferences, retailers can play a significant role in influencing them, especially in matters concerning healthy eating and sustainability.

The table below examines how the various trends might influence retailer behavior and opportunities.

Depending on the food type, retailers may source products from any of the three previous steps in the value chain: food companies, traders and farmers.

Table 10: Implications of volatility, complexity and scrutiny for retailers

Trend	Aspect	Forecast	Opportunities
Volatility	High crop prices	Increase in food as a percentage of disposable income	• Private label development • Links to suppliers • Supply chain efficiency • Longer term agreements
	Security of supply	Changing locus of production	Integrating smallholders into supply chain
Complexity	Lifestyle	Growth in demand for convenience foods	Growth in packaged and prepared foods
	IT	Channel fragmentation	• Communication strategy • Online shopping
	Emerging market growth	Rapid growth in retailer penetration in emerging markets	FDI opportunities
	Government healthy eating programs	Increasing emphasis on nutritional and health aspects	Growth of functional foods
Scrutiny	Food safety	• Growth in labeling • Increased testing	• Control of supply chain • Auditing of suppliers
	The 'ethical consumer'	Backlash against packaging/waste	• Rapid growth in adoption of certification schemes • Educational role

Source: KPMG International, 2013

Conclusion:
A new era of collaboration?

In the previous sections we outlined strategies for addressing the increased volatility, complexity and scrutiny of the agribusiness value chain. Some apply to all stages in the value chain: the need for better business intelligence to anticipate volatility and understand complexity; agility to react to volatility; and risk management strategies to protect against volatility. Others strategies are more specific to particular parts of the value chain. Increasingly, many require an element of collaboration with other players within and beyond each link in the value chain, not only between private companies but also between the public and private sectors. Collaboration has the following advantages:

- Provides greater visibility, and in some cases foresight along the supply chain
- Affords greater influence over factors previously beyond an organization's control, providing greater security and possibly reducing costs
- Provides access to new skills and resources and promote innovation

Collaboration can take many forms. For example, at one extreme, it can mean mergers between companies, either in order to diversify the portfolio or vertically integrate and obtain more control over upstream or downstream activities. At the other extreme, it may be a loose and non-exclusive collaboration between different parties to pool complimentary resources or property. Table 11 maps the spectrum of possible forms of cooperation.

Many collaborations are already taking place between sectors as well as within them, all indicative of a gradual trend towards greater integration (see Table 12). In the future it is almost certain that companies will have to increasingly direct both their scanning activities and collaborative efforts beyond the sectors in which they operate to adjacent sectors and further up or down the value chain.

Designing successful collaborations

Key skills in the future are likely to include

- Identification of which parts of company strategy are best served through collaborations
- Identification of suitable partners
- Choice of the appropriate form of collaboration

Table 11: Types of collaboration

	Tight.....Loose					
Type of cooperation	**M&A**	**Cooperatives**	**Joint ventures**	**Exclusive alliances**	**Non-exclusive alliances**	**Contracts**
Reasons/ benefits	• Portfolio diversification • Geographic expansion • Vertical integration to secure supplies, internalize margins • Synergy extraction	• Economies of scale • Increased bargaining power	• Pooling of complimentary skills • Cost/risk sharing	• Pooling of complimentary skills • Cost sharing	• Pooling of complimentary skills • Cost sharing	• Securing supply • Extracting value adds

Source: KPMG International, 2013

Having decided that some form of collaboration is needed in order to meet pre-agreed strategic goals, the issue then becomes one of implementation. By their very nature collaborations are complex entities involving diverse organizations which may have widely differing cultures. In order to maximize their probability of success there are some critical ground rules which need to be followed:

- There must be a clear value-add for each party, whether from increased sales and/or reduced costs; without this the collaboration will not be sustainable
- The objectives of the participating organizations must be aligned, or, at the minimum, not contradictory
- Whilst a collaboration between different partners can result in 'hybrid vigour' there must be some degree of cultural compatibility between the participants
- Regulatory and legal requirements must be satisfied
- The complexity of collaborations makes it essential to have clear governance and strong leadership
- Ongoing, open and honest communication between the partners is fundamental to realizing the collaboration's objectives
- In the case of collaborations involving an R&D element, IP issues must be agreed at the outset, sometimes using a novel approach. For example, the use and development of patent pools is increasingly common

In the case of collaborations which have both private and public sector participants (PPPs), meeting some of these criteria can be particularly challenging. Additionally, if the collaboration involves Government, there may be an additional requirement to create the right enabling environment in which the collaboration can succeed, for example by addressing any legal and infrastructure constraints, which might otherwise hold it back.

In the future it is almost certain that companies will have to increasingly direct both their scanning activities and collaborative efforts beyond the sectors in which they operate to adjacent sectors and further up or down the value chain.

Future predictions

During the last decades of the 20th century, the agriculture and food chain remained relatively obscure by the standards of many other industrial sectors. However from the beginning of the 21st century that has all begun to change. Some future trends are predictable: the drivers of population and economic growth remain the same and can be anticipated, as can their consequences in terms of the impact on urbanization and farm demographics. Likewise the continuing growth of emerging markets is a reliable trend.

Other trends are much less predictable, due in large part to the forces examined previously in this report: volatility, complexity and scrutiny. There are significant 'wild cards': global warming, biotechnology, and the changing role of Africa, China, and Russia.

Some elements are predictable: the drivers of population and economic growth remain the same and can be anticipated, as can their consequences in terms of the impact on urbanization and farm demographics.

Having said that, even amongst all this uncertainty it is possible to make some further predictions if only of a directional nature:

- Agribusiness will continue to be more volatile than it has been in the past
- It will become subject to ever more scrutiny driven by concerns over food safety, sustainable production and GM, as well as the general march towards increasing sustainability. There will be greater and more detailed traceability and labeling and a continued growth in certification schemes.
- Agricultural trade will continue to grow in absolute, and quite possibly also relative (to overall production) terms
- There will be more collaboration across different stages within the agribusiness chain which will lead to ever more integration. These collaborations will take many different forms. As part of this there will be a tendency to take a longer view
- Africa will increasingly be seen as an opportunity by players within the value chain
- The rate of innovation will continue at least at recent high levels
- Companies based in emerging markets will occupy an increasingly important place on the world stage

Whatever happens, agribusiness will remain an attractive and exciting sector for the foreseeable future.

Table 12: Examples of specific collaborations within and across sectors

	Input industries	Farmers	Traders	Food companies/ processors	Retailers	'Public sector'
Input industries	Bayer/AgraQuest BASF/Becker Underwood (CP) Monsanto/BASF (GM) Vilmorin/KWS (corn traits) Syngenta/Deere (Plene)	Monsanto's Integrated Farming Systems (IFS)	DuPont/Cargill (Plenish) DuPont/ADM (Plenish) BASF/Cargill (Canola oil)	DSM/Poet (Cellulosic ethanol) DuPont/Brion (Bioenergy) BASF/Pronovo Biopharma Syngenta/Bonanza Bioenergy Bayer Fresh produce alliances (240) DuPont/Japan Tobacco		SAGCOT Syngenta/CGIAR (Ug99) Syngenta/ EMPRAPA Arcadia/USAID
Farmers		Farmer cooperatives	'Outgrower schemes' Marubeni/ Sinograin Oils/ Shandong Liuhe Group (Animal feed)	Unilever has 3 million farmers in supply chain		
Traders			ADM/Wilmar Marubeni/ Gavilon ADM/GrainCorp	Cargill/Provimi Olam/ Rusmolco Unilever/Cargill (sustainable verified rapeseed oil)		Olam PPPs Cargill PPPs
Food companies				PepsiCo/Unilever Ardent Mills (Cargill, ConAgra/CHS)	ASDA/Forza Morrisons/ Farmer's Boy	Unilever PPPs Collaborations with certification organizations like Fairtrade/ Rainforest Alliance (e.g. Unilever, Mars)
Retailers						USAID

Colour coding: M&A; Co-operatives; JVs; Exclusive alliances; Non-exclusive alliances; Contracts

Source: KPMG International, 2013

Notes

Notes

Contact us

Global

Chris Stirling
Global Head of Life Sciences
KPMG International
T: +44 20 73118512
E: christopher.stirling@kpmg.co.uk

Willy Kruh
Global Chair, Consumer Markets
KPMG International
T: +1 416 777 8710
E: wkruh@kpmg.ca

Ian Proudfoot
Global Head of Agribusiness
KPMG in New Zealand
T: +64 936 75882
E: iproudfoot@kpmg.co.nz

UK

Liz Claydon
Partner, UK Head of Consumer Markets
KPMG in the UK
T: +44 20 76943483
E: liz.claydon@kpmg.co.uk

Chris Stott
UK Head of Agribusiness
KPMG in the UK
T: +44 113 2313825
E: christopher.stott@kpmg.co.uk

kpmg.com

kpmg.com/app

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